CAgE2015

PROGRAM BOOK

Conference on

AGRI-ENTREPRENEURSHIP DEVELOPMENT : ISSUES & TRENDS

Faculty of Agriculture, Universiti Putra Malaysia
26 - 27 January 2015

Jointly Organized by:

MESSAGE FROM VICE CHANCELLOR UNIVERSITI PUTRA MALAYSIA

On behalf of Universiti Putra Malaysia, I wish to welcome all participants and honoured guests of the Conference on Agri-Entrepreneurship Development: Issues and Trends (CAgE2015) jointly organized by UPM, PETA, FAMA, and our fellow partner universities UNEJ, USU, UNPAD, UB and TUA.

Universiti Putra Malaysia is a research university recognised as one of the leader university in the field of agriculture. With the advancement of technology in agriculture, it has attracted more entrepreneurs to enter agricultural-based ventures. This Conference is a reflection of the efforts by UPM and the co-organisers to discuss the issues pertaining to agri-entrepreneurship development particularly among the young graduates. This meeting is expected to pave the way for sharing of experiences and to enabling interactions with relevant experts in the field of agri-entrepreneurship from various countries, especially Malaysia and Indonesia.

There is a concern worldwide that in the current setting, the young generations are shying away from the agriculture industry. However, with the issues of food security, increasing urban population, unstable world economy, and increasing food prices, the governments are putting back their focus on enhancing agriculture sectors and enticing the younger generations to participate in the industry. The amount of research grant in the field of agriculture is also a significant factor in pushing the field into a higher ground. Interest in the agriculture sector is seen from the increasing number of applicants for agriculture-based programs in institutions of higher learning. With hard work, innovation, and active participation, the future of agri-entrepreneurship can indeed be a bright one.

I wish to all participants of this Conference to take this opportunity to learn from each country's experience and share the knowledge for future betterment in the areas of agri-entrepreneurship development.

AGRICULTURE. INNOVATION. LIFE.

Prof. Dato' Dr. Mohd. Fauzi Hj. Ramlan
Vice Chancellor
Universiti Putra Malaysia

MESSAGE FROM
DEAN
FACULTY OF AGRICULTURE
UNIVERSITI PUTRA MALAYSIA

On behalf of the Faculty of Agriculture, Universiti Putra Malaysia, I would like to extend a warm welcome to our guests of honour and participants of the Conference on Agri-entrepreneurship Development: Issues and Trends. This Conference is a reflection of the efforts by UPM and the co-organisers to lead in the development of entrepreneurship in agriculture sectors. This meeting is expected to pave the way for sharing of experiences and to enabling interactions with relevant experts in the field of agri-entrepreneurship.

It is through the recognition of the importance of agri-entrepreneurship in agricultural sector that drove UPM, PETA, FAMA, UNEJ, USU, UNPAD, UB and TUA to initiate the organising of this Conference.

I wish to thank on behalf of the organisers to Yg. Bhg. Dato' Vice Chancellor UPM for accepting to officiate this Conference, and all paper presenters and participants who were specially invited to this Conference. I hope the deliberations of this Conference will significantly contribute to our initiative to discuss, to learn and to share knowledge and technologies to push forward the development of agri-entrepreneurship in the agricultural sector.

I wish to also congratulate the Organising Committee for their teamwork and efforts for successfully holding this event. In the future I am sure that there will be more similar meetings organised on agri-entrepreneurship where more progress are made bearing the fruits from our efforts today.

Prof. Dr. Abdul Shukor Juraimi
Dean
Faculty of Agriculture, UPM

MESSAGE FROM CHAIRMAN ORGANIZING COMMITTEE

On behalf of the Organizing Committee of the Conference on Agri-Entrepreneurship Development: Issues and Trends (CAgE2015), I would like to convey our great pleasure and appreciation to all participants. Our committee and its advisory board has worked diligently to ensure all program activities for both days – 26th and 27th January 2015 prepared and goes smoothly. For this Conference, 64 papers were accepted for oral presentation and 30 papers will be chosen to be published in the Journal of Agribusiness Marketing and Malaysian Journal of Agricultural Economics. It takes a lot of effort among all team players to make this event a success.

There are 40 international participants and presenters joining this conference and I extend my utmost gratitude for their cooperation given prior to this event. It is hoped that during this Conference, all the participants will learn and share experiences, as well as establish their working network.

I also wish to thank all members of UPM's partner agencies and universities – PETA, FAMA, UNEJ, USU, UNPAD, UB and TUA for assistance rendered during the preparation of this Conference. Hopefully we can emulate events such as this yearly at different university in the future.

Prof. Dr. Zainal Abidin Mohamed
Chairman
Organizing Committee
CAgE2015

Opening Ceremony

Conference on Agri-Entrepreneurship Development: Issues and Trends (CAgE2015)

&

Agri-Entrepreneurship Incubation Program 2015

Dewan Pertanian
26 January 2015 (Monday)

10.30 am	-	Arrival of Distinguished Guests and Delegates
10.50 am	-	Arrival of YBhg. Prof. Dato' Dr. Mohd Fauzi Hj. Ramlan Vice Chancellor, UPM
11.00 am	-	Negaraku and Putra Gemilang
	-	Doa Recital
	-	Welcome address by YBhg. Prof. Dr. Abdul Shukor Juraimi Dean, Faculty of Agriculture, UPM
	-	Officiating address by YBhg. Prof. Dato' Dr. Mohd Fauzi Hj. Ramlan Vice Chancellor, UPM
	-	Handing Over Licensing Agreement of *Ayam Akar Putra* between UPM and APC Nature Farm Sdn. Bhd.
12.30 pm	-	Lunch
1.30 pm	-	End of ceremony

PROGRAM SCHEDULE

Monday (26 January 2015)

0800 – 0830 Registration
(Venue: Admin Building Foyer)

0830 – 1030 Concurrent Sessions
(Venue: Lecture Rooms)

1030 – 1100 Refreshment
(Venue: Admin Building Foyer)

1100 – 1200 Opening Ceremony
(Venue: Dewan Pertanian)

1200 – 1300 Lunch break
(Venue: Dewan Pertanian)

1400 – 1500 Plenary Discussion: Youth Empowerment and Agri-Entrepreneurship Development
(Venue: Dewan Pertanian)

1500 – 1630 Concurrent Sessions
(Venue: Lecture Rooms)

1630 – 1700 Refreshment
(Venue: Admin Building Foyer)

2000 – 2200 Conference Dinner
(Venue: Dewan Pertanian)

Tuesday (27 January 2015)

0830 – 1015 Concurrent Sessions
(Venue: Lecture Rooms)

1015 – 1030 Closing Ceremony
(Venue: Lecture Hall 1)

1030 – 1100 Refreshment
(Venue: Admin Building Foyer)

1100 – 1600 Tour to an agri-entrepreneur enterprise (for International Delegates)
(Assembly Point: Admin Building Foyer)

SCIENTIFIC PROGRAM

MONDAY (26 January 2015)			
0800 – 0830	Registration		
CONCURRENT SESSIONS			
	Session 1A **Production Economics** Chairperson: *Dr. Yodfiatfinda* Lecture Room 1	**Session 1B** **Agricultural Entrepreneurship Education** Chairperson: *Dr. Hasni Arief* Lecture Room 2	**Session 1C** **Agribusiness Economics and Management** Chairperson: *Tn. Hj. Rohizad Ridzwan* Lecture Room 3
0830 – 0845	Analysis of Factors Influencing Productivity of Aquaculture System Floating Net Cage at Lake Cirata(Case Study at Lake CirataSub-districtCianjur West Java Province) **Atikah N.**, Ine M., and Isni N. *(CAgE -15-402)*	Feasibility Analysis of Smallholders Coffee Plantation in Jember **Joni M. M. Aji1**, Julian A. Ridjal, Apriyanto D. Laksono, Ebban B. Kuntadi1, and Siswoyo H. Santosa *(CAgE -15-432)*	Farmers Awareness on New Local Feed Ingredients for Chick-en: Palm Kernel Cake **Siti Fatimah M.,** Zainalabidin M., Golnaz R. and Juwaidah S. *(CAgE -15-374)*
0845 – 0900	Output Supply, Input Demand and Efficiency of Paddy Farming in Peninsular Malaysia **Lira M.,** Mad Nasir S., Zainalabidin M., Ismail L. and Alias R. *(CAgE -15-411)*	Influencing Factors towards Students' Entrepreneurial Attitude at Universitas Sumatera Utara **Diana C.** and Arwina S. *(CAgE -15-400)*	Potential of Feed Mills Industry in Malaysia **Zakiah H. A.G,** Zainalabidin M., Ismail A.L. and Abu Hassan M. I. *(CAgE -15-383)*
0900 – 0915	Effectiveness of Microcredit Program for Small Business in Agro-Based Industry Among Rural Poor **Rika T.**, Zainalabidin M., and Jarir, H.H. J. *(CAgE -15-395)*	The Intention of BSEP Participants to Become Agri-Entrepreneurs **Muhammad Mu'az M.,** Zainalabidin M., Golnaz R. and Mad Nasir S. *(CAgE -15-408)*	Modelling of Boom and Bust of Cocoa Production Systems in Malaysia **Abragimov A.,** Fatimah M. A. and Bala B.K. *(CAgE -15-425)*

0915 – 0930	Designing A Model Development of Beef Cattle in West Java Indonesia **Rochadi T.** and Taslim *(CAgE -15-396)*	Brain Revolution in Malaysian Agri-Entrepreneurship: A Review **Muhammad Ali** and Norsida M. *(CAgE -15-427)*	Internal Reinforcement of Yoghurt Households Industry: A New Potential Micro Small Entrepreneur in Indonesian Urban Area **Yoni A.**, Hermawan S. and M. Rizal T. *(CAgE -15-377)*
0930 – 0945	Comparative Study on Rethurn to Technology and Scale in Broiler Industry **Ilmas A.**, MohdMansor I. and Kamal H. A. W. *(CAgE -15-426)*	Factors Influencing Students' Intention in Becoming Agri-Entrepreneur **Elina W. G.,** Golnaz R., Rika T. and Munirah J. *(CAgE -15-385)*	Implementation of Supply Chain Management in Mocav Cluster Agroindustry **Evita S. H.** *(CAgE -15-429)*
0945 – 1000	Profit Gap and Efficiency Measure of the Small-Scale Production of Shallot: The Case Study of Shallot Production in East Java Province - Indonesia **Sujarwo,** Michael R., Sayed S., and Nuhfil H. *(CAgE -15-388)*	Youth Empowerment Through Extension Education and Entrepreneurship Development in Nigerian Agriculture: Obstacles And Prospects for Improvements **Olatinwo K. L.,**Abdullilahi A. K. and Abu R. T. *(CAgE -15-370)*	Motor Cycle Role in Supporting Operating Sheep Farms and Marketing in the Southern District Tasik Malaya (Case Study in Gunung Kembar Farm Sheep Group at Ciroyom Village Bojong Gambir) **Maman P.** *(CAgE -15-392)*
1000 – 1015	The Indonesian Comparative Advantage on Food Crop Cultivation **Hery T.**, Tri Wahyu N. and Nuhfil H. *(CAgE -15-391)*	Theoretical Perspective of Incorporating Entrepreneurship in Agricultural Production **Nuhfil H.** and Sujarwo *(CAgE -15-386)*	Model of Economic Linkage between the Sulawesi Corridor and the East Java –East Kalimantan Province **Arman,** Setia H., Noer A. A., Akhmad F. and Yodfiatfinda *(CAgE -15-376)*
1015 – 1030	Competitiveness Analysis of Strategic Food Commodities in Lampung Province **Wan A. Z.**, Ali I. H., Eka K., and Novi R. *(CAgE -15-371)*	Intention towards Implementing Urban Agriculture Among City Dwellers **NurDalinna I.**, Juwaidah M., Zainalabidin M. and Golnaz R. *(CAgE -15-430)*	Nutritional Values of Swiftlet Guano: Evidence from the East Coast Economic Region, Malaysia **Azizon A.**, Wan Zahari .M. and Che Ku Amir Rizal C.K.M. *(CAgE -15-424)*
1030 – 1100	Refreshment		
1100 – 1200	Opening Ceremony (Venue: Dewan Pertanian)		

1400 – 1500	**Plenary Discussion:** "Youth Empowerment &Agri-Entrepreneurship Development" *Chairman:* Tn. Hj. Rohizad Ridzwan (FAMA) *Panelists:* Prof. Dr. Nuhfil Hanani (UB) Prof. Dr. Wan Abbas Zakaria (UNILA) Dr. Diana Chalil (USU) Dr. Sigit Soeparjono (UNEJ) Dr. Ismail Abd Latif (UPM)		
	Session 2A **Food Safety and Nutrition** Chairperson: *Prof. Dr. Nuhfil Hanani* Lecture Room 1	**Session 2B** **Economic and Social Development** Chairperson: *Prof. Dr. Wan Abbas Zakaria* Lecture Room 2	**Session 2C** **Food and Agricultural Marketing** Chairperson: *Dr. Diana Chalil* Lecture Room 3
1500 – 1515	Effects of Socio-Demographic Characteristics on Consumers' Purchase Intention towards Seaweed-Based Products in Malaysia **Nurliyana A.M.**, Juwaidah S., Zainalabidin M. and Golnaz R. *(CAgE -15-384)*	Visitors' Motivation to Visit, and Cultural and Heritage Attributes Towards the Overall Visitors' Satisfaction of Homestay Program in Selangor **Faizah S.**, Amin M. A., Alias R. and Ismail A.L. *(CAgE -15-413)*	Analysis of Processing Methods, Marketing Channels and Profitability Determinants of Selected Cassava Products in Kogi State, Nigeria **Ekpa D.**, Adeola S.S., Umar M and Ekpa M.O *(CAgE -15-368)*
1515 – 1530	Socio-Demographic Profile Role in Awareness and Preference Towards Natural and Synthetic Functional Food in Malaysia **Phuah K. T.**,Zainalabidin M.,Golnaz R., and Mad Nasir S. *(CAgE -15-379)*	Crafting Knowledgeable Ranchers to Consolidate The Sustainability of Edible-Nest Swiftlet Ranching Industry **Selvakkumar K.**N. V., Nitty H. K., Mad Nasir S., Ismail A. L. and Mohd Noor Hisham M. H.*(CAgE -15-416)*	Effect of Demographic Profile on Consumer Beef Preference **Sitihawa J.**, Golnaz, R., Juwaidah. S., Rika.T. and Zainalabidin, M. *(CAgE -15-380)*
1530 – 1545	Consumers' Willingness-To-Pay (WTP) for Organic Rice Based on their Socio-Demographic Profiles **Ibitoye O. O.**, Nolila M. N., Nitty H. K. and Norsida M. *(CAgE -15-410)*	Model of Development and the Enhancement of Medan Rattan Product Competitiveness **Ritha F. D.** andSetri H. S. *(CAgE -15-369)*	Identification of Technical Difficulties in Implementing Agility Using Cluster Analysis **MukherjeeA.**, Nitty. H.K, Mad Nasir S., and Ismail A.L *(CAgE -15-417)*

1545 – 1600	Effectiveness of Go Green Campaign: An Empirical Investigation on Intention to Purchase Green Food **MasoumehH.**, Zainalabidin M., Golnaz R., Mad Nasir S., and Ismail A. L. *(CAgE -15-409)*	Posdaya (Family Empowerment): A Concept of Family Entrepreneurship to Boost Rural Area Development in the West Java Province-Indonesia **Yodfiatfinda,** Maulidian and Yoni A. *(CAgE -15-372)*	Factors Influencing Consumer's Retail Formats Choice for Fresh Fruits Purchase in Klang Valley Malaysia **Abdullahi A.G.**, Amin M. A., MohdMansor I., Nolila M. N. *(CAgE -15-407)*
1600 – 1615	Consumers' Awareness towards Food Label in Kelantan **ZulAriff A.L.** *(CAgE -15-404)*	Poor Farmers Empowerment Model through Entrepreneurial Development in North Sumatra Province **Rahmanta** *(CAgE -15-373)*	Integrated Farming System between Cassava and Sheep **Hasni A.**, Iman H., Mansyur and Siti N. *(CAgE -15-393)*
1615 – 1630	Factors Underlying Food Choice Motives Among Malaysian Adults **Ismawati S.**, Zainalabidin M., Golnaz R., Mad Nasir S., and Juwaidah S *(CAgE -15-378)*	Perception of the Gazettement of Marine Park Area of Pulau Tinggi and Pulau Sibu and its Implications on Local Community **NurAmalina H.**, Nitty, H.K, Ismail A.L. and Yusoff, F.M. *(CAgE -15-414)*	Understanding the Knowledge of Aflatoxins Contamination in Peanut-based Products among Stakeholders: Manufacturer's Perspective **NurNazurah M. A.**, Nitty H. K., Mad Nasir S. and Jinap S. *(CAgE -15-412)*
1630 – 1700	Refreshment		
2000 – 2200	Dinner (Venue: Dewan Pertanian)		

TUESDAY (27 January 2015)			
	Session 3A **Production Economics** Chairperson: *Dr. Evita Soliha Hani* Lecture Room 1	**Session 3B** **Entrepreneurship and Economic Development** Chairperson: *Dr. Tavi Supriana* Lecture Room 2	**Session 3C** **Food and Agricultural Policy Analysis** Chairperson: *Dr. Sigit Soeparjono* Lecture Room 3
0830 – 0845	Determinants Analysis on the Development of Smallholders Dairy Cattle in West Java **Cecep F.**, Andre R. D., and Sri Rahayu *(CAgE -15-394)*	Analyzing Entrepreneurship among Organic Paddy Farmers in North Sumatera **Diana C**. and Riantri B. *(CAgE -15-399)*	Rock And Roll Never Dies: The Potential Growth of Cocoa Industry in Malaysia **ChakrinUtit** and Mohdyusof S. *(CAgE -15-421)*
0845 – 0900	Malaysian Palm Oil Forecasting Model and Econometric Validation Tests **WongK. K. S**., Mad Nasir S., Zainalabidin M., JuwaidahS. *(CAgE -15-398)*	Engineering of Agricultural Cooperative Enhancing Competitiveness based on Agro-preneur Human Resources **Suhartini,** Fahriyah, Rosihan A. *(CAgE -15-387)*	Cost and Return of Poultry Subsector in Competitive Market Environment **ZulianaZ.** A.,Ismail A. L.,Zainalabidin M., and Abu Hassan M. I. *(CAgE -15-406)*
0900 – 0915	Analysis of the Technical Efficiency of Rice Farms in Madiun District, Indonesia - A Stochastic Frontier Analysis **Syafrial,** Hery T.,Rosihan A. and Abdul W. M. *(CAgE -15-390)*	The Role of GMP Awareness and Certification in Determining the Entrepreneurs Intention towards Green Practices in Malaysia **Viduriati S.**, Golnaz R., Zainalabidin M., Mad Nasir S. and Juwaidah S. *(CAgE -15-375)*	A Market Model of the Malaysian Cocoa: An Impact Assessment of the Palm Oil Prices **AmnaAwad A. H.** and Fatimah M. A. *(CAgE -15-420)*
0915 – 0930	The Technical Efficiency (TE) of Mango Farmer in Perlis, Malaysia **Salina M.**, Juwaidah S., Ismail A. L. and Nolila M. N. *(CAgE -15-418)*	Developing Green Economy Prototype for Reducing Population Pressure on Land through the Development of Agroforestry Agroeco-business, The Case Study at Spillway Outlet Cirata Reservoir Upper Citarum River Basin on West Java Province in Indonesia **Engkus K. W.** (CAgE -15-397)	Awareness and Knowledge of Agriculture Fresh Produce Traceability among Producer and Wholesaler in Malaysia **Juliana R. S. J.,** Norsida Man and Ismail A. L. *(CAgE -15-428)*

0930 – 0945	Enduring the Storm for Survival: Export Competitiveness of Malaysian Cocoa **Che Ku Amir R. C. K.** M., Kusairi M. N. and AlliaFarhanna R. *(CAgE -15-428)*	Critical Success Factors in Enhancing Beef Production of Various Farming Systems **Rafidah Y.,** Juwaidah, S., and Golnaz, R *(CAgE -15-382)*	Cost Analysis of Rice Milling: A Case Study of 7 Rice Mills in Malaysia **Bonhee C.**, Fatimah M. A., KusairiMohd N., ShaufiqueF.S. *(CAgE -15-423)*
0945 – 1000	Technical Efficiency Measurement by Data Envelopment Analysis: An Application in Open System Broiler Farms of Peninsular Malaysia **Kamal H.A. W.** and MohdMansor I. *(CAgE -15-415)*	The Sustainability of the Robusta Coffee Farming at the Southern Area of Lumajang Regency East Java Province **Soetriono** *(CAgE -15-419)*	The Role of Rural Institutions on Food Security Policy in East Java Province **Nuhfil H.,** Rosihan A. and Fahriyah *(CAgE -15-389)*
1000 – 1015	Revealed Comparative Advantage of Cocoa Products: Selected ASEAN Countries **Nurhafizah M.**, Allia F.R and Kusairi M. N. *(CAgE -15-422)*	Economics of Small-Ruminant Marketing in Northwest Nigeria: Analysis of Price Determinant **Umar A. M.** *(CAgE -15-403)*	Food Security Challenges in Nigeria: A Paradox of Rising Domestic Food Production and Food Import **Haruna U.**, Ahungwa G. T., Abdullahi M. A. and Muktar B.G. *(CAgE -15-405)*
1015 – 1030	Closing Ceremony (*Venue: Lecture Hall 1*)		
1030 – 1100	Refreshment		
1100 – 1600	Tour to an agri-entrepreneur enterprise (for International Delegates)		

INFLUENCING FACTORS TOWARDS STUDENTS' ENTREPRENEURIAL ATTITUDE AT UNIVERSITAS SUMATERA UTARA

Diana Chalil[1] and Arwina Sufika
Universitas Sumatera Utara
Medan, Indonesia
[1] Corresponding email: ana.ch@lycos.com

Abstract

In 2012-2013, BPS recorded more than 600,000 open unemployment from university graduates. The aim of this study is to analyze influencing factors towards students' entrepreneurial attitude. Data was obtained from 121 USU students from various faculties and study programs, by using a structured questionnaire. Of the 121 samples, 21 of them did not completely answer the question, thus were not included in the estimation and were subsequently analyzed. The attitude is measured by 4 factors namely (1) their orientation after graduation, (2) students' perceptions of success determination, (3) the tendency to be action oriented, and (4) the level of innovativeness. Influencing factors consist of 3 groups namely (1) motivation that includes financial need, work challenge and the need to be recognized, (2) competence that includes the ability to identify opportunities, the ability to cope with stress, the ability to cope with problems, the ability to cope with uncertainty and the ability to deal with failure, and (3) personality which consists of self confidence, leadership and the totality in working. The linear estimation result shows that of the 11 independent variables, only 3 significantly influence the independent variable, namely the challenge of work, the ability to deal with failure and the totality of work. All of them have positive signs, with a value of 0.419, 0.067 and 0.409, respectively.

Keywords: entrepreneur, attitude, motivation, competency, students' personality

Introduction

In 2013, five ministries in Indonesia have agreed to develop entrepreneurship to address the unemployment problem. Ministry of Manpower and Transmigration targeted the creation of 10,000 new entrepreneurs annually. One of the targets is educated unemployment in urban areas, including those from the college graduates (Kemenakertrans, 2013). In 2012-2013, BPS (2014) recorded more than 600,000 open unemployment from university graduates. Such a condition does not merely stem from the lack of job opportunities, but is also caused by the high interest of college graduates to find a job rather than to create ones. This indicates that students' attitude towards entrepreneurship is still minimum; although a number of entrepreneurship programs have been conducted at various universities, including Universitas Sumatera Utara. For example, as a complement to many entrepreneurial programs that have been there before, since 2009 the Government through the Directorate General of Higher Education, Ministry of Education and Culture has launched the Student Entrepreneurial Program (PMW) to be implemented and developed by universities. The program is implemented in the entire State University (PTN) and in some Colleges (PTS) selected results Coordinator of Private Universities (Kopertis). However, after evaluating the program in Universitas Hasanuddin, Makassar, Indonesia, Yusuf (2012) stated that implementation of the program is not effective. The Indonesian Ministry of Manpower and Transmigration claimed that one of the problems might stem from the university curriculum that does not focus on the creation of strong entrepreneurs (detik.com, 2012).

In USU, entrepreneurship education is divided into curricular and extracurricular education. Curricular education is implemented in entrepreneurship courses, while extracurricular is in all activities carried out by a number of supporting units in the Bureau of Student and Alumni. In early 2008, USU sent its staff for a fostering entrepreneurship in students- comparative study to

the five universities in Malaysia. The results of the visit was the formation of USU Student Entrepreneurship Center (SEC) USU. Conducting a comparative study in three countries, namely Indonesia, Japan and Norway Indarti and Rostiani (2008) found that education is a major influencing

factor of the Indonesian students' entrepreneurship intensity. Similarly, Thomson (2004) argues that entrepreneurship education can effectively improve various entrepreneurial characteristics.

Kazemi and Manandar (2012) suggested that entrepreneurship has a number of dimensions including creativity, inner control (independency), leadership, dealing with ambiguity and uncertainty, need for achievement, personal control, innovation, self-confidence, attitude toward self-efficacy, inner control, creativity, leadership, intuition attitude toward earning money, competition (rivalry), risk taking, self-effectiveness, differentiability, and inner independency.

Using respondents' perception of 4 entrepreneurial attitudes determinants namely leadership, creativity, need for achievement and interior control they find that the level of entrepreneurial level of athlete students in Tehran, Iran is above average. No demographic variables such as gender, having a self-employed father, employment status of mother, and the type of university have significant impact on the level of entrepreneurial attitude in students.

In contrast, using Structural Equation Model, Yang (2013) find that gender and parents' entrepreneurial experience have significant impacts on Chinese undergraduates' entrepreneurial attitude, subjective norms, perceived behavioral control, and entrepreneurial intention. Yang suggests effective entrepreneurship education could significantly enhance perceived behavioral control and entrepreneurial intention. Similarly, Schwarz *et al* (2009) and Rasli *et al* (2013) suggest that educators and practitioners may influence individuals' entrepreneurial attitudes by influencing individual desire for achievement, risk taking propensity, internal locus of control, or improving their innovativeness. In Austrian and Malaysian student cases, university courses on entrepreneurship and small business management as well as incubators located on campus appear to be crucial for waking students' enthusiasm and interest in business ownership. The aim of this study is to analyze the influencing factors towards students' entrepreneurial attitude.

Method

This research was conducted at USU, which is one of the universities that have continuously implemented entrepreneurship programs for students. Since 2009 USU has a Student Entrepreneurship Center. USU Students also follow and receive entrepreneurial grants from the Directorate General of Higher Education. USU has also established various collaborations with private companies and government institutions in developing entrepreneurship programs.

Data was obtained from 121 USU students from various faculties and study programs, by using a structured questionnaire modified from those in the Business Development Bank of Canada (BDC) website www.potentielentrepreneur.ca/client/ QuestionnaireNew Section11En.asp.

Sampling was conducted by a convenient sampling method. The population is students who have known entrepreneurship either through lectures or as participants in various entrepreneurship programs and activities in USU. Of the 121 samples, 21 of them did not completely answer the question, thus were not included in the data estimation.

The data was then analyzed with multiple regression model with entrepreneurial attitude as the dependent variable and 11 independent variables grouped in motivation, competencies and personality factors

The attitude is measured by 4 factors namely (1) their orientation after graduation, (2) students' perceptions of success determination, (3) the tendency to be action oriented, and (4) the level of innovativeness. The information is collected through 8 questions. Each of these factors has a score of 1 to 4, with 1 reflecting the "very low", while 4 is "very high". By dividing the range of the minimum and maximum total scores in 3 intervals, these 4 factors were classified into the"less supportive", "moderately supportive" and "very supportive" entrepreneurial attitude.

Influencing factors consist of 3 groups namely (1) motivation that includes financial need, work challenge and the need to be recognized, (2) competence that includes the ability to identify opportunities, the ability to cope with stress, the ability to cope with problems, ability to cope with uncertainty and ability to deal with failure, and (3) personality which consists of self confidence, leadership and the totality in

working. Dewi *et al*. (2012) and Sukmana (2008) find that motivation can encourage a person to overcome problems in achieving goals and improving performance. All of the information about these independent variables is collected through32 questions. Similar with the dependent variable, each of these 11 independent variables also has a score of 1 to 4. The total score of each group is also divided into 3 levels. The influencing factors are then estimated Ordinary Least Square (OLS) Method.

( ) ; i=1,1,...,11

in which y is the entrepreneurial attitude, x are the independent variables, β the coefficient regressions of each of the independent variables and ε is the error term. The model specification is determined through the Ramsey Linearity Test. The usage of OLS method is justified through the 3 classical tests namely Park Test, VIF Test and Uji Durbin Watson Test for homoscedasticity, multicollinearity and autocorrelation, respectively.

Results and Discussion

The data shows that from the total 100 samples included in the estimation, 76% are female students and 24% are male students. Among them, 42% comes from the social faculties and the rest (58%) from science. The description of the dependent and independent variables are as follows.

The total score of their answers about the dependent variable, entrepreneurial attitude shows that only 2% of the total samples are classified into the "less supportive", while 77% and 21% are "moderately supportive" and "very supportive" entrepreneurial attitude, respectively. In particular, only 5% of the total respondents intend to find a job after graduation, while 95% still seek opportunities to start their own business while looking for a job, but none of the respondents solely focus on starting their own business. More than 90% of them tend to be action-oriented and innovative. However, among them more than 50% also believe that luck and destiny influence their success considerably.

The total score of their answers concerning the independent variables motivation and personality shows that samples tend to have "moderate" motivation and entrepreneurial personality; with 7%, 75% and 18% have the "low", "moderate" and "high" motivation, respectively, and 1%, 80% and 19% have the "less supportive", "moderately supportive" and "very supportive" personality, respectively. Respondents are more motivated by the entrepreneurial work challenge and the need to be recognized than the encouragement of financial needs. 75% and 96% of respondents prefer to be involved in a new project and activities that are valued by wider community. 93% of the respondents have almost never experienced serious financial problems that make them need to earn extra income. Furthermore, 62% of the total samples still live with their parents. In terms of personality, 82% of respondents have an above average level of confidence and 92% have an above average level of working totality. However, only 53% of the total respondents have fairly good leadership. The total score of their answer concerning the

other independent variable, competencies, shows that samples tend to have a high level of competency; none of them belong to the low competence and only 6% were moderate, while the rest 94% was recorded as the high competence. Nearly 80% of the respondents have a fairly good ability to identify opportunities and to cope with problems, and even 89% and 97% have a fairly good ability to cope with uncertainties and to cope with failure. They are only still not good in the ability to cope with stress, in which 55% of them still have low score.

The influences of the independent variables to the dependent variables are estimated through the multiple linear regression model. The linear regression equation is used based on the Ramsey-Test of a significance 0.52, indicating that the linear model fits to the estimated data sets. In addition, the three classic assumption namely the homogeneity, multicollinearity and autocorrelation tests are conducted as a requirement in using the Ordinary Least Square Method. Graphically, the residuals regression does not have any particular pattern. The Park Test result also shows that only 1 of the 11 independent variables has a significance value less than 5%. Therefore it can be said that there is no serious problem of heteroscedasticity. The result also shows that all independent variables have VIF values less than 2, indicating that the regression is also free from multicollinear problem. The Durbin-Watson test has a

value of 1.86, which still lies in the "doubtful range", but since it is very close to 1.90 (the border of the "no correlation range"), it can be concluded also that there are no serious autocorrelation problem in the regression. The results are as follows.

Table 1. Estimation Results of the Multiple Linear Regression

Variables	Unstandardized Coefficients		t	Sig.	VIF
	B	Std. Error			
Constant	8.991	2.922	3.077	.003	
Financial Needs	.207	.356	.581	.562	1.077
Work Challenge	.419	.133	3.158	.002	1.238
Need to be Recognized	.614	.399	1.539	.127	1.123
Ability to Identify Opportunities	.155	.229	.675	.501	1.400
Ability to Cope with Stress	-.034	.121	-.286	.776	1.138
Ability to Cope with Problems	.213	.156	1.369	.174	1.336
Ability to Cope with Uncertainty	-.247	.178	-1.391	.168	1.084
Ability to Cope with Failure	.442	.239	1.852	.067	1.392
Self Confidence	.014	.099	.144	.886	1.790
Leadership	.095	.118	.810	.420	1.199
Totality in Working	.409	.196	2.082	.040	1.264
F test	4.265				
significance	0.000				
R^2	0.348				
Adjusted R^2	0.266				

Table 1 shows that of the 11 independent variables, only 3 significantly influence the independent variable, namely the challenge of work, the ability to deal with failure and the totality of the work. All of them have positive signs, with a value of 0.419, 0.067 and 0.409, respectively. The significant and positive sign of “challenges of work” might be related to the age range of the samples, which in between 19 and 23 years. In general, youth are attracted with challenging activities. In this case, 25% of the total samples are “not too fond” of the work challenge, 65% “moderately love” challenge, and only 10% who “really love” it. With a range of 8 scores between each of the low, medium and high level of the entrepreneurial attitude, respondents need an increase minimum 1 score and maximum 8 scores to improve their entrepreneurial attitude from low to moderate or from moderate to high.

The "challenges of work" regression coefficient of 0.419 shows that a unit increase in the score of "challenges of work" will increase the score of the entrepreneurial attitude 0.419. In other words, a unit and 8 scores unit of the entrepreneurial attitude increase will need 2.39 and 19.09 score increase in the "challenges of work" score. With a range of "challenges of work" low, medium and high respectively by 4, it can be concluded that the increase of the "challenges of work" from low to moderate or from moderate to high can improve the attitude of the respondents from low to moderate or from moderate to high. The "ability to deal with failure" regression coefficient of 0.067 shows that a unit increase in the score of "ability to deal with failure" will increase the score of the entrepreneurial attitude by 0.067. In other words, a unit and 8 scores unit of the entrepreneurial attitude increase will need 14.92 and 119.40 score increase in the "ability to deal with failure" score. With a range of "ability to deal with failure" low, medium and high respectively by 2, it can be concluded that although significant, the impact to the entrepreneurial attitude is so small, hence could be seen as no improvement at all. The "totality of the work" regression coefficient of 0.409 shows that a unit increase in the score of "totality of the work" will increase the score of the entrepreneurial attitude 0.409. In other words, a unit and 8 scores unit of the entrepreneurial attitude increase will need 2.44 and 19.56 score increase in the "totality of the work" score. With a range of "totality of the work" low, medium and high respectively by 2, it can be concluded that the increase of the "totality of the work" from low to moderate or from moderate to high can improve the attitude of the respondents from low to moderate or from moderate to high.

Except these 3 variables, the estimation result shows that other 8 independent variables namely financial needs, need to be recognized, ability to identify opportunity, ability to cope with stress, ability to cope with problems, ability to cope with uncertainty, self confidence and leadership do not significantly

influence the samples' entrepreneurial attitude. 4 of these insignificant variables are in the competencies group, which in fact appear to have moderate to high level. Unfortunately, this estimation shows that these competencies does not significantly influence the attitude, thus explaining only 21% of the total samples reach the "highly support" entrepreneurial attitude. Theoretically, Mitzhelmore and Rowley (2010) suggested that competencies, say the ability to identify niche market, is one of the factors that determine the success of an entrepreneur. Many programs in the universities, including in USU, are designed to improve this ability, and in this case, 77% of the total samples have such an ability. However, Mitzhelmore and Rowley (2010) also find that besides competencies, an entrepreneur also needs the ability to build good human relations. Similarly, based on their empirical study, Kovac *et al*. (2010) suggest that besides competencies, such as knowledge and skills, entrepreneur also need to maintain good emotions and attitude.

Such factors have not been included in this study. These factors might be significantly influence and explain the students' entrepreneurial attitude, because the adjusted R^2 in this study is still 0.266, showing that only 26% of the entrepreneurial attitude variations can be explained by the 11 independent variables included in the equation. The rest 74% of the variation will be explained from other independent variables that have not been included yet. Previous studies show that the estimation of entrepreneurial intention or attitude is a complex condition with a wide range of influencing variables. In addition, many variables are not well-defined. Competencies, for examples are interchangeable with the skills, knowledge and expertise, hindering the clarity in practical applications and implementations (Mitzhelmore and Rowley, 2010). Similar problems found in Jaen and Linan (2013) study that uses data from 3223 respondents, and incorporate 11 independent variables. Their estimation results only have 0.404 of R^2 value. Solesvik (2013) showed that one possible solution could be inserting mediating variables. In his study, including the mediating variables, namely subjective norm and perceived behavioral control, significantly increase the adjusted R^2 value.

Conclusion

In conclusion, samples of this case have entrepreneurial potential, shown by the 98% who have the moderate and high supportive of entrepreneurial attitude. This is influenced by 3 factors namely the motivation of having challenge of work, the ability to deal with failure and their totality of the work. This potential can be developed by improving the existing curriculum and entrepreneurship training at Universitas Sumatera Utara. This can be done, for example, by integrating the research activities with entrepreneurship, so the results are not only useful for academic purposes but can also be used for business purposes (Rahayu & Fitriati, 2013). Of course, this needs to be supported by all involved parties, including lecturer, facilitator, and the university policy makers.

References

BPS (2014). Pengangguran Terbuka Menurut Pendidikan, Retrieved October 30, 2012 from http://www.bps.go.id/tab_sub/view.php?kat=1&tabel=1&daftar=1&id_subyek=06&notab =4.

detik.com (2012). Cak Imin: Ada 3 Masalah dalam Mengembangkan Wirausaha, Retrieved January 02, 2015 from http://finance.detik.com/road/2012/12/25/121916/2126270/4/cak-imin-ada-3-masalah-dalam-mengembangkan-wirausaha

Dewi, E. *et al.* (2012). Pelatihan Motivasi dan Kewirausahaan bagi Tim Penggerak PKK Kelurahan Rawasari, Kecamatan Kota Baru Kota Jambi. *Jurnal Pengabdian pada Masyarakat* 52. Universitas Jambi.

Indarti and Rostiani (2008). Intensi Kewirausahaan Mahasiswa: Studi Perbandingan antara Indonesia, Jepang dan Norwegia. *Jurnal Ekonomika & Bisnis Indonesia*, 23(4).

Jaen, I. and Linan, F. (2013). Work Values in A Changing Economic Environment: The Value of Entrepreneurial Capital. *International Journal of Manpower*, 34 (8), 939-960.

Kazemi, R.M. and Manandar, S. (2012). Identifying the Factors Affecting Entrepreneurial Attitude of Athlete & Non-athlete University Students. *Information Management and Business Review*, 4 (6), 352-361.

Kemenakertrans (2013). Kemenakertrans Latih 10.000 Calon Wirausaha Mandiri, Retrieved December 29, 2014 from http://disnakertranstebo.com/2013/11/kemenakertrans-latih-10000-calon.html

Kovac et al. (2010). Entrepreneurial Conative Components of Competencies: The Case of Slovenia. *Organizacija*, 43 (6).

Mitzhelmore, S. and Rowley. J. (2010). Entrepreneurial Competencies: A Literature Review and Development Agenda. *International Journal of Entrepreneurial Behavior and Research*, 16 (2), 92-111.

Rahayu, A.Y.S. & Fitriati, R. (2013). Change in Student Mindset toward Entrepreneur an Action Research. *International Journal of Administrative Science & Organization*, 20 (2).

Rasli *et al*. (2013). Factors Affecting Entrepreneurial Intention Among Graduate Students of Universiti Teknologi Malaysia. *International Journal of Business and Social Science* 4 (2), 182-188.

Sukmana, U.D. (2008). Peran Pendidikan Kewirausahaan dalam Menumbuhkan Motivasi Wirausaha. *Equilibrium* 4 (8).

Schwarz, E.J. *et al*. (2009). The Effects of Attitudes and Perceived Environment Conditions on Students' Entrepreneurial Intent: An Austrian Perspective. *Education + Training* 51 (4), 272-291.

Solesvik, M.Z. (2013). Entrepreneurial Motivations and Intensions: Investigating the Role of Education Major. *Education + Training*, 55(3).

Thomson, J.L. (2004). The Facets of The Entrepreneur: Identifying Entrepreneurial Potential, *Management Decision* 42 (2), 243-258.

Yang, J. (2013). The Theory of Planned Behavior and Prediction of Entrepreneurial Intention Among Chinese Undergraduates. *Social Behavior and Personality*, 41(3), 367-376.

Yusuf, A.T. (2012). Evaluasi Program Mahasiswa Wirausaha di Universitas Hasanuddin, Retrieved January 02, 2015 from http://repository.unhas.ac.id/bitstream/handle/123456789/2086/Andi%20Taufiq%20Yusuf%20E211%2008%20264.pdf?sequence=1

ANALYZING ENTREPRENEURSHIP AMONG ORGANIC PADDY FARMERS IN NORTH SUMATRA

Diana Chalil[1] and Riantri Barus
Universitas Sumatera Utara
Universitas Nusa Bangsa
[1] Corresponding email: ana.ch@lycos.com

Abstract

Currently, with the increase in health and environmental awareness, organic rice demand is likely to increase. This could be an opportunity for organic paddy farmers to improve their income. However, this could only be realized if the farmers have the entrepreneurial ability to manage the dynamics of the organic rice agribusiness system. The aim of this study is to analyze the entrepreneurship among organic paddy farmers in North Sumatra. Data were collected from depth interview with 45 organic, semi organic and conventional paddy farmers, and analyzed with Structural Equation Model (SEM). The level of entrepreneurship is formed by 4 possible factors namely networking, the ability to identify and solve problems, reasons to become a paddy farmer and risk taking behavior. The factor loadings indicate that among them only networking and risk taking behavior appear to be important. Four possible variables namely land size, level of education, age and cosmopolitan level are included in the model. The estimation result shows that only cosmopolitan level significantly influences the entrepreneurial level.

Keywords: entrepreneurship, organic paddy farmers, networking, risk taking

Introduction

Rice is the staple food for the majority of Indonesians. With a population of 237 million, Indonesia is known as the world's largest rice consumer. As a strategic commodity, rice market in Indonesia is often interfered by the Government. However, this is not prevailed in the organic rice market. Therefore, organic rice producers could have the opportunity to gain potential profits that are likely to increase with the increase in consumer awareness of health and environment. Reviewing a number of empirical previous studies Siregar (2014) found that the majority of consumers are willing to pay premium prices for organic products. In the city of Morogoro, Tanzania, 78% of respondents are willing to pay premium prices because of the environmental and health benefits they receive by consuming organic products. In Kathmandu, 58% of the respondents are willing to pay 6%-20% more expensive for organic products, while in Indonesia consumers are willing to pay 65% more expensive than the actual organic products' market price.

However, this potential extra benefit could only be realized if organic rice producers have the ability to manage the dynamics in the organic rice agribusiness system. In general, having the time lag between cultivation and maturation, and being perishable, agricultural commodity price fluctuations are relatively high. Moreover, the high dependency on uncontrollable factors such as climate and land suitability requires farmers to continuously make decisions not only based on the existing condition but also on the expectation and prediction of the future conditions Meridith *et al.* (1982 in Husin *et al*. (2012) state that entrepreneurs are characterized by their ability to predict the opportunities in the future. The organic rice market in Indonesia is still slowly developing. In North Sumatera, only 3 villages are recorded as organic paddy farming area. They are Desa Lubuk Bayas, Kabupaten Serdang Bedagai, Desa Namu Landor, Kabupaten Deli Serdang and Desa Laguboti, Kabupaten Toba Samosir, with an area of 21 ha, 2.5 ha and 20 ha, respectively (BITRA, 2013). Among them, Serdang Bedagai has the largest area, but only consists of 13 organic rice farmers.

Husin *et al.* (2012) show that in Malaysia, environmental considerations appear to be one of the entrepreneurial drivers in the agricultural sector. Farmers find that environmental friendly products, such as organic products give higher profit but with more challenges than non organic ones (Vonne *et al*., 2003). Moreover, the demand for environmentally friendly goods tends to keep increasing in the future (James and Stellingwerf, 2012). To analyze such a condition, this study was conducted to identify the characteristics of entrepreneurship among organic rice farmers in Sumatera Utara.

Method

This study is was conducted at Desa Lubuk Bayas, Kecamatan Perbaungan, Kabupaten Serdang Bedagai, which appear to be the largest organic paddy farming in North Sumatra. Data are collected through 13, 12 and 20 organic, semi organic and conventional farmers, respectively. Organic farmers are determined through census sampling method, while the semi organic and conventional farmers are determined with convenient sampling method. The data are then analized with Kruskal Wallis Test and Structural Equation Model (SEM). In the Kruskal Wallis Test, the data are divided into 3 groups namely the organic, semi organic and conventional farmers, while in the SEM estimation all of them are used to estimate a single model.

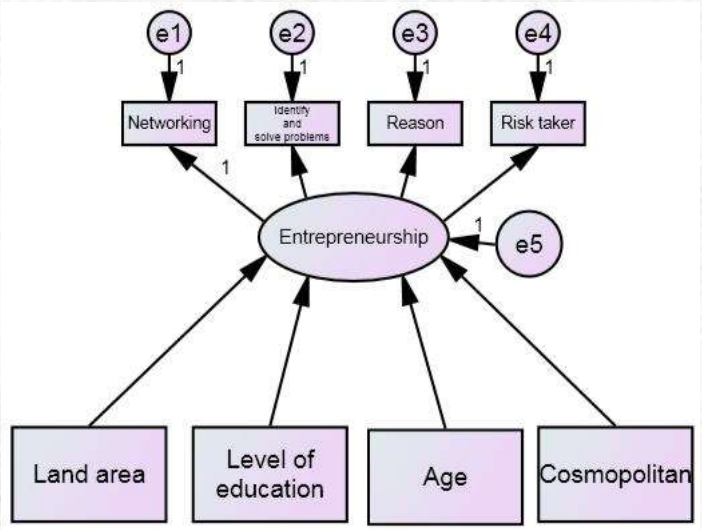


Figure 1. Indicators and Variables in the Structural Equation Model

Entrepreneurial attitude is measured by (1) networking, (2) the ability to identify and solve problems, (3) the reason to choose farming and its commodity, and (4) the attitude towards risk. Networking is assessed from the relationship and involvement of farmers with farmer group, agricultural extension, agricultural agencies and rice millers. The ability to identify and solve problems includes problems in production, selling price, availability and price of inputs. Traikova *et.al* (2012) call these as push and pull factors in deciding to start a business. Push factors emphasis on meeting the financial needs, while pull factors refer to the utilization of opportunities for business development. Risk takers associate with farmers' decisions to cultivate new commodities and to invest, or to distribute risk through product diversification or having side jobs. Nowadays, farmers tend to face a higher risk because of the higher uncertainties either in the input and output volatility, climate change, international trade restrictions or more stringent food safety standards (Broll *et al*., 2013). Each component of these factors was scored with the lowest value for the most inappropriate, while the highest for the most appropriate condition in accordance with the entrepreneurial characteristics. The total scores were then divided into low, medium and high level of entrepreneurship, with a 30% interval of the total range between the minimum and maximum scores. The importance of each of these factors to the farmers' entrepreneurship level is determined through their loading factor values, which is the correlation of the variable and the factor. The square of the loading factor values are the interpreted as the contribution to the entrepreneurship level variance. Factor loading in between 0.3 and 0.4, 0.4 and 0.5 and greater than 0.5, which equals to a 9% and 16%, 16% and 25%, and greater than 25% variance, considers as minimum, more important and significant (Hair et al, 1998,

p.111). Finally, difference in entrepreneurship level among farmers' groups was analyzed with the Kruskal-Wallis Test.

To analyze the influencing factors for entrepreneurial characteristics, 4 independent variables namely (1) land area, (2) education, (3) age, and (4) the level of cosmopolitan were regressed to the dependent variable using the Structural Equation Model. Farmers' cosmopolitan level is measured with the frequencies of participating exhibitions, taking trips outside their village to search for information related with their business, or actively looking for the information in newspapers or televisions. The Goodness of Fit of the model is justified with the Values of Chi Square, CFI and RMSEA.

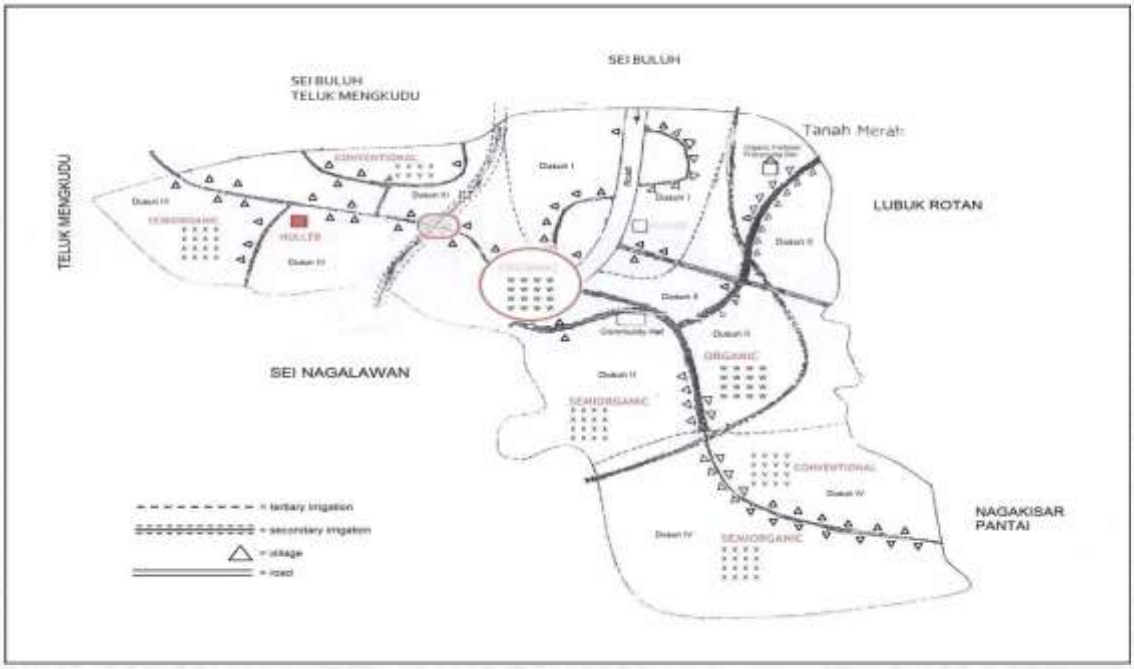
Results and Discussion

The results on the four independent variables influencing entrepreneurial characteristics are as follows. Concerning land space, on average farmers in Desa Lubuk Bayas own less than 1 ha of land area, with 0.54 ha, 0.71 ha, and 0.78 ha of the organic, semi-organic, and conventional ones, respectively. Many farmers only use a small part of their land area to cultivate organic rice for family consumption, as they realize organic rice is good for health, but consider that the risk is still too high while the benefit is still unclear. On education, all farmers have only finished their junior high school formal education. In general, farmers are still in the productive age with an average of 46 years. The development of organic rice in Lubuk Bayas is supported with a leader farmer, Mr. Kamaruddin's entrepreneurship, who tries to make the organic rice farming as a profitable business. For example, Mr.Kamaruddin differentiates organic rice by applying different labels. By doing this, the rice can be sold with a higher price, with a range of Rp9.000,- to Rp15,000,- per kg (US$0.72 – US$1.2) In addition, Mr Kamaruddin also tries to provide organic pesticide, so that there is no constraint for the paddy farmers in Lubuk Bayas to apply the organic farming system. Loans for farmers to pay their previous chemical fertilizer usage and substitute to organic farming systems are also provided (Chalil, 2014).

The result shows that farmers' entrepreneurial attitude level is still low, although that of the organic farmers is higher than the semi-organic and conventional farmers. In detail, 53.85% of organic rice farmers are within the moderate level, and 46.15% are within the low level of entrepreneurship. Semi-organic farmers have 50% each for the low and medium entrepreneurship levels, while all conventional farmers have low entrepreneurial level. Kruskal-

Wallis Test shows that the difference is significant at α 5%. The data shows that the main factor that effects entrepreneurial attitude level among groups is the networking system. Organic farmers tend to be more active and have broader networking and are slightly more cosmopolite than the others, with total cosmopolitan scores of 6.80, 9.00 and 9.23 for the conventional, semi organic and organic farmers, respectively. The estimation indicates that organic farmers have higher score because they are more active in attending exhibitions.

In addition, conventional and semi organic farmers have low risk taking value, reflecting by their reluctance to change to the organic farming system. Although organic rice is priced higher than its non-organic counterpart, the price difference is not enough to compensate the relatively low organic paddy productivity in the first three years, even though the selling price could be higher if the organic rice has been certified. In Medan, North Sumatra, certified organic rice is offered at a price range from IDR24,450 to IDR37,500 (US$1.95 – US$3.00) per kg, while uncertified organic rice offered at IDR12,000 to IDR16,500 per kg (US$0.96 – US$1.32). Overall 71% of the total respondents are willing to pay higher price for than their actual payment for the organic rice they consume (Siregar, 2014). Unfortunately, organic rice from Desa Lubuk Bayas is not eligible for certification because it still uses the same irrigation with conventional paddy farming (Figure 2). However, no organized and systematic effort has been taken in dealing with the problem.



Source: Chalil 2014, 526

Figure 2. Map of Lubuk Bayas Village

In addition, paddy farmers in Lubuk Bayas still have various misunderstandings about the organic rice farming system. Some farmers assume that in organic farming they can still use some chemical herbicides along with the organic fertilizers and pesticides as long as it is not directly applied to the paddy crop. Such a condition has often slipped through, as the surveillance system through Internal Control System (ICS) also needs to be improved.

Differently, Kruskal-Wallis Test shows no significant difference in the farmers' ability to identify and solve problems, which is low for all groups. Some farmers cannot identify the causes, but even those who can identify were still unable to solve it. Organic farmers, for example, still have low productivity, although the 4 seasons of transition period has passed away. This is partly due to the un-optimal implementation of organic rice farming system. For example, the usage of manure as a substitute for chemical fertilizers is recommended 2 tons/ha. However, many farmers do not fulfill the recommendation due to high labor costs for bringing the manure to their farms. Similarly, on average the usage of organic pesticides are still un-optimal because farmers need to make and provide it by themselves. In addition, results of using organic pesticides are considered to be less effective because not only repel and kill pests of rice. Most farmers do not dare to take the risk of crop failure due to the pest attack and begin to use the chemical pesticides again (Amala, 2013). The Kruskal-Wallis Test also shows no significant difference among farmers' attitude towards risk, which is risk-averse for all groups. Less than 10% has changed commodities that have been inherited from their parents, although they tend to wait until other farmers have proved the benefit of implementing new commodities or techniques. McElwee (2005), states that entrepreneurs take calculated risks. However, this is rather difficult for the sample farmers because most of them do not have farm records.

These influencing actors are then analyzed with SEM Model. The Goodness of Fit Tests show that the Structural Equation Model fit with the data set, as indicated by the chi-square value, 20.96 less than chi-square table 28.87, CFI 0.93 less than 0.9 and RMSEA 0,06 less than 0:08. The estimation results are as follows.

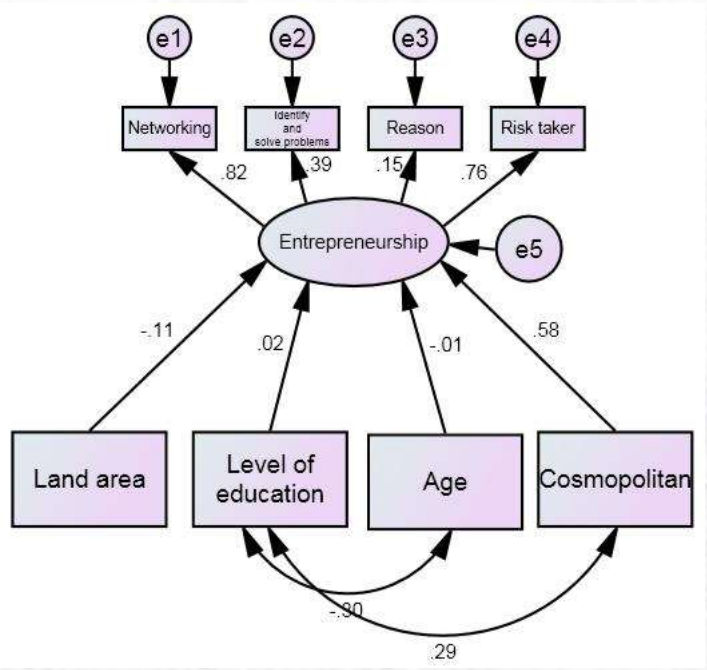


Figure 3. Estimation Result of Structural Equation Modeling

The estimation results show that 3 of the 4 variables used to measure entrepreneurial attitude, namely networking, identify and solve problems, and risk taker are significant with loading factors of 0.82, 0.39 and 0.76, respectively. Networking shows farmers ability to establish effective partnerships and relationships, by realizing the key stakeholders in their farming business, maintaining good contact, can negotiate and make deal with them (Kahan, 2012). Loading factor of the networking 0.82 > 0.5 shows that this factor is considered significant, and 67% of the entrepreneurship level variance could be explained by the networking factor. In Lubuk Bayas, 85% of the paddy farmer samples have established networks with extension agents and agriculture office staffs, and consult problems they encountered in the field. However, conventional and semi organic paddy farmers have not established networks with large mills, and only sell their yields to village traders, which in turn sell them to the large mills.

Farmers do not know the large mills' price and receive the selling price determined by the village traders. In contrast, organic farmers have a better marketing networking. They sell their harvest directly to the mill, which is managed by Mr. Kamaruddin and can have the information about the cost and profit margins. Loading factor of the identify and solve problems 0.39 < 0.4 shows that the minimum level, with only 15% of the entrepreneurship level variance could be explained by the identify and solve problems. One of the farmers' main problems is the lack of capital, thus makes farmers use fertilizers less than recommendations. In general farmers borrow money from their relatives of village traders, because the procedure is relatively easy and no extra interest comparing those from the banks. Loading factor of the risk taking 0.76 < 0.5 shows that this factor is considered significant, with 58% of the entrepreneurship level variance could be explained by the risk taking factor. Such an important significance mainly stems from the organic farmers that took the risk to try new farming system, experience the productivity decrease in the first years, and expect to enjoy higher profit in the feature. However, from the total respondent only 27% choose paddy based on their expectation of the good price and demand. 64% only continue thise have been started by their parents, as their paddy field areas are also inherited from their parents.

To estimate infuencing factors of the enterpreneurship level, 4 independent variables namely land area, eduaction, age and cosmopolitan are included. The estimation result shows that only cosmopolitan is significant, with a relatively strong correlation value, 0.58. This is consistent with Chaudhari *et al.* (2007) finding which shows that cosmopolitan is one of the important

factors in entrepreneurial characters. However, in this case, on average farmers cosmopolitan level is still low, which is 2.09 of the maximum score 4. This might be explained from the data that shows from 4 activities used to measure the cosmopolitan, only exhibitions are always relevant with their business. A number of farmers often take trips outside their village, but only few are related with organic farming.

Most farmers always watch televisions, but rarely about agriculture, while only few of them read newspapers. Other independent variables namely land area, level of education and age are insignificant. Land area is insignificant because most farmers only use a small part of their total land area for organic rice farming. In theory capital endowment such as land area is positively related with entrepreneur attitude. However, this is not the case in organic rice farmers in Serdang Bedagai. This might be explained by the low organic rice productivity. In addition, as organic farms are not separated with the semi organic and conventional ones, the risk to be attacked by pests and diseases are relatively high.

Conclusion

On average, organic farmers in Serdang Bedagai still have a low entrepreneurial level. The estimation result shows that the farmers' entrepreneurial level is determined by their networking and risk taking behavior. In fact, they still have poor networking and risk taking behavior. Farmers still considers that the risk of organic rice farming is still too high while the benefit is still unclear, thus avoid taking the risk. Most of them cultivate organic rice just in some part of their land area for family consumption, because they realize that organic rice is good for health but is not enough to compensate for the risks. The estimation results also show that the organic farmers' entrepreneurial level is only influenced by their cosmopolitan level, but not by their land size, level of education or age. Unfortunately, on average, paddy farmers in Lubuk Bayas also have a low cosmopolitan level that needs to be improved. To do so, the government and private stakeholders could provide more required information, and conduct more training for paddy farmers in Lubuk Bayas.

R**eferences**

Amala, T. A. and Chalil, Diana (2013). Faktor-faktor yang Berhubungan dengan Tingkat Adopsi Petani terhadap Sistem Pertanian Padi Organik (Studi Kasus: Desa Lubuk Bayas Kecamatan Perbaungan Kabupaten Serdang Bedagai). *Jurnal Ceress*, 2(10).

BITRA Indonesia (2013). Data Produksi Padi Organik di Sumatera Utara. Medan.

Broll *et al*., (2013). Price Risk and Risk Management in Agriculture. *Contemporary Economics*, 7(2), 17-20.

Chalil, Diana (2014). Analyzing Farmers' Learning Process in Sustainable Development: The Case of Organic Paddy Farmers in North Sumatra, Indonesia. *Handbook of Research on Pedagogical Innovations for Sustainable Development*, edited by Ken D. Thomas and Helen E. Muga, 525-542. USA: IGI Global.

Chaudhari, R.R. *et al.* (2007), A Scale for Measurement of Entrepreneurial Behaviour of Dairy Farmers, *Karnataka J. Agric. Sci* 20 (4), 792-796.

Hair et al. (1998). *Multivariate Data Analysis*. United States of America: Prentice-Hall International.

Husin *et al*. (2012). Small Farmers And Factors That Motivate Them Towards Agricultural Entrepreneurship Activities. *Journal of Agribusiness Marketing*, 5, 47-60.

James, B. and Stellingwerf, J.J. (2012). Sustainable Entrepreneurship: The Motivations and Challenges of Sustainable Entrepreneurs in the Renewable Energy Industry. Master Thesis in Business Administration: Strategic Entrepreneurship. Jonkoping International Business School.

Kahan, David (2012). Entrepreneurship in Farming. Farm Management Extension Guide, Food and Agriculture Organization of the United Nations. Rome.

McElwee, G. (2005). Developing Entrepreneurial Skills of Farmers, SSPE-CT-2005-006500, ESOF and University of Lincoln.

Siregar, D.K. (2014). Faktor-Faktor yang Mempengaruhi Kesediaan Konsumen Membayar Harga Premium Beras Organik di Kota Medan. Master Thesis in Magister Agribusiness. Universitas Sumatera Utara.

Traikova *et al.* (2012). How Farmers Become Entrepreneurs: Prenatal Diagnostic of Rural Firms in Bulgaria. *Poster Presentation*. IAAE Trienniel Conference. Brazil, 18-24 August 2012.

Vonne *et al*., (2003). Natural Behavior, Animal Rights, or Making Money – A Study of

Swedish Organic Farmers' View of Animal Issues. *Journal of Agricultural and Environmental Ethics*, 17(2), 157-179.

MODEL OF DEVELOPMENT AND THE ENHANCEMENT OF MEDAN RATTAN PRODUCT COMPETITIVENESS

Ritha F. Dalimunthe, Setri Hiyanti Siregar
rithadalimunthe@gmail.com
Faculty of Economics and Business, University of Sumatera Utara

Abstract

The purpose of this study was to overcome the problems of rattan SMEs. Therefore, a strategy that can be used to enhance the competitiveness of rattan products and to predict how a business can be a instrument for furniture makers to improve their performance. The data for this study were obtained through direct observation, documentation study, in-depth interview, and Focus Group Discussion (FGD). SWOT analysis with SWOT matrix was used to prepare the strategic factors of good rattan craftsmen and artisans in the city of Medan compared to those of the city of Cirebon. The result of SWOT analysis through quantitative approach showed that the value of External Factor Evaluation Matrix (EFE) was 2.67 and the value of Internal Factor Evaluation Matrix (IFE) was 1.93. The position of Medan rattan craft in the diagram of SWOT analysis is in the first Quadrant.

Keywords: ***Competitiveness, Rattan, Medan***

Introduction

Competitiveness is a strength owned by a company to exceeded or outperform the other companies. According to Kotler (2009:2), a company can identify its competitors through the competition from the industry and marketpoint of view.

Kuncoro (2006:86) argued that competition is a circumstance when an organization plays its role or races to achieve the desired results and goals such as the consumers, the market share, survey rank or resources needed. According to the marketing perspective, competitor is an organization that is able to meet the needs of the same customer in other words the one that identifies who our competitors is the perspective of strategic group, namely, a group of companies competing in an industry (Kuncoro, 2006: 87).

High competitiveness of the company will create a competitive advantage. According to Kotler (2001: 55) competitive advantage is an advantage over the competition which is obtained by giving customers the great value, through lower prices or by providing more benefits that correspond to higher pricing.

Rattan is one of the creative industries which are seriously affected by the environmental changes occurred in the city of Medan,Province of Sumatera Utara. For example, rattan as raw material has been very difficult to obtained since one year after the financial crisis of 1997/1998 up to the present (2014) due to the government regulations prohibiting to sell the unprocessed raw materials that one by one the rattan craftsmen began to close down and move on to other business. In addition, a lot of furniture made from non-rattan raw materials has emerged.

At the beginning, there were 80 rattan craftsmen belonged to the rattan small and small and medium industries, now there are only 30 craftsmen left. In addition, the global market requiresstandard quality of a product based on ISO 9000, and that related to the environmental issues based on ISO 14,000, although according to the observers, this issue is often unfairly used by the developed countries as non-tariff barriers (Kuncoro and Abimanyu, 1995).

Current condition of rattan industry is experiencing a shortage of raw material supply due to the regulation on the supply of rattan raw material, and this phenomenon can be seen especially in the craftsmen who day by day are increasingly difficult to get a supply of rattan. Another challenge that must be considered in assisting the development of this rattan small industry is the competence of its human resources (the craftsmen) in improving their skills and knowledge to face the significant challenges in the future. These internal factors are entirely found within the organization itself.

The purpose of this study was to overcome the problems faced by the rattan SMEs and to find out the strategy that should be used to improve the competitiveness of the rattan products and to predict how a business can be a forum to improve the performance of rattan craftsmen.

Theoretical Overview

The success in managing internal factors has a very significant contribution to the success of a business ((Michael Hitt et al, 2008).In addition to internal factors, external factors also have a great influence on the competitiveness of rattan craftsmen because the success in managing external factors influencing the success of rattan business is an empirical issue. Therefore, the issue mentioned above is very interesting to study as a phenomenon occuring to the rattan craftsmen by focusing the attention on what the actual weaknesses and strength of the rattan small industries area. Kuncoro (2000) argued that the challenges faced by the rattan craftsmen can be divided into two categories: first, in general, the challenge faced by the Small Industries with the turnover of less that Rp. 50 millions is how to keep their business surviving. Usually, they do not need big capital to expand their business, just to help the cashflow go smoothly. Second, the challenge faced by the Small Industries with the turnover from Rp. 50 millions up to Rp. 1 billion is much more complex. In general, they have thought and planned to further expand their businesses.

Business development is a concept related to a “big” and long-term decision determining the success or failure of an organization. By using a strategy of management, it will be very beneficial and promising. By using the strategy of management, a business practitioner can interact in an attempt of its implementation (Tjiptono, 2008).

In general, the problem faced by the small industries especially rattan industries among other things are (Jafar Hafsah, 2004):

a.Internal factors

1). Lack of capital

Capital is a major factor that is required to develop a business unit, generally due to the business belongs to an individual or the company which is closed in nature relies on the limited amount of capital belongs to the owner.

2). Limited Human Resources

Most small businesses grow traditionally.

3). Weak Business Networking and Market Penetration Capabilities

b. external factors

1) Business climate is not yet fully conducive

Even though, the government's policy to cultivate Small and Medium Business has been perfected from year to year.

2) Lack of Busines Facilities and Infrastructures

The lack of information related to the advancement of science and technology causesthe facilities and infrastructure they chosecannot grow fast either.

3) Implications for Regional Autonomy

4) Implications of Free Trade

Research Method

Research Informants

Research informants consist of :

1. Rattan craftsmen.

Rattan craftsmen are the core informants for the researcher

2. Cooperatives Management.

The cooperatives management are functioned as accompanying informants for the researcher

3. The staff of the Medan City and Sumatera Utara Provincial Cooperatives Services.

The staff of the Medan City and Sumatera Utara Provincial Cooperatives Services are functioned as the informants for the researcher

Data Collection Techniques

Primary data

The primary data related to the activities done by the rattan craftsmen or the management managing the activities done by the craftsmen in their operational activites to collect the rattan handicrafts related to the rattan handicraft management process about strengths, weaknesses, opportunities and threats faced by the rattan craftsmen. The primary data consists of the infoprmation found through:

1. **Interview**

To obtain information about rattan business originated from the informants, the researcher conducted an interview with the rattan craftsmen, the management of Medan rattan cooperatives, the staff of Medan City Small and Medium Business and Cooperatives Service, and the staff of Cirebon District Trade and Industry Service that the data obtained were accurate and accountable.

2. **Observasi**

In addition to interview, the researcher also made an observation on the object of study namely the rattan handicraft busines practitioners in the City of Medan and Cirebon District.

3. **Focus Group Discussion(FGD)**

A directed Focus Group Discussion (FGD) or just Discussion Group is a process in collecting information about a very specific certain problem and it can also be conducted through interviewing a group of people guided by a moderator that the participants are able to openly and spontaneously express anything related to the topic of issues being discussed (Henning, 1990 and Irwanto, 1998).

Interaction between the participants is the basic to obtain information. The participants have the same opportunity to to propose and give a statement, respond, comment or ask questions.

Secondary Data

The secondary data are the data needed related to the SWOT analysis and other support obtained through library research. The secondary data for this study were obtained from textbooks, scientific journal articles, internet and the findings of the previopus study related to this study through documentation study method.

Data Analysis Techniques

This is a phenomenological study with qualitative approach (Cresswell, 1994:138) to obtain in-depth information about the experiences felt by the rattan craftsmen in the city of Medan. The purpose of this descriptive study was to systematically and accurately clarify the description the facts being studied. Based on this, the Data Analysis Techniques used includes:

1. The data obtained were then analyzed through Qualitative Descriptive Analysis method. Qualitative Descriptive Analysis is an analysis method to find a thoroughand precise relationship ofa situation.
2. SWOT Matrix was used in formulating the strategic factors of the rattan craftsmen in the city of Medan. This matrix clearly describes about the opportunity or external threats being faced by the rattan craftsmen that can be adjusted to the strengths and weaknesses they have. This matrix may be able to produce 4 (four) sets of strategy alternative possibilities.
3. Matrix SPACE consisting of 4 (four) quadrants showing whether or not the aggressive, conservative, defensive, or competitive strategy which is the most suitable for a particular business.
4. EFE (External Factor Evaluation) Matrix is used to allow the formulation of a strategy to make a summary and to evaluate the marketing, production processes, raw materials, and human resources.
5. IFE (Internal Factor Evaluation) Matrix is a strategy formulating tool used to summarize and evaluate the major strengths and weaknesses based on the functional activities of the business, and is the basis for identifying and evaluating relationships to develop IFE matrix.

Result Of Study

The result of this study using the 5 (five) data analysis techniques mentioned above showed that:

1. The strengths of rattan handicraft business in the city of Medan are that the rattan product has been adequately known in the city of Medan, the competitive price and the availability of on-line selling, and the government policy under Law No.32/2004 on Prohibition to Export Raw

Material, while the weaknesses of the business are the weak product production process (R&D), lack of variation and product quality, weak financial condition, low equipment facility to produce product, limited human resources and low distribution network.

2. The threats to rattan handicraft business are a lot of new competitors, the availability of various synthetic rattan products, the availability of culinary product made of rattan shoot (pakkat), globalization, the reasonable price of competitor's product.
3. The SWOT analysis through quantitative approach showed that the value of EFE Matrix was 2.67 and the value of IFE Matrix was 1.93
4. The position of the product of rattan handicraft in the City of Medan was in Quadrant I of SWOT analysis diagram.

Therefore, the strategy suggested to the rattan craftsmen in the City of Medan to maintain their business is progressive strategy including several attempts such as to improve their ability to produce creative rattan handicraft, to increase their market segments through online media and create unique products that can meet market demand, to strengthen their access to the banks to obtain working capital and to improve their financial management that becomes the constraint of their financial system and to keep increasing the number of human resources who are active in the field rattan handicraft as a creative small industry that can settle the unemployment problem and look for the raw material suppliers to be able to meet the increasing order in the future.

ANALYSIS OF PROCESSING METHODS, MARKETING CHANNELS AND PROFITABILITY DETERMINANTS OF SELECTED CASSAVA PRODUCTS IN KOGI STATE, NIGERIA

Ekpa, D[1]., Adeola, S.S[1]., Umar, M[2] and Ekpa, M.O.[3]

1. Department of Agricultural Economics & Extension, Federal University Dutsin-Ma, Katsina State, Nigeria
2. Department of Agricultural Economics and Extension, Federal University, Dutse, Jigawa State, Nigeria
3. Department of Vocational and Teacher Education, University of Nigeria, Nsukka.

Abstract:

The study is an analysis of processing methods, marketing channels, and profitability determinants ofselected cassava products in Kogi state, Nigeria. The study was carried out in Kogi East senatorial District of the state. A multi-stage sampling technique was employed in the selection of 120 respondents from who information were collected and analyzed. The data used for the study were collected using structured questionnaire and analyzed using descriptive statistics and profit function analysis. The study showed that there are three processing methods and three marketing channels for each of the cassava products selected. The study also showed that the variable costs and fixed costs were both significant in profit determination. The study concluded that processing and marketing activities of cassava products are prominent and profitable in the study area. It was recommended that capital base of the respondents be boosted so that they can use modern processing and packaging techniques.

Key words: cassava, *fufu, gari,* cassava flour.

Introduction:

Cassava (*Manihotspp*) is believed to have originated from Brazil and was introduced into West Africa countries by the Portuguese (Antonio, 2002). Benue and KogiStates in the north central zone of Nigeria are the largest producers of cassava in the country (IITA, 2004). Cassava"s comparative advantage compared with other food crops lies in its efficient production of cheap food energy. In addition, cassava is available all year round as well as tolerant to extreme conditions. These qualities contribute in alleviating African food crises (Nweke, Dixon, Asiedu and Folayan, 1994). This accounts for why Philip (2005) referred to cassava as the "famine security crop".

Studies have shown that cassava contains substances known as cyanogenicglucosides, which break down into hydrocyanic acid (HCN) after the crop must have been harvested. This acid makes raw cassava very poisonous for human consumption. Processing is therefore important as a means of removing this poison by reducing its toxicity and increasing its palatability (Adegeye, 1999). After harvest, cassava roots are processed to stop physiological and microbial spoilage, reduce the cyanogenicglucosides content and convert the roots to other products that are more acceptable (Asiedu, 1989). Major products derived from cassava are cassava flour (alibo), *fufu, garri,* starch, tapioca, sliced cassava chips (*abacha*) and other cassava-based products.

Rural based cassava processing activities offer opportunities in terms of employment. It is estimated that 60 percent of the labour force in Sub-Saharan Africa are gainfully employed in small-scale food processing enterprises and majority are women (ITDG, 2005). Cassava may in fact hold the key to fully land use intensification in Africa (Enete, 1995). This is because population increase is often accompanied by switch to crops previously thought to be inferior due to protein, essential minerals and vitamins content but with higher yield as is the case with Africa where cassava has ousted the traditional yam (Griggs, 1980).

The market for cassava can be divided into two categories, the traditional food-oriented market and the new emerging market for industrially processed cassava. The vast majority of the cassava grown in Nigeria is processed and sold through the traditional market channels which are fairly well known.In 2002, cassava suddenly gained national prominence following the pronouncement of a Presidential

Initiative. The intent of the Initiative was to use cassava as the engine of growth in Nigeria. To put Nigeria in the global context for competition, the country needs to upgrade the use of cassava in primary industrial manufacturing of starch, ethanol, chips and flour in order to provide an industrial base for further diversification of its national economy. Cassava can be used to improve rural and urban income and development in Nigeria if investments in the downstream sector or the industry are made more effective through value addition.

The value chain describes the full range of activities which are required to bring products from conception, through different phases of processing involving a combination ofphysical transformation and the input of various producers, before delivery to the final consumers and final disposal after use (Kaplinsky and Moris, 2000). Most of the processors prefer to offer the commodity to the market without bearing the cost involved in value adding because of the uncertainty in the market. The continuous fluctuation of prices of final goods in the market poses a serious problem to processors who are interested in adding value to their products.This study therefore examines the different processing methods, marketing channels adopted by the processors of cassava in the study areas well as the input factors that influence profit in the cassava processing and marketing enterprises.

Methodology

The studyarea is Kogi East in KogiStateand comprises of nine (9) local government areas. Located on latitudes $7^0\ 02^1$ N and $8^{\ 0}\ 00^1$ N and longitudes $6^0\ 45^1$ E and $7^0\ 42^1$ E (KSADP, 1995), Kogi East has a population of 1,449,091 people almost 50% of Kogi State‟s population of 3,278,487 people. With a total land mass of 13, 937 sq. km; the area has common boundaries with river Benue on the North, river Niger on the West, Anambra and Enugu States on the South and Benue State on the East. Kogi East are divided for administrative purposes into two (2) agricultural zones namely:- Zone "B", and Zone "D". Zone "B" comprises of Ankpa, Bassa, Dekina, Olamoboro and Omala Local Government with Anyigba as the head quarters. Zone "D", comprises of Ibaji, Idah, Igala-MelaOdolu and Ofu, Local Government Area with Aloma as its head quarters A Multi-stage purposive random sampling techniques was employed in selecting respondents. This is because the study area is contiguous in terms of cassava processing and marketing. First, two (2) local government areas were purposely selected from each of the two agricultural zones giving rise to four (4) Local Government Areas. Secondly, three (3) communities were randomly selected from each local government to give twelve communities. Thirdly, two (2) villages was randomly selected from each community to make up twenty four villages. Fourthly, five (5) cassava processors and marketers were randomly selected from each village counting to a total of one hundred and twenty (120) respondents from whom relevant information were collected for analysis using a well structured questionnaire.

Descriptive statistics such as mean, frequency distribution, and percentages were used to determine the methods of processing and channels of marketing used in the study area whileProfit function analysis was applied to estimate the relationship between input and output prices used by the firm and its profit level.

The generalized profit function model is given as follows:

$\pi^* = \pi^* (Py, P_1, P_2, P_3, Z_1, Z_2)$ Where

:π^* = amount of maximum profit ₦

Py = price of output of cassava products ₦ P_1 =

per unit price of water ₦

P_2 = per unit price of transportation ₦ P_3 =

Per unit price of storage ₦

Z_1 = land rent ₦

Z_2 = depreciated value of basins, knives, bags and sieves ₦

Note: ₦is the sign for Naira, the currency used in Nigeria.

Results and Discussions

Techniques for Garri Processing

The results of the study showed that, there are three distinct processing channels or different stages in transforming cassava to garri product in the research area. The first channel is depicted thus, Peeling-Washing-Grating-Dehydration-Fermentation-Frying. While the second channel is depicted as Peeling-Washing-Grating-Dehydration-Fermentation-Oiling-Frying and the third channel is Peeling-Washing-Grating-Dehydration-Frying.

The frequency distribution of respondents according to their channels of processing cassava into garri is shown in Table 1. The result shows that majority (58%) of the respondents adopted channel „1" of the processing stages in the transformation of fresh cassava to garri. Meanwhile, 38% of the respondents adopted channel „2" in their processing of cassava to garri while 4% of the respondents adopted channel „3" in the transformation processes. These implied that the majority of the respondents preferred processing channel „1" probably due to the demand for fermented garri, because of its taste and the cost implication of adding oil to their garri during processing period. The channel „2" has more respondents than channel „3" due to its nutritional value of vitamin „A" contents in oil palm. This channel was better in terms of value addition in the processing stages.

Techniques for Cassava Flour Processing

The results of this study show that, there are three major processing channels in transforming cassava to flour product in the study area. The first channel is depicted thus Peeling-Washing-Soaking-Sifting-Dewatering-Molding-Drying. While the second channel is depicted as Peeling-Washing-Soaking-Sifting-Dewatering-Molding- Drying- Milling and the third channel is Peeling-Washing-Soaking-Sifting-Dewatering-Drying- Milling.

Table 1 Distributions of Respondents According Processing Techniquesin three cassava products

	Frequency	**Percentage**
Distributions of Respondents According to Garri Processing Techniques.		
Processing channel 1	69	58
Processing channel 2	46	38
Processing channel 3	5	4
Distribution of Respondents According to Cassava Flour Processing Techniques		
Processing channel 1	84	70
Processing channel 2	34	28
Processing channel 3	2	2
Distribution of Respondents According to Fufu Processing Techniques		
Processing channel 1	106	88
Processing channel 2	10	8
Processing channel 3	4	4
TOTAL	**120**	**100**

Table 1 show that majority (70%) of the respondents adopted processing channel „1" stages as their major practice in the study area. The implication of this was that, most of the respondents do not mill their dried molded cassava, before taking it to the market in order to ease transportation hence reduced cost of transportation, occupy little space and reduced white dusty powder. Meanwhile, 28% of the respondents adopted channel „2" while 2% of the respondents adopted channel „3" in the transformation of fresh cassava to cassava flour

Techniquesfor Fufu Processing

The results of the study showed that there are three distinct processing channels of different stages in transforming cassava to fufu product in the study area. The first channel is depicted thus, Peeling-Washing-Soaking-Fermentation-Sifting-Dewatering-Boiling-Molding. While the second channel is depicted as Peeling-Washing-Soaking-Fermentation-Sifting-Dewatering-Molding-Boiling and the third channel is Peeling-Washing-Soaking-Sifting-Dewatering-Molding-Boiling.

The frequency distribution of respondents according to their cassava to *fufu* processing channels is shown also in the Table 1. The study showed that 88% of the respondents adopted processing channel „1" as the major channel of transforming fresh cassava tubers into fufu. Meanwhile 8% of the respondents adopted processing channel „2" in transforming the fresh cassava tubers into fufu, whereas, 4% of the respondents adopted processing channel „3". The implication of the above results was due to lack of fermentation in the processing channel „3" hence reduction in the popular demand by the respondents because fermentation in the cassava processing channel reduce or eliminate cyanide contents in fresh cassava tubers.

Channels for Garri Marketing

The result of the study showed that there are three distinct marketing channels in moving the garri products to the final consumers. The first channel is Packaging-Transportation-Wholesaling-Retailing-Final Consumers. While the second channel is depicted as Packaging-Wholesaling-Retailing-Final Consumer and the third channel is Packaging- Retailing-Final Consumers.

The frequency distribution of respondents according to their garri marketing channels is shown in figure 1.This result showed that, 60% (majority) of the respondents adopted marketing channel „1" in the marketing of garri product. Meanwhile, 37% of the respondents adopted the marketing channel „2" while 3% of the respondents adopted marketing channel „3" and this implies that most of the respondents transported their garri products to the market and sold to larger outlets comprising of wholesaling-retailing and final consumers hence more profit, unlike in fufu marketing channels which adopted marketing channel „3" that involved selling the product directly to the retailers and final consumers only, without involving wholesalers and the need to transport their products to the market as a result of bulkiness and low profit.

Table 2: Profit function analysis for *Garri*

Model	***Unstandardized coefficient***		***Standardized coefficients***		
	B	**Std. Error**	**Beta**	***T***	***Sig***
1 (const	2.729	.136	7.086	7.222	.000
Per unit price of water	.092	.460	.033	.201	.841
Per unit of transportation	1.544	1.908	.187	2.999**	.036
Per unit of storage	.388	1.480	.137	.262	.794
Land rent	.121	.361	.068	.334	.739
Depreciated value of basin, knives, bags and sieves	1.360	.267	-.222	2.560**	.044

Channels for Cassava Flour Marketing

The results of the study showed that, there are three major marketing channels of different stages in moving the cassava flour products to the final consumers. The first channel is Packaging-Transportation-Wholesaling-Retailing-Final Consumers. While the second channel is depicted as Packaging - Wholesaling-Retailing-Final Consumers and third channel is Packaging-Retailing-Final Consumers.

The frequency distribution of respondents according to their cassava flour marketing channels is shown in figure 2. This indicated that, 53% of the respondents adopted marketing channel „1" in the marketing of cassava flour product. Meanwhile, 36% of the respondents adopted the marketing channel „2" while 11% of the respondents adopted the marketing channel „3" and this implied that some of the respondents are not involved in selling their cassava flour product at home to retailers and final consumers but rather preferred transporting the cassava flour to the market where they can sell their products to wholesalers, retailers and final consumers in order to make more profit via sale to larger „buyers.

Channels for Fufu Marketing

The results of the study showed that, there are three distinct marketing channels of different stages in moving the fufu products to the final consumers. The first channel is Packaging- Transportation-Wholesaling-Retailing-Final Consumers. While the second channel is depicted as Packaging-Wholesaling-Retailing-Final Consumers and third channel is Packaging-Retailing-Final Consumers.

The frequency distribution of respondents according to their fufu marketing channels is shown in figure 3. This indicated that, 27% of the respondents adopted marketing channel „1" in marketing *fufu* product. Meanwhile, 16% of the respondents adopted marketing channel „2" while 57% of the respondents adopted marketing channel „3" and this implied that most of the respondents do not like transporting the bulky wet fufu to the market with little profit hence preferred to sell their fufu products at home to retailers and final consumers which account for the 57% of the respondents hence maximizing their profit. Majority of the respondents don"t like transporting their fufu products to the market due to the offensive odour which also repel some buyers.

Factors that influence profitability in *garri* processing/Marketing

In the garri enterprise, the combined effects of all the variable and fixed inputs in the profit function explained 78.9% of the variation in the maximum variable profit. The t–values revealed that all the variable costs were significant in influencing profit except unit cost of water, and storage that were insignificant.

Transportation:- The transportation was one of the variable input that contributes positively to garri product output and was significant at 5% level of probability. This positive relationship was in agreement with Ibrahim 2009, as transportation facilitates the movement of *garri* products to the market for sales.

Basin:- Basin was one of the fixed input that contributes positively to output of garri products and was significant at 5% level of probability. This positive relationship was in agreement with *a priori* expectation because, more basins will increase more output.

Sieves:- This was one of the fixed input which contributes positively to garri product output and was significant at 5% level of probability. This positive relationship was in agreement with *a priori* expectation because sieves help in adding value to the garri products hence more quality output and income.However, the results suggest that garri product enterprises were operating within the rational area of the profit function using the cost items and the significant output prices.

The Factors That Influence Profitability in Cassava Flour Processing/Marketing.

Table 3 evaluates the factors that influence profitability in cassava flour processing/marketing enterprises in the study area showing the variables unstandardized and standardized coefficients, standard error and its level of significant.

The resultant model for flour product showed that in the cassava flour product enterprise, the combined influence of all the variables and fixed inputs in the profit function explained 80.1% of the variation in the maximum variable profit. The t-value showed that all the variable costs were significant in affecting profit except cost of water and storage that were insignificant. Their positive relationship was as expected. The t– statistics also showed that fixed cost items that were significant at 5% level of probability were depreciated expense of basin, knives and sieves while depreciated expense of bags only was insignificant.

Transportation: - This transportation was among the variable input that contributes positively to cassava flour product output and was significant at 5% level of probability. This positive relationship was in agreement with *a priori* expectation. The transportation aid the movements of the cassava products to the final consumers in order to achieve the aim of marketing processes.

Basin: - Basin was among the fixed input that contributed positively to the output of cassava flour product and was significant at 5% level of probability. This positive relationship was in agreement with *a priori* expectation because the basin adds value to the processing/marketing activities hence more output.

Knives:- This was also one of the fixed items which contributes positively to cassava flour product output and was significant at 5% level of probability. This positive relationship agrees with *a priori* expectation because knives help in the value addition process of transforming cassava tubers into cassava flour product hence more quality output.

Sieves:- The sieves as a fixed input, it contributes positively to cassava flour product output and was significant at 5% level of probability. This positive relationship is in agreement with *a priori* expectation because sieves aid value addition in the processing and conversion of cassava tubers into cassava flour hence more quality output.

From the above, the results showed that cassava flour product enterprises were operating within the rational area of the profit function using the cost items and the significant output prices.

The Factors That Influence Profitability InFufu Processing/Marketing.

Table 4 evaluate the factors that influence profitability in *fufu*processing/marketing enterprises in the study area showing the variables unstandardized and standardized coefficients, standard error and its level of significant.The resultant model for fufu product showed that in the *fufu* processing enterprise, the combined effect of all the variables and fixed inputs in the profit function explained 84.4% of the variation in the maximum variable profit. The t – values showed that all the variable costs were significant in influencing profit except cost of water and storage that were insignificant. Their positive relationship was as expected. The t- statistics also revealed that fixed cost items that were significant at 5% level of probability were depreciated expense of basin, knives and sieves while depreciated expense of bags was insignificant.

Transportation :- The transportation as a variable input, contributes positively to cassava fufu product output and was significant at 5% level of probability. This positive relationship was in agreement with *a priori* expectation because this transportation aid output of those processors/marketers through the movement of the cassava product fufu to the final consumer.

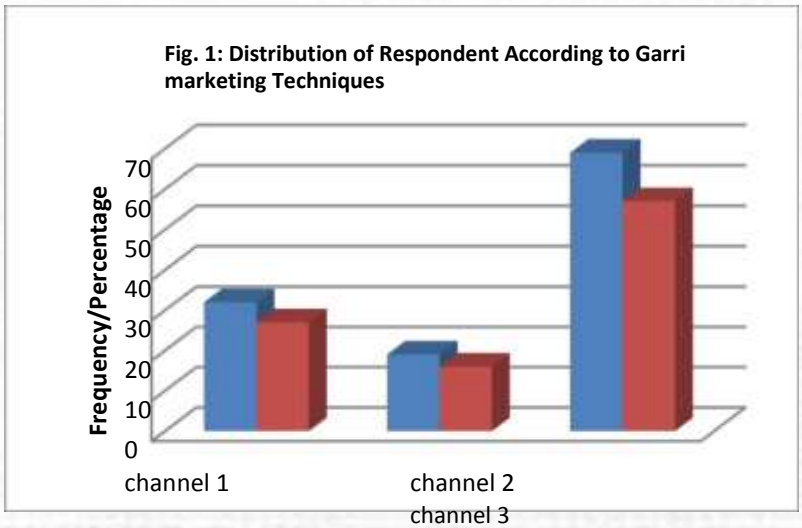


Fig. 1: Distribution of Respondent According to Garri marketing Techniques
Frequency/Percentage
70
60
50
40
30
20
10
0
channel 1
channel 2
channel 3

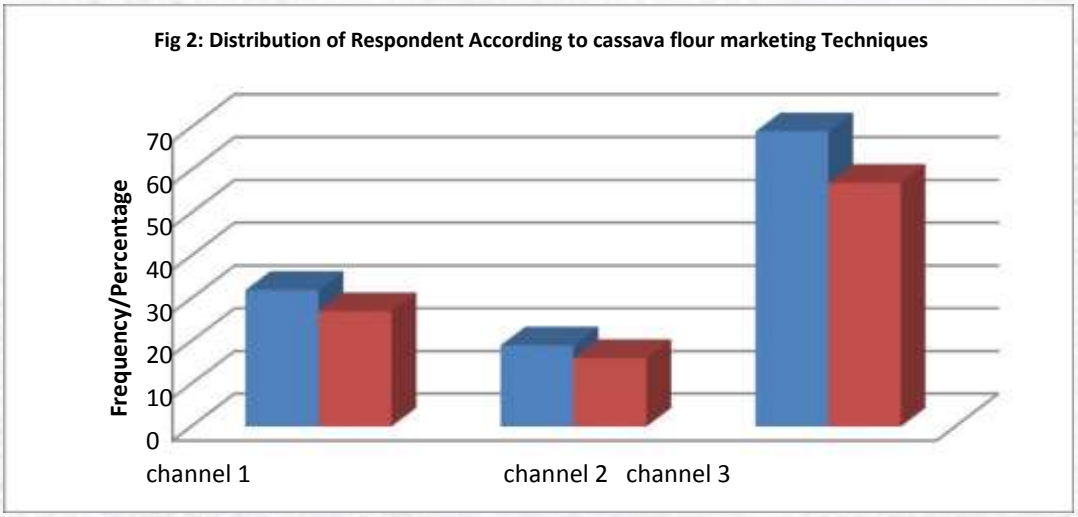


Fig 2: Distribution of Respondent According to cassava flour marketing Techniques
Frequency/Percentage
70
60
50
40
30
20
10
0
channel 1
channel 2
channel 3

CAgE-15-368

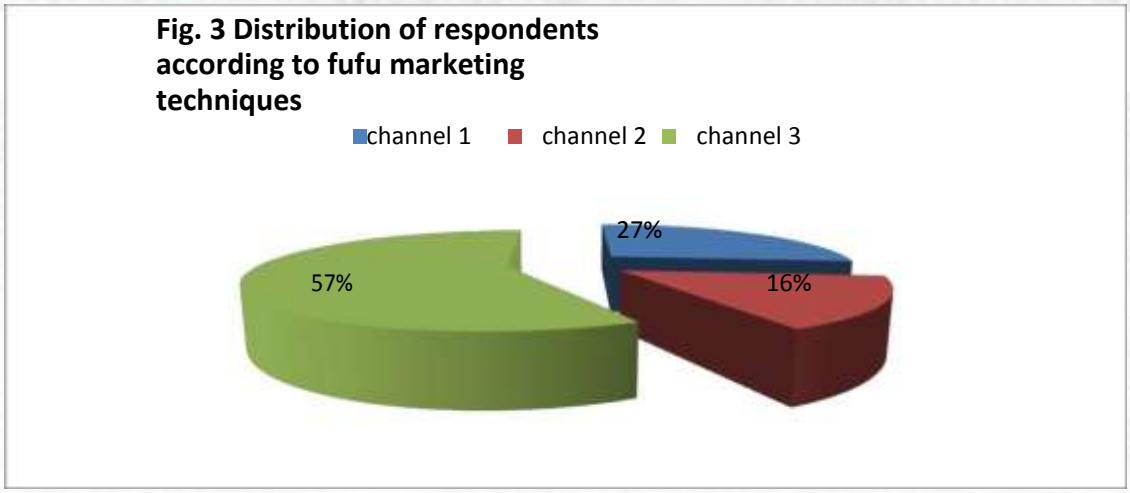


Fig. 3 Distribution of respondents according to fufu marketing techniques
channel 1
channel 2
channel 3
27%
16%
57%

Basin :- Basin as a fixed input, contributes positively to the output of cassava flour product and was significant at 5% level of probability. This positive relationship was in agreement with *a priori* expectation because basin aid processing activities via value addition, this help to increase output.

Knives :- This was one of the fixed input which contributes positively to cassava fufu product output and was significant at 5% level of probability. This positive relationship agrees with *a priori* expectation because knives are used in processing the cassava roots into edible and sellable products hence more output.

Sieves :- Sieves as fixed input, contributes positively to cassava fufu product output and was significant at 5% level of probability. This positive relationship is in agreement with *a priori* expectation because sieves help in the process of value addition to the quality of cassava *fufu* output.The results showed that, *fufu* product enterprises were operating within the rational area of the profit function using the cost items and the significant output prices.

Conclusion and Recommendation

Cassava products handling in the form of processing and marketing are prominent activities in the study area. Each of processing and marketing are profitable in the study area. However, it was noted that the strategies were still not fully automated. Using sophisticated machines for processing and better packaging will increase the profit margins for the respondents. It is therefore recommended that the respondents be empowered by increasing their capital base so to increase their productivity and hence their profit margin.

References

Adegeye, A.J. (1999). "Issues and Options in Expanding the Cassava Industry (Production and Processing) in Nigeria".*Report* submitted to International Fund for Agricultural Development (IFAD).

Antonio, C.A. (2002). *Cassava Biology, Production and Utilization: The Origin and Taxonomy of Cassava.*CABI Publishing; Brazil. Pp. 1-343.

Asiedu, J.J. (1989).*Processing Tropical Crops – A Technical Approach* .Macmillan Press Ltd. London and Basingstock. Pp 15 – 16.

Enete, A.A. (1995). Trends in Food Crops yield under Demographic pressure conditions in Sub-Sahara Africa: The case of cassava in South East Nigeria, (*Unpublished M.Sc thesis*, Department of Agricultural Economics, University of Nigeria, Nsukka. P. 30.

Griggs D. (1980). Population Growth and Agrarian Change: A Historical perspective, Winrock International Pub. USA. Pp. 75-77.

Ibrahim M.K. (2009): "An Economic study of cassava processing in Kogi State". *Unpublished M.Sc.*tIhesis, Department of Agricultural Economics University of Nigeria Nsukka.

International Institute of Tropical Agriculture (IITA) (2004)."*Nigeria's Cassava Industry*" Statistical Handbook.

ITDG (2005).Agro-processing; Practical Answers to Poverty. Retrieved August, 2007 from www.itdg.org/agroprocessing

Kaplinsky, R and M. Moris (2000).A Hand book for Value Chain Research.Prepared for theIDRC.Retrieved March 2008 from http://www.ids.ac.uk/ids/global/odfs/vchNov01odf.

KSADP (Kogi State Agricultural Development Projects) (1995)."A colossus in Agricultural Transformation". . In*: Agric Digest,* A publication of the Ministry of Agriculture, Kogi State, vol. V No. 1. Pp 5-6.

Nweke, F.I.; A.G. Dixion; R. Asiedu and S.A. Folayan (1994). Cassava Varietal Needs of Farmers and the Potential for Production Growth in Africa. *COSCAWorking paper* No10. Pp 11-12.

Phillip, D.O.A. (2005). "The Potentials of Cassava in the Nigeria Economy: The Case of Ogun State". *Paper presented at the Second Quarterly Buisness Forum*, in Ota, Ogun state.

YOUTH EMPOWERMENT THROUGH EXTENSION EDUCATION AND ENTREPRENEURSHIP DEVELOPMENT IN NIGERIAN AGRICULTURE: OBSTACLES AND PROSPECTS FOR IMPROVEMENTS.

Olatinwo Kehinde Latifat, Abdullilahi Abu Khidir and Abu Rimi Tijani

Department of Agricultural Economics and Extension, Federal University Dutsin-Ma,Katsina State.

Corresponding author e-mail: ***latifatolatinwo@hotmail.com***

Abstract

The objective of this study is to analyse the significant of extension education and entrepreneurship development on youth empowerment. The survival of Nigeria's agriculture rests basically on the youth who are the farmers and leaders of tomorrow. Up till now, the teaching and learning of agriculture has proceeded in such a manner that graduates of such programmes have failed to make successful launch into the world of agricultural enterprises. Major limitations that championed this irregular situation were identified to include poor policy framework, socio-economic pressures, undue parental and peer influences, improper value orientation and of course, the nature of curricula. In response to these ugly trends, some initiatives aimed at instilling entrepreneurial skills were proposed by this study. The initiatives focused on curricular re-orientation that integrate entrepreneurship/enterprise education, retraining of graduates, financial support system among others.

Keywords: Agriculture, Entrepreneurship, Programmes, Nigeria, youth, empowerment.

Introduction

The prospects of agricultural development is often enshriled in complexity, because it involves the interplay of many factors (Famoriyo and Nwagbo, 1981). In Nigeria, agricultural development is often viewed from the angles of application of science and technology, development of infrastructures and provision of extension services. Hence, the organisation of production along business lines indicated by Adesimi 1986 is often set aside. Therefore, it is no surprise that agriculture has lost its pride of place in the economy of the Nigeria nation as indicated in the prevalent macroeconomic environment. The macroeconomic indicators of this anomalous development accordingly include: Ever widening food supply – demand gap; Ever rising food import bills; Rapid decline in foreign exchange earnings from agricultural exports; and Rapid decline in agricultural production (Ugochukwu and Amadi, 2012).

The rapid decline in agricultural production has been attributed to the continuous decline in agricultural labour. This, cohisidentaly is occasioned by the continued efflux of the youth and school leavers from the rural farming communities in search of employment other than agriculture (Ugochukwu and Amadi, 2012). Supporting this claim Miri (1996) asserts that for the survival of agriculture to be ensured:

> *We need to attract the younger generation whose perception of agriculture is just a case of labouring in the field …. A generation who would rather work in an office than out in the fields getting their hands dirty …*

He then opines that agriculture must be promoted as a scientific employment with young peopleseeing it is more than just feeding an animal or digging a hole and planting a crop. The views of Bamaisaiye (1989) cited in Amadi (2001) is consistent with the foregoing expose on the decliningperformance of the agricultural sector. The following factors were indicated;

Mass migration of youth into urban centre thus leaving farming in the hands of old, illiterate parent; Lack of scientific knowledge of agriculture among the surviving generation of illiterate farmer; The sustained use of traditional farming tools and methods; and non-lucrative and energy consuming farm-occupations with the attendant low morale among farmers and youth.

Similarly, Amadi (1996) expressed the need to not only attract, but also retain youth in the agricultural occupations through proper mobilization. The recognition of education as an important vehicle for agricultural transformation, and the youth as possible agent or target mobilizers necessitated the following policy thrusts initiated as certain times in the past by the government:

1The evolution of the 6-3-3-4 education system as reflected in the various versions of the National Policy on Education namely; 1978, 1981, 1998, 2002 and 2008 editions. By this arrangement agriculture was classified as pre-vocational and vocational at the primary, Junior and Secondary levels respectively.

2. Consistent with number (1) above was the revision of the school curriculum with emphasis on the development of occupational skills (Comparative Education Study and Adaptation Centre (CESAC), 1985).

3. The launching of the agricultural entrepreneurship scheme of the National Directorate for Employment (NDE), in 1986.

4. The launching of school-bound agricultural programmes for example:

4. The Rivers State's school-to-Land Programme

5. The Anambra State's Mobilization for Agriculture and Industries (MOSAI) and,

6. The Imo State's School-based Food Basket Programme.

Commenting on these programmes, Amadi and Emeruwa (1989) reported that they were packaged to inculcate in the youth, requisite vocational and entrepreneurial skills and appropriate work habits in preparation for a successful entry into the world of work.

The ideals of the agriculture curriculum notwithstanding, Ivowi (1983), Zahradeen (1990), and Ochu and Umunnagbu (1993) variously observed that agricultural education programmes at the secondary level are not as practically oriented as was originally intended in the curriculum. Ochuand Umunnagbu (1993) further cited the views of wheeler (1990) and Ebun (1990) who independently reported that a good proportion of students of agriculture graduate in excellent grades without adequate exposure to the practical training that would ensure skills development. Ochu's work which sought information on the degree of relevance of the Senior Secondary agricultural education practical content reveals that with a per centage rating of 56%, the curriculum was deemed relevant to intermediate manpower development but that notwithstanding, Igbokwe (1994) wondered why school leavers and graduates of such programmes have continued to find themselves ill-equipped to move into adult life productively. Going by these developments, Amadi (2001) in a study reported the existence of a wide generation gap between the school (agricultural education programmes,) and the world of work. This picture becomes clearer when we compare the performance of graduates of agriculture with that of their counter parts in other vocational areas such as woodwork (carpentry), electrical work, Home economics, to mention a few.

The agricultural occupation skills that are indicated in the curriculum are for convenience classified into three broad categories namely;

5) Vocational skills

6) Entrepreneurship skills and

7) Psycho production skills

These categories are not mutually exclusive as there can be some overlaps. Vocational skills are specific behaviours, habits or attitudes which are concerned with the abilities of a person to secure gainful employment (self, or paid). Entrepreneurship skills are viewed as those specific behaviours or habits that are required by an individual to make a successful launch into agricultural business (Okorie, 1997). Entrepreneurship emphasizes self-reliance and relative economic independence (Iwuanyanwu, 1997) and rather creates a favourable atmosphere for economic interdependence and synergy within the society (Amadi, 2004).

The Psycho production skills (Olaitan& Ali 1997) are acquired abilities for performing tasks adequately with the hands in response to sensory stimuli. It may suffice to emphasize that the performance of psych production skills requires proper coordination of the senses.

In summary therefore, it important to restate that Nigeria's economy can only regain its pride of place if agriculture is given the necessary the necessary support to sustain its contributory quota to the Gross Domestic Product (GDP) and if youths are fully mobilized and motivated to form the core agents of the needed change. (Ugochukwu and Amadi, 2012).

Entrepreneurship Qualities/Skills

Entrepreneurship can be viewed in the light of a wide social, cultural and economic context as being innovative at home work, school or leisure. It involves life attitudes, including the readiness and the courage to act within the prevailing social, cultural and economic contexts. These qualities which Nelson (1979) referred to as "Occupational Survival Skills" include special attitudes, knowledge andskills relating to decision making, problem-solving, trouble shooting, human relations and businesscommunications to mention a few. Hodgett (1982) added to list the following; sound mental ability, high achievement drive, technical competence, resourcefulness and creativity. Steinhoff and Burgess (1993) further the following to this list: high vision for business, ability to plan, organize and follow through. This list though inexhaustible, further includes the following entrepreneurial behavior (Haftendorn&Salzano, 2005): Creativity and curiosity, Motivation by success ,Willingness to take or bear intelligent business risks, Ability to cooperate with others, Ability to identify business opportunities, and Ability to tolerate uncertainties.

Agricultural Entrepreneurship Initiative for the Youth

As indicated earlier, there are specific issues of serious concern affecting agriculture which In advertently call for a critical assessment of roles youth can play as potential future leaders. The Worrisome revelation that the youth have continued to migrate out of the rural farming communities is exacerbated by the concurrent ageing of the peasants. The youth have shown little concern, and only a few initiatives are in place for replacing the declining and ageing farmer population in the rural farm holds (Amadi 2001).

Target Initiatives and Beneficiaries

The youth agricultural entrepreneurship initiatives can take any form and be targeted at a specific youth-group which may be primary level leavers, secondary school leavers, graduates of agriculture or non agriculture programmes at tertiary level. The proposed groups are as shown below:

Target Group 1: Primary School Leavers/pupils

We need to appreciate the fact that it is at the primary level that awareness about careers is generally created; it therefore becomes necessary that agriculture is positively presented as one of the career options they could consider. Schools (Teachers and administrators) should mount awareness programmes aimed at conscientizing children about agriculture as a profitable career option, (Organization for Economic Cooperation and Development, (OECD, 1999). The primary school curriculum should be reviewed to make agriculture a core programme of study. In addition, awareness campaigns should be mounted through the production and circulation of attractive brochures, posters and pamphlets bearing career and vocational messages typical of agriculture.

Target Group 2: Secondary School Students

Noteworthy is the fact that students at this stage of secondary level are faced with two important choices that can programme their future. First is the choice of subjects and secondly, they make career choices. Choice of career more often is a function of subject choice yet; some make parallel choices which run in conflicts with intended careers. The present Policy on Education which classifies secondary agriculture as pre- and vocational is a commendable development. There is however, the need for attitudinal change toward agriculture in order to correct the wrong perceptions of the youth who see working on farmlands as signs of social and economic poverty. The curriculum should stress enterprise education even at the fundamental level.

Action Proposed: The attitudinal change is possible through awareness education so as to expose the youth to the multiplicity of career options that agriculture can offer. Secondly, students of agriculture should be supported financially through tertiary level agricultural programmes. Entrepreneurship and business concepts can be taught through team-based experiential / work based learning. Entrepreneurship and enterprise development can be integrated throughout the curriculum as an optional subject or an after-school activity.

Target Group 3: Tertiary School Students (Undergrads)
The Unified University Curriculum in Nigeria is another commendable landmark in the educational development of the country that can tap into for developing entrepreneurial skills in the youth.
Action Proposed: It is imperative therefore, those tertiary students of agriculture are supported financially via bursary awards; internships, industrial works experience scheme, etc. The one-year National Youth Service could be used to achieve internship with graduates farmed out to reputable agricultural establishments. The curriculum should emphasize entrepreneurship education through Cooperative Occupational Experience Programme (COEP).

Target Group 4: Post Tertiary Youth
Graduates of agricultural programmes have suffered from unemployment as a result of low or non-mobilization of investment resources thereby ending up in endless search of none existent jobs.
Action Proposed: Unemployment census should be undertaken to identify such graduates for the purpose of retraining them for entrepreneurship development and business start-ups. Again, the federal Government's initiative through the agricultural skills programmes of the NDE is highly commendable.

Target Group 5: De schoolers
Some young people by omission or commission find themselves out of school pre-maturely; at a stage they would not have acquired the "occupational survival skills".
Action Proposed: Assembling of the dropouts at community/local and state levels for the purpose of imparting necessary occupational and entrepreneurial skills is imperatives. Farm-skill centres need to be established at local levels. Graduates of farm-skills programmes should also be provided with financial support to float businesses.

Target Group 6: Holiday Makers Agricultural Programme
This programme targets all categories of students who are studying agriculture at various levels so as to expose them meaningfully to practical farming skills and competencies. It is believed that such hands-on experiences will further stimulate their interest, consolidate their knowledge and capitalize their potentials and capabilities. The programme currently run as Students Industrial Work Experience Scheme (SIWES) as well as other work-based experience programmes at the tertiary level needs to be revised, planned, coordinated and monitored by specialists in agriculture.

Constraints to Effective Youth Agricultural Entrepreneurship Development and Empowerment
Constraints to effective youth agricultural entrepreneurship development and empowerment are multidimensional and have been identified to include the following: Curricular constraints, Societal value disorientation, Government priority emphasis on non agricultural components of the economy, Socio-economic pressure, Parental influence, Low aptitude disposition, Difficulty in accessing resources such as land, finance and market information, Natural hazards that cast doubt on economic viability farming.

Curricular Constraints
This takes various forms and shapes ranging from poor curriculum orientation to poor implementation of school-based agricultural programmes. The poor curriculum orientation gave rise to:

- Poor awareness about the scope of opportunities in the field of agriculture.

- Lack of awareness of the economic diversity of agricultural enterprises.

- Agriculture is presently offered as an alternative to science subject streams including Home Economics rather than as part thereof, as a result of which some interested students do not follow through to the tertiary level.

- Agricultural awareness, training and education are not adequately addressed in the primary and secondary school curricula due to poor implementation.

Poor Societal Value Orientation

It is believed that the poor image of agriculture is caused by the poor value orientation of the Nigerian society. While premium is placed over such vocational callings as medicine, engineering and law, agriculture was relegated, a condition that worsened over the dominant influence of the emergent petro-economy. Youth thus look down upon agriculture.

Government Policy Frameworks

These have not made the case better since policies are not matched with commensurate actions and economic defaulters have not been appropriately sanctioned by the various government agencies. Policy emphasis is always on petroleum and more of lip service on agriculture. Even atthat, youth are not properly involved when they should normally occupy a central position youth programmes are not properly mobilized financially.

Parental Influence

This border on the undue influence of most parents over their wards' career choice, most of who would vow not to allow their wards to take to agriculture as a course of study. This wanton pressure misdirects even the enthusiastic ones to career choices not consistent with their dispositions (Okorie & Ezeji, 1988).

Peer Influence

A sort of bandwagon effect rules children of school age. The youth, ipso facto tend to follow a monotypic pattern in career choice as there is a tendency for the opinion of one influencing those of the others.

Difficulty in AccessingProduction resources

Production resources such as land, finance and market intelligence are a serious constraint considering the fact that agriculture is capital intensive. Funds mobilization is still a major setback and of course, returns to investment (RTI) are still low due largely to low input value for those who eventually take up the adventure.

Summary of Strategies for Effective Youth Agricultural Entrepreneurship Development

Although some suggestions have been proffered alongside target initiatives, it would be proper to once more articulate an assemblage of the strategies. These include initiating:

4. Awareness-raising programmes at primary, secondary and tertiary levels designed to familiarize pupils with the philosophy of entrepreneurship which would exert positive influence on enterprise culture (Hayton et al, 2002).
5. Programmes which aim at immediate enterprise creation to be run in schools.
6. Teachers and vocational instructors' programmes should emphasize enterprise education.

Entrepreneurship should also form integral part of both primary and secondary school curricular.

7. Resource materials and training packages relevant for entrepreneurship development should be made accessible to institutions of learning running agricultural programmes.
8. The government (local, state and national) should form genuine alliances with agencies that possess comparative advantage in various aspects of training provisions with special interest in agriculture entrepreneurship.
9. Establishment of farm schools aimed at production intermediate school-based community

Partnership – could help to strengthen curriculum areas through the engagement of mentors from the local business community.

2. Skilled farm manpower development scheme akin to the farm settlement scheme of the old whose curriculum will emphasize both vocational and entrepreneurial skills acquisition should be introduced.
3. Establishment of Pilot farms (at local and state levels) with commercial orientation for the training and induction of youths through excursion and fieldtrips.
4. Institution of Youth Revolving Loans Scheme which will target the financing of youth agricultural enterprises at a highly subsidized interest rate.
5. Monitoring and Evaluation (M & E) of Youth Agricultural Entrepreneurship Scheme to align the youth activities with intended objectives.

References

Amadi, U.P.N. & Emeruwa, B.C. (1989). Appraisal of Instructional Materials Needed for Implementing Senior Secondary Agriculture Curriculum. Postgraduate Seminar Presented in the Dept. of Vocational Teacher Education. University of Nigeria, Nsukka 24th August.

Amadi, U.P.N. &Obodo, G.E. (1996). Youth Organization as a Strategy for Entrepreneurial Skills Development in Agriculture. In Esomonu N.P.M. (e d.). The Essential of Entrepreneurship Education in Technology, Science & Art, Umunze: research & Publication Unit, FCE (T), Umunze.

Amadi, U.P.N. (2001). Availability and Utilization of Instrucitonal Resources in Teaching and LearningAgricultural Occupation Skills in Imo State Secondary Schools. PhD Thesis of the Nnamdi Azikiwe University, Awka Ibom

Bamaisay, E.A. (1989). Agricultural Education and Economic Development Policy Implementation for the Higher Education.

Comparative Education Studies and Adaptation Centre (CESAC) (1986). Agricultural Science Curriculum for Senior Secondary Schools. Lagos: CESAC.

Didiza, A.T. (1991). The Agriculture Youth Development Initiative for South Africa in South Africa Agricultural Youth Development Initiative. Johannesburg: The Agricultural Youth Development Initiatives.

Haftendon, K &Salzano C. (2005) Facilitating Youth entrepreneurship Participation: an Analysis of Awareness &Promotion Programmes in Formal and Non-formal Education Geneva: International Labour Organization (ILO).

Hayton,J et al (2002). National Culture and Entrepreneurship: A Review of Behavioural Research in Entrepreneurship. Theory & Practices 26 (4).

Hodgett B. (1992). Effective Small business Management. New York: Academic Press.

Igbokwe, E.N. (1994): Identification of Tasks for Senior Secondary Agriculture Curriculum. A survey of Poultry Production. Review of Education 14. Institute of Education, University of Nigeria,

Miri, S. (1996). What Future for Agriculture in the Pacific. Spore No. 56. A Publication of the Centre for Agriculture & Rural Development (CTI). Netherlands.

Nelson, R.E. & Leach, J.A. (1981). Increasing Opportunities for Entrepreneurship. In Greenwood L. (ed.). Contemporary Challenges.

Nsukka. Ivowi, U.M.O. (1983). Resources Management in Technical Education. In Eyibe, S.c. (ed) Administration, Planning and Supervision. Focus on Technology Education. Oko : Oko Polytechnic press.

Ochu, A.O. &Umunnagbu, M.I. (1993). An Assessment of the Effectiveness of the Senior Secondary School Agricultural Education Programme in Manpower Development in Nigeria. Journal of Teacher Education 1(2).

Okorie, J.U. (1997). Instructional Facilities for the Growing Vocational & Technical Institutions in Nigeria. Lead Paper at the 5th Annual National Conference on Vocational & Technical Education held at FCEb (T), Umunze.

Okorie, J.U. &Ezeji, S.C.O.A. (1988). Element of Guidance, Vocational and Career Education. Onitsha Summer Educational Publishers. Organization for economic Cooperation and Development (OECD) (1999

Steinhoff, D & Burgess, J.F. (1993): Small Business Management Fundaments 6th edition New York: McGrawHillInc.

Zahradeen, U.A. (1990). Integrating Productive Work into Voocational Technical Education in Nigeria. Technical Education Today 2(1).

COMPETITIVENESS ANALYSIS OF STRATEGIC FOOD COMMODITIES IN LAMPUNG PROVINCE

Wan Abbas Zakaria[1)], Ali Ibrahim Hasyim[1)], Eka Kasymir[1)], and Novi Rosanti [1]

[1]*University of Lampung, Indonesia, Jl. Soemantri Brojonegoro No.1 Gedong Meneng Rajabasa Bandar Lampung 35145, Lampung Phone/Fax:* 0721-781821; *Email: wan_abbas@yahoo.com*

ABSTRACT

Food commodities play an important role in income increase of people, job opportunities, and regional and national development. Competitiveness of food commodities needs for community welfare increasing and national food security and sovereignty. The aims of this research were: (1) to analyse competitiveness of strategic food commodities in Lampung Province, (2) to analyse infrastructure development impact, changes of input and output prices against of strategic food commodities in Lampung Province, and (3) to know the policy of suitable minimum prices of strategic food commodities in Lampung Province. This research conducted in Lampung Province. The regencies for this study were selected by purposive sampling i.e. Middle Lampung, North Lampung, South Lampung, and East Lampung. Determination of the farmers was done by stratified simple random sampling. Total Samples in this study were 120 respondents. The results showed that the farming of strategic food commodities (paddy, corn, and cassava) had PCR and DCR value less than one point. Strategic food commodities had lesser value due to increase of transport charge, fertilizer price increase, and decline of output prices. Competitiveness of strategic food commodities in Lampung Province was sensitive to output prices decrease. The policy of minimum price of paddy at least two times greater than the price of corn and the minimum price of corn at least two times greater than the price of cassava.

Key words : Competitiveness, food commodities, PCR, DCR

INTRODUCTION

Agricultural development intends to achieve competitive and sustainable industrial agriculture based on local resources, to expand food security and nutrition, to improve food diversification, to increase value, competitiveness, and export, as well as to increase welfare and income. To achieve those goals, Ministry of Agriculture has set prime target, i.e. achieve rice self and sustainable sufficiency in production, improvement food diversification, increase added value and export, and improvementof farmers welfare (KementerianPertanian, 2009).

The importance of the agricultural sector to the national economic can be seen, for example, from the amount of Indonesia's gross domestic income derived from agriculture sector, which is known as the second-biggest sector after food processing sector. The contribution of agricultural sector on gross domestic in come tend to decrease from 15.28 % at the end of 2010 to 14.44% at the end of 2012. Food commodity is very crucial and potential because food commodity is necessary for human life. In addition, the importance of food comodity can be seen from the contribution of food comodity on gross domestic bruto, as shown in Table 1.

There are several main food commodities, i.e. rice, corn, and cassava. Rice is Indonesia main staple food, while corn is important for feed industry in addition to staple food, and cassava is mainly used for tapioca industry and mocav. Production target of food crops in Indonesia in 2010-2014 is shown in Table2.

Table 1. Gross domestic income at current prices of Indonesian agricultural sector in 2009-2012

No	Agricultural sector	Year 2009	2010	2011	2012	% (*)
1	Food comodity	419,194.80	482,377.10	529,968.00	574,330.40	48.24
2	Horticulture	111,378.50	136,026.80	153,709.30	159,753.00	13.42
3	Livestock	104,883.90	119,371.70	129,297.70	146,089.70	12.72
4	Forestry	45,119.60	48,289.80	51,781.30	54,906.50	4.61
5	Fisheries	176,620.00	199,383.40	226,691.00	255,332.30	21.45
	Amount	857.196.80	985,448.80	1,091,467.30	1,190,411.90	100.00

*) percentage in 2012

Source : Central Bureau of Statistics, 201

MATERIALS AND METHODS

The research was conducted in Lampung Province. Research location was determined purposively based on previous survey results. Based on the survey, four regencies were determined as the center of important food commodities in Lampung province, namely, Central Lampung Province is one of the centers for rice, corn and cassava production in Indonesia. Lampung Province is the seventh largest rice production, third largest corn production, and the main production of cassava in Indonesia. As food production center in Indonesia, Lampung province should be able to increase production and productivity of it farming, in order to contribute to the fulfillment of production target established by national government for rice, maize, and cassava, and also to meet the needs of local and national markets.

Increase in competitiveness needs to be considered on the conception of the increase in welfare which is measured from the increased of farm productivity. Increase in productivity can be done by allocating factors of production efficiently to produce maximum production or to reduce production costs. The government had established some policies to help farmers to increase their productivity as well as to increase their comparative and competitive advantages of farming through input subsidies and regional minimum price policy.

Although Lampung Province is the center of rice, corn and cassava production, some areas in the region still experiencing problems that could affect the availability of food. Farm land for food commodities has decreased in some areas. The decrease was due to land conversion from food commodities into plantation crops such as rubber, oil palm and cocoa, which is done by farmers. Data obtained from the Department of Agriculture and Horticulture (PTPH) Lampung showed that agricultural land conversion has reached 38.31 percent of total land area of 447 thousand hectares (ha). The decreased of farm land affect the production of important agricultural commodities in Lampung, namely rice, maize, and cassava. In addition, the attacks of various diseases also caused the decrease of quality and quantity of crops resulting in low prices. Low selling prices and high production costs hence caused low profits. Therefore, this study aims to: (1) analyze the competitiveness of strategic food commodities in Lampung Province, (2) analyze the impact of infrastructure development, changes in input and output prices on the competitiveness of strategic food commodities in Lampung Province, and (3) determine minimum pricing policy that is suitable for strategic food commodities in Lampung Province.

Table 2. Production target of food crops in Indonesia in 2010-2014

No	Commodities	Year				
		2010	2011	2012	2013	2014
		(000 ton)				
1	Rice	66,680	68,800	71,000	73,300	75,700
2	Corn	19,800	22,000	24,000	26,000	29,000
3	Soy Bean	1,300	1,560	1,900	2,250	2,700
4	Cassava	22,248	22,400	25,000	26,300	27,600
5	Sweet potato	2,000	2,150	2,300	2,450	2,600

Source : Agriculture Ministry, 2009

Lampung, North Lampung, South Lampung and East Lampung. Sampling method used was stratified simple random sampling assuming homogeneous groups of population. Research method was survey method. The data used in this study were primary data and secondary data. The primary data were obtained through direct interviews with farmer households respondents. Secondary data were obtained from the department or agency related to the study and previous reports.Competitiveness analysis was done using PAM matrix (Police Analysis Matrix). PAM was used to calculate the revenues, expenses, and profits in private and social rates, as shown in Table 3.

Table 3. Policy Analysis Matrix (PAM)

	Description	Revenue	Cost		Profit
			Tradable Input	Nontradable Input	
1	Private Price	A	B	C	D
2	Social Price	E	F	G	H
3	Policy Impact	I	J	K	L

Source : Pearson, et.al.,2005

Description:

Financial Profit	(D)	= A-(B+C)
Economic Profit	(H)	= E-(F+G)
Transfer Output (OT)	(I)	= A-E
Transfer Input Tradable (IT)	(J)	= B-F
Transfer Input Nontradable (FT)	(K)	= C-G
Net Transfer (NT)	(L)	= I-(K+J)
Private Cost Ratio (PCR)		= C/(A-B)
Domestic Resources Cost Ratio (DRC)		= G/(E-F)
Nominal Protection Coeficient of Output (NPCO)		= A/E
Nominal Protection Coeficient of Input (NPCI)		= B/F
Efective Protection Coeficient (EPC)		= (A-B)/(E-F)
Profit Coeficient (PC)		= D/H
Subsidi Ratio to Produsen (SRP)		= L/E

The assumption of Rupiah exchange rate was Rp 9,830.26/US $ and the shadow exchange rate was Rp 9,826.24/US $. Input was divided into two, namely tradable inputs and non-tradable inputs. More details explanation is given in Table 4.

Table 4. Determination of tradable and nontradable input

Tradable	Nontradable
Urea Fertilazer	Manure
SP-36 Fertilazer	Seeds
Phonska Fertilazer	Compost Fertilizer
KCl Fertilizer	Petroganik Fertilizer
Pesticide	Karbio Fertilizer
	Dolomit
	KNO3 Fertilizer
	Micro Fertilizer
	Labour
	Land Tax
	Equipment
	Land
	Corncob
	Irrigation cost
	Transport cost

The social price of cassava was predicted based on Bangkok FOB price of tapioca from January to August 2013. The social price of rice, corn, urea, SP-36, Phonska and KCl were predicted by price Free On Board (FOB) and the price of Cost, Insurance and Freight (CIF) . The social price of pesticides was 80% of its private price because the pesticides prices prevailing in the market considered including 20% of import tax (Oemar and Mulyana, 2006). The social price of labor was calculated at 80% of its private prices because farmers' labor was considered to have lower productivity (Suryana, 1980). The social price of manure, seeds, compost fertilizer, petroganik, dolomite, karbio fertilizer, KNO3 fertilizer, micro fertilizers, equipment depreciation, land lease, corncob, irrigation costs and transport costs similar to the private prices, while the tax on social price was considered zero because the tax is a form of government intervention that should not exist in a perfectly competitive market.

Sensitivity analysis was used to determine the impact of changes in the components of revenues, expenses and profits in the farming of food commodities. Analyzer tools used to measure the sensitivity of PCR were the elasticity of PCR and the DRC, with the following formula

$$\text{PCR elasticity} = \frac{\Delta PCR / PCR}{\Delta Xi / Xi}$$

$$\text{DRC elasticity} = \frac{\Delta DRC / DRC}{\Delta Xi / Xi}$$

Where;
ΔPCR = Change of PCR value
ΔDRC = Change of DRC value

ΔXi = Change of tested parameter
Xi = Tested parameter

Criteria :

PCR or DRC elasticity < 1 means inelastic
PCR or DRC elasticity ≥ 1 means elastic

RESULTS AND DISCUSSION

Competitiveness of Strategic Food Commodities

Competitiveness of strategic food commodities can be measured by the PCR and the DRC value from the PAM matrix. PCR value indicates a competitive advantage while DRC value shows comparative advantage. PAM matrix of strategic food commodities can be seen in Table 5.

Table 5. Policy Analysis Matrix of strategic food commodities farming (per hectare) in Lampung Province, 2013

	Components	Revenue (Rp)	Tradable Input (Rp)	Nontradable Input (Rp)	Profit (Rp)
Rice					
PS I	Private price	19,719,956.40	1,451,683.31	13,515,012.41	4,753,260.68
	Social price	22,002,582.45	2,522,670.90	12,615,144.09	6,864,767.47
	Divergence	-2,282,626.06	-1,070,987.59	899,868.32	-2,111,506.79
PS II	Private price	17,195,853.88	1,413,559.20	12,769,228.56	3,013,066.12
	Social price	16,618,717.03	2,166,816.85	11,933,646.19	2,518,254.00
	Divergence	577,136.84	-753,257.64	835,582.37	494,812.12
Corn					
PS I	Private price	13,310,944.59	1,667,684.36	6,073,785.10	5,569,475.13
	Social price	16,490,429.65	2,816,087.69	5,588,892.04	8,085,449.91
	Divergence	-3,179,485.06	-1,148,403.33	484,893.05	-2,515,974.79
PS II	Private price	11,904,379.70	1,626,920.05	5,989,764.09	4,287,695.55
	Social price	12,729,789.57	2,467,413.77	5,511,405.22	4,750,970.57
	Divergence	-825,409.87	-840,493.72	478,358.87	-463,275.02
Cassava	Private price	18,593,746.10	1,361,658.39	9,818,022.77	7,414,064.94
	Social price	22,127,168.97	1,880,341.33	9,020,150.32	11,226,677.32
	Divergence	-3,533,422.87	-518,682.95	797,872.46	-3,812,612.38

Note : PS = Planting Season

The variation in the private and social revenue was due to the different rates of output price between private and social. The variation of price was believed caused by the market structure for rice, corn and cassava which generally is oligopsonistic. The difference in private inputs cost for tradable and non-tradable were caused by the policies set by the government for tradable inputs, such as fertilizer subsidies and pesticides import taxes, as well as the policy on non-tradable inputs such as the minimum wage policy. Market distortion and government policies affect the private and social profit of food commodities. The largest private and social profit of food commodities per year were from corn farming of Rp 9,857,170.68 / ha and Rp 12,836,420.49 / ha

respectively. Competitiveness indicators of strategic food commodities in Lampung are shown in Table 6.

Table 6. Indicators ofcompetitiveness strategic food commodities in Lampung Province, 2012/2013

Ratio	Rice		Corn		Cassava
	PS I	PS II	PS I	PS II	
PCR	0.74	0.81	0.52	0.58	0.57
DRC	0.65	0.83	0.41	0.54	0.45

Table 6 shows that the strategic food commodities which include rice, maize and cassava in Lampung Province were competitive both financially and economically, which characterized by PCR and DRC value less than one. The smaller the value of PCR and the DRC, the higher it competitiveness. This is in line with the finding of Zakaria (2004) were the production of rice in two cultivation systems, with irrigation and rainfed, had competitiveness both in the rainy season and dry season. This study is also in line with research of Abidin (2006) which stated that the competitiveness of cassava for biofuel on dry land in Center Lampung becoming more competitive because it was supported by an increasingly competitive market system as indicated by the increasing in number of agricultural industries which process cassava products and its derivatives, and hence created new demand and resulted in increasing price of cassava.

Indicators of government policy can be determined based on the value of output Transfer (OT), Nominal Protection Coefficient of Output (NPCO), Input Transfer (IT), Nominal Protection Coefficient of Input (NPCI), Transfer Factor (FT), Net Transfer (NT), effective Protection Coefficient (EPC), Profitability Coefficient (PC) and Subsidy Ratio to Producers (SRP). Policy indicators for strategic food commodities can be seen in Table 7.

Table 7. Indicators of government policy on strategic food commodities farming in Lampung

Ratio	Rice		Corn		Cassava
	PS I	PS II	PS I	PS II	
OT	-2,282,626.06	577,136.84	-3,179,485.06	-825,409.87	-3,533,422.87
NPCO	0.90	1.03	0.81	0.94	0.84
IT	-1,070,987.59	-753,257.64	-1,148,403.33	-840,493.72	-518,682.95
TF	899,868.32	835,582.37	484,893.05	478,358.87	797,872.46
NPCI	0.58	0.65	0.59	0.66	0.72
NT	-2,111,506.79	494,812.12	-2,515,974.79	-463,275.02	-3,812,612.38
PC	0.69	1.20	0.69	0.90	0.66
EPC	0.94	1.09	0.85	1.00	0.85
SRP	-0.10	0.03	-0.15	-0.03	-0.17

OT value is the difference between private revenue and social revenue, whereas NPCO is the ratio between private revenue and social revenue. OT value on rice farming (PS I), corn and cassava were negative and NPCO value were less than one. It shows that revenue of farming received by the farmers were lower than their expectation as a result of private output price were lower than the social price. This phenomena may be due to oligopsonistic market structure, where there were few buyers (contractors) with many sellers (farmers), so that the farmers act as the price takers. Different condition occured in rice farming (PS II) where OT value was positive and NPCO was more than one. This condition happened because the average of rice FOB price at PS II decreased and tends to be lowered than the average price of rice in the area of research that lead to private revenue became higher than social revenue.

IT value represents the difference between private tradable inputs cost and social tradable input cost, while NPCI is the ratio between private tradable inputs cost with social cost. IT value on strategic food commodities farm in this study were negative and NPCI were less than one, which means that the farmers paid for the tradable inputs cheaper than it should be. This was due to subsidies policies implemented by the government for urea, Phonska and SP-36 fertilizer, as well as import taxes for drugs.

Transfer Factor (FT) is the difference between private non-tradable inputs cost with social costs. FT value on strategic food commodities were positive, which means that farmers paid for non-tradable inputs higher than it should be. This was due to the policy of Average Minimum Wage (UMR). The policy aims to protect workers from low wage. This policy negatively affected strategic food commodities farming, because the profits were transferred from the farmers to non-tradable inputs manufacturers.

Net transfer (NT) is the difference between private profits to social profits, while Profitability Coefficient (PC) is the ratio of private profits to social profit. Net transfers show the overall impact of government policy on farming systems of strategic food commodities. NT values on rice farming (PS I), corn and cassava were negative with PC values less than one. It means that the profit received by the farmers were lower than expected, and the government's policies, output as well as input policies have not provide incentives to the farmers yet. Different conditions occur in rice farming in PS II where the NT value was positive and PC value was more than one, which means that the farmer gained higher profit than it should be. This condition happened because on PS II, very few farmers who grew rice so that the price of private output was higher than the social price.

EPC is the ratio between the difference of private revenue and private tradable input costs and the difference of social revenue and private tradable input costs. EPC value in rice farming (PS I), corn (PS I) and cassava were less than one. These conditions indicated that the distortion of the market and government policy towards the input and output still unprotected, existing policy should be able to protect farmers and encourage exports. EPC values in rice farming (PS II) and corn (PS II) were more than one, which means the overall policies of the government provide protection for farmers in production activity.

SRP is the ratio between the divergence of the profit components with social revenue. SRP value on rice farming (PS I), corn and cassava were negative, which means that any market distortions and government policy towards the input and output causing a decrease in profit of farmers, while the value of SRP on rice farming (PS II) was positive, which means that market distortions and government policies for the input and output causing an increase in farmer profits.

Sensitivity Analysis

Sensitivity analysis is used to determine the impact of revenues, cost and profit changes in competitiveness analysis. Three scenarios were used in the sensitivity analysis of strategic food

commodities, namely the increase in transport costs, the increase in fertilizer costs and a decrease in output prices.

The increase in transport costs

Sensitivity analysis of the increase in transport costs was done by increasing the cost of transport until competitive advantage reached the break-even point and the PCR value was equal to one. The results of the sensitivity analysis of the increase in transport costs were shown in Table 8.

Table 8. Sensitivity Analysis of the increase in transport costs

		Increased Transport cost					
		%	Transport cost (Rp)	*PCR*	*DRC*	El. *PCR*	El. *DRC*
Rice	PS I	-	-	0.74	0.65	-	-
	PS II	-	-	0.81	0.83	-	-
Corn	PS I	1,135%	5,998,167.24	1.00	0.81	0.08	0.09
	PS II	935%	4,703,144.33	1.00	0.95	0.08	0.08
Cassava		470%	9,061,903.80	1.00	0.81	0.16	0.18

The amount of transport cost reflects the existing infrastructure (roads) condition. High transport costs reflect poor road condition. Based on the analysis, increase in transport costs did not affect the competitiveness of rice, as the farmers did not not pay for the transport cost. The increase of transport cost in corn farming (PS I and PS II) and cassava farming were 1,135 percent 935 percent and 470 percent respectively, causing PCR values equal to one and higher DRC values. This means that the competitive advantage was at the break even point and comparative advantage became low.

The analysis showed that the increase in corn and cassava farming transport costs caused PCR and DRC elasticity values less than one. These results showed that the competitiveness of strategic food commodities were not sensitive to the increase in transport costs.

The increase of fertilizer cost

Sensitivity analysis of the increase in fertilizer price was done by rising the price of fertilizer until PCR value equal to one, which means that the competitive advantage is at break-even point. The results of the sensitivity analysis of the increase of fertilizer price were given in Table 9.

Table 9. Sensitivity Analysis of the Increase in Fertilizer Price

Commodity	Season	Change (%)	Increased in Fertilizer Price							
			Urea Price (Rp/kg)	Phonska Price (Rp/kg)	SP-36 Price (Rp/kg)	KCl Price (Rp/kg)	PCR	DRC	El. PC	El. DRC
Rice	PS I	417.3%	9,819.93	12,913.34	11,630.33	28,404.47	1.00	1.26	0.08	0.22
	PS II	273.5%	7,147.76	9,265.98	8,188.27	19,870.20	1.00	1.29	0.08	0.21
Corn	PS I	425%	10,333.45	13,984.09	12,661.25	29,100.00	1.00	1.90	0.21	0.86
	PS II	336%	8,581.68	11,610.52	10,460.21	24,166.86	1.00	1.88	0.21	0.74
Cassava		610%	13,314.38	19,093.73	30,132.77	46,961.98	1.00	0.95	0.12	0.18

Fertilizer is a very important input component for the farmers. Therefore, the government set the fertilizer subsidy policy so the price becomes cheaper and can be reached by all the farmers. Based on the sensitivity analysis, the increase in the price of fertilizer in rice farming were 417.3 percent (PS I) and 273.5 percent (PS II), and for the corn were 425 percent (PS I) and 336 percent (PS II). All those values made the PCR and DRC value equal to one, while the competitive and comparative advantage were at breakeven point.

The study also showed that fertilizer price increase 610 percent in cassava farming to get the PCR value equal to one and a higher DRC value. These conditions mean that competitive advantage was at breakeven point and comparative advantage become low. PCR elasticity and DRC value were less than one, suggested that the competitiveness of strategic food commodities are not sensitive to the increase in fertilizer prices.

The decrease in output price

Sensitivity analysis of the decrease in output price was done by lowering the price of output to create the PCR value equal to one, which means that the competitive advantage is at break-even point. The results of the sensitivity analysis of the decrease in output prices were shown in Table 10.

The reults showed that the competitive advantage of rice farming (PS I and PS II), corn (PS I and PS II) and cassava will be at break even if the decline in the price of each output were 24 percent, 17.15 percent, 42 percent , 36 percent and 40 percent respectively. PCR elasticity and DRC values were higher than one indicated that the competitiveness of strategic food commodities were sensitive to a decrease in output prices.

Table 10. Sensitivity Analysis of the Decrease in Output Price

		%	Increased Output Price					
			Private Cost (Rp/kg)	Social Cost (Rp/kg)	PCR	DRC	El. PCR	El. DRC
Rice	PS I	24%	2,686.60	2,997.58	1.00	0.89	1.46	1.55
	PS II	17.15%	3,012.87	2,911.75	1.00	1.03	1.34	1.43
Corn	PS I	42%	1,080.93	1,339.13	1.00	0.82	2.81	2.42
	PS II	36%	1,244.27	1,330.54	1.00	0.97	1.99	2.24
Cassava		40%	480.34	571.62	1.00	0.79	1.89	1.93

Policy Instrument

The sensitivity analysis showed that the increase in transport and fertilizer cost and also the decrease in output cost caused a decrease in competitiveness of rice, corn and cassava farming. PCR elasticity and the DRC values showed that the competitiveness of rice, corn and cassava were not sensitive to the increase in transport and fertilizer costs, but sensitive to a decrease in output cost. It means that the stability of the price of rice, corn and cassava was very important to be maintained. Therefore, output minimum price policy for those commodities is needed in order to improve its competitiveness.

Output cost is a very important variable in determining the competitiveness of strategic food commodities. Competitiveness of strategic food commodities which are most vulnerable to the decrease in output prices is the competitiveness of rice. A decrease in output cost with a low percentage makes rice farming lose its competitiveness. A decrease in output cost will also affect the farmers profit. Therefore, this condition might trigger land conversion from paddy fields to corn farming.

The profit of paddy farming was Rp 7,766,326.79 per hectare per year. That amount of profit was lower than corn farming of Rp 9,857,170.68 per hectare per year. That condition might lead to land conversion from rice to corn farm. Therefore, we need output price policies that can regulate rice grain price to remain stable in order to provide higher profit than corn farming.

Profit. Assuming that the private price of corn has not changed (fixed), i.e. Rp 1,852.50 /kg (PS I) and Rp 1,944.17 kg (PS II), the analysis showed that the price of rice grain provided higher profit per year compared to corn farming profits of Rp 3,850.00 / kg (Table 11).

Table 11. PAM of Rice and Corn Farming

	Components	Revenue	tradable Input	nontradable Input	Profit
Rice (Rp 3,850/kg)					
PS I	Private price	21,477,180.23	1,451,683.31	13,515,012.41	6,510,484.51
	Social price	22,002,582.45	2,522,670.90	12,615,144.09	6,864,767.47
	Divergence	-525,402.22	-1,070,987.59	899,868.32	-354,282.95
PS II	Private price	18,205,235.04	1,413,559.20	12,769,228.56	4,022,447.28
	Social price	16,618,717.03	2,166,816.85	11,933,646.19	2,518,254.00
	Divergence	1,586,518.01	-753,257.64	835,582.37	1,504,193.28
Corn					
PS I	Private price	13,310,944.59	1,667,684.36	6,073,785.10	5,569,475.13
	Social price	16,490,429.65	2,816,087.69	5,588,892.04	8,085,449.91
	Divergence	-3,179,485.06	-1,148,403.33	484,893.05	-2,515,974.79
PS II	Private price	11,904,379.70	1,626,920.05	5,989,764.09	4,287,695.55
	Social price	12,729,789.57	2,467,413.77	5,511,405.22	4,750,970.57
	Divergence	-825,409.87	-840,493.72	478,358.87	-463,275.02

The rice grain price was two times higher than the price of corn at the farmer level. Thus, to prevent land conversion, the government set the price of grain two time higher than the price of corn through the grain minimum price policy.

Besides rice, the competitiveness of strategic food commodities that also sensitive to a decrease in output prices was competitiveness of corn. Land conversion from corn into cassava by corn farmers is a problem that nowadays occurs in Lampung Province. This condition occurs because corn farming is considered less profitable than cassava. The costs of corn farming are not comparable with low revenue due to low price of corn. In addition, corn farming has a higher difficulty level than the cassava farming so that the farmers prefer to cultivate cassava.

In 2012, an increase in the selling price of cassava occurred where the price was Rp 1,100 / kg, resulted in massively trigger land conversion from corn into cassava. That price was the highest price ever attained by cassava farmers in Lampung Province. The results of the sensitivity analysis concluded that when cassava price reached Rp 1,100 / kg, farmers profit reached Rp 14,517,884.39 per hectare per season, as shown in Table 12. That amount of profit was earned by the cassava farmer in a year, because cassava is generally harvested once a year.

Table 12. PAM of Cassava and Corn Farming

	Components	Revenue	tradable Input	nontradable Input	Profit
Corn (Rp 2,250/kg)					
PS I	Private price	16,167,139.18	1,667,684.36	6,073,785.10	8,425,669.72
	Social price	16,490,429.65	2,816,087.69	5,588,892.04	8,085,449.91
	Divergence	(323,290.47)	(1,148,403.33)	484,893.05	340,219.80
PS II	Private price	13,777,036.08	1,626,920.05	5,989,764.09	6,160,351.94
	Social price	12,729,789.57	2,467,413.77	5,511,405.22	4,750,970.57
	Divergence	1,047,246.52	(840,493.72)	478,358.87	1,409,381.37
Cassava (Rp 1,100/kg)	Private price	25,697,565.54	1,361,658.39	9,818,022.77	14,517.884.39
	Social price	22,127,168.97	1,880,341.33	9,020,150.32	11,226,677.32
	Divergence	3,570,396.57	(518,682.95)	797,872.46	3,291,207.06

The increase in cassava price triggers corn farmers to switch to cassava farming, because corn farmers profit per hectare in a year was only Rp 9,857,170.68, less than the profits of cassava farming at the highest price (Rp 1,100 / kg). These conditions threaten the stability of food security in the province of Lampung, because land conversion led to the decrease of production and availability of corn in the market. Therefore, corn import was needed to fulfill the need of corn. It had a negative impact, where imports would drain foreign exchange and lead to depend on imports.

Government intervention to stabilize the price of corn through the implementation of regional Minimum Price policy (PMR) is needed to anticipate these conditions. To prevent shifting from corn land into cassava, corn regional minimum price need to be set at the level where the farmer can get the same advantages as cassava in one year. Based on calculations, when cassava price was at the highest price (Rp 1,100.00 / kg), the price of corn that can provide the same profit per year was Rp 2,250 / kg. Thus, the regional minimum price for corn commodity that can be set to prevent shifting and still provide decent profit for farmers was Rp 2,250.00 / kg or about two time of the cassava price.

CONCLUSIONS

Conclusions

Based on the research that has been conducted, it can be concluded that the strategic food commodities farming in Lampung Province were financially and economically competitive with PCR and DRC value less than one. Competitiveness of strategic food commodities in Lampung decrease with the increase in transport costs, fertilizer cost,and also the decrease in output prices. Competitiveness of strategic food commodities in Lampung were sensitive to a decrease in output prices. Regional minimum price policy for strategic food commodities (rice, corn, and cassava) is necessary to prevent land conversion between the commodities. The minimum price of rice (grain) was two times higher than the price of corn and corn minimum price was two times higher than the price of cassava.

Recommendations

Government, as the policy makers, shoulds establish regional minimum price policy for rice and corn commodity, where the minimum price of corn is two times higher than the price of cassava, and minimum price of rice is higher than the price of corn

REFERENCES

Abidin, Z. (2007). Daya Saing Usahatani UbiKayu untuk Biofuel di Lahan Kering Kabupaten Lampung Tengah. *Journal of SosioEkonomika* 14 (1), 47-61.

Badan Pusat Statistik. (2013). *Statistik Indonesia 2013*. Bandar Lampung: BPS Provinsi Lampung

Kementerian pertanian. (2009). Rancangan Rencana Strategis Kementerian Pertanian Tahun 2010-2014. Jakarta: Departemen Pertanian.

Oemar, A. dan A. Mulyana. (2006). Daya Saing Usaha Perkebunan Kelapa Sawit di Sumatera Selatan sebagai Subsektor yang Diintervensi Pemerintah. *Journal of SosioEkonomika* 12 (1), 44-52.

Pearson, S., Gotsch, C., & Bahri, S,. (2005). *Aplikasi Policy Analisys Matrix pada Pertanian Indonesia*. Jakarta: Yayasan Obor Indonesia.

Sambodo, M.T., Ahmad H. F., Latif A., Purwanto. (2007). *Mengurai Benang Kusut Daya Saing Indonesia*. Jakarta: LIPI Press.

Suryana, A. (1980). *Keuntungan Komparatif Dalam Produksi Ubikayu dan Jagung di Jawa Timur dan Lampung Dengan Analisa Penghematan Biaya Sumberdaya Domestik*. Tesis. Bogor: Institut Pertanian Bogor.

Zakaria, W.A. (2000). *Analisis Permintaan dan Penawaran Ubi Kayu di Propinsi Lampung*. Disertasi. Bogor: Institut Pertanian Bogor.

Zakaria, WA., Lestari, DAH, & Indriani, Y. (2004). The Impact of Irrigation Development of Rice Production in Lampung Province. In: Pearson, S., Gotsch, C., & Bahri, S, ed. *Aplikasi Policy Analisys Matrix pada Pertanian Indonesia*. Jakarta: Yayasan Obor Indonesia. 146-160

DESIGNING A MODEL OF BEEF CATTLE DEVELOPMENT IN WEST JAVA INDONESIA

Tawaf, Rochadi and Taslim
Animal Husbandry Faculty, Universitas Padjadjaran
rochadi_tawaf@unpad.ac.id

Beef production is a crucial issue in West Java because this region is the center of the national beef consumers. This study aimed to design a development model of beef cattle in West Java as the basis for beef cattle development in the region. The basic concept used in this model is to meet the need of domestic consumers for beef and its potential development in West Java.

The analytical method used in this study was a systematic analysis of the literature review of several previous studies with agribusiness systems approach and analysis of dynamic systems. Validation of data was done through Focus Group Discussions with stakeholders and related agencies, in order to produce a valid judgment. This study was carried out in August 1, 2014 - November 30, 2014 in BAPPEDA(Regional Development Planning Agency), government of West Java.

The results of this study are as follows: The model design of the development of beef cattle in West Java, which refers to the agribusiness system, divided into the area of village breeding centers in the southern part of West Java which manages the cows and calves operation and rearing; The suburb areas that manage fattening system and meat processing in the urban areas.

Keywords: model development design, beef, and beef agribusiness system

Introduction

Beef production plays an important role in West Java because this region is the center of the national beef consumption.West Java has the potential to produce beef that can meetthe consumer' demand. Yuhani, et al (2014) stated that the population dynamics of beef cattle in West Java was affected by the following reasons; (1) any export of beef cattle by 1%, the cattle population will be decreased by 0.4%. This indicates that we need a program / strategy to improve beef cattle population in West Java, and (2) The low production of beef at the increased rate of only 0.75% per year. This indicates that the production of beef in West Java has been growing relatively lower than the increased rate of population. The projection of the next five years and the population level of beef production in West Java province have showed that by the end of 2015, the population of beef cattle in West Java will reach nearly 350 thousand heads whilst beef production will reach about 84 thousand tons with an increase in the average of 0.75 percent per year.

On the one hand, the growth of the cattle population in West Java is strongly influenced by the cattle trade, especially in feeder cattle trade. The cattle trade of female and male calves that comingmostly from Central Java and East Java for breeding and fattening. Thus, the cattle population in West Java can be maintainedeach year especially in the center area of the development of livestock. While on the other hand, according to the BAPEDA (planning agencies of government of West Java, 2013), West Java has grown and developed centers of economic growth in the last decade, namely the Metro around Jakarta for the western part of West Java; Metro Bandung Raya and surrounding areas in the central region ofWest Java and Metro Cirebon Raya in surrounding eastern West Java. Economic growth will also determine the pattern of livestock development in the region.

This study aimed to design a model of the development of beef cattle in West Java which follow the trend of economic growth in the three areas of West Java. The basic concepts used in the model are to supply the consumer needs for domestic beef and to develop the potential of available resources in West Java.

Research Methods

The analytical method used in this study was a systematic analysis of the literature review of several previous studies with agribusiness systems approach and analysis of dynamic systems. Validation of data was done through Focus Group Discussions with stakeholders and related agencies, in order to produce a valid judgment. This study was carried out in August 1, 2014 - November 30, 2014 in BAPPEDA(Regional Development Planning Agency), government of West Java.

Results and Discussion

The livestock business development in West Java is very dependentupon the attraction and the power of the market and the downstream industries. Based on this phenomenon, it can be seen that the framework of beef cattle development model involves the power of leverage in the development of downstream industries. In this case, the downstream industriesare fattening cattle and beef processing industries development. Both industriesare highly related to the strength of the pull of the market or consumer demand so that the design development in the next upstream subsystem can be determined. Based on the previous studies by Tawaf (2009) and BAPPEDA West Java (2013), the development of fattening cattle in West Java can be done by the central market in three areas of business development offattening beef cattle and specifically described as follows and see figure 1:

1. The eastern part of West Java; namely the metro area of Cirebon Raya. The main consumers in this region are in each district capital and the center of town with a base Agropolitan city. In this region there are five animal market, the company fattening of APFINDO (associate producer of beef and Indonesian feedlots) members and Beef Cattle Breeding Center. In this area, there will be an international airportin the next few years, which will give the acceleration of economic growth in the eastern region of West Java.

2. Central region of West Java, namely Bandung Raya Metro area, including: Bandung Regency, West Bandung, Cimahi and Sumedang District. The main consumers in this region-based services and tourism industries which are located around the city of Bandung. In this region, there is only one animal market and two companies of fattening beef cattle APFINDO members.

3. Metro area around Jakarta, namely the western part of West Java with market centers to Jakarta and surrounding areas. The main consumers in this region-based industries and services. In this region, there are three animal markets and three companies of fattening beef cattle APFINDO members.

Figure 1. Map of Centers of Economic Growth in West Java

In connection with the development of economic growth centers in the three regions with different characteristics, the determination of the model development of beef cattle in West Java is as follows: based on the analysis of models of dynamic systems with agribusiness systems, the approach of the model is divided into three corresponding analysis of beef cattle farming value chain as shown in Figure 2: Breeding, rearing and feedlots.

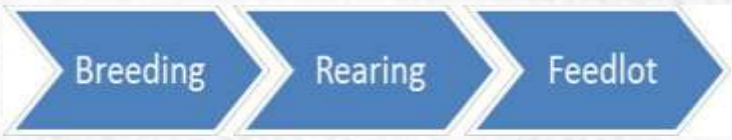


Figure 2. The value chain of beef cattle production

The analysis of the value chain in the beef cattle business is always preceded by activities in the downstream sector. This sector is considered as the locomotive of the movement in the cattle business activities in the upstream sector (breeding). The movement of breeding occurs because consumer demand is transparent to farmers in on-farm producers. Therefore, the analysis in this study was initiated by the sub-system on farm feedlot carried by beef cattle farmers.

Causal loop model of the development of beef cattle in West Java as shown in Figure 3.

Based on Figure 3, the complexity of the structure of the causal relationship in the agribusiness system of beef cattle in West Java needs to be understood in advance. This includes the availability of male calves, sub-systems for readily slaughtered cattle which are needed based on the public demand for beef in the market, and sub-system provision of readily slaughtered cattle through the process of fattening and rearing which are carried out by small farmers and large-scale enterprises.

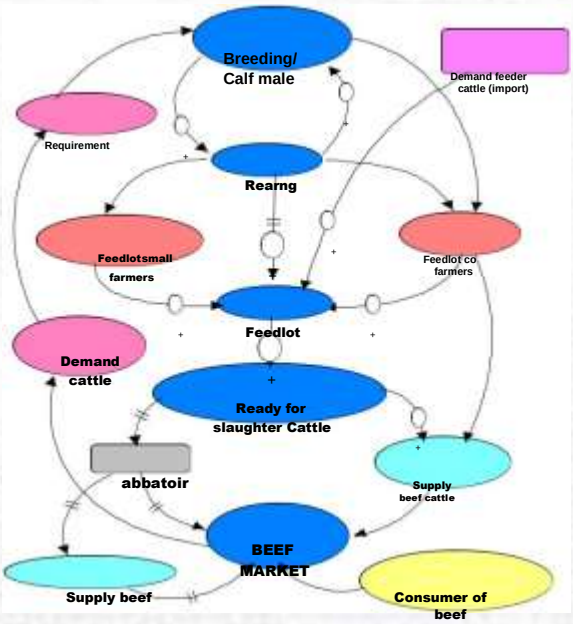


Figure 3. Causal Loop Model Development of beef cattle

Each sub-system is designed by typical factors and interact dynamically according to time and circumstances. An understanding of the studied system will determine the resulted dynamic model. Thus, the development of beef cattle in West Java is designed as a model based on consumer demand in accordance with the region as a center for consumers. This is in according with the theory of von tunen (1826) in Wilson and Birkin (2010) which states that proposed in which a single point of consumption is located at the center of a homogeneous plain with the following characteristics: uniform fertility; uniform transport costs; uniform production costs; infinitely elastic demand at a given price; and a single market centers.

The model development of beef cattle industry in West Java based on existing conditions and agribusiness systems perspective can be formulated as follows:

1. Beef market centers are mainly located in the center of economic growth or in the first circle such as (a) in sorounding Jakarta region: Brogor, Depok, Bekasi, Karawang and Purwakata in the west as an industrial area in West Java. (b) in the sorounding Bandung Raya region, which is located in Bandung, Bandung regency, West Bandung Regency and Sumedang district as an industrial area and tourist services, and (c) in *Ciayumajakuning* region, namely: District/city of Cirebon, Indramayu Regency, Regency Majalengka and Regency Kuningan. In these centers of beef market, it is worthy to develope primary industries that produce beef products ready for consumption. In this industry, the development of abattoirs and meat processing companiesas well as its derivatives such as meatballs and sausage industries is strongly recommended.

2. Supporting regional center for consumers or second circle is every suburb area of the market centers in the three regions. In this area, secondary businesses in beef industry such as cattle fattening is worthy to be developed.

3. The third area of the outer circle, is the areas that have the potential of natural resources to support on-farm beef cattle. These areas are relatively far from the center of economic growth but having a comparative advantage which are favorable for the beef cattle breeding business. These areasare recommended as a center for the development of beef cattle breeding in West Java, or region of village breeding centers located throughout the southern region of West Java.

Conclusion

The results of this study are as follows: that the design model of the development of beef cattle in West Java, which refers to the agribusiness system, is divided into several regions.Village breeding center in the South West Java manage cow calves operation and rearing whilethe suburb areas focus on the fattening system. Finally, the meat processing should be in urban areas.

Acknowledgements

Researchers would like to thank to the Regional Development Planning Agency the government of West Java Province who has financed and facilitated this research.

References

Bappeda Jawa Barat (2013) Rancangan Awal RPJMD Provinsi Jawa Barat Tahun 2013-2018; Disampaikan pada Acara Pengarahan Rancangan Awal RPJMD 2013-2018 dan RKPD 2014; available at : http://bit.ly/1z12Vup

Tawaf, Rochadi (2009) Response of Feedlot Business to the Change of Beef Market Mechanism in Existing Regional Resources and Government Policy of West Java, Disertasi. Program Pascasarjana Universitas Padjadjaran

Wilson A. G. and Birkin M. (2010) Geographical Analysis, Volume 19, Issue 1, Article first published online: 3 September 2010, pp 32 Wiley On Line Library available at : http://bit.ly/1qEU5Rq

Yuhani Hani, Remi Tjahari, Antje Sumartini, Rochadi Tawaf, Taslim, Nana Sutrisna dan Laila Nur Shasta (2014) Model Klaster Pembangunan Sapi Potong di Jawa Barat; Bappeda Pemerintah Daerah Provinsi Jawa Barat

POOR FARMERS EMPOWERMENT MODEL THROUGH ENTREPRENEURIAL DEVELOPMENT IN NORTH SUMATRA PROVINCE

Rahmanta

Lecturer of Agribusiness Major Faculty of Agriculture
University of North Sumatera
Medan – Indonesia

Email : rahmantaginting@yahoo.com

ABSTRACT

Majority of North Sumatra Province population lived in rural areas in 2012. The population of North Sumatra province who lived in rural areas is 6.67 million (50.48%) and those living in urban areas amounted to 6.54 million (49.52%).The number of poor people in North Sumatra province changes from year to year, in 2012 the number of poor people of North Sumatra Province around 1.38 million people or 10.41 percent of the total population of North Sumatra Province. This study wants to examine poor farmers empowerment model through entrepreneurship expansion to improve their family lives. The data used is primary data relating to the opinions of others as well as thoughts that are complementary and mutually corrective. Focus Group Discussion was used to collect information from various parties who are directly involved with the problems of poor rural farmer empowerment through entrepreneurial development. The study shows that poor farmers empowerment model through entrepreneurial development in improving their families lives using team work approach, farming diversification, farmers as entrepreneurs, and partnership.

Keywords : farmers empowerment model, entrepreneurial development, and partnership

INTRODUCTION

Poverty is a major problem in the local and national economy. High poverty rate can reduce the achievement of national governments and development activities, and eradication of poverty is the target in improving economic conditions. Development activities that do not change the conditions of poverty will cause problems that triggered social and political issues, so that the stability of the country will be disrupted and usually simultaneously will interfere with the economic performance (Arifin, 2006).

Majority population of North Sumatra Province lived in urban areas in 2012, around 6.67 million (50.48%) and those living in urban areas around 6.54 million (49.52%).The number of poor people in North Sumatra province changed from 1999 – 2010, as a result of the monetary crisis in mid-1997, the poor in North Sumatra province in 1999 increased to 16.74 per cent of the total population of North Sumatra Province which is about 1.97 million.

In 2003, there is a decrease of the poor both in absolute terms and as a percentage, 1.89 million people or about 15.89 per cent, while in 2004 the number and percentage dropped to 1.80 million, or approximately 14.93 percent, then in 2005 the poor dropped to 1.84 million, or 14.68 percent, but due to the impact of fuel price increase in March and in October 2005 the poor in 2006 increased to 1.98 million or 15.66 percent. In 2007, the number of poor people was 1.77 million, or 13.90 per cent, this figure declined in 2008 to 1.61 million, or 12.55 percent. In 2009, the poverty rate is back down to 1.50 million, or 11.51 percent. Later in the month of September 2012 decreased to 1.38 million, or 10.41 percent.

Empowerment in development includes the process of giving power to improve the social position, culture and economy of the community, in order to give them a significant role in the agricultural development.

Empowerment can be distinguished in two respects. First, that empowerment as an effort to provide the strength and ability of individuals or groups to be more empowered. There is an outer elements (either in the form of institutions or individuals) that provide power in taking part at the community development. Second, stimulate and motivate the farmers about their power and ability as individuals or groups.

Creative and innovative capabilities are the basis of Entrepreneurship to find opportunities for success. The essence of entrepreneurship is the ability to create something new and different through creative thinking and innovative action to create market opportunities, (Suryana, 2003).

Thus, the entrepreneur has the characteristics of self-confidence, task-oriented and results, risk taking, independence, initiative, energetic and hard working. In addition, entrepreneur also has the ability to lead, innovative spirit, creative, and future-oriented.

According to Krisnamurti (2014), agriculture has a major role in the economy of North Sumatra Province with a key pillar in maintaining economic stability, contribute to the growth, reducing poverty and reducing inequality.

Agriculture is a source of food, the most important society's basic needs, which also has a great contribution in maintaining the stability and control of inflation. Agriculture is an important part in the supply chain of various industrial products, creating employment opportunities not only from the farmer but also contribute significantly to foreign exchange earnings from non-oil exports. When agriculture is well developed, it will always have a positive impact for the whole economic development.

Based on the description above, the farmers need to be empowered due to the majority population of North Sumatra province is farmers and lives in rural areas, hence the purpose of this study is to formulate an empowerment model for poor farmers through the entrepreneurial development to improve their family lives and to increase farmers' participation in the process of agricultural development.

RESEARCH METHOD

Location and Reseach Object

This study was located in the province of North Sumatra, especially in Serdang Bedagai regency, due to local governments in Serdang Bedagai is very serious and consistent in managing agricultural and reducing poverty at the rural areas

The object of this study is the rural poor farmers. Other sources of important and relevant information from policy makers who are directly related to the empowerment of poor rural farmers, such as the Department of Agriculture, Department of Cooperatives, Department of Industry and Commerce, and other agencies.

Conducting Focus Group Discussion (FGD)

In this research, focus group discussion was used to gain information and collect data relating to the opinions of others as well as the thoughts of complementary and mutual correction of the various parties involved directly with the problem of poor rural farmer empowerment through entrepreneurial development.

Methods of Data Analysis

This study used a qualitative approach; This approach is used in order to study the problems profoundly and comprehensively. In accordance with the qualitative approach, in analyzing the data this study empowering poor farmers model framework.

Data analysis was performed by examining the data obtained from various sources or information. Data analysis is the process of organizing and sorting data into a pattern, and a basic description of the unit so that the theme can be found. The data have been analyzed and interpreted to determine the purpose and meaning, and then linked to the research problem. Analysis of data includes: (a) organizing the data set into several categories, or processing information that truly important and considered as a theme or research centers, (b) the interpretation, including patterns identification, trends, and explanations that will lead to the correct conclusion

RESULT AND DISCUSSION

Efforts are being made to empower poor rural farmers through entrepreneurial development

Small business has a very important role in the economic development of the region, especially for providing business field, employment opportunities, public revenues increasing, Non-oil exports increasing and strength regional industrial structure. However, for development, the problems are going to external or internal problem issues, They are : (1) the climate business do not support the growth of development of small businesses to optimize potentially,
(2) infrastructure-oriented business relatively limited business development, (3) the ability of public entrepreneurship as small businesses are still not running optimally, and (4) the professional attitude of an entrepreneur is not entrenched, (5) the length of the distribution chain, and others.

In an effort to provide the strength and ability of the empowerment, there are two parties need to be reviewed carefully, first, the parties are empowered and second, the empowering parties. In order to obtain satisfactory results, it is required a strong commitment from both sides. From the empowerment parties must move from the approach that the poor farmers are the subject which follow directional approach, held out by the targetted group and used group or individual approach.

Empowerment parties must have commitment to carry out a empowering programs, due to the last experience showed that many development programs did not showed the aspects of empowerment. Low commitment on the part of empowerment parties can arise from the thoughts that the empowerment will reduce their power.

Empowerment is more related to the bottom-up approach rather than top down approach. Institutions associated with the empowerment programs must take action based on the public consciousness.

Participatory farming strategies in agricultural development paradigm centered on people. This approach emphasizes the importance of community capacity to improve internal strength in agribusiness management. People-centered development as the antithesis of big industry-oriented development is a new alternative to increase production to meet the growing and increasing needs of society.

The main focus of agricultural development efforts in the future remains to be resting on the role and activities of the farmers. There are three pillars to note, the use of appropriate technology, and the role of government support, as well as taking advantage from the increase in demand. The centrality of the farmers also need to be implemented in the supply chain, to link the farmers with the production demand of consumer, and it can be drawn as follows:

The farmer should be able to build a supply response to meet the increasing demand. Farmers should receive the greatest benefit from these developments. If the farmers do not has the ability to participate, there must be support and policy from government to change the situation.

This study recommended several strategies to build the capacity of farmers to respond to consumer demand growth and be able to utilize appropriate technology, namely:

1. Direct Policy and Support from Government to Farmers

Nowadays, Government direct support to the farmers still focused on subsidized seed and fertilizer. Fertilizer subsidies can reduce production costs and increase productivity. On the other hand, consideration may be given to subsidized price of the product in order to increase farmers income.

2. Research and Development, Technology Application and Farmers Relief

Research and development, application of appropriate technology, and farmers relief is needed to help farmers in respond to a variety of developments directly on the unit area where the farmers are. Increasing agricultural production through the use of technology can be done by optimizing existing technologies and the development / technological innovation.

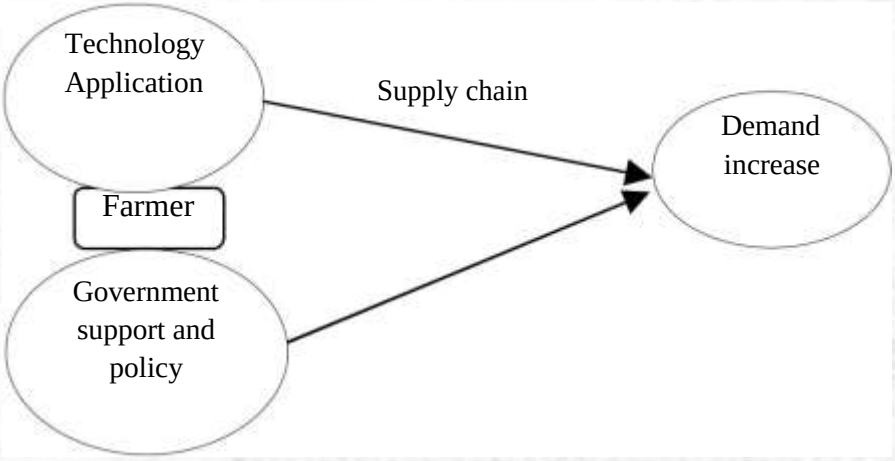


Figure 1. Farmers centrality

\

The technology support is not only needed by farmers during crop cultivation, but it is also needed in the post-harvest processing, frequently, the farmer can not immediately sell all of their crops, either because the price is not suitable or have not found the right consumers. In this waiting period, required the help of technology to keep the harvest remain in good condition and fresh before eventually pass into the hands of consumers.

Innovation and technology in agriculture cannot be applied properly in the absence of competent agricultural workers in assisting farmers. Counseling activity can be defined as the process of technology transfer where farmers are expected to apply various technologies that have been made. In addition, counseling activities and advisory services to farmers can be defined as the process of dissemination and transfer of knowledge and experience (education) in the processing of agricultural land that has been successfully carried out (best practices) by other farmers.

3. Institutional Development and Multi product Zone and Agricultural Supply Chain Services

Recently, the agriculture waste is very large, due to lack of efficiency, the amount of waste occurs primarily because the business concept that focuses on just one product output. Rice farming is typically calculated only with the output value of dry grain harvest, while the chaff, groats, straw, etc. are not taken into account. Cacao farm efforts are almost always designed to produce output while the cocoa beans and cocoa fruit pulp has not been widely used. Many farming activities that can be used as examples of a single product oriented approach, even though there are many options to make them into multiple products oriented. One area covering hundreds of hectares of rice fields for example, can be optimized to produce 4-5 rice-based products, including power generating biomass energy and other value-added products. This area can then also be developed as a unit of agricultural supply chain services, ranging from processing, packaging, brand development, storage, transportation, and so forth.

4. Direct Financing To Support Farmers

Extensive agricultural areas, made the farmers difficelt to cultivate the areas, it will be a very good idea to design support direct financing to farmers, either in the form of investment, employment credit, insurance, and so forth. Even can also be combined with personal finance for farmers and their families or also in the form of other development programs such as housing, consumption, nutrition, education, and others.

The Farmer Empowerment Through Partnership Strategy

1. Cooperation

One of the the procedure to accomplish small bussines weaknesses agribusiness by creating a group of net working, It can be designed by an organization with one vision and mission in other that to decrease human resource limitation

2. Teamwork building

Team work building is an elegant strategy by trusting each team, the leader of the team builds the effort, trust and cooperate to each other , The sense of belonging builds the strength and powerfull energy team in other that to dismiss the suspicious of each team and interfered by other side parts.

3. Working group development

In the reform era, we are determined to open a corridor widest freedom of association, assembly, and states of mind. We want to end the long-standing in single role policy the necessity of working group development to divide some places for the organization of certain professions. Commercial business activity always refers to efforts to create a profit (profit-making), but in creating a new paradigm to be making a profit for the stakeholders. Implied that the business must be profitable for stake holders unless the owners, farmers, the environment and society.

4. Establishment partnerships and business networking

The strategy of partnerships and business networking build the principle of mutual business and the embodiment of togetherness strive, grow and develop together, cooperate while competing as well as fairness in the distribution of value added. The most important thing to consider in the partnership is fundamental problems of farmers as the plasma at the beginning of the partnership, for example changing patterns of farmers. The rule requires the ability of farmers to adopt the technology, farm management systems, cropping and post-harvest handling. The industry is the core of the partnership will establish criteria to be met farmers, among others: (1) access to land, (2) the ability to adopt new technologies, (3) the potential for organizing production activities (4) the agreement that has been made, discipline , loyal, honest and committed, (5) Ability to pay back loans (loans) inputs.

Strategy can be done in the development of partnerships and business networks are: (1) the needs an adequate promotion of the potential of leading agro-ecosystem conducive to businesses and institutions as a business partner. It can be done by business groups and also by the local government, (2) the raise awareness of potential investors for the positive aspects of investing in agribusiness through small agribusiness group. It can be achieved through exhibitions and efforts to emphasize the benefits of short-term and long-term development of farmer-entrepreneurs agribusiness partnership, (3) The development of communication forum system integration which supporting institutions such as business organizations, extension, sectoral agencies, developers science and technology, and others.

The core of partnerships developing at this time (1) The core partnership strategy: A Strategy of partnership between farmers / farm groups or the group as a partner with the core enterprise business partner. The core company provide land, means of production, technical guidance and management and the production market. The Group of business partners must meet the needs of the company in accordance to the agreed requirements, (2) the core of subcontracting: It is a partnership between the company and its business partners with a group of business partners who produce the necessary components partner companies as part of its production. Generally characterized by a collective contract agreement includes volume, price, quality and time, (3) The operational cooperation agribusiness partnership pattern: A pattern of a business relationship which groups of partners to provide land, facilities and personnel. While the partner company providing cost, capital, management and processing of production facilities to commercialize or cultivate an agribusiness commodity. The strategy of cooperative partnership agribusiness operations are often conducted research the farmer area always shortage capital and management in farming, and farmers have the availability of labor farming to cover the advantages and disadvantages, farmers in partnership with other companies are needed.

CONCLUSIONS AND RECOMMENDATIONS

Conclusion

a. Empowering small business entrepreneurship can be done in a participatory manner farmers and governments as well as the subject of practitioners put themselves as facilitators.
b. Entrepreneurship development can be done in a participatory manner with mutually beneficial partnership program to support the empowerment of farmers.

Recommendations

The farmer groups policy should be developed by farmers. The formation of the group and mutually beneficial partnership which facilitated by the government will be able to build new entrepreneurship in order to improve the farmers welfare.

REFERENCES

Adimihardja, K. (2001). *Strategies for Community Empowerment*. Bandung : Main Humanities Press.

Arifin, B. (2006). *Reflection Of The Poverty Reduction Strategy. Business and Political Economy*. Bandung : Bandung Islamic University.

Central Agency Statistics. (2013). *North Sumatera In Figures 2013*. Medan : Central Agency Statistics North Sumatera Province.

Central Agency Statistics. (2013). *Serdang Bedagai In Figures 2013*. Sei Rampah : Central Agency Statistics Serdang Bedagai Regency.

Kasmis, (2007). *Entrepreneurship*. Jakarta : King Grafindo Perkasa.

Krisnamurthi, B. (2014). *Policy for Empowerment for Growth, Growth to Empower*. Bogor : Paper presented at the opening of the XVII National Conference and The XVI National Congress Association Indonesian Agricultural Economy.

Ministry of Agriculture. (2010). *Ministry of Agriculture Policies and Programs That Support Community Entrepreneurship Program*. Jakarta : Directorate General of Ministry of Agriculture and Agricultural Products Processing.

Ratnawati, S. (2011). *Models of Poor Rural Women Empowerment through Entrepreneurship Development*. Surabaya : Entrepreneurship Journal Vol. 5 No. 2, University of Widya Kartika.

Suryana, (2003). *Entrepreneur. Pratical Guidance, Tips, and The process to success. Jakarta : Salemba Empat*

- **PRODUCTION ECONOMICS**

- **AGRIBUSINESS ECONOMICS AND MANAGEMENT**

FARMERS AWARENESS ON NEW LOCAL FEED INGREDIENTS FOR CHICKEN: PALM KERNEL CAKE

Siti Fatimah Mohamad, Zainal Abidin Mohamed, Golnaz Rezai, Juwaidah Sharifuddin
Corresponding Author: puterisitifatimah@gmail.com
Department of Agribusiness and Information System,
Faculty of Agriculture, Universiti Putra Malaysia

Extended Abstract

Poultry in Malaysia has achieved self-sufficiency over 100%. However, poultry inputs sector, especially feed is still dependent on imported feed ingredients. Palm Kernel Cake (PKC) is waste from palm oil products and has been successfully convert into ruminant feed, but PKC still do not be commercialize in the poultry feed. This study is to identify the perceptions of chicken farmer and factors willingness to adopt new local feed ingredient (PKC) in which 300 poultry farmers throughout peninsular Malaysia was chosen as respondent using stratified random sampling method based on farm size. Attitudes on choosing feed on farms and factors that influence awareness on new local feed ingredient (PKC) were analyzed using descriptive analysis and binary logistic regression analysis.

Penternakan ayam di Malaysia telah mencapai tahap kadar saradiri yang melebihi 100%. Walaubagaimanapun, sektor input terutama sektor makanan haiwan jenis unggas masih bersandar pada bahan makanan yang diimport. PKC merupakan hasil buangan dari produk kelapa sawit dan telah berjaya digunakan di dalam sektor makanan haiwan ruminan, namun masih lagi tidak dikormesialkan di dalam sektor makanan haiwan berjenis unggas. Kajian ini bertujuan mengenalpasti persepsi awal dan faktor-faktor kesanggupan penternak ayam menggunakan bahan makanan ayam tempatan (PKC) di mana 300 penternak ayam seluruh semenanjung Malaysia telah dipilih secara startified simple random berdasarkan saiz ladang. Persepsi dan faktor-faktor yang mempengaruhi kesedaran penternak mengenai bahan makanan ayam tempatan baru (PKC) dianalisis menggunakan analisi diskriptif dan analisis binary logistic regression.

Keywords: Palm Kernel Cake, Poultry Industry, Awareness, Logistic Regression

Introduction

Poultry industry in Malaysia have achieves more than 100 percent self sufficient year by year. This 100 percent self-sufficient is not only ensuring the food security in term of Malaysian white meat consumption, but also increase the GDP in agriculture sector. The National Agro-Food 2011 to 2020 aims to increase the poultry sub-sector's productivity in order to ensure national food security and increase its contribution to export trade. The initiatives include encouraging the adoption of new technology, research and development in feed production and improving surveillance to reduce poultry diseases, all of which have contributed to an increase in poultry production in year 2010 by MYR 5,083.06 Million to MYR 6,042.96 in year 2012 (DOS, 2013). Investments on technology into environmentally controlled housing or close house have increased the productivity of breeders, and improved feed conversion ratio.

Cost of input is one of the main constraints that every company or farms need to face. In poultry industry, the cost of production is increasing year by year. This is due to the increasing in feed

price where most of ingredient in chicken feed is been imported. According to Department of Veterinary (2012), cost of feed in total production cost consist more than 70 percent, followed by cost of day-old-chick, 21 percent. Cost of chicken feed by 50 kg is around MYR66.65 in year 2006 then increase to MYR 87.30 in year 2010 and this price continue to increase (DVS, 2012). Corn is the major proportion in chicken feed; consist about 52 percent, followed by soybean meal, 34 percent (DVS, 2012). Price of world corn is increase due to the ethanol production, and this may bring a problem to the poultry feed industry especially to Malaysia. In order to sustaining poultry industry with more than 100 percent self sufficient, an alternative feed need to be find and replace the corn proportion as efficient as possible.

Problem Statement

Price of input in chicken feed is continued to increase since it is related to the increasing of world price grain especially corn. Poultry industry in Malaysia is highly depending on corn and soybean meal as main feed ingredient. In order to help farmers and reduce the cost of feed in Malaysia, many researches have been done on local crop and grain such as tapioca, sagoon, and palm kernel cake (PKC). Local ingredient such as tapioca and sagoon need a large space in order to be produce in a large scale and it is different with PKC which is only a waste from palm oil. PKC is obtained from the kernel after the oil has been extracted. The kernel contains 50% fats, 9% crude protein and significant amounts of digestible starches, sugars and cellulose.

Many researches have been done on PKC by Research University (RU) and research instituted. Universiti Putra Malaysia has come out with a product of PKC named ZeoPKC; an alternative feed for ruminant and non-ruminant. Besides that, Malaysia Agriculture Research and Development Institute (MARDI) also have come out with the percentage of PKC that be include in feed. According to MARDI, PKC can be used under various concentrations for different farm animals such as, for beef cattle up to 90%, dairy cattle 50%, swine 25-30%, poultry 20-25%, sheep and goat 30-40% and fish 20-30% of total ration.

The usage of PKC as feed is already be commercialize in ruminant industry for cattle and goat industry few years back, but not in non-ruminant industry. PKC is a new alternative feed that not yet be commercialize for non-ruminant in Malaysia.

After many research and improvement is has been done on PKC as one of the alternative to non-ruminant feed, however the application of PKC on farm is still less and almost none. Do these chicken farmers aware of the existence of PKC as one of the alternative feed for non-ruminant industry? Or are there any other factors that influence the awareness of chicken farmers toward this new local feed ingredient?

Methodology

This study is using the stratified random sampling. All respondents involve in this study are poultry farmers from small farm size with less than 20 000 chickens per farm to the large farms size with more than 50 000 chickens per farm. This study cover all the peninsular state from Johor, Malacca, Negeri Sembilan, Selangor, Pahang, Terengganu, Kelantan, Perlis, Kedah, Penang and Perak.

All responds and result from respondent is analyze using Statistical Package for Science Social (SPSS). Descriptive analysis used for the socio-economic background of respondents and also farmers attitude while choosing their feed on farms, while binary logistic regression analysis used

to evaluate and identify factors that influence awareness of respondents toward new local feed ingredient (PKC).

Result and Discussion

Quality is more important than price. Respondents checked for the quality (72.7% of total respondents) instead of price (3.7% of total respondents) every time they choosing feed for farm. A better quality of feed may lead to a better feed conversion ratio. According to farmers, quality of feed also related to the brand where 71% of farmers choose a quality feed based on brand. However, in term of awareness toward local by-product that can be used for chicken feed is still undefined. In order to see and determine factor that effect awareness, binary logistic regression is being used to analyze.

Six factors are being identified to give influence toward awareness regarding new local feed ingredient. These six factors include position in company, age, level of education, type of chicken, extension programme and involvement in contract farming. The model predicted to be correct is 72% correct. In order to see the fitness of the model, Hosmer and Lemeshow test are being used and the result for Hosmer and Lemeshow test is 0.526 which mean the model is fit.

Young age farmers are more likely aware on existence of PKC as new local by-product for chicken feed compare to the elder farmers. The result of extension programme show that farmers that once go to any course that related to chicken farming are more likely aware on existence local new feed ingredient. Farmers with village chicken (*Galus Galus Domesticus* sp) type are more likely to aware on the existence of new local feed ingredient, compare to farmers with broiler chicken (Cobb and Ross). Extension programme also show a significant influence toward awareness on new local feed ingredient.

References

Department of Veterinary Services (2012). *Info Kad Unggas,* Kuala Lumpur : Department of Veterinary Services.

Department of Veterinary Services (2013). The Broiler Chicken Industry in Peninsular Malaysia. Status of the Industry in 2013 and Prospects for 2014, Kuala Lumpur : Department of Veterinary Services.

Fatimah, M.A., Nik Mustapha, R.A., Bisant, K., Amin, M.A. (2007). *50 Years of Malaysian Agriculture: Transformational Issues, Challanges and Direction*. Malaysia: Universiti Putra Malaysia Press

Laupa Junus (Newpaper Publish). *Makanan Tambahan Ternakan daripada Sisa Sawit*, Retrieve October 21, 2014 from http://psasir.upm.edu.my/1212/1/0123.pdf

Onuh, S.O., Ortserga, D.D., Okoh, J.J. (2010). Response of Broiler Chickens to Palm Kernel Cake and Maize Offal Mixed in Different Ratios. Journal of Nutrition 9 (6). 516-519, 2010.

Sharmila, A., Alimon, A.R., Azhar, K., Noor, H.M. and Samsudin, A.A. (2014) Improving Nutritional Values of Palm Kernel Cake (PKC) as Poultry Feeds: A Review. Mal. Journal Animal Science. 17(1):1-18.

INTERNAL REINFORCEMENT YOGHURT HOUSEHOLD INDUSTRY: A NEW POTENTIAL MICRO-SMALL ENTERPRENEUR IN INDONESIAN URBAN AREA

Yoni Atma[1], Hermawan Seftiono[1] and M. Rizal Taufikurrohman[2]

[1)] Lecturer at Food Science and Technology Department, Faculty of Bioindustry, Universitas Trilogi-Jakarta

[2)] Lecturer at Agribusiness Department, Faculty of Bioindustry, Universitas Trilogi-Jakarta

Corresponding Author: **Yoni Atma** (yoniatma@universitas-trilogi.ac.id). Address: Kampus Trilogi, Jalan Trilogi No. 1. Kalibata-Jakarta Selatan 12760 Indonesia

---

Abstract

Micro small enterprises (MSE) sector is one of major player in economic activities, provide employment opportunities, local economic development and community development. Business areas in the MSE sector such as foods, crafts, services, health and others. Food and meals is the most implemented in micro-scale sectors. Even functional food business has its own market. The functional food became popular not only at the level of large industries, but also on home scale industries. However, home scale industries was difficult to compete with a branded products produced by a large industry. Generally, factors that affect toward sustainability and development of an industry are internal factors and external factors. Internal factors is factors that can be controlled and direct implications to the industries. This paper presents strategies and technical aspect for strengthening the internal factor in business developing of yoghurt household industry. The study was conducted using a combination method such as observation and interviews to obtain quantitative and qualitative data. The results showed that the internal factors in yoghurt household industry are human resources, financial management, management of raw materials, processesing, packaging and marketing. Each factor has strengths and weaknesses. The strengths of each other will be mutually reinforcing. Internal reinforcement constructed based on the strengths, weaknesses, opportunities and threats in the internal environment and analysis of external factors that will support the industries. Understanding by household's managements about food technology and regulations are needed to make a model of internal reinforcement. Result from this research shown that most of business owner have competent level in education and experience. Business financial managed by the owners directly. Raw materials quality checking especially fresh milk is important things on initial stages of production. Another important stages are controlling production process such as accuracy of the formula, temperature of heating milk (pasteurized), addition of starter bacteria and incubation time. Commitment by production and marketing employee is needed for development of industries. Price of yoghurt household industry is cheaper than branded yoghurt. Unfortunately the visual communication design of packaging yoghurt household industries still modest. Variation in the type and size of yoghurt packaging provide a lot of options for consumers. Promotion carried out by door-to-door, public event, and direct distribution to the grocery shops. Yoghurt household industries that using social media and internet for promotion is slightly. Continously promotion and improvement of promotional strategies by employees is still lacking due to limited human resources.

Keyword: yoghurt, household industry, internal factor, urban area, micro-small entrepreneur

Introduction

The rapid growth of urban areas is positive influence to the economic growth and urbanization. Industrialization, speed up technological developments and completeness public facilities make urban area is desired place to gain a better life. However, it is lead to an increasing of unemployment and poverty. Unemployed in Indonesia in 2014 is reached 5.7%, or about 7.4 million people and the poverty rate reached 11.25%, or about 27 million people. Urban areas, particularly who close to the megacity region is contributor to the highest unemployment rate in Indonesia. This areas such as Jakarta, Banten and West Java provinces (BPS, 2014).

One alternative solution to overcome the unemployment and poverty is enterpreneurship. The majority of entrepreneurs starting a business from small scale then grow to medium scale. In Indonesia, micro and small enterprises (MSE) were growing rapidly. Data from the Ministry of Cooperatives and SMEs in (2010) showed that the number of business units in Indonesia in 2009 was 52,937,314 units, where 52,723,470 business units (99.59%) are MSE and the majority (98.96%) of them are micro enterprises. Indonesian economy from MSEs sector is a major player in economic activity, providing employment opportunities, and local economic development and community development (Asmara, 2014). Based on data from the Central Statistics Agency (BPS) in 2005, the number of SMEs reached 42.39 million units, or approximately 99.85% from total business unit in Indonesia. It is provide approximately 99.45% for job opportunities from total about 76.54 million workers. In addition, the SME sector is also able to provide approximately 57% of the goods and services, 19% contribution to export as well as contributing to national economic growth reaches 2-4% (Supriyanto 2006).

Industrialization in urban area is growing rapidly. Important factors that encourage of it growth are the flow of information, infrastructure and consumers. In urban areas the flow of information would be faster, infrastructure is more comprehensive and distribution of products to consumers would be easier so that reduced of distribution costs. Although limited in land area, but the development of the industry that does not need a wide land area such as the downstream industry is growing very promising. This has led to the centralization of the industrial area in urban. Not only large-scale industry but also the micro, small and medium enterprises.

Micro, small and medium scale business are competitors of the large-scale, especially for domestic consumers (Jarmal, 2009). One of which is yoghurt household industry. Yoghurt industry does not require wide land area. Furthermore, raw milk can be supplied from many of farmers in surrounding areas.Yoghurt as functional food industry has its own market segment. It is exclusive food because in addition to meet the nutritional needs, also have health benefits. Yoghurt is made from milk that inoculated with microbial life to perform fermentation. In addition to containing protein, vitamins and minerals, yoghurt also can maintain a healthy digestive tract and increase endurance (Parvez et al. 2006). Globalization and modernization requires consumers to selectively choose food products and beverages. Especially in urban areas, the products ready to eat would be chosen because of time. In addition to good taste, another consideration is the health benefits will be selected for routine activity and maintain body condition. It is also causes more yoghurt processing industries ranging from small, medium and large. So that are also increasing competition for customers to be able to survive and thrive (Dewi, 2009).

Study by Dewi (2009) showed that the factors affect the sustainability of yoghurt household industry are external factors and internal factors. External factors consist of the macro-environment and industrial environments that are beyond the control of the industry. While the internal factors include human resources, financial management, production and operations and marketing. Internal factors implicated directly to the survival of the industry. Analysis of internal factors not only on identifying the strengths and weaknesses of the industry but also the opportunities and threats. Therefore the identification of the internal condition provide formulation to the internal reinforcement strategy yoghurt household industry.

Urban society lifestyle affect the behavior of individuals or a group of people to satisfy the needs and desires in control and adaptation to the environment. Communities in urban environments more selective in choosing food. They choose foods based on taste, appearance and health benefits. Moreover, the rate of population growth in urban areas is very rapid. According to the central statistics agency (BPS) in Indonesia, the average of population growth rate in the Jakarta-Bogor-Tangerang-Bekasi is reached 4,95%. Both of facts is potential for positioning of yoghurt products to consumers as one of the marketing strategy (Supartoyo et al. 2013). Therefore this research is conduct to answer how the internal state of the yoghurt households industry in urban areas. How to combine the internal condition of the other industries in the process and management towards strengthening. How industry can compete with large-scale industry. In addition, based on the study of literature in food technology, what is effective improvisasion for granted so that it becomes a model or strategy of reinforcement.

Materials and Methods

Preparation and field research carried out on November until December 2014. Sampling location is done by purposive sampling in JABODETABEK AREA, Indonesia. It is because Jakarta and the surrounding megacity area is an area that has highest of economic growth, urbanization, and the unemployment rate. In this area also occur high social inequalities where one side is negative impact, but when seen from the marketing potentiality is a positive thing. Object of the research is yoghurt household industry that categorized as establish and may to compete with large-scale industrial. This research using the combination methods. Combination method is one of statistical methods that combine quantitative and qualitative analysis. It is divide to sequentially and mixture combination. Combination method support overall data that be strengthening of the internal factor which is comes from the primary data, secondary data and observations.

Data is obtained through observation and deep interview. Data were collected through questionnaires to the respondents (owner, employee production, and marketing employees). Direct structured interviews conducted with respondents, and then continued with observation companies and recording of data. Literature studies conducted to support the formulation of strategies and models of reinforcement. The questions type is closed and open questions that covering of industry profile, human resources, management and production techniques such as raw materials, production and packaging and marketing management. Open question given to respondents for more information. Finally, data tabulated and analyzed descriptively.

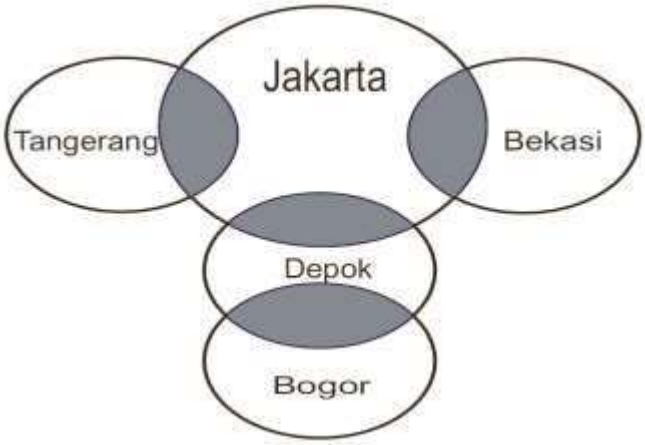


Figure 1. Sampling location for research

Results and Discussion

Yoghurt houshold industry

Company structure of yoghurt household industry composed of owners who directly supervises several employees. Employees consists of employees of the purchase and inspection of raw materials, the employee in charge of making yogurt (production), and the employee in charge of distribution and sales stages. Most employees of the distribution and sales are not permanent employees. Some industries do not have a specific employee to purchase and inspection of raw materials so that for this part is handled directly by the owner. The whole industry yogurt households have permanent employees for the production process.

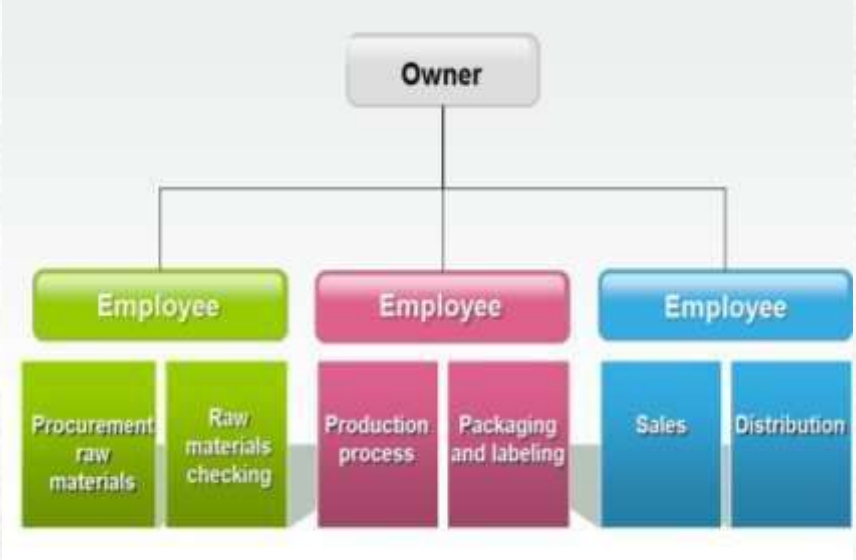


Figure 2. Organization structure of yoghurt household industry

The internal factor is the basis to be built an industry. It is determine how strong the industry to survive in the competition against the large-scale industry. Yoghurt households industry that has been established in urban areas is grown since 4-6 years ago that managed directly by the owner. Owner as a entrepreneurs of yoghurt household industry has an adequate educational and experience background. Most of them are bachelor and master degree. Educational background is correlated with the quality of products and production process. Production process that includes the receipt of raw materials, processing, and packaging process. Stages for receipt of raw materials shown that the incoming raw materials meets to quality. Processing stages shown that each stage of processing carried out with well operation, including the prevention of contaminants. Packaging stages has complied with the rules of good packing which is sterilization packaging and labeling packaging that suitable for food products.

In general constraints faced by entrepreneurs are financial capital and marketing aspects. The initial capital for the establishment of industries ranging from 5-10 million. These funds come from the owners. This limited capital cause to limitations of competent employees recruitment because they require for a salary standard. In addition, the limited funds made industry difficult to innovate a new products according to market trends because it would require funding to conduct research and *trial error*. Although product is diverse but modify the products tend to be monotonous in the bottles, packaging cup, and ice mambo.

The financial arrangements are made with simple accounting bookkeeping. Financial management including the purchase of raw materials, packaging materials, production, salary

and promotion costs. Fresh raw milk purchased from a nearby farmer. The main raw material in the manufacture of yoghurt is fresh milk. Raw material fresh milk is come from cattle farmers. According to some owners who statement that fresh milk in addition cheaper, it is also produce yoghurt with good quality. The closeness between the owners household industry and farmer can be an advanced lines of communication between each other in order to provide the best quality milk. Communication and closeness has been done by some of the household industry, even some farmer submit the results of laboratory tests. Fresh milk that used for yoghurt production must in good condition and do not using damaged or contaminated milk. They realized to quality checking on raw materials receiving and record this stages so that providing information of each raw material on the initial production.

Production as early stage is begun by boiling of fresh milk. Some household industries is only heating with temperature of 80-95 ^{0}C and then keep the temperature stable during 20 minutes. Heating is carried out with stirring for homogenization. Milk is rich nutrients food, then heating of fresh milk is at pasteurization temperature for keep the milk nutrition. Pasteurization divided into two methods: a long pasteurization (LTLT = Low Temperature Long Time) at 62,8 ^{O}C - 65.6 ^{O}C for 30 minutes and cooled rapidly at 10 °C. Then short pasteurization (HTST = High Temperature Short Time) at 85 °C - 95 °C for 1-2 minutes and cooled rapidly at 10 °C. Although it has limitations for pasteurization but most of them had a good understanding about yoghurt processing and have formulation in each varian. Formulation is based on volume total of fresh milk for one varian. Heating of fresh milk is at below 100 °C and than record this stages. Heating that carried out at 85-90 °C for 15 minutes to whey protein (albumin and globulin) denaturation to produce condensed milk and alteration into casein that have better consistency and homogenity in the final product. Heating also to eliminating the contaminant microbial in milk so that provide optimum growth and fermentation by microbial starter, reducing of oxygen so that deterioration of proteins by contaminant bacteria is inhibited, furthermore, this protein can be used easily by yoghurt starter for fermentation (Buckle et al. 1987; Tamime and Robinson 1989). Heating is a role to killing the microorganism contaminants and provide favorable conditions for fermentation by bacteria inoculant.

Fresh milk that has been heated then cooled and added with bacteria starter (bacterial inoculants). Starter purchased from laboratories and chemical shop. The addition of a starter carried out in the porseline table. Some household industry are prevent contamination with heat sterilization and alcohol spraying in the workplace area. It is suggests that employers already has a basic science in security for dairy products which is a very susceptible to contamination by bacteria. At the time of starter inoculation, some industry not used alcohol but only aided by the using candle to prevent contamination. Inoculation is a critical stage so that spraying for table and the air around the inoculation place with alcohol is important to ensure sterile conditions. Starter is stored at cool temperatures (≤4 ° C) due to it is would make *Lactobacillus bulgaricus* and *Streptococcus thermophillus* as bacteria starter are in an inactive condition. Starter bacteria replaced at intervals of every 2-4 weeks and 1-3 months.

Incubation carried out along of 9-24 hours at room temperature. Weakness encountered during incubation is the influence of environmental temperature. Some industries reported that increasing temperature above the room temperature cause more acidic product. Generally, incubation carried out at room temperature for around 8-10 hours. Another scientific source stated that fermentation by lactic acid bacteria for yoghurt incubation is 6 hours. It is to obtain the perfect texture of yoghurt fermented by *Lactobacillus bulgaricus* and *Streptococcus thermophillus*. It is also important to known that when buying a starter inoculant must to consider the freshness starter (Ray 2004; Parvez 2006).

Incubation is the final stages in the processing of yoghurt. Organoleptic testing carried out before released after incubation stages. Organoleptic testing required for quality assurance of products in each production to prevent out of standard finish goods based on taste, texture, flavor, apparience aspect or degree of acidity (pH). In this case the owner prefer to using senses of sensory compared equipments such as pH meters. Purchasing of equipments such as a pH

meter causing increase the financial capital. Yoghurt packaging is using polyethylene bottle, polyethylene cup or plastic package for ice mambo type. Labeling of package carried out before release the finish goods. Label is consist some important information such as the brand of yoghurt, expirate date, raw material composition, name of industry, and healty massage. Some household industry have permission term from scientific legal agencies LPPOM MUI (Lembaga Pengkajian Pangan, Obat-obatan dan Kosmetika Majelis Ulama Indonesia). Licensing for yoghurt products to City Health Department (Departemen Kesehatan) usually difficult because yoghurt derived from milk that categorized as perishable foods, so it must be through the food and drug regulatory agency (BPOM) licensing. City Health Department require complex pre-requisite procedure for household licensing term. Therefore, owner manage licensing of yoghurt to LPPOM MUI that more easy for pre-requisite. According on government regulation No. 7 1998 about food in article 30, paragraph 1 indicates that the label of a product must contain at least: product name, list of materials used, the net weight or net contents, produsen name and address, halal term, and expirate date.

Finish goods is stored at temperature <10 °C. Yoghurt that storage at below 10 °C did not affect to the total acid, it is because low temperature inhibite activity of the starter bacteria. Storage yoghurt at room temperature is not recommended because could be decrease the quality of yoghurt and causing deterioration (Sugiarto 1997). Labeling of package yoghurt is simple but still attractive and colorfull. In addition, brand name is using the names are easier to remember by the public. Label of yoghurt contains information about the healthy benefit. In addition, packaging has not attractive plastic label so that industry used sticker paper label.

The last stage in yoghurt industry chain is the marketing. Price aspect indicates that yoghurt household industry are directly compete with competitors. Industries using retailer or distributor network to extend the marketing area. Some marketing employee to yoghurt household industry are part-time distributors or retailers. In addition, the owners has not manpower or distribution agent that able to distribute to the more wide area. In order for increase the selling point, some of yoghurt industries has been given discount when distributor is selling in a certain quantity. It is expected to increase selling product which will increase the industries profit. Sometimes promotion is done towards participated in public exhibitions. Because the financial capital problem, so the retailers or distributors are purchase the product directly to produsen. Consignment system is not implemented because of financial capital is limited. Another thing that an weaknesses is when there is increase of raw material prices that affect to the selling price of yoghurt. Unfortunately when the selling price of yoghurt is increase there could be complaints from some consumers but if the price constant impact to reduced the industry profit.

Yoghurt household industry relatively maintain relations and trust with the communities around production place. It is one of promotion strategy by product information spreading so that consumers know about yoghurt products. Little some yoghurt entrepreneur that promotion through social media such as blogs, twiter or facebook and internet. They prefer to using conventional promotion method. Promotion by social media and internet actually is very beneficial because low cost promotion. User of sosial media and internet has been increase presently. In addition, it is not require adding of marketing employee. Most easer marketing area is in surrounding yoghurt production area. It is for maintain freshness of yoghurt. Another easer marketing area is in public center. Expanding of marketing opportunities is done to another city. Marketing to another city lead to increasing the selling poin but weaknesses in packing and distribution stages because have to treath the packing for maintain overall quality aspect. For transfer of yoghurt to long distance area or outside of local area, some household industry provide transportation so that help the distribution activity.

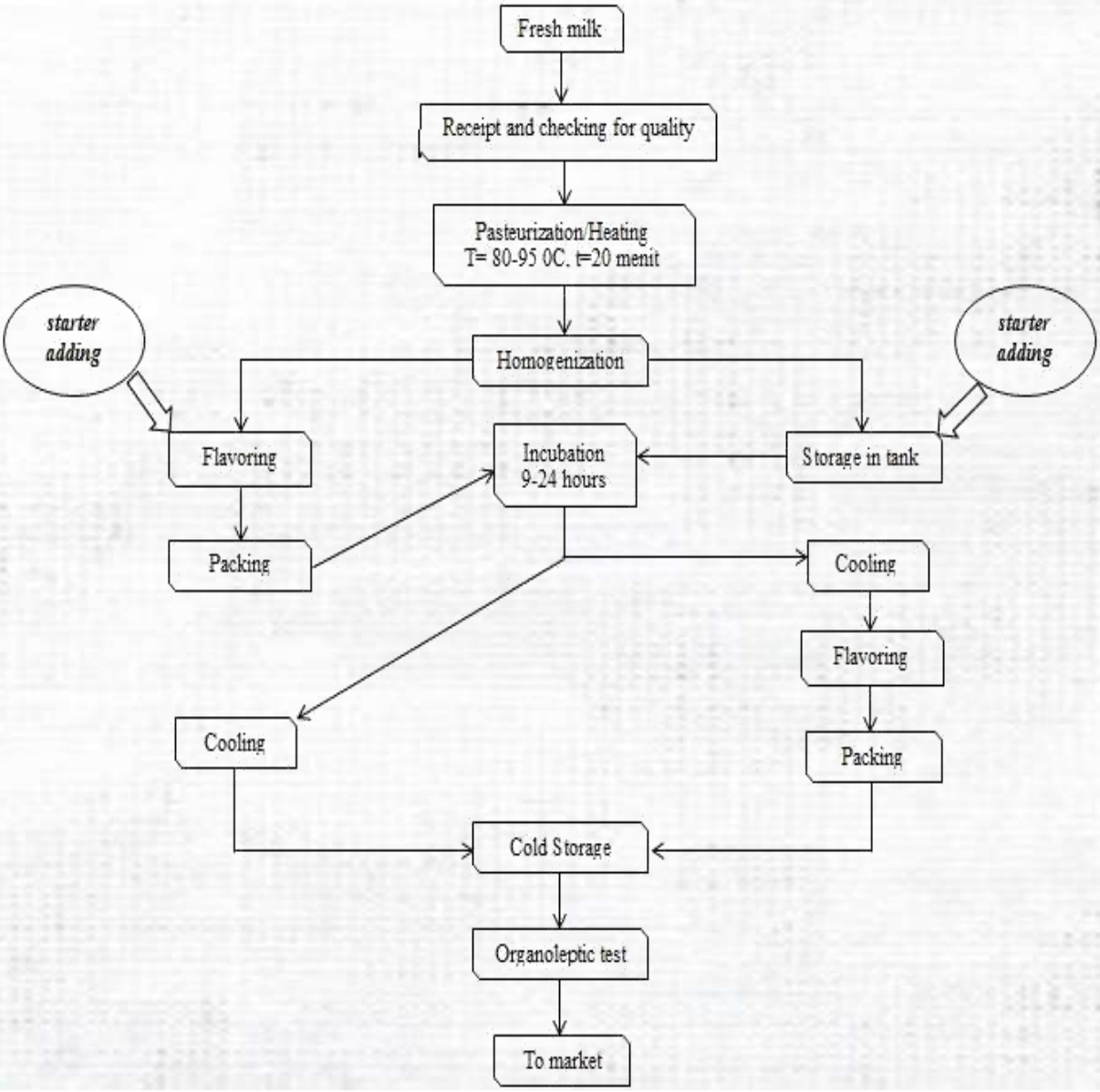


Figure 3. Scheme of yoghurt household industry production

Internal factors

The internal factor that important to be considered in the management of yoghurt household industry is the quality of raw materials, production processes, promotion or marketing and human resources. Required of analysis for strength-weaknesses-opportunities-threats (SWOT) for it by the owner as the manager of the household industry. Owner must be able to combining the strengths and opportunities of each factor and then eliminate the threats and weaknesses. Result of this study which explained above is suggests that yoghurt household industry although have some weaknesses, however it is also have strenght and opportunities that can be develop this industries.

Figure 4. Combination strengths of internal factor for reinforcement

MSE have benefit because the organization is smaller. Yoghurt household industry have smaller human resources that can be easier to supervise and coordination. The number of human resources in yoghurt household industry is <10 employee. Although background of most the employee is elementary and junior high school but the ability to production is relatively categorized as competent employees. Simple tutorial is able to improve the technical capabilities of employees. High loyalty shown by the employees to owner which caused by kinship and closeness factors. Employees in industry comes from family, relatives and neighbors.

The production place have long distance to garbage disposal area to prevent contamination. It is support with good sanitation by washing equipment for the production and disposal of the waste product. Yoghurt products are made with a variety of flavors and sizes. Flavors include plain, mango, strawberry, grape, melon, lecy and durian. Size also varies such as 20 ml, 100 ml, 250 ml and 1000 ml. Each variety of flavors and sizes have different prices and cheaper than the yoghurt produced by large-scale industrial (manufacture). Different of type for packaging also provide diversification of choice for consumers. Shape of packaging made bottle, round, and glass or cup. The label on the packaging in addition to delivering visual communication about products and brand name products also about the nutritional components, manner of serve or consumption, storage and other promotional messages. Most of the yoghurt household industry can promote through distributors such as shops, directly to consumers, free social media such as facebook, websites and direct sales in door to door and at home.

In the internal factor, the human resources is the biggest obstacle faced to yoghurt household industry. Unfortunately this aspect have important role in production and marketing stages. Human resources also needed by overall of internal factors. The ability of an employee affect to final product because employee who technically do the stages on early receipt of raw materials until the promotion. Employees perform the production process such as determining the formulation, set the temperature and time of incubation, orgnoleptic testing, labeling, storage, distribution and promotion. If the employee performs well on all factors then the result will be satisfactory.

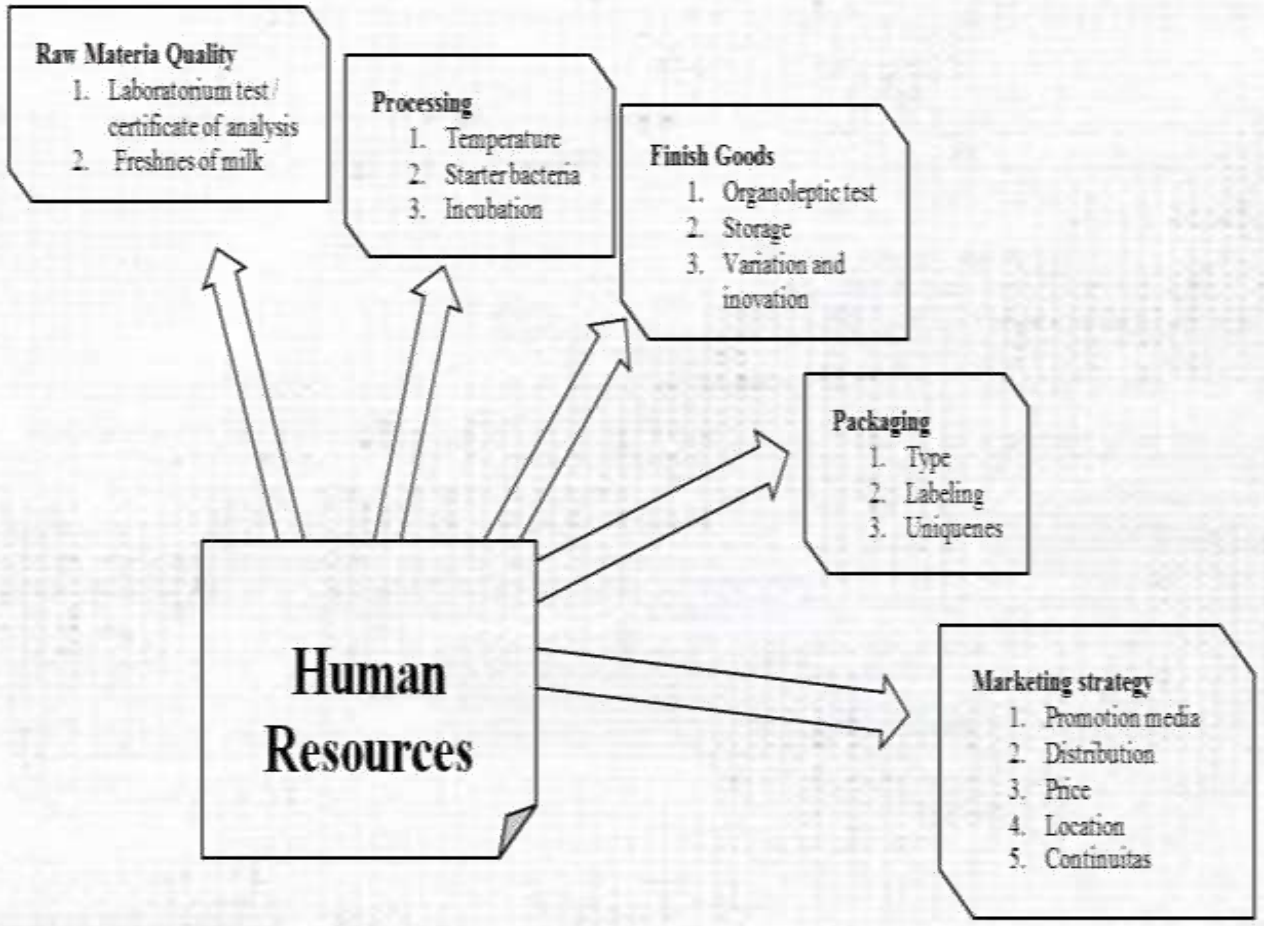


Figure 5. Reinforcement yoghurt household industry by human resources factor

Human resources is the potential inherent in human beings to realize their role as social beings are adaptive and transformative able to manage itself and all the potential inherent in nature to the welfare of life in order to achieve a balanced and sustainable communities. Definition of human resources in groups or cooperatives are the resources or the potential or strength, or the ability in human, which determines the attitude and human quality for achievement and make the organization alive and able to compete. Humans are the most important element in managing and moving production factors such as capital, raw materials, equipment, and others to achieve the goals of an organization or business unit. If an organization has developed, it is more difficult on planning and control of members or employees, this happens because the more complex problems that arise accompanies each progress. Hence need keep the employee motivation. High motivation will be positively correlated with productivity. Work motivation is influenced by factors such as rewards, admission, occupation, responsibility, self-development, salaries, job condition and rules.

The owner yoghurt household industry have close relationship with employees. Some of them comes from family owner so that matters relating to the working pressure is almost nothing. But this is also affect to relaxing condition and without the target. Whereas in business the target is a very important thing. On the other hand employees who are not relatives, neighbors or other family tend to quickly get bored and look for another job. There are also employees who work part-time because the salary comes from household industries is not enough to meet the life necessities of employee. The owner should be able to provide enough salary to the employees so as to increase the commitment of employees to focus on the development of the industry.

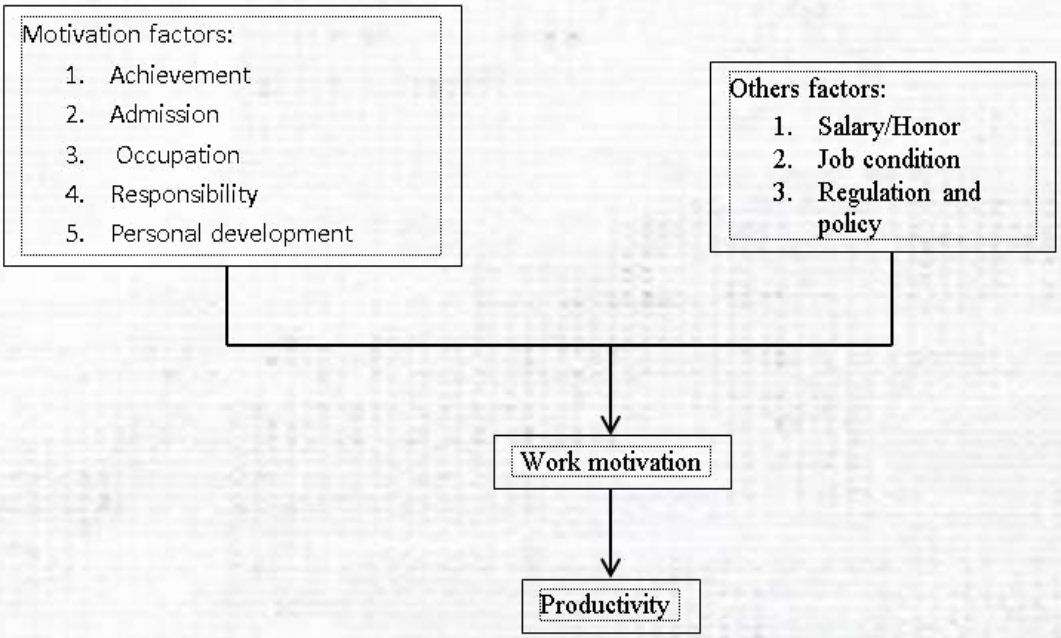


Figure 6. Factor for support work motivation of employee (Widayanti, 2004)

Internal reinforcement

Business development in micro, small, and medium enterpreneur require strategies. The strategy should have indicators of success. The achievement of an indicator because technical procedures and responsibilities is carried out with appropriate. Someone in an industry must be able to perform well and develop of management, it is the task of a manager. Management of industrial development such as management for easy to obtaining licensing according the rules of government, human resource management, financial and production management. Managers in household industry yoghurt is the owner that directly supervises and oversees employees. Employees as technical implementation should be given appropriate and responsible job description. Recording a critical factor in the incoming raw materials, processing, packaging the final product is needed as relate to the development of industries which being as a document to obtain certain permits that will be integrated with campaign management. Because of yoghurt household industry limited in human and capital resources, so that should be established effectively and efficiently specialized employees who consistent perform as sales promotion and marketing. Similarly, like the owner as managers and employees as the technical implementation that has indicators, the sales must be set the succesfull indicator.

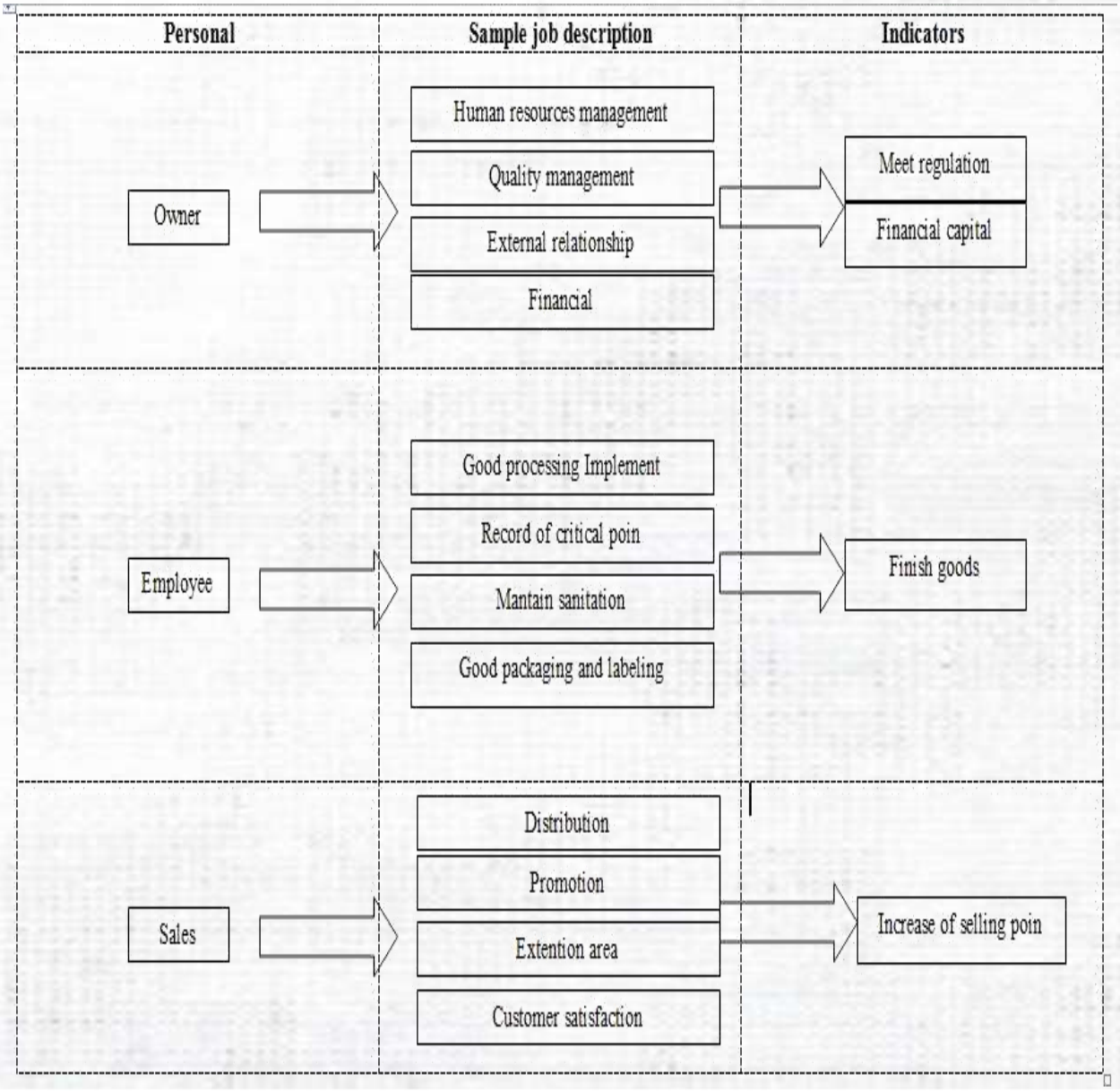


Figure 7. Models for reinforcement strategy

Conclusion

Yoghurt household industry provide a source of income for the businessman. The industry is appropriately carried out in urban areas because of the raw materials needed is simple, lifestyle surrounding community, and population growth. Most of the industry has been producing yoghurt appropriately. In addition many product variations but the production equipment and type of packaging is simple. The internal factor that important to be considered in the management of yoghurt household industry is the quality of raw materials, production processes, promotion or marketing and human resources. Lack of human resources is a major obstacle in the internal factors. Reinforcement the internal environment in yoghurt household industry carried out by combination of each strengthness. The opportunities support the reinforcement. It is required the creativity of the owner related development management of yoghurt household industry. An owner or manager must assign tasks and responsibilities of each division is accompanied by indicators of success for advance the industry.

Reference

Asmara, A., Purnamadewi, YL., Hutagaol, MP., Meiri, A. (2014). Micro and small enterprise (MSE) household profile and factor affecting the poverty of micro and small enterprise household. International Seminar of Agricultural Finance for Rural Development and Sustainability. Bogor 20-21 November, 2014.

Buckle KA, Edwards RA, Fleet GH, dan Wooton M. 1987. *Ilmu Pangan*. Terjemahan: H. Purnomo dan Adiono. Universitas Indonesia Press, Jakarta.

Dewi, M. (2009). Analisis strategi pengembangan usaha yoghurt pada Rinadya yoghurt kabupaten Bogor [skripsi]. Bogor: Fakultas Ekonomi dan Manajemen, Institut Pertanian Bogor.

Hersona, S., Rismayadi, B., Mariah, ES. (2012). Analisis pengaruh pengembangan sumber daya manusia (SDM) terhadap kinerja pegawai pada badan kepegawaian daerah kabupaten Karawang. Jurnal Managemen 9:3, 717–729

Jarmal, AB. (2009). Program pemberdayaan small and medium enterprise promotion (smep) oleh swisscontact [skripsi]. Bogor: Fakultas Ekologi Manusia, Institut Pertanian Bogor.

McKinley, M.C., 2005. The nutrition and health benefits of yoghurt. International. Journal of Dairy Technology 58, 1–12

Ministry of Cooperative and SME's. (2010). Statistik usaha mikro, kecil dan menengah (UMKM) tahun 2008-2009. Ministry of Cooperative and SME's, Jakarta.

Parvez, S., Malik, K.A., Ah Kang, S., Kim, H.-Y., (2006). Probiotic and their fermented food products are beneficial for health. Journal of Applied Microbiology 100, 1171–1185

Ray, B. (2004). Fundamental of food microbiology. Florida: CRC Press.

Sugiharto, (1997). Proses pembuatan dan penyimpanan yoghurt yang baik. Lokakarya Fungsional Non Peneliti. Hal 62-69.

Siregar, OF. (2010). Analisis strategi pengembangan usahakecil keripik pisang "kondang jaya" binaan koperasi bmt al-ikhlaash kota Bogor [skripsi]. Bogor: Manajemen Agribisnis, Institut Pertanian Bogor.

Sugiyono. (2013). Metode penelitian manajemen. Bandung: Alfabeta.

Supartoyo, YH., Tatuh, J., Seindow, RHE., (2013). The economic growth and the regional characteristics : the case of Indonesia. Bulletin of Monetary Economic and Banking 2013.

Supriyanto (2006). Pemberdayaan usaha mikro, kecil, dan menengah (umkm) sebagai salah satu upaya penanggulangan kemiskinan. Jurnal Ekonomi dan Pendidikan 3:1, 1-16

Tamime AY, Robinson RX. 1989. *Yoghurt Science and Technology*. Pergamon Press Ltd.

Widhayanti, R. 2004. Analisis hubungan motivasi kerja dengan produktivitas kerja karyawan PT. Dahana [Tesis]. Bogor: Fakultas Ekonomi dan Manajemen, IPB.

DETERMINANTS ANALYSIS ON THE DEVELOPMENT OF SMALLHOLDERS DAIRY CATTLE IN WEST JAVA

Cecep Firmansyah*, Andre R Daud*, and Sri Rahayu*
*Faculty of Animal Husbandry Padjadjaran University
Email : cepfirmansyah@gmail.com

ABSTRACT

This study aims to reveal the dominant and determinant factors in the development of a sustainable dairy farm in West Java, This study used a survey method, and location of study determined purposively, namely: Garut, Tasikmalaya, Bogor, Cianjur, Sukabumi, Kuningan, Bandung, West Bandung and Majalengka. The number of respondents 65 persons consisted of dairy farmers, officers and adviser, policy makers in the West Java province. Respondents farmer categories determined by multi-satage random sampling method, while others purposively. Data were collected by focus group discussion (FGD). The analysis model used *perspective analysis*. The results showed that: (a) the dominant factor in sustainable development efforts are dairy cows feed, dairy cows, human resources, capital, institutional, government policies, technology and innovation, and (b) the determinants factors of sustainable dairy development effort, that: quality of human resources, government policy, and institutional dairy cows.

Key Words :*dominant factors, determinants, smallholders dairy cattle*

INTRODUCTION

The demand of milk in Indonesia is expected to rise continually. According to the BPS (2013), the population of Indonesian grew 1:49% / year during the period 2000 – 2010, and projected to reach more than 300 million people in 2035. As population growth directly affects the demand for milk, so there is a need to increase the performance of dairy farming subsystem.

In Indonesia, dairy farming is concentrated in Javaisland. One of the largest milk producing region is West Java which has 22:54% share of total dairy cattle population and 29.86% of the milk production in the level of the national. In fact, there are nearly 640 thousand heads of dairy cattle which produces nearly 990 thousand tons milk per year (DGLAH, 2013). However, it is indicated that the contribution of the number of dairy cattle and the milk produced by West Java tends to decrease by 2.88% and 0.50% per year respectively[1].

The performance of dairy farming sector– especially traditional smallholder - is the resultant of various factors both internal and external. In general, these factors can be grouped into human resources, natural resources, capital resources, technology and innovation resources, organizational resources, and government policy. It is argued that the decreasing performance of the dairy farming is determined by these factor. In West Java case, it is observed that there are several situations related to the factors such as very low scale of size, land conversion which drive the scarcity of roughage, decreasing the role of dairy farmer cooperative, and also changes in national and global business environment.

The whole situation indicates the need for greater efforts to address the problems facing by dairy farming sector. In the long run, the greater reliance on imported milk will likely be the case if there are no improvements on dairy production system. The initial step for the such improvement should be to identify the dominant factors which determine the performance of dairy farming sector, especially in the smallholder setting.

METHODS

A survey was conducted among 65 person who represents the stakeholder of dairy sector in West Java. It included farmers, dairy extension officers, and the government officers from regency and provincial level. The farmers were determined by multi-stage random sampling, and the others were purposively determined.

The survey was located in nine milk producing area in West Java such Garut, Tasikmalaya, Bogor, Cianjur, Sukabumi, Kuningan, Bandung andWest Bandung, and Majalengka. These locations were preferred based on the distinct characteristic for each location which able to represent the whole situation of West Java dairy sector. The area of Bandung and West Bandung represents milk producing area which is in the coverage of bigger and better management dairy cooperatives compared to other area. Garut, Sukabumi, Kuningan and Bogor represent the dairy area which is in the coverage of medium scale management cooperative. Then Tasikmalaya and Majalengka represent the dairy area which is in the coverage of lower scale of management dairy cooperative.

Perspectives analyses was used as a main method to examine the dominant factors in the dairy dynamics. Various factors that have been collected in the survey then are grouped, sorted, and scored according to the degree of its influence and dependence. This step of analyses was conducted through Focus Group Discussion which was attended by various stakeholder.

RESULTS AND DISCUSSION

In general, the advance of dairy farming varies in each study area. However, it is observable that the role of dairy cooperatives in supporting the advance tends to decline. The fact also shows that the quantity of milk production also decreases significantly overtime. It can be found that the situation is correlated with the decrease of cow population, the growth of off-farm activities, and also the appearance of "milk collector" as the competitor for cooperatives.

Supporting and Constraining Factors in Dairy Farming

Having identify the factors, there are seven supporting factors and 14 constraining factor to be considered in the improvement of smallholder dairy sector. Overall, the improvement should be in the form of take full advantage of supporting factors, while reducing the constraining factors. The factors are listed in the following table.

Table 1. Supporting and constraining factor in the improvement of smallholder dairy

Supporting factors	Constraining factors
+ The number of dairy farmers in West Java is still significant; + The farmer groups still exist in dairy production areas; + Dairy farming is inherited as a family culture overtime; + The support from extension officer, animal health and AI in the field; + The cooperatives exist in the dairy production area; + Several dairy processing manufacturer operates in West Java; + Many milk based home industries operate in dairy production areas; + The availability of dairy experts and research institutions; + The increasing trend of market demand and milk price;	– Relatively low quality of human resources; – Farmer groups are only functional for administrative matter; – Low rate dairy technology adoption – Imbalance distribution of dairy field officer among areas; – Heavy reliance on family labor; – Heavy reliance on external input, i.e replacement stock; – Good farming practice is not applied; – Weaken relationship between farmers and the cooperative; – Inconsistent agricultural policy and lack of political will; – Competition between cooperative and milk collector; – The function of cooperative is decreasing; – Low capital; – Low farmer bargaining position in the market; – The increasing demand for slaughtering cow;

Dominant Factors in the Dairy Development

The dominant factors in the dairy development in West Java are determined comprehensively by stakeholders involved in focus group discussion. The factors are derived from supporting and constraining factors which have previously identified. All previous factors are grouped, and then several irrelevant factors are eliminated. The selected factors are then scored based on its degree of dependence and influences. This results seven dominant factors which will determine the improvement of dairy production. The dominant factors are listed in the following table.

Tabel2. Scores, Dependence and Influence Degree in Dairy Production System

No.	Factors	Dependence degree	Influence degree	Dependence score	Influence score
1	Availability of feed	12	6	1,14	0,57
2	Quality of milking cow	14	7	1,33	0,67
3	Quality of human resource	9	13	0,86	1,24
4	Accessibility of capital	14	17	1,33	1,62
5	Institutional aspect	10	12	0,95	1,14
6	Government policy	9	12	0,86	1,14
7	Technology and inovation	11	12	1,05	1,14

As can be observed on the table, the quality of cow and capital have the highest degree of dependence among other factors. It is indicated that the condition of these factors depends on the other dominant factors. In the other word, the improvement of these factor will be somewhat determined by improvement other factor. The lower dependence score such as human resource and policy likely indicates the higher degree of neutrality. The dominant factors which give high influence can be seen from the influence scores. Human resources and also capital are likely to have significant influences to the other dominant factors. It indicates that addressing these factors in improving dairy farm will likely multiple effect to other factors. Mukson et al ((2009) who conducted similar research in the different locations arrived to similar conclusion that the human factor is a primary factor that determines the performance of dairy cattle farming.

The Classification and Position of Dominant Factors

The dominant factors, as previously discussed, are then mapped according to eachpair of dependence and influence score. This factor mapping is to better illustrate the most significant factors that should be prioritized in the context of dairy development. In the form of four-quadrant graph, the factors are then classified as mediating factor, determining, boundless and bounding factor. The map of dominant factors can be seen in Figure 1.

As given in the graph, the primary concern in the context of dairy development is the factors which are in the determining quadrant. These factors have relatively high degree of influence, but lower in dependence. Human resources, institutional aspect and supporting policy is believed to become the initial factors that should be addressed in improving the performance of dairy sector. Soekartawi (2003) shows that labor is one of production factor that significantly determines the production process.

Institutional aspect, especially the role of cooperative, is also the determining factor in dairy development. As stated by Yusdja (2005), cooperatives have been transformed into enterprises which only pursue their economic or financial objective while leaving the substantial role of cooperative which is to promote participation and control by member producers and provide high quality service to the members.

Agriculture policy, especially in dairy policy, is believed to have high influence on all dominant factors in dairy production system. Although the score of policy is not as high as other determining factor, it is estimated that the influence of any policy will be significant to the development. However, until recently, there are no such relevant policies that drive the advance of dairy sector in West Java.

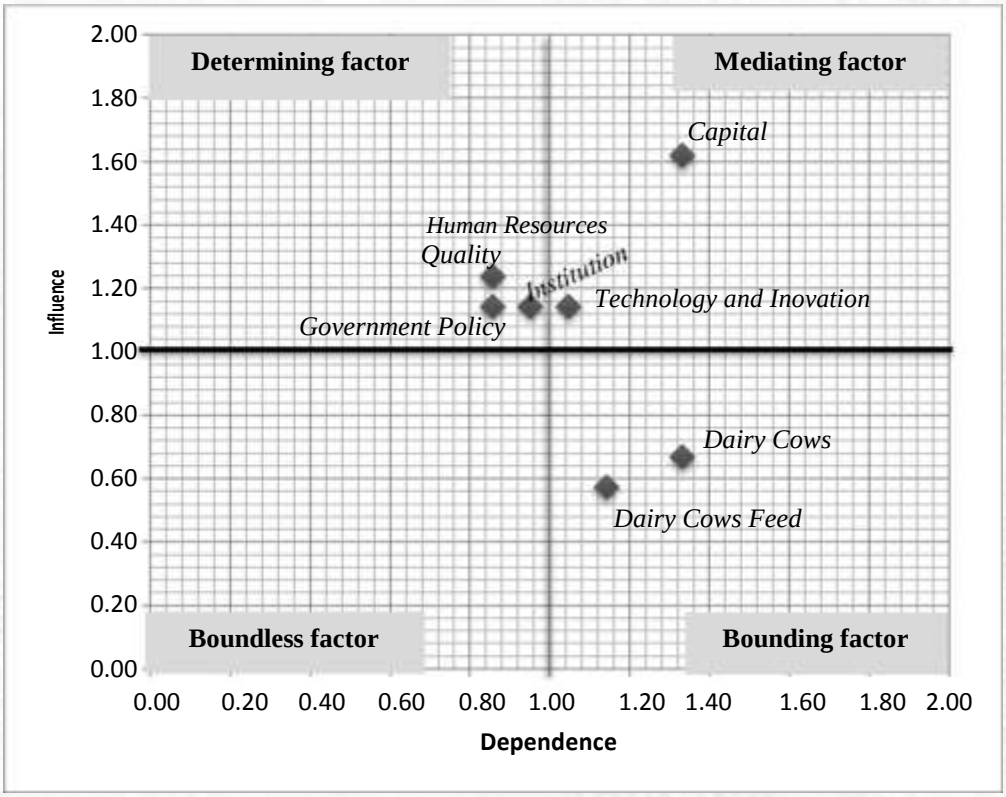


Figure 1. The positioning of dominant factor in dairy development

Mediating factor quadrant is indicated by the factors which have high degree of both influence and dependence such capital and technology. These factors, if addressed, will result on the improvement of dairy sector performance but likely in the short term only. Even the degree of influence is high, these factors also have high dependency on the other factors, such factors in the determining quadrant. Then capital and technology are necessary in the process of improving dairy performance but not necessarily sufficient.

The last quadrant, bounding factor, is indicated by the factors which have relatively low degree of influence but high degree of dependency, such the quality of cows and feed. As indicated by the degree, the availability of good quality cows and feed is likely determined by the financial or capital status of the farmers. In the real situation, the capital status of farmer would also determined by the support cooperative through the facilitation in the financial aspect (i.e. loan, hedge, insurance, etc). The government policy is also instrumental in influencing the bounding factors. Since the absence of formal input market for smallholder dairy, Firmansyah (2007) shows that providing "input market – like" programs in dairy sector are likely to be important in the process of dairy development.

Conclusion

Dairy sector development in West Java should be based on the information about any factors that predominantly affect the performance of the dairy farming. This research has identified factors that support or constraint the development of dairy sector. Based on these findings, improvement of human resources and institutional quality is the main target that should be addressed initially. Through these factors, it is expected that other dominant factors in the sector of dairy cows can also be resolved.

References

BPS. 2013. *Indonesian Population Projection 2010 – 2013*. Collaboration Between Badan Perencanaan Pembangunan Nasional, Badan Pusat Statistik, and United Nations Population Fund. Jakarta.

BPS. 2013. Statistics Indonesia. Badan Pusat Statistik. Retrieved November 02, 2014 from www.bps.go.id.

DGLAH, 2013. Livestock *And Animal Health Statistics*. Direktorat Jenderal Peternakan dan Kesehatan Hewan. Kementrian Pertanian. Jakarta.

Firmansyah, C. (2007). *Performa Usaha Peternakan Sapi perah Rakyat*. Tesis. ProgramPascasarjanaUniversitasPadjadjaran. Bandung. p: 71-72.

Mukson, T., 2009. Faktor-faktor yang Mempengaruhi Kinerja Usahaternak Sapi Perah Rakyat di Kecamatan Getasan Kabupaten Semarang. Seminar Nasional Kebangkitan Peternakan. Program Studi Magister Ilmu Ternak Program Pasca Sarjana Fakultas peternakan Undip. Semarang.

Soekartawi. 2003. Teori Ekonomi Produksi (Dengan Pokok Bahasan Analisis Fungsi Produksi Cobb-Douglas). Rajawali. Jakarta. Halaman 7-8, 142-143.

Yusdja, Y., 2005. Kebijakan Ekonomi Industri Agribisnis Sapi Perah di Indonesia. Jurnal Analisis Kebijakan Pertanian. Volume 3 No. 3, September 2005 : 257-268. Pusat Analisis Sosial Ekonomi dan Kebijakan Pertanian.IPB. Bogor.

MODEL OF ECONOMIC LINKAGE BETWEEN THE SULAWESI CORRIDORS AND THE EAST JAVA- EAST KALIMANTAN PROVINCE

by

Arman[1], Setia Hadi[2],NoerAzam Achsani[3], Akhmad Fauzi[2]and Yodfiatfinda[4]

1) PhD (Candidate) at the Department of Agribusiness, Faculty of Economic and Management, Bogor Agricultural University
2) Senior Lecturer and 3) Professor at Bogor Agricultural University
4) Lecturer at Agribusiness Department, Faculty of Bio-industry, UniversitasTrilogi-Jakarta

Corresponding Author: Arman (arman.arman@yahoo.co.id). Address: KampusTrilogi, JalanTrilogi No. 1. Kalibata-Jakarta Selatan 12760 Indonesia

Abstract

This study aims to analyze the economic linkages between the corridor of the Sulawesi Island, (all provinces in the Sulawesi Island except the West Sulawesi Province) and the East Java - East Kalimantan Province (Multi-Regional). The focus of the study is to examine the economic development of each region, especially the Sulawesi corridor due to the interaction of trade with other regions. Which areas that obtain economic benefit, is one part to be estimated in this study. Data collection techniques in this research are using secondary data available in the institutions related to the research topic. The method used is a non-survey or indirect approach. Data were obtained from the Central Statistics Agency (BPS). The data which is required in the research is data the Inter Regional Input-Output (IRIO) that are available in the BPS. IRIO data used is the data of 2005. The classification of the IRIO data consists of 35 sectors of each region. The results show that among these regions, interconnecting economic activities is appearing. The pattern of linkages in the area of the Sulawesi Island is relatively weak and economic linkages between the South Sulawesi and other Sulawesi regions are very small, meanwhile the pattern of linkages are stronger between the Sulawesi Island and the East Java. The East Java region is expected to obtain relatively higher pay off from the interaction than Sulawesi region. The impact on the economy of South Sulawesi and Others Sulawesi influence and linkage with the economy in East Java, but the increase in end demand for the certain sector in East Java does not provide a significant effect on the output of the sector in Other Sulawesi and South Sulawesi. The multiplier value of income is still dominated by the public administration and security sector in 2005 and 2011, except in South Sulawesi.

Keyword: Economic linkage, Sulawesi Corridor, East Java and East Kalimantan

Introduction

This study analyzes the economic linkages between the Sulawesi Island region (all provinces in the Sulawesi Island except the West Sulawesi) and the South Sulawesi, East Java and East Kalimantan (Multi-Regional). The focus of the study is how the economic development of each region especially Sulawesi corridor due to the interaction of trade with other regions. Which areas obtain the economic benefit is also one part to be estimated in the study.The existing potential and alleged asymmetric development of the region are the important part in reviewing the development of the economic in the Sulawesi corridors region due to the interaction to the East Java and East Kalimantan. Initial allegations of asymmetric economic development is reflected byrelatively different productivity among the regions.

East Java's economic productivity is much more developed than that in the Sulawesi Corridor and East Kalimantan. The South Sulawesi is much more developed than the other Regions in the Sulawesi Island. Development in the South Sulawesi regional seemlydoes not give effect onthe surrounding region of Sulawesi. The South Sulawesi is able to accelerate and quick in responding

to the economic development of the other areas on the island of Sulawesi. This fact is the reason why the South Sulawesi is separated unit of analysis in the Sulawesi Island and become a part of the area which the linkages is being analyzed with other regions.Economic activity and industrialization is concentrated on the island of Java, where 63.8% of the industry will be in Java out of 22.7 million unit of industrial enterprises. As many as 17.7% of industrial companies operating in Sumatra Island, 7% of companies operating on the Sulawesi Island and 5.3% operating on the Borneo Island, BPS (2007)

Hill et.al (2008), Priyarsono and Rustiadi (2010) argued that inequality between the regions continues up to this day. Java Island is still very dominant in economic activity while the eastern region of Indonesia is still far behind. The phenomenon of industrialization and asymmetric development boostthe backwash effect among regions in the provincial units (especially in urban areas and industrial). According to Myrdal (1970), the backwash effect isoccurred in the village or a region due to inequality of development. Asymmetric economic occurs due to added value received as a result of the origin region is very low and investments between regions still reflect a significant difference, which in the East Java is the greater one.

Areas that focus on industrial activities are benefited the larger economic and trade than areas far from the center of development (Lesage and Llano, 2007). Heringaand Heijman (2013) stated that agriculture can thrive by using the model of multifunctional agriculture (the activities are; (i) green care, (ii) tourism, recreation and education, (iii) on-farm sales and (iv) green services) because it gives relatively higher economic impact than the primary Agriculuture and provide a broader economic effect on employment, commodity and income.

Objectives of the Study

The objectives of this study are (1) to analyze the pattern of economic linkages between the region of Sulawesi Island (economic corridor), South Sulawesi, East Java and East Kalimantan, (2) to describe what is the unequal region and benefit (pay-off) of the interactions and trade linkages and (3) to estimate the value-added income and (4) develop a model of development and linkage among regions.

Method

Data collection techniques in this research is using secondary data available in the related institutions. The method used is a non-survey or indirect approach. Data were obtained from the Central Statistics Agency (BPS). The type of data that is required in research is data Inter Regional Input-Output (IRIO) which are available in the BPS. Irio data used is the data of 2005. The classification of the data consists of 35 sectors Irio of each region. Data of the Sulawesi Corridor, South Sulawesi, East Java and East Kalimantan. Data Irio in treated with RAS into 2011 because inventory data is only recorded in 2005. The model of interaction between development agent and areas of economic activity is a model that has been developed by Wassily Leontif 1930s. The Leontif models then wins the highest award i.e. Nobel for science in 1973 (Miller and Blair, 2009).Location of research on the island of Sulawesi, South Sulawesi, Southeast Sulawesi, Central Sulawesi, North Sulawesi and Gorontalo. The province of East Java and East Kalimantan also examined to see the extent of inequality and the linkages between islands and provinces.

In the early stages of analyzing the interaction between the trade to meet the aggregate demand and aggregate final demand per unit area. The flow of goods between regions that appear to value the interaction aggregated flow/value of exports and imports goods in terms of domestic. This analysis to determine the extent of dependency and interaction with other areas visible region of the flow of goods. Formulation used;

..... (1)

Above equation can be simplified to be equation (2)

Σ..... (2)

The estimation results of equation 1 and 2 will result in the value of the interaction of the flow of goods between regions. Reflects the estimated value of the output is exported to other regions as input between other regions and input among other areas that come from other areas of domestic imports.Further analysis is conducted to translate the number of input sector "i" needed to produce one unit of output sector "j". The analysis was performed to generate the magnitude of the coefficient input technique value. Mathematical formula used is

..... (3)

Each value of the input coefficient hereinafter referred to as the technical coefficient matrix input or matrix technology. If the formula is written in a matrix, with sectors of n (35), it can be expressed as a matrix A.

[ ] ..... (4)

By using mathematical operation, then equation (3) can be changed to be , so the equation is expressed as equation (5)

..... (5)
..... (6)
..... (7)

Equation (7) can be simplified by using an matrix notation;

..... (8)
..... (9)

where, I is the identity matrix of size nxn, A is the coefficient matrix, while X and Y are the column vector matrix shows the output of the final equation. Matrix $(IA)^{-1}$ known as matrix Leontif. Leontif matrix is a key matrix to determine the various input output forecasting models.

The matrix can be used to predict the final demand of the economic system simultaneously. The matrix can also be use to estimate the sector linkages within the region and among regions through backward linkage effect and forward linkage effect approach. Such an approach can estimate the role of the sector in the economy, knowing the key sectors that can drive economic performance and determine strategic sectors that can strengthen linkages of sector and economic performance (Daryanto and Hafizrianda, 2010).The method used by Chenery-Watanabe (1958) to estimate the linkages between sectors is backward linkage and forward linkage. The principles of the estimates isobtained from the Leontif model where the forward linkage see the demand side (demand driven) and forward linkage view of the supply-side (supply-driven). Formula backward linkage is equation (10) and (11)

= .....

(10)

..... (11)

..... (12)

..... (13)

where, BL is direct backward linkages in sector j and FL is direct forward linkages, while xij is number of intermediate inputs from sector i used to generate sector j. The use of input coefficients have not been able to describe economic conditions in the aggregate because only through one iteration process. The use of input coefficients are only able to reflect the first beat of the economy if the performance of end demand increase. The size of these methods are often referred to as a direct forward and backward linkages but not estimate indirect effects among sectors.

To complete the estimation of the indirect effects, the matrix Leontif used to estimate the sector linkages. The method is often referred to as direct and indirect linkages both backward and forward. The formula used to estimate the direct and indirect linkages backward is equation (14) and the formula used for the direct and indirect equation is equation (15)

..... (14)

.....(15)

Furthermore, the domestic value-added estimates which is obtained from each sector if the final demand increases. Mathematical formula used was adopted from a model built by Morilla, Diaz-Salazar and Cardenete (2006). Added value to be estimated in this model is the value-added sector income regions.

..... (16)

Discussion

Structure of Demandand Supply

The estimation results show that the total output of other Sulawesi (Sulain) are used as the intermediate input between regions of origin as much as 92.82%. Output other Sulawesi region are exported to East Java about 1.37% , while to to other areas under 1%. Output of the South Sulawesi (Sulawesi) which is used as input certain industries ranged between 78.53% while total output is exported in East Java (Java) of 1.91%, Other Sulawesi 0.86%and East Kalimantan 1.23%. Output of East Kalimantan and East Java is used as an input sizeable as much as 85.5% and 89.04%, while domestic exports to other areas of the two regions average below 1% each region. In detail the value of domestic exports between regions is presented in Table 1.

Table1.Structure of Intermediate Demand based on Column (domestic export), 2005

Region	Su-lain	Sulsel	Jatim	Kaltim	ROI	Jumlah
Sulain	37,080,044	150,136	547,169	213,686	1,956,833	39,947,867
%	92.82	0.37	1.37	0.54	4.90	100
Sulsel	327,052	29,629,014	723,974	467,575	6,581,246	37,728,861
%	0.87	78.53	1.92	1.24	17.44	100
Jatim	1,276,047	644,841	312,765,696	1,445,336	35,114,962	351,246,882
%	0.36	0.18	89.04	0.41	9.989	100
Kaltim	789,089	807,951	601,160	91,593,289	13,318,524	107,110,014
%	0.74	0.75	0.56	85.51	12.43	100

Source : IRIO 2005 (processed)
Sul-ain ; Other Sulawesi, Sulsel=West Sulawesi, Jatim=East Java, Kaltim=East Kalimantan, ROI ; Rest of Indonesia

In 2011, the proportion of output relative domestic exports (trade area) among others Sulawesi, South Sulawesi, East Java and East Kalimantan are relatively unchanged significantly, but the nominal value of output and exports increased every area. In detail the value of domestic exports between regions (trade area) is presented in Table 2.

Table2.Structure of Intermediate Demand based on Column (domestic export), 2011

Wilayah	Sulain	Sulsel	Jatim	Kaltim	ROI	Total
Sulain	82,823,187	321,094	1,192,954	394,017	4,472,038	89,203,291
%	92.85	0.36	1.34	0.44	5.01	100
Sulsel	961,849	71,488,300	1,520,389	1,169,620	16,476,999	91,617,157
%	1.05	78.03	1.66	1.28	17.98	100
Jatim	3,167,318	1,622,598	628,106,519	3,434,904	181,734,225	818,065,564
%	0.39	0.20	76.78	0.42	22.22	100
Kaltim	2,003,386	2,122,293	1,284,497	180,018,710	29,293,849	214,722,735
%	0.93	0.99	0.60	83.84	13.64	100

Source : IRIO 2005 (processed)
Sul-ain ; Other Sulawesi, Sulsel=West Sulawesi, Jatim=East Java, Kaltim=East Kalimantan, ROI ; Rest of Indonesia

In general, the relative output of other Sulawesi used in its own territory and the other become intermediate input did not change significantly. Output ranges from 92.85% in Sulain used by them self (origin) as intermediate inputs, while 1.34% is used in East Java, 0.36% is used South Sulawesi, 0.44% used in East Kalimantan and 5.01% used ROI area. South Sulawesi region using the relative output amounted to 78.03% as intermediate inputs of the total output. More output is exported to the territory of another Sulawesi, East Java, East Kalimantan and ROI becomes the input of the amount of each - respectively 1.05%, 1.66%, 1.28% and 17.98%. East Java uses as input the output of the remaining 76.78% is exported kewilayah Other Sulawesi, South Sulawesi, East Kalimantan and ROI as input between each - respectively 0.39%, 0.20%, 0.42%, and 22, 22%. East Kalimantan region using the output as input of83.84% the remaining is exported to the region Other Sulawesi, South Sulawesi, East Java Regional respective ROI - 0.93%, 0.99%, 0.60%, and 13, 64% respectively.

Import demand of Sulawesi South, Other Sulawesi and East Kalimantan is quite large from East Java compared to the needs of domestic imports of East Java and East Kalimantan Sulawesi. Output East Java is much greater than in South Sulawesi and Other Sulawesi. The resulting output is capable of providing the input for its own region and other regions. In detail, the transaction value of trade (domestic import side) is presented in Table 3.

Table3.Structure of Intermediate Demand based on raw(domestic import) 2005

Region	Sulain	%	Sulsel	%	Jatim	%	Kaltim	%
Sulain	37,080,044	78.43	150,136	0.35	547,169	0.16	213,686	0.22
Sulsel	327,052	0.69	29,629,014	69.61	723,974	0.21	467,575	0.47
Jatim	1,276,047	2.70	644,841	1.52	312,765,696	89.83	1,445,336	1.46
Kaltim	789,089	1.67	807,951	1.90	601,160	0.17	91,593,289	92.30
ROI	7,807,586	16.51	11,330,460	26.62	35,299,882	10.09	5,509,142	5.55
Jumlah	47,279,818	100.00	42,562,402	100.00	379,667,943	100.00	99,229,027	100.00

Source : IRIO, 205 (processed) Sul-ain ; Other Sulawesi, Sulsel=West Sulawesi, Jatim=East Java, Kaltim=East Kalimantan, ROI ; Rest of Indonesia

The estimation results is indicating that the input of other Sulawesi region originating from the origin region (own) of 78.43%. While intermediate inputs originating from South Sulawesi, East Java and East Kalimantan as much as 0.69%, 2.7% and 1.67% respectively, the rest comes from an ROI of 16.51%. Furthermore, the input of South Sulawesi region is originating from the region of origin (own) about 69.61%. While intermediate inputs originating from Other Sulawesi, East Kalimantan and East Java, amounting to 0.35%, 1.52%, 1.90% respectively the rest comes from an ROI of 36.28%.

Intermediate input in the East Java from the origin (self-region) of 89.38%, while that coming from South Sulawesi, Other Sulawesi and East Kalimantan as much as 0.21%, 0.16% and 0.17% respectively, the rest derived from an ROI of 10.09%. Intermediate input of East Kalimantan region originating from the region of origin (self-region) ranged from 92.31% while that of South Sulawesi, Other Sulawesi and East Java as much as 0.47%, 0.21% respectively and 1.46%, the rest comes from an ROI of 5.55%.

In 2011 (data Irio RAS), inter-regional trade linkages are not much changed significantly. It only the nominalvalue that increase. In detail, the incidence of inter-regional trade from the import side (from the domestic sphere) is presented in Table 4 below.

Tabel4.Strukturpermintaanantaraberdasarkanbaris(impor domestik) 2011

Wilayah	Sulain	%	Sulsel	%	Jatim	%	Kaltim	%
Sulain	82,823,187	76.04	321,094	0.31	1,192,954	0.17	394,017	0.20
Sulsel	961,849	0.88	71,488,300	69.55	1,520,389	0.21	1,169,620	0.59
Jatim	3,167,318	2.91	1,622,598	1.58	628,106,519	88.66	3,434,904	1.72
Kaltim	2,003,386	1.84	2,122,293	2.06	1,284,497	0.18	180,018,710	90.08
ROI	19.961.422	18.33	27,238,715	26.50	76,353,303	10.78	14,819,288	7.42
Jumlah	108,917,163	100.00	102,793,001	100.00	708,457,662	100.00	199,836,539	100.00

Source : IRIO, 2005 (processed)
Sul-ain ; Other Sulawesi, Sulsel=West Sulawesi, Jatim=East Java, Kaltim=East Kalimantan, ROI ; Rest of Indonesia

In 2011, Intermediate input of Other Sulawesi originating from the region itself (origin) as much as 76.04% while intermediate inputs imported by 0.88% from South Sulawesi, East Java 2.91%, 1.84% of East Kalimantan and the ROI of 18.33%. Intermediate input of South Sulawesi region originating from the region itself (origin) amounted to 69.55% while intermediate inputs imported of 0.31% from Other Sulawesi, East Java 1.58%, 2.06% of East Kalimantan and 26, 50% of ROI region.
Intermediate input of East Java from its own territory (origin) as much as 88.66% while intermediate inputs imported by 0.17% from Other Sulwesi, 0.21% of South Sulawesi, 0.18% of East Kalimantan and 10.78 % of ROI. Intermediate input of East Kalimantan region originating from the region itself (origin) of 90.08% while intermediate inputs imported from Other Sulawesi (0.20), South Sulawesi (0.59%), East Java (1.72%) and ROI region (7.42%)

Economic Linkages of Other Sulawesi Region

The main driving sector of the economy in 2005 in Other Sulawesi(if end demand increase) is the air transport sector, the basic industry of iron, steel and non-ferrous base metals, industrial goods of metal and building. In 2011, the sector of electricity, gas and water shift the position of the metal industry. The shift in the position does not reflect the metal industry sector is no longer growing, but only shows the position of the sector changed in influencing economic performance. In detail the linkage of the region is presented in Table 5.

Table 5. The Linkage of Other Sulawesiamong regions2005 dan 2011

	NS	Sector	BL	Sulain	Sulsel	Jatim	Kaltim	ROI
2005	31	Air transportation	2,543	1,900	0,007	0,048	0,048	0,541
	20	The basic industry of iron, steel and non-ferrous base metals	2,282	1,924	0,004	0,028	0,025	0,302
	21	Industrial goods of metal	2,280	1,291	0,003	0,153	0,039	0,794
	26	Construction	2,278	1,695	0,034	0,077	0,029	0,444
	NS	Sector	BL	Sulain	Sulsel	Jatim	Kaltim	ROI
2011	31	Air transportasi	2,399	1,851	0,006	0,041	0,036	0,465
	25	Electric, gas andwater	2,151	1,685	0,006	0,025	0,033	0,402
	26	Construction	2,136	1,643	0,033	0,080	0,021	0,360
	20	The basic industry of iron, steel and non-ferrous base metals	1,952	1,713	0,003	0,018	0,015	0,203

BL ; Backward Lingkage, Sul-ain ; Other Sulawesi, Sulsel=West Sulawesi, Jatim=East Java, Kaltim=East Kalimantan, ROI ; Rest of Indonesia

The estimation results showed that the increase in end demand in the air transport sector in Other Sulawesi by 1 will boost performance in all sectors amounted to 2,543 (2005) and 2,399 (in 2011). The magnitude of the impact of economic linkage ofOther Sulawesi region received 1.9 (2005) and 1.85 (in 2011), the impact of South Sulawesi 0,007, East Java0.48, East Kalimantan 0.048. Sector which has the effect linkages in Other Sulawesareas is the Industrial Sector of metal goods. The increase in demand for the metal goods industry sector in 2005 will drive the output of the entire sector amounted to 2,282, where the effect upon the Other Sulawesi region amounted to 1,291; South Sulawesi0.003; East Java0.153, and East Kalimantan 0.039. East Java obtain a large enough effect that is 0,153. Impact of Other Sulawesi on South Sulawesi is very small when compared with East Jawa and East Kalimantan. Though South Sulawesi is in the same island and closer than the East Java. The condition reflects that influence on South Sulawesi against the Other Sulawesi in term of influencing economic output is very small.

Linkage of the South Sulawesi

The increase in end demand of the air transportation sector in the South Sulawesi by 1 will boost performance in all sectors of 2.23 (2005) and 2.16 (in 2011). The magnitude of the impact of regional economic linkage received by South Sulawesi amounted to 1,414 (2005) and 1,944 (in 2011), the impact of Other Sulawesi0.003, East Java0.012, and East Kalimantan 0.069. Largest impact on Borneo economic is the air transport sector in 2005 amounted to 0.069 and 0.55 in 2011 while the sector that gives effect to the economy of East Java is the food and beverage industrialsector by 0.02, the textile industry 0.03 and steel industry sector 0.38 in 2005. Economic conditions do not change there in 2011. In detail, the region's economic linkage is presented in Table 6.

Table 5. The Linkage of Other Sulawesiamong regions2005 dan 2011

	NS	Sector	BL	Sulain	Sulsel	Jatim	Kaltim	ROI
2005	31	Air transportation	2,543	1,900	0,007	0,048	0,048	0,541
	20	The basic industry of iron, steel and non-ferrous base metals	2,282	1,924	0,004	0,028	0,025	0,302
	21	Industrial goods of metal	2,280	1,291	0,003	0,153	0,039	0,794
	26	Construction	2,278	1,695	0,034	0,077	0,029	0,444
	NS	Sector	BL	Sulain	Sulsel	Jatim	Kaltim	ROI
2011	31	Air transportasi	2,399	1,851	0,006	0,041	0,036	0,465
	25	Electric, gas andwater	2,151	1,685	0,006	0,025	0,033	0,402
	26	Construction	2,136	1,643	0,033	0,080	0,021	0,360
	20	The basic industry of iron, steel and non-ferrous base metals	1,952	1,713	0,003	0,018	0,015	0,203

BL ; Backward Lingkage, Sul-ain ; Other Sulawesi, Sulsel=West Sulawesi, Jatim=East Java, Kaltim=East Kalimantan, ROI ; Rest of Indonesia

The magnitude of the economic linkage upon the East Java reflect the performance of the sector in South Sulawesi output impact of certain sectors in East Java. This reflects the demand originating from East Java and East Kalimantan are relatively larger than the Other Sulawesi. On other hand, Other Sulawesi (closer than South Sulawesi) has a very small impact on the performance of the sector in South Sulawesi.

Linkage of the east Java

The increase in end demand for the air transportation sector in East Java by 1 will boost performance in all sectors amounted to 2.469 (2005) and 2,071 (in 2011). In 2011, the palm oil sector and construction proportionally give impact on increase of sector's performance while the industrial sector of electricity, gas and water and marine trasnportationperformance were down. The increase in end demand for machinery industry sector by 1 will boost sector output performance of 2,231 in 2005 and 2.13 in 2011. In detail the economic linkage among region is presented in Table 7.

Table 7. Linkage sector of East Java among regions, 2005and 2011

	NS	Sector	BL	Jatim	Sulain	Sulsel	Kaltim ROI
2005	31	Air transportation	2,469	1,728	0,001	0,001	0,4150,324
	25	Electric, gas &water	2,378	1,846	0,001	0,001	0,3630,168
	30	Marine transportation	2,360	1,547	0,002	0,002	0,3900,418
	22	Machinery and equipment	2,231	1,414	0,001	0,001	0,0220,795
	NS	Sector	BL	Jatim	Sulsel	Sulsel	Kaltim ROI
2011	22	Machinery and equipment	2,130	1,370	0,000	0,001	0,0020,758
	31	Air transportation	2,071	1,633	0,001	0,001	0,0040,432
	10	Palm oil industry	1,997	1,396	0,011	0,000	0,0040,586
	26	Construction	1,889	1,737	0,002	0,001	0,0020,147

BL ; Backward Lingkage, Sul-ain ; Other Sulawesi, Sulsel=West Sulawesi, Jatim=East Java, Kaltim=East Kalimantan, ROI ; Rest of Indonesia, NS ; Sector number

The estimation results show the effect of the performance of the sector in East Java, only to give effect to the area of East Kalimantan in 2005, but in 2011 performance of the sector in East Java, only a very small effect in Other Sulawesi, South Sulawesi and East Kalimantan. In 2005, air transportation, electricity, gas and water, marine transportation and industry give economic impact in East Java by 1.72, 1.846, 1.547 and 1.414. The magnitude of the impact of end demand in East Kalimantan amounted to 0.415, 0.363, 0.390 and 0.022 respectively. Economic linkages with South Sulawesi and Others Sulawesi still very small. This reflects the economy of East Java, South Sulawesi and Others Sulawesi do not have a strong economic relationship. In 2011, East Java economy is getting stronger, but does not give effect to the region of South Sulawesi, Other Sulawesi and East Kalimantan. End demand sector in East Java more influential to the area rather than an effect on other areas. The condition is different from the development of the sector in South Sulawesi and Others Sulawesi which give effect to the output of the sector in East Java. It reflects inter-regional economy is still asymmetric and tend to be the dominant influence of East Java.

Linkage of the East Kalimantan

Strong performance in 2005 in contrast to the strong performance of the sector in 2011. In 2005, a strong impact sector economy is the food and beverage industry, air transport, electricity, gas and marine transportation equipment and repair industry. End demand increase by 1 will encourage the output of the entire economy of 2.635, 2.089, 2.008 and 2.008 respectively. In 2011, the increase in end demand by 1 basic industries of iron, steel and non-ferrous base metals, iron and steel sector, industrial machinery and equipment and footwear industry will lead to boost economic outputof 2,374 (all sectors together). In detail the linkages of the region is presented in Table 8.

Table 8. Linkage of economic sector in the East Kalimantan among regions, 2005 dan 2011

	NS	Sector	BL	Kaltim	Sulain	Sulsel	Jatim	ROI
2005	12	Food and beverage industry	2,365	1,883	0,057	0,008	0,216	0,201
	31	Air transportation	2,089	1,769	0,001	0,001	0,019	0,298
	25	Listrik, gas & air	2,008	1,919	0,001	0,001	0,006	0,082
	23	Marine transportation equipment and repair industry	2,008	1,403	0,001	0,001	0,140	0,463
	NS	Sektor	BL	Kaltim	Sulsel	Sulsel	Jatim	ROI
2011	20	The basic industry of iron, steel and non-ferrous base metals	2,374	2,038	0,001	0,000	0,303	0,032
	21	Iron and stell industry	2,374	2,038	0,001	0,000	0,303	0,032
	22	Machinery and equipment	2,374	2,038	0,001	0,000	0,303	0,032
	14	Shoes industry	2,374	2,038	0,001	0,000	0,303	0,032

BL ; Backward Lingkage, Sul-ain ; Other Sulawesi, Sulsel=West Sulawesi, Jatim=East Java, Kaltim=East Kalimantan, ROI ; Rest of Indonesia, ROI ; Rest of Indonesia

The estimation results indicate that the effect of economic sector linkage performance in Kalimantan has a strong influence on the performance of the sector in East Java, while the influence upon the South Sulawesi and Other Sulawesi is very low (not significant). In 2005, the performance of the sector which give effect to the East Java is the food and beverage industry and the transportation equipment sector and improvement of each of 0.216 and 0.140. In 2011, East Java linkage sectors with stronger (0.303), while the South Sulawesi and Other Sulawesi is weaker.

MultiplierIncome/Wage

Multiplier value estimates the amount of remuneration if end demand increase by 1. The result indicates that the amount of the value of high wages in 2005 in the dominance of the public administration and defense sector, South Sulawesi just different. This reflects a governance sector is still very significant in pushing the value of wages. The results are interesting in East Java, where the area is an industrial area but high wage multiplier value instead of the industrial sector. Other interesting results found in the East Kalimantan, where the mining sector is the dominant sector but the multiplier value sector of wages are lower than in the government sector. In detail, the multiplier value of wage area of 2005 is presented in Table 9.

Table 9. Coeficientof wage/salary multiplier, 2005

Other Sulawesi			**South Sulawesi**		
NS	Sector	Koef	NS	Sector	Koef
34	Government anddefense	0,764	35	Other services	0,933
35	Other services	0,427	23	Transportation and repairing	0,445
18	Petro-chemical Industry	0,404	1	Rice	0,427
East Java			**East Kalimantan**		
NS	Sector	Koef	NS	Sektor	Coef
34	Government and defense	0,933	34	Government and defense	0,933
1	Rice	0,597	3	Plantation	0,297
2	Food crops	0,549	10	Palm industry	0,292

Source :Tabel IRIO 2005, calculated

Economic conditions in 2011 did not change where the general government sector and the defense is still a sector that has a high wage multiplier if end demand increase by 1. South Sulawesi into different areas for other service sectors that have a high multiplier value if end demand rises. The existence of the government regulation on standardof minimum wage and strong private authority to regulate wages of company becomes a key factor why the private sector wages are likely to have a constant value or lower multipliers. In detail, the multiplier value wage region in 2011 is presented in Table 10.

Table 10. Coeficientof wage/salary multiplier 2011

	Sulawesi Lain		**Sulawesi Selatan**	
NS	Sector	Koef NS	Sector	Koef
34	Government and defense	0,66935	Other services	0,933
32	Communication	0,37323	Transportation and repairing industry	0,371
29	Land transportation	0,31519	Cement industry	0,339
	East Java		**East Kalimantan**	
NS	Sector	Koef NS	Sector	Koef
34	Government and defense	0,69934	Government and defense	0,933
7	Oil mining, gas and geothermal	0,6413	Plantation	0,292
1	Rice	0,54026	Construction	0,261

Source :Tabel IRIO 2005, calculated

Conclusions

Conclusion of this study are:

4. The pattern of linkages in the region of Sulawesi Island is relatively very weak. Interaction and economic linkages between South Sulawesi with Others Sulawesi are very small. The pattern of stronger linkages is found between the Sulawesi Island (South Sulawesi and Other Sulawesi) to the East Java
5. The impact on the economy of South Sulawesi and Others Sulawesi influence and linkage with the economy in East Java, but the increase in end demand for the certain sector in East Java does not provide a significant effect on the output of the sector in Other Sulawesi and South Sulawesi
6. The multiplier value of income is still dominated by the public administration and security sector in 2005 and 2011, except in South Sulawesi.
7. Although the East Java is an industrial area but income multiplier value of the public sector and the rice sector is greater than other sector(2005 and 2011), in line, East Kalimantan as the mining industry is major industry, but higher income multiplier value come from plnatation (2005 and 2011)

Reference

Hill,H.,B. Resosudarmo, and Y. Vidyattama. 2008. Indonesia's Changing Economic Geography.
CCAS Working Paper No.12.Doshisha University.

LeSage, JP danLlano,C. 2007. A Spatial Interaction Model With Spatially Structured Origin and Destination Effect. Department of Finance an Economics, Texas State University-SanMarcos.18 Oktober 2007.

Rustiadi, E dan D.S. Priyarsono. 2010. *Regional Development in Indonesia: Problems, Policies, and Prospect. Regional Development in indonesia. Crestpent Press.* Bogor

Miller,REdan Blair PD. 2009. *Input Output Analysis; Foundations and Extensions. Cambridge University Press*

Chenery,HB and T.Watanabe. 1958. International Comparasions of the Structure of Production. Econometrica, 26: 487 – 521

Daryanto,A and Y Hafizrianda. 2010. Model – Model Kuantitatif ; untuk perencanaan pembangunan ekonomi daerah. IPB. Bogor

[BPS]. 2007. Sensus Ekonomi Nasional. Jakarta

Heringa,PW, CM van der Heide and WJM Heijman. 2013. The Economic Impact Multifunctional agriculture in Dutch Regions : An Input Output Model. ELSEVIER and NJAS.

Morilla, CG, GL Diaz-Salazar, and MA Cardenete. 2006. Economic and Environmental Efficiency Using a Social Accounting Matrix. ELSIVIER

THE INDONESIAN COMPARATIVE ADVANTAGE ON FOOD CROP CULTIVATION

Hery Toiba[1)]**,** Tri Wahyu Nugroho [1)],Nuhfil Hanani[1)]

[1)] Department of Socio-economic, Faculty of Agriculture, Brawijaya University Malang,Indonesia

ABSTRACT

Agriculture sector is still most important part of the Indonesian economy. The sector significant contributes to economic growth, and providing employment. However, presently the agricultural sector, especially main crops faces strong challenges trade liberalization, deforestation, land conversion, natural disaster, and climate change. Furthermore the majority of food-crop farmers are smallholders facing problems in capital, and technology. As a result, the food-crop sector is vulnerable to shock in economic and natural problems. The Indonesian government continues to address those issues through many programs to support improving productivity, and competitiveness. Important policies to address the issues are ensuring self-sufficiency of main food crops. The question is the extent of comparative advantage in Indonesian food crop. The primary objective of this study is to analyze the Indonesian comparative advantage on food crop cultivation. To address each of the purpose, data is analyzed from farmers, traders and agricultural staffs. Surveys were conducted from July to August 2014. The samples consist of 165 farmers, 32 commodity traders, 32 seed Suppliersand 28 agricultural extension staffs from six provinces: East Java, Central Java, Yogyakarta, West Java, Lampung and South Sulawesi. Domestic resource cost was estimated to explore whether Indonesia have the comparative advantage on food-crops. This study found that only rice and corn has comparative advantage. By maximum utilization of domestic resources efficiently, the need for rice and corn in the country can be met without import. Thus, it can save the foreign exchange. In contrast, soybean has no comparative advantage as an import substitute. This implies that policy to achieve the self-sufficiency on rice and corn are a realistic policy without compromising the efficiency use of resource. On the other hand, the policy to attain the self-sufficiency on soybean seems to be unrealistic without substantial improvement in productivity of soybean.

Key words - Comparative advantage, food crops, Indonesia

INTRODUCTION

Agriculture sector is still playingan important role of the Indonesian economy. This sector hassignificant contribution to economic growth and providing employment. At the macro-economic indicators, the agricultural sector's contribution to economic growth is relatively large with ranks second after the manufacturing sector. Moreover, the composition of the manufacturing sector also consists of processed food and beverage industry as well as industrial agricultural inputs, such as fertilizers, pesticides and mechanization of agriculture.In 2012, agricultural sector contributes 14 percent to overall Gross Domestic Product (GDP) and contributes 34 percent employment in labor forces (OECD,2012).

Moreover, the growth of agriculture sector contributes to eradicate the poverty. Previous studies suggest that increase on agriculture growth is more effective elevation of poverty than growth in other sectors (Cervantes-Godoy, D. and J. Dewbre, 2010). Siregar et all (2012) points out that poverty in Indonesia decrease from 21.1 per cent of the during 1996-2000 to around 15.4 percent in 2006-2010. It also implies that reduction of poverty can improve food security.

Meanwhile, the composition in the agricultural sector, sub-sector of food crops contributed the highest among several other sub-sectors, with contributions reaching 48 percent (Anonymous, 2013).In the sub-sector of food crops, strategic commodities which have a major influence on social, economic and political are corn, soybeans and rice. Therefore, the government established three strategic commodities, together with the sugar and meat towards self-sufficiency (Siregar, et al., 2012).

However, presently the agricultural sector, especially main crops faces strong challenges. At global front, trade liberalization, free regional areas are among issues faced. Trade liberalization policies or more commonly known as free trade is growing rapidly with the increasing desire of countries to improve the welfare of the community through commerce. This policy focuses on the removal of barriers to trade so that the flow of trade from one country to another become faster and cheaper. The consequences of trade liberalization is becoming increasingly integrated market and are open so that each state should be able to produce competitive products in order to compete in the world market.

The effort to improve the competitiveness of food commodities, especially corn, soybean, and rice are assessing the challenges or problems which associated with on farm activities, post-harvest and marketing. Problems which faced by farmers in cultivating are related to inputs and production processes. Related to these problems, theavailability and accessibility of fertilizer, seeds, water, pests and diseases, and the availability of new technology become challenge for food crop farmers in Indonesia. As for the post-harvest and marketing issues, the problems faced by farmers concerning the problem of yield loss, harvest and post-harvest technology, as well as market and price guarantees.

Availability and coverage of the aspects of the input, needs to be concentrated on the study of comparative advantage in Indonesian food crops. Availability and the ability of farmers to get seeds, fertilizers, and agricultural machinery, is the initial key to increasing competitiveness. Therefore, the capability of capital becomes very important. Although these inputs are available, but if it does not have a range to buy the product, then the farmers will certainly not be able to pursue farming as well.

The Indonesian government continues to address those issues through many programs to support improving productivity, competitiveness and rehabilitation of natural resources and the environment. One of important policies to address the issues is ensuring self-sufficiency of corn,soybean, and rice. Thus, the policies increase competition for scarce resources usage across commodities. The question is the extent of comparative advantage in Indonesian food crop.Thus, the purpose of this study is to examine the comparative advantage on food crop (corn, soybeans, and rice) cultivation in Indonesia.

DATA AND METHODS

The analysis of this study focuses on comparative advantages on food crops cultivation. The process of data collection involved 15 trained enumerators and was conducted in six provinces: East Java, Central Java, Yogyakarta, West Java, Lampung and South Sulawesi. In each province in Java will be select several district which are a major producing area of corn, soybeans, and rice. The list of selected provinces and district for corn,soybean and rice is show in Table 1.

Table 1. List of selected provinces and districts based on the center area of corn soybean and rice

Province	Name of selected districts based on the center area of commodities		
	Corn	Soybean	Rice
East Java	Tuban Kediri Malang	Banyuwangi Lamongan Madiun	Jember Pasuruan Bojonegoro
Central Java	Grobogan Kendal	Grobogan Wonogiri Kebumen	Demak Sragen
Yogyakarta	Gunung Kidul	Gunung Kidul	Sleman
West Java	Majalengka Tasikmalaya Garut	Garut Cianjur	Indramayu Subang
Lampung	South Lampung	South Lampung	South Lampung
South Sulawesi	Jeneponto	Maros	Maros

Interview were conducted from July to August 2014. The samples consist of 165 farmers, 34 collector traders, 34 seed suppliers, and 28 agricultural extension staffs. The location researches choose from center of food production of corn, soybean and rice. Farmer samples were selected randomly by survey team from list provided by village leaders. Snowball ball sampling was used to select traders. Agricultural staff samples were selected non-probability sampling by survey team from list provided office of department of agriculture crops in each district. The total number of selected farmers are 165, commodity traders are 32, seed suppliers are 32, and extention staffs are 28.

The method was used in this study is Domestic Resource Cost method, Domestic Resource Cost (DRC) was used to evaluate the cost of using protection to maintain existing agriculture.DRC measure domestic cost and foreign input which utilized in production of a specific commodity at world prices. The DRC measure real cost of attaining one unit of foreign exchange cause one unit production of a specific commodity.

RESULTS AND DISCUSSION

In this research, several food crops were analyzed to know how the comparative advantage. The results generally showed that rice had higher comparative advantage than corn, while soybean had no comparative advantage. It was indicated by the Domestic Resource Cost Ratio (DRCR) value of three commodities as shown at Table 2 below.

Corn and rice farming in Indonesia has comparative advantage, indicated by the DRCR value was less than 1. It means that corn and rice farming in Indonesia was more efficient and profitable in the utilization of domestic resources when it was produced domestically. Therefore, corn and rice were feasible to be produced and developed to meet domestic needs.

Table 2. Comparative Advantage of Corn, Soybean, and Rice Farming in Indonesia, Java and Outside Java, 2014

No	Area	Commodities		
		Corn	Soybean	Rice
1	Indonesia	0.65	1.20	0.37
2	Java	0.57	1.03	0.34
3	Outside Java	0.52	0.68	0.36

Notes: Commodities have comparative advantage if the DRCR < 1
While commodities have comparative disadvantage if the DRCR > 1

By maximum utilization of domestic resources efficiently, the need for rice and corn in the country could be met without import. The same result shown at the calculation of DRCR value of corn and rice farming based on the region, which were java and outside java. Both crops showed that they were more efficient and profitable in the utilization of domestic resource rather than import.

The soybean farming in outside java had the comparative advantage. The domestic resource in outside Java could produce soybean more efficient and give profit to the farmers. More efficient soybean farming in outside Java than in Java indicated that there's potential soybean farming development outside Java. The higher productivity could support the food sovereignty of soybean. Furthermore, the soybean farming development also could be established in Java by the improvement of high yield seed variety to increase the productivity. The research about high yield soybean seed variety should be conducted, so that there would be the high yield seed variety of soybean which give high productivity, puddle or drought tolerant, and also pest tolerant. Realizing the soybean development should involve all parties, which were government, farmers, and agriculture extension staff.

This study also found that the average productivity of soybean in Indonesia is only 1.75 tons/ha. The results of the simulation that has been done in order to lower soybean DRC value less than 1, the productivity of soybean in Indonesia should be above 2.2 tons/ha.

CONCLUSIONS

The results show that generally rice and corn had comparative advantage, but soybean had no comparative advantage. This is indicated by the DRC value of cornand rice is less than one, and soybean is more than one. By maximum utilization of domestic resources efficiently, the need for rice and corn in the country can be met without import. Likewise the analysis of comparative advantage based on region which is Java and outside Java shown the same result. Nevertheless, soybean cultivation in outside Java shows that there is comparative advantage. This implies that policy to achieve the self-sufficiency on rice and corn are a realistic policy without compromising the efficiency use of resource. On the other hand, the policy to attain the self-sufficiency on soybean seems to be unrealistic without substantial improvement in productivity of soybean, especially in Java. However, based on DRC value of soybean in outside Java had comparative advantage. Thus, specifically of policy for self-sufficiency of soybean should be concentrated in outside Java.

ACKNOWLEGMENTS

We would like to acknowledge the assistance of Agriculture Economic Laboratory, Department of Socio-Economic, Faculty of Agriculture, Brawijaya University and United State Department of Agriculture as funders

REFERENCES

Anonymous, 2013. *Buletin PDB Sektor Pertanian*, Vol. 12, No.1, Pusdatin, Deptan Republik Indonesia.

Cervantes-Godoy, D. and J. Dewbre ,2010, *EconomicImportance of Agriculture for Poverty Reduction*, OECD Food, Agriculture and Fisheries Working Papers, No. 23,OECD Publishing.

OECD, 2012, *OECD Review of Agricultural Policies: Indonesia 2012*, OECD Publishing.

Siregar, H Jahroh, S. Dicky, I,and Hermansah,T, 2012, *A Study on Supportive Policies for Maximizing Agricultural Investment in Indones* in The Role of Policies in Agricultural TransformationLessons from Brazil, Indonesiaand the Republic of Korea,CAPSA Working Paper No. 106.

PROFIT GAP AND EFFICIENCY MEASURE OF THE SMALL-SCALE PRODUCTION OF SHALLOT: THE CASE STUDY OF SHALLOT PRODUCTION IN EAST JAVA PROVINCE - INDONESIA

Sujarwo[1)], Michael Reed[2)], Sayed Saghaian[2)], and Rini Dwiastuti[1)]
[1)]**Department of Agricultural Economics-AgribusinessUniversity of Brawijaya**
[2)]**Department of Agricultural EconomicsUniversity of Kentucky**

Abstract

This study attempts to find ways for small-scale farmers to increase efficiency with their current technology in their shallot production. Frontier production specification is not fit with this data since the residual cannot be decomposed to obtain technical inefficiency measure. The cost frontier also cannot be applied due tolimited variation of input prices. This paper attempts to propose an approach for obtaining efficiency measure and efficient allocation of inputs as well. Both calculations rely on a double-log production function estimated by Principal Component Regression (PCR) to overcome multicollinearity. The results confirm that small-scale shallot farmers have difficulty in allocating their inputs efficiently. Land, seed, and labor are over-utilized; while fertilizer and pesticide are under-utilized. On average, overall efficiency considered as allocative efficiency as well obtained by the farmers is 72.93%. Furthermore, small-scale shallot farmers have estimated gross profit losses of 39.67% on average due to inefficient allocation of inputs.

Keywords: production function,efficient allocation of inputs, profit gap

INTRODUCTION

Production efficiency, especially for small-scale farmers, is an important issue since millions of farmers run their operations based on experience without farming records or technological support from government or other organizations. Tradition plays a big role in decision-making, which can be a problem as external factors change. This is true for small farmers through the world and is certainly true in Indonesia. According to Statistics Indonesia, the number of small farm households (with less than 0.5 hectares of land) was 19.0 million in 2003 and 14.3 million in 2013.

This paper attempts to measure efficiency in small scale shallot[1] farming in Indonesia based on cross-sectional data which have limited price variations. This happensbecause the data were collected for one period shallot production, May-August 2012, and the farmers bought from the same fertilizers and pesticides retailer.Based on this situation, cost frontier cannot be obtained properly. Additionally, the faming size is relatively small, 0.242 on average, and that brings homogenous technology applied among the shallot farmers. In this sense, it is high possibility that we will not be able to get technical inefficiency measure.This is confirmed through the results of data analysis.

The approach proposed in this paper will give advantage to obtain efficient inputs and overall efficiency level as well when we cannot get the overall efficiency from the cost frontier.

Profit gap measure is obtained based on the gapof the optimum output generated from efficient allocation of inputs and the actual output derived from actual allocation of inputs. These analyses certainly trying to answer both what the efficient allocation of inputs and what the overall efficiency are condition on certain cost level.

LITERATURE REVIEW

Farrell (1957) introduced the conceptual framework for measuring efficiency. Assuming a constant return to scale (RTS) production function and the efficient combination of inputs for producing unit output presented by an isoquant, any deviations from the points on the isoquant are accounted as technical inefficiency. Additionally, profit maximization occurs where the budget line is tangent to the isoquant. Any deviation in allocation of inputs from this tangency with the budget line and isoquant is considered allocative or price inefficiency. The combination of both technical and allocative efficiency is economic efficiency.

Yotopoulus and Lau (1971) introduced non-frontier estimation in production efficiency by assuming that a firm maximizes profits given the technology available. They define a profit function as “unit-output-price" profit (UOP profit), which is the maximum level of profit for each set of normalized input prices (deflated by output price) and quantities of fixed inputs use.

Aigner et al. (1977) and Jondrow, et al. (1982) made a breakthrough in measuring technical inefficiency based on decomposition of the error term from a stochastic production function into white noise random error and technical inefficiency. The negative skewness in the error term is an indication that technical inefficiency exists. Moreover, the random error and technical inefficiency are assumed to be distributed independently.

Schmidt and Lovell (1979) derived the cost frontier under cost minimization (dual approach), which minimizes the production cost subject to the frontier production function. This derivation results in a cost frontier as a function of the input prices and output in linearly homogenous form. The error term coming from the cost frontier estimation (OLS or MLE) is then decomposed into the white noise random error and the extra cost (due to allocative inefficiency) of producing below the production frontier (due to technical inefficiency). Allocative inefficiency is measured associated with positive skewness in the distribution of the decomposed error term from the cost function estimation.

Quiggin and Lan (1984) studied the application of the cost and profit functions approach for cross-sectional data. They asserted that cross-sectional data collected for a single period of time do not allow enough variation of input and output prices. Accordingly, cross-sectional data are not relevant for these approaches.

DATA

This study uses primary data collected from a survey of a small village in Indonesia. This village is a center of shallot production located in Nganjuk Regency, East Java. The sample farmers were selected using a simple random sampling over about 650 shallot farmers in 2012. Parel, et al (1973) suggested that several factors such as population size, homogeneity level, expected significant level, and expected sampling error, are important to be considered in determining sample size. Accordingly, we get 36 farmers as a sample size.

METHODOLOGY

Kopp and Smith (1980) found that alternative functional forms have limited effects on empirical technical efficiency measurements. For that reason, this study considers a double-log function due to its simplicity and other benefits. The benefits of the double-log function are the coefficients of the function represent the elasticities, and the sum of the coefficients is the returns to scale (RTS) (its homogeneity).

Production functions are notorious for having problems with multicollinearity (as input use is highly correlated among its components). This study applies Principal Component Analysis (PCA) in the OLS estimator and MLE to estimate input elasticities for the production function. Frontier production function estimated by MLE is conducted to confirm whether there is technical inefficiency in shallot production or not.

Having fit production function with concave in input satisfying the law of diminishing marginal productivity (Coelli, 2005), the efficient allocation of input, overall efficiency, and profit gap can be obtained. The allocative efficiency of input can be calculated as follow:

Σ

Equation ( ) represents the efficient allocation of input, , in shallot production at a certain level of input costs, IC, which is a minimum cost and treated exogenously. In addition, prices are given at the market (exogenous variables). Furthermore, the level of overall efficiency (EE) is measured based on this formula:

Σ

Where εi is obtained from this formula, (( ) [ ]) , is total input coefficients, and

is the elasticity of input-j.

A profit gap is defined as a difference of profit between the efficient and the actual allocation of inputs by farmers at a certain amount of costs production.This gap is a result of the efficient and actual allocation of inputs.

THE RESULTS

Production function

The result of frontier production function shows that the gamma is 0.20 and insignificant for 5% significant level. Additionally, the intercept from OLS and MLE frontier are the same which is 0.8238. These results are convincing us that there is no technical inefficiency in the model. The next analysis is that estimating production function using OLS and the result shows that labor has the highest factor elasticity, 0.313, while land and seed have almost the same contribution to shallot production, 0.161 and 0.159, respectively. N, P, and K have elasticities that are nearly the same and small, 0.095, 0.053, and 0.077, respectively. The contributions of insecticides and fungicides in shallot production are higher than the contribution of fertilizers (N, P, and K).

Efficient allocation of inputs

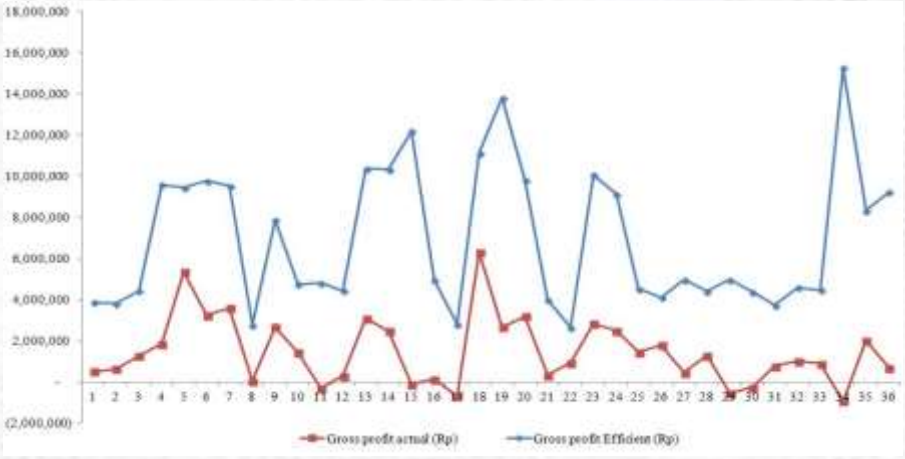
From the allocation of inputs analysis, we find that there is no efficient allocation of inputs. Land, seed, and labor are over-utilized; while fertilizer and pesticide are under-utilized. However, primary inputs such as land, seed, labor which are mostly owned by farmerare used closer to efficient levels.

Overall efficiency

Overall efficiency of shallot farmers is 72.93% with 9.29% of standard deviation. According to this analysis, overall efficiency level is not related to the farming size. The ability to handle such high uncertainty in the shallot production is the main reason for obtaining higher overall efficiency in their production regardless what the size of the farming is.

Profit gap

Having the production function found and the level of prices which are farmer gate of inputs and output prices, the profit gap each farmer can be depicted as follow:



CONCLUSION

The farmers allocate their primary inputs (land, seed, and labor) quite close to the efficient level, but they allocate fertilizer, insecticide, and pesticide inefficiently. Important information obtained during the interview sessions with the farmers provides plausible reasons why this is the case. Farmers have their own land and seed (or buy seed from their neighbor) and most labor comes from the farmer's household. The farmers govern those inputs much more efficiently because the farmers have very good information and knowledge on how to allocate those inputs based on experience. Allocating fertilizer and pesticide, however, are constrained by the state of nature in the period of shallot production. Uncertain weather conditions, pests and diseases attacked are obvious constraints for the farmers and there is not enough time to reach such an effective and efficient way to deal with all those problems. As a result, there is a profit gap about 39% between actual and efficient allocation of input.

REFERENCES

Farrell, M., 1957. "The Measurement of Productive Efficiency." *Journal of the Royal Statistical Society*. Series A (General), 120(3): 253-290.

Lau, L. and P. Yotopoulos, 1971. "A Test for Relative Efficiency and Application to Indian Agriculture." *The American Economic Review* 61: 94-109.

Aigner, D., C. Lovell, and P. Schmidt, 1977. "Formulation and Estimation of Stochastic Frontier Production Function Models." *Journal of Econometrics*, 6(1): 21-37.

Jondrow, J., L. Knox, I. Materov, and P. Schmidt, 1982. "On the Estimation of Technical Inefficiency in the Stochastic Frontier Production Function Model." *Journal of Econometrics,* 19 (2): 233-238.

Schmidt, P. and C. Lovell, 1979. "Estimating Technical and Allocative Inefficiency Relative to Stochastic Production and Cost Frontiers." *Journal of Econometrics*, 9(3), 343-366.

Quiggin, J. and A. Bui-Lan, 1984. "The Use of Cross-sectional Estimates of Profit Functions for Tests of Relative Efficiency: A Critical Review". *Australian Journal of Agricultural and Resource Economics, 28*(1): 44-55

Parel, C. and Agricultural Development Council, 1973. *Sampling Design and Procedures*. New York. Agricultural Development Council.

Kopp, R. J.,and W. E Diewert,., 1982. "The Decomposition of Frontier Cost Function Deviations into Measures of Technical and Allocative Efficiency." *Journal of Econometrics,* 19(2), 319-331.

Coelli, T. J., Rao, D. S. P., O'Donnell, C. J., and G. E., Battese, 2005. An Introduction to Efficiency and Productivity Analysis. Springer.

‘

ANALYSIS OF THE TECHNICAL EFFICIENCY OF RICE FARMS IN MADIUN DISTRICT, INDONESIA - A STOCHASTIC FRONTIER ANALYSIS

Syafrial[1], Hery Toiba[1], Rosihan Asmara[1],Abdul Wahib Muhaimin[1]
[1)] Department of Socio-economic, Faculty of Agriculture, Brawijaya University Malang,Indonesia

ABSTRACT

This research examines the level of technical efficiency and factors that influence the technical efficiency in rice farms. The samples of 40 paddy farmers in the district of Madiun, Indonesia were obtained using stratified multi-stage random sampling methods. Stochastic frontier models are used to examine the technical efficiency of rice farms. While, regression models are used to explore the factor that affected technical efficiency of rice farms. Empirical results suggest that the level of technical efficiency on rice farms is relatively high. It indicates that the rice farmers use relative efficiency on their input resources. In addition, the result of regression analysis also confirms thattechnical efficiency levels are affected by usage of seed, land and NPK. Therefore, the government should provide affordable rice seeds, fertilizer for smallholder farmers to increase level of technical efficiency.

Key words - the technical efficiency, rice farms, Indonesia, stochastic frontier analysis

INTRODUCTION

Paddy is major staple and main crop in Indonesia. Role of rice on food security and inflation is relatively important. Therefore, Indonesian government focus on achieved on self-sufficiency on rice. Several programs have implemented to achieve the program, for examples, paddy seed subsidy and dissemination of new technology. However, there are several questionswhat government should develop new technology first or improve efficiency in short run.

Study of efficiency measurement on agriculture could answers the questions with measuring the level of efficiency usage of scarcity resources, especially in Java island. Even though, study on measuring of technical efficiency have been tempted in Indonesia, especially in rice farming (Esparon and Sturgess,1989; Erwidodo,1990,Squires, and Tabor, 1991; Llewelyn, and Williams, 1996;Daryanto,2000; Roche,2006;Tinaprilla,2014),but very few focus on paddy farming that highly competitive with other main food crop (sugarcane, maize).The objectives of the study are to estimate factors affecting paddy production and to analyze factors affecting the technical efficiency of rice farms on area that there is highly competition among main food crops in Java.

RESEARCH METHODS

To address each of the objectives, data is analyzed fromfarmssurveys that were conducted from December2010 to January,2011. The sample comprised40farmersin Madiun district, East Java, Indonesia. The samples and location were selected using systemic random sampling methods. The surveys were conducted via face-to-face interviewswithhead of household of farmer household.

The questionnaire was developed after reviewing relevant literature, interviewing key informants from Government. The questionnaire was refined after conducting pretests. The survey collected information related to: (1) Characteristic of household members, (2) Agricultural land; (3) crop production; (4) crop and labor inputs; (5) crop utilization; (6) Crop sales information. Additionally, information was obtained regarding the household's income sources as well as household assets.

Stochastic frontier models were used to analyzewhether crop inputs and labor input help to explain production on paddy farming. In addition, the stochasticfrontieranalysis was also used to assess technical efficiency of rice farms. While, to analyze factors affecting the technical efficiency of rice farms were utilized the linear regression models. Table 1 provides summary statistic for each variable that used in this study.

Table 1. Summary statistic of variables

Variable	Obs.	Mean	Std. Dev.	Min	Max
Log Production	40	8.633	0.559	8.294	10.510
Log Land	40	-1.174	0.534	-2.526	0
Log Seed	40	3.697	0.504	2.996	5.298
Log Urea	40	5.895	0.605	4.382	7.090
Log NPK	40	5.817	0.604	4.382	6.908
Log Compos	40	5.881	0.588	4.605	6.685
Log Pesticide	40	7.492	0.738	5.586	9.364
Log Labour	40	4.664	0.575	3.121	5.858
Technical Efficiency	40	0.848	0.049	0.692	0.928
Age	40	49.075	12.300	22	75
Age2	40	2555.875	1206.156	484	5625
Education (Junior High)	40	0.100	0.304	0	1
Education (Senior High)	40	0.225	0.423	0	1
Family Size	40	3.550	1.197	0	7
Land Tenure	40	0.825	0.385	0	1
Capital	40	0.675	0.474	0	1

RESULTS AND DISCUSSION

Factors affecting paddy production

Table 2 reports the results from estimating the ordinary least square (OLS) and maximum likelihood (ML) estimates of production function parameters. The results of OLS give estimates of average production function, while the ML model provides estimates of the stochastic production frontier that indicates the best practice performance. The coefficient of land,seed and fertilizer were positive and significant for MLE.The coefficient of the variable of urea,compos, and pesticide were statistically insignificantly in

both methods. In addition, labor is insignificant in both models.A possible explanation for the insignificancies of labor is famer's still use family labor that they are no hired charge.

Table 2. OLS estimates of Cobb-Douglass production function and MLE estimates of the stochastic frontier production function

	OLS		MLE	
	Coefficient	St. Error	Coefficient	St. Error
Constant	4.270***	(1.002)	4.443***	(0.938)
Land	0.406*	(0.213)	0.392*	(0.204)
Seed	1.095***	(0.142)	1.109***	(0.140)
Urea	-0.119	(0.138)	-0.117	(0.123)
NPK	0.258	(0.172)	0.259*	(0.152)
Compos	-0.098	(0.149)	-0.103	(0.136)
Pesticide	0.091	(0.101)	0.088	(0.091)
Labor	-0.025	(0.181)	-0.032	(0.167)
LR test			0.03	0.434
lnsig2v			-2.679***	(0.927)
lnsig2u			-3.049	(3.680)
sigma2			0.1159982	0.115
Lamda			0.8311921	0.5177164
Log likelihood			-7.6254517	
F-Stats [p-value]	11.67 [0.0000]			
R2	0.719			
N	40		40	

Standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1

Table 2 also shows that value of the ratio of variance of farm-specific technical efficiency to the total variance (. It means that difference between observed output and frontier output are caused by technical inefficiency.

Output of frontier also reports the results of a test that there is no technical inefficiency component in the models.Table 2 shows that coefficient of is insignificant, meaning that hypothesis null is true that there is no presence one-side error component. Moreover, table 2 show that LR =0.03 a p-value of 0.434 for the half-normal model. There are several possible explanation for this result. A possible explanation for this might be that the test is based on an asymptotic distribution and sample size was relative large.

Table 3 provides the results of distribution of technical efficiency among farmers. There are few variation of level of technical efficiency with range from 0.690 to 0.950. the average technical efficiency is 0.848, and the value is relatively high compared another study (Tinaprilla,2014).

Table 3. Frequency distribution of technical efficiency of paddy farms

Technical efficiency	Number of farmer	Percent
0.690-0.750	2	5
0.751-0.799	3	7.5
0.800-0.850	11	27.5
0.851-0.899	21	52.5
0.900-0.950	3	7.5

Analysis of factors affecting the technical efficiency of rice farms

Table 4 provides the finding of estimating of factors affecting the technical efficiency of rice farms. Regression model performs relatively modest. The R^2 value of 0.310 is not high, but it commons in estimating of farming data**.** The F statistic is 6.53 with a p-value 0.000. It means that collectively the variable included in models could explain the variation of mean value of technical efficiency. Only coefficient of variable of land tenure is statically highly significant for the level of technical efficiency.

Table 4. OLS estimates of factors affecting the technical efficiency of rice farms

	Coefficient	Standard Error
Age	-0.002	-0.003
Age2	0	0
Education (Junior High)	0.003	-0.021
Education (Senior High)	-0.017	-0.017
Family size	-0.004	-0.005
Land Tenure	-0.065***	-0.015
Capital	4	-0.018
Constant	0.965***	-0.089
F-value	6.53	
Observation	40	
R-Squared	0.31	

Standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1

CONCLUSIONS

This study exploresthe level of technical efficiency and factors that influence the technical efficiency in rice farms. The technical efficiency is examined by using stochastic frontier models. We found evidence that increasing using input such as land, and seed as well NPK fertilizer could increase the paddy production. In addition, we also found that farmers relatively allocated their resources. It is showed by average technical efficiency is relative high. Surprisingly, only variable of land tenure are significant for the level of technical efficiency on paddy farms. This result may be explained by the fact that farmers who rent land tend allocated their resources efficiently. Therefore, they tend tend have high technical efficiency.

The results of study provide insight on the factors related to technical efficiency on paddy farms in Indonesia. This result may be useful for policy makers interested to achieve self-sufficiency in rice. Finally, a number of important limitations need to be considered. First, the study used limited samples. Therefore, we do not pretend to say that the study representatives on level provinces, even districts. Second, We only consider one season on our analysis. Further study is needed to examine other season in one year.

REFERENCES

Daryanto, H, 2000. Analysis of the technical efficiency of rice production in West Java province, Indonesia; A Stochastic frontier production function approach. [Dissertation]. University of New England. Armidale. Australia.

Erwidodo ,1990.Panel data Analysis on farm-level efficiency, input demand and output supplyof rice farming in West Java, Indonesia, unpublished Ph. D. dissertation, Department ofAgricultural Economics, Michigan State University.

Esparon, N and Sturgess, N, 1989. The measurement of technical efficiency using frontier production functions of rice Farms in West Java, *Bulletin of Indonesian Economic* Studies, 25(3), pp:59-83

Llewelyn, R and Williams, J, 1996. Nonparametric analysis of technical, pure technical, and scale efficiencies for food crop production in East Java, Indonesia, Agriculture Economic 15(2) pp:113–126

Roche, F, 2006.The technical and price Efficiency of Fertiliser use in irrigated rice Production, *Bulletin of Indonesian Economic Studies* ,30(1), pp: 59-83

Squires. D, and Tabor, S. 1991,Technical efficiency and future production gains in Indonesian agriculture, Development Economics. 24, pp:258-270.

Tinaprilla, 2014.Rice farming efficiency in Indonesia rice production central:stochastic metafrontier production function approach, [Dissertation in bahasa]. IPB Bogor. Indonesia.

POTENTIAL OF FEED MILLS INDUSTRY IN MALAYSIA

Zakiah Hanum A.G[1]**,** Zainalabidin Mohamed[1], Ismail Abd Latif[1] and Abu Hassan bin Md Isa[2]

[1]Department of Agribusiness and Information Systems
Faculty of Agriculture Universiti Putra Malaysia
43400 UPM Serdang, Selangor, Malaysia

[2]Faculty of Economics and Business
Universiti Malaysia Sarawak
94300 Kota Samarahan, Sarawak, Malaysia

Keywords:

Comparative advantage, domestic resource cost, local resources, feed mill, imported input

Introduction

Poultry industry is the most technologically advanced of the livestock sector, commercialized and integrated in its production system. It has been in a continuous transformation towards adopting the most modern production systems and feeding technologies available. Currently Malaysia is self-sufficient in poultry meat and eggs. Feed mill industry plays an important role in livestock development in Malaysia especially the non-ruminant sub sectors such as poultry (both broiler and layers) and swine. These non-ruminants depend on processed formulated feed products and 80% of the cost of production of poultry depends on feed. Most of the feed ingredients are imported especially corn but the price feed corn is very competitive and increasing over the years not only due to crude oil price but also due to competition for ethanol production from corn. The trend of importation is increasing over the years indicating the demand for animal feed is also increasing and affecting the feed ingredients prices couple with high demand lead to unstable price of chicken and eggs in the market. Hence how competitive Malaysian feed mill industry will be given the current scenario of increasing feed ingredients? Can alternative feed ingredient from local source be substitute to the imported ingredient without reducing the quality of feed? Thus this study is trying to gauge Malaysian feed mill competiveness from the domestic resource cost (DRC) perspective given the current scenario where most of the ingredients used in feed formulation are tradable.

Materials and Methods

Policy Analysis Matrix

The concept of the PAM was created by Monke and Pearson (1989) and augmented by Masters and Nelson (1995) for measuring input use efficiency in production, comparative advantage and the degree of government interventions (Nelson, 1991).It's divided by two accounting identities: one defining profits as the difference between revenues and costs, and other measuring the effects of divergence as the difference between observed parameters.

Table 1: The Policy Analysis Matrix structured

	Revenue	**Tradable Input**	**Domestic Factor**	**Profit**
Private Prices	A	B	C	D`
Social Prices	E	F	G	H
Divergence	I	J	K	L

Table 1 show Policy Analysis Matrix (PAM) structured. The first line of the PAM contains the value for the accounting identity measured at private prices (A, B, C, D), which are the prices actually used the different agents to purchase their inputs and domestic factors and sell their outputs. The second raw (E, F, G, H), of the PAM gives the value of the same identity but measured at social prices that would prevail if the value of tradable inputs and outputs and domestic factors were not modified either by output, input, or factor market failure, which results are distorted price system. Third row (I, J, K, L), obtained by subtracting the social value from the private value, and indicates the magnitude of the divergence between the situation at private prices and social prices. The PAM gives a range of indicators for assessing the efficiency of a system. If D positive, the system generates profit under the current policy and market conditions and is competitive and if H is positive, the systems would be able to make profit even without benefiting from a subsidy or being constrained by taxes and have a comparative advantage.

Domestic Resource Costs

To measure the comparative advantage of economic activities producing tradable good in Malaysian feeds industry.DRC measures the ratio of the domestic cost resources (G) used by the commodity (production or marketing) system to value added created (E-F) used by commodity system. Both measured at social prices.

$$\mathbf{DRC} = \frac{\mathbf{G}}{\mathbf{(E-F)}}$$

If the:

DRC= 1, economy on balance,

0<DRC<1, a country have comparative advantage,

DRC>1 and DRC <0, no comparative advantage on that country

Table2. Conversion Factor from Private to Social Analysis

Cost of Production	
INTERMEDIATE INPUT	
Cost of Feed	**Conversion Factor**
Selling and distribution costs	0.98
TAX	0.88
RENT	0.00
LICENCE	1.00
PRIMARY INPUT	0.00
Administrative expense	0.88
Other operating expense	0.86
Finance costs	1.3

Source: Veitch, 1986

Revenue and cost of production were collected from the income statement of the manufacture in the private values (financial values).Then the private values need to be converted into social value (economic values) prior DRC calculations. Conversion factors were used to convert the private to the social valued using the formula develop from Vietch M.D (1986), as can be seen in Table 2. The items divide into intermediate input and primary inputs. The intermediate inputs included cost of feed and selling and distribution costs whereas primary inputs include administrative expense, other operating expense and finance costs.

Table 3 shows the costs of inputs into domestic and foreign are calculating the protection and comparative advantage in the PAM. The cost of domestic component is known as non-tradable and foreign was tradable. Intermediate input in feed production consist cost of feed and selling and distribution costs. Cost of feed assumption at 10% domestic and 90% foreign. Selling

and distribution costs assumed to be 80% domestic and 20% foreign. Tax, rent and license was 100% domestic without no foreign. The primary input in feed production includes administrative expense, other operating expense and finance costs. In case of administrative expense, it is assumed that both domestic and foreign has 50% for each. Other operating expense and finance costs use 100% of domestic source.

Table3. Conversion Factor from Private to Social Analysis

Cost of Production	Domestic (%)	Foreign (%)
NTERMEDIATE INPUT		
Cost of Feed	10	90
Selling and distribution costs	80	20
TAX	100	0
RENT	100	0
LICENSE	100	0
PRIMARY INPUT		
Administrative expense	50	50
Other operating expense	100	0
Finance costs	100	0

Source: Veitch, 198

Results and discussion

The result show descriptive analysis of feed milling industry which profit below RM250000, small feed mills industry which have profit RM250000 until RM 10000000 and micro feed mill industry which have RM10, 000000 and above. The number of feed mills in Malaysia is around 62.Micro is 24, small is 36 and medium is 2 only. There is 82% feed milling produce all animal feed, 8% for poultry feed and 10% for fish feed.

Table 4: Analysis of Domestic Resource Costs

Feed Manufacture Level	DRC
Micro	0.94
Small	0.86
Medium	0.80
All Size	0.84

The DRC uses to measure comparative advantage analysis of micro feed mill. Table 4 shows analysis of domestic resource cost value in ranked order for each level of feed milling (Micro (0.94), Small (0.86), Medium (0.80) and all size (0.84) is less than 1 which means feed milling industry in Malaysia has comparative advantage but the value is too small. Medium size of feed

mills has the highest comparative advantage in production compared to others size because it has least DRC. This is because lower input requirements and lower production costs.

Malaysia has a high comparative advantage in the medium feed mill production compare than others level of feed mills. The potential for feed industry being grown in Malaysia is not very good. Feed industries have many attractive alternative crops such as palm oil, rice, vegetables and fruit to choose from. These crops have ready marketing outlets and the output prices are better than feed crop prices that imported from others country. Nevertheless, these products need to be uses as raw ingredients in producing feed for livestock to support Malaysia for achieving comparative advantage in feed mills industry.

References

A.Cosnitot. (2009). An Elementary Theory of Comparative Advantage. 1-31.

Mohammadi, S., & Yaghoubi, P. (2008). Analysis of revealed comparative advantage in the E-service market. *International Conference on System Engineering* .

S.Golub, C.Hsieh. (2000). Classical Ricardian Theory of Comparative Advantage Revisited. *Review of International Economics* , 221-234.

S.Pearson. (2002). Introduction to the Policy Analysis Matrix Central Issues of Agricultural Policy. 131-137.

Utkulu, U.,& Seymen, D. (2004). Revealed Conmparative Advantage and Competitiveness : Evidence for Turkey. *The European Trade Study Group 6th Annual Conference* , 1-26.

Zainalabidin, M., Mad Nasir, S., Anjahamzah, A.R. (2008), Comparative Advantage Indices of Selected Livestock Production Sectors in Brunei Darussalam.

Zainalabidin, M., Mad Nasir, S., Chiew, F.C. Livestock and Feedstuff Sectors: Is There a Comparative Advantage? *The Malaysian Journal of Agricultural Economics* Vol. 9 (1992)

OUTPUT SUPPLY, INPUT DEMAND AND EFFICIENCY OF PADDY FARMING IN PENINSULAR MALAYSIA

Lira Mailena[1], Mad Nasir Shamsudin[11], Zainalabidin Mohamed[1], Ismail Latif and Alias Radam[2]

[1]Department of Agribusiness and Information System, Faculty of Agriculture, Universiti Putra Malaysia

[2]Department of Management and Marketing, Faculty of Economics and Management, Universiti Putra Malaysia

[1]Corresponding author. Email: mns@upm.edu.my

This study was supported by the LRGS Food Security: Enhancing Sustainable Rice Production through innovative Research, Vot. No.: 5525017.

ABSTRACT

Despite various government supports to increase production and farmers income, however, paddy production is hampered by the lower paddy yield compared to other neighbouring countries such Indonesia and Vietnam. Other crucial issue that need to be considered is the limitation of allowable policy instruments to support and subsidize the domestic industry including the paddy farm and automatically will affect to the increase of input prices. Therefore, this study aims (1) to estimate the production behaviour of rice farm in term on input demand output supply elasticity of paddy farms and (2) to measure technical and scale efficiency based on the parametric (stochastic frontier analysis), non parametric approaches (DEA) and bootstrapped DEA in order to depict more holistic feature of rice paddy farm efficiency in Peninsular Malaysia. Duality theory with restricted transcendental profit function is utilized as it is able to depict the behaviour of input demand and output supply simultaneously. Stochastic Frontier Analysis and Data Envelopment Analysis that improved by bootstrapping method were used to measure the level of technical and scale efficiency. A total of 523 respondents were surveyed that included three regions in Peninsular Malaysia that is East Coast Region, Northern Region and Central Region. The findings of this study show that output supply of paddy was responsive to the changes of paddy price as shown by paddy farm in East Coast Region, Northern Region and Peninsular Malaysia. Regarding the input demand, paddy farms in all regions were responsive to the price changes of pesticide. However, the value of elasticity revealed that both output supply and input demand were not elastic to the change of its price and indicated that farmers continued to purchase input as much as they required although there was an increase in input price. Generally, paddy farms in three regions were not fully technically efficient. Based on parametric approach and non parametric approach, paddy farms should increase the production by 62.7 percent of current production to achieve the potential output. However, after correcting the bias in the bootstrapping method, technical efficiency score reduced sharply to 0.280 and depicted that parametric and non parametric approaches were overestimate. Thus, rice farms areas should increase production by 72 percent to achieve the potential output. In addition, average scale of efficiency scores were higher than technical efficiency scores and it suggested that inefficiencies were mostly due to inefficient technical practices rather than the scale of production or the size of operation. Therefore, production increase by improving technical efficiency of rice farms could be gained by optimal utilization of production inputs. In this context, extension program with regards to optimal input used should be emphasized.

Keywords: Output supply, Input demand, Elasticity Technical Efficiency, Scale Efficiency

INTRODUCTION

Malaysian paddy farms are characterized as a relatively small sub sector that operated by independent Malay family households. There are 677,884 ha paddy planted which is managed by 172.23 thousand farmers with average farm size about 1.45 ha (Ministry of Agriculture and Agro Based Industry, 2013). Therefore, Malaysian authority has actively supported the paddy farms in order to increase production and farmer's income simultaneously.

Government provides various input subsidy schemes which are 240kg/ha of mixed fertilizer and 80 kg/ha of organic fertilizer as well as RM200/ha/season subsidy for pesticide control. In order to stimulate farmers to improve their paddy yield, government distributed the incentive at amount RM 650 for each MT of increase in yield compare to the previous year. Further, the price-support programme was introduced in 1980 and set at 33 RM per ton paddy sold to the National Rice Board or private rice millers or wholesalers. However, due to some grievances expressed by the farmers, the government decided to increase the rate to RM 165. 00 per ton in the same year. In 1990, it was further increased to RM247.50 per ton (Abdullah, 2000) and currently the price support is at RM 248.1 per ton.

However, despite those various government support, paddy production is hampered by the lower paddy yield at 3.9 ton/ha compared to other neighbouring countries such Indonesia and Vietnam that have achieved the paddy yield at 5 ton/ha. In this context, paddy farm which mainly engaged by small farmers are presumed to be a factor that contributed to the less efficiently management on paddy farms compared to industrial farms. Industrial crop with the large plantation companies are professionally managed, otherwise, paddy farms which mainly engaged by small farmers are not so well-managed. Helfand and Levine (2004) described similar condition for farms in the Center West Brazil which obtained the large farms with the professional management tended to access and to use the technologies and inputs intensively and it effected to the positive efficiency on production and vice versa for the small farms. In addition, trade liberalization is the crucial issues to be considered since the allowable policy instruments to subsidize the domestic industry including the paddy farm will be limited and automatically will be effect to the increase of the input prices. While farmers are observed to shrink from investing into farm inputs due to their dependence on subsidy. Yet, the incentives to use more inputs has been constrained by the input prices that severe the profit as well.

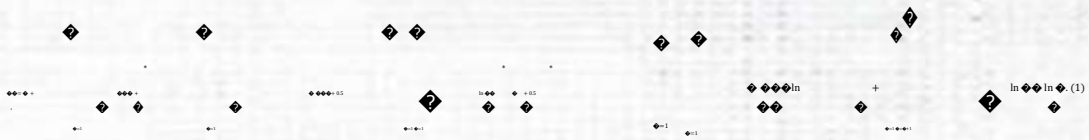
Those conditions conceive that difficulties on improving the yield are potentially caused by the uninventive use of inputs due to the inefficient technical practices in the paddy farms. Hence, the identification of possibility to increase rice production in Malaysia should mainly focuses on analysis of price responsiveness and efficiency in the allocation of variable inputs in the paddy farms. Yet, up to now, there have been limited studies on the efficiency of Malaysian paddy farm that compare parametric, non parametric and bootstrap approach. Radam *et al* (2001) and Thean *et al* (2012) conducted efficiency study and focused on one method, either parametric or nonparametric methods. While using more than one method to obtain the farm efficiency from the estimation of frontier in order to benefit from the advantages of both is more useful to depict the holistic feature of production units. Therefore, this study aims to analyze the production behaviour and efficiencies in Malaysian rice farms. Then, the specific objectives are (1) to estimate the production behaviour of rice farm in term on input demand output supply elasticity of paddy farms and (2) to measure technical and scale efficiency based on the parametric (stochastic frontier analysis), non parametric approaches (DEA) and bootstrapped DEA in order to depict more holistic feature of rice paddy farm efficience in Peninsular Malaysia.

THEORETICAL FRAMEWORK

Duality Theory and Derivation of Input Demand and Output Supply

Duality theory is underlying the analysis of input demand and output supply responsiveness. According to Mc Fadden in 1978, duality theory proved that production and profit function can describe the behaviour of input demand and output supply equally well when satisfies the properties of monotonicity and convexity. Thus, duality theory or duality approach is directly specifying suitable maximum profit function rather than production function. This theory is preferable to be used because it overcome the problem on solving the first order condition as required on primal approach and overcome the simultaneous equation bias since input are not independent of error term. In addition, profit function involves merely input or output price and fixed input which are exogenous.

The application of input demand and output supply derivation based on the duality approach can be presented through the use of normalized restricted translog profit function. This function includes the normalized profit function that defined as the current revenues less current total variable costs normalized by the price of output. Then, assuming that farmer want to maximize the profit subject to a given state of technology and a mix of fixed inputs and marginal condition, following Lau and Pan (1972), the normalized restricted profit is stated as the maximum profit given the levels of fixed input and the variable input prices. According to Christensen, et al (1973), the normalized restricted translog profit function for a single output was given by:



The partial derivates of restricted profit function with respect to logs of input price yield the negative input demand of input as follows:

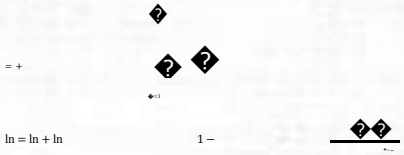
where:

= normalized profit

$P_{i,l}$ = input price for i=1.....n and j =1....p

Z_k = quantity of quasi fixed input

The equation for output supply V can be written as:



where:

= normalized profit V = output supply

Pi= input price for i=1....

Then, coefficients of the translog profit function and input share functions are used to derive the elasticity of output supply and input demand for variable inputs in the farms. The own price elasticity of supply is given by:

... (5)

10. ... (6)

(7)

6. ... (8)

Own-price elasticity for variable input demand function is expressed as follow:

Concept and Efficiency measurement

Efficiency concept was intimately linked to the use of frontier production function that represents the maximum output attainable from each input level. The efficiency level was regarded as the gap between actual and production frontier. Farrell (1957) distinguished the efficiency into technical efficiency, allocative efficiency and scale efficiency. Technical efficiency measures the ability of farms to produce the maximum potential output from a given inputs or a given set of technology. Then, allocative efficiency measures the ability of farms to utilize the inputs in optimal proportion given their respective prices and available technology. Technical and allocative efficiency are then combined and called as the total economic efficiency.

Measurement on the efficiency was supported by two principle approach which are parametric and non parametric approach. SFA is a well known estimation technique for parametric frontier and DEA is estimation technique for non parametric frontier. BOOTSTRAPED DEA is a recently advance on DEA due to disadvantage of DEA is that the efficiency score is highly sensitive to sample selection since no statistical noise and all error term are attributed to the inefficiency.

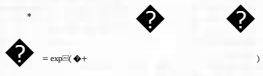
In this paper we use the stochastic frontier production function which was proposed firstly by Aigner et al (1977) and was followed by Battese and Coelli (1992). These authors proposed the following model:

$$y_i = f(x_i, \beta) + \varepsilon_i \quad \ldots\ldots (9)$$

where yi is the output obtained by the farm i, xi is the vector of used input, β is a vector of parameters to be estimated and ε_i is a composed error including vi and ui.

The error component "vi" account the measurement error in the output variable due to the weather, the combined effect of the unobserved input on production, errors in the observation and measuring of data. Then, the error component "u_i" account the existence of technical inefficiency on the production and is assumed to be distributed independently of v_i. According to Omondi (2013), the error component u_i is a non negative error component that depicts deviation from the frontier caused by controllable factors in production. It is assumed to be half normal, identically and independently distributed with a mean of zero and constant variance.

With given input vector, x_i, the potential output is defined by the function:



.....(10)

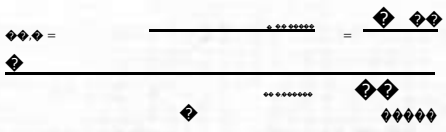
The estimated technical efficiency of the *i*th farms can be defined as the ratio of the observed output for the *i*th farms relative to the potential output or the production frontier, given the available technology and can be formulated as follows.

.....(11)

Data Envelopment Analysis (DEA) was formally developed and named by Charnes e*t al* (1978) where efficiency was defined as the weighted sum of outputs over the weighted sums of input in the constant return to scale assumption. Constant return to scale is appropriate when all farms are operating at an optimal scale and this assumption cannot be fulfilled when farms operate on imperfect competition, constraint on finance, etc. Further, Banker *et al* (1984) extended the model to include variable return to scale (VRS) and named as the pure technical efficiency.

DEA involves the use of liner programming methods to construct a non parametric piece wise surface of frontier over the data. Then, efficiency measure are calculated relative to this surface and this technique identifies efficient production unit which belong to frontier, otherwise the inefficient ones is remain below the frontier (Coelli *et al, 2005*). Thus, DEA assumes that there are no random effects in the production.

DEA can also measure the scale efficiency since it is possible that even though the production units technically efficient but they are not equally productive due to the effects of scale. If the underlying production technology is a globally constant return to scale (CRS), then the production unit is automatically scale efficient. However, when the farms might be too small in its production scale or the production unit are too large and it may operate within the decreasing return to scale, efficiency level might be improved by changing their production scale or the size of operation. Scale efficiency is measured as the ratio of technical efficiency on CRS to technical efficiency on Variable Return to Scale (VRS). Therefore, we can define an output orientated measure of scale efficiency at a given input, x and the output, q as follows:



.....(12)

The bootstrapped DEA was suggested by Simar (2000) that derived from some unobservable data generating process, could remove inherent dependency among efficiency scores and obtain the bias corrected DEA efficiency scores. The bootstrap is defined as the re-sampling

technique as a mean of approximating the properties of the sampling distribution of an estimator when this is difficult to be obtained by using alternative means and hence allowing one to construct the confidence interval (Simar and Wilson, 2000).

According to Nastis *et al* (2012), the bootstrap method is aimed to analyze the sensitivity of efficiency scores relatives to the sampling variations of the estimated frontier and provide the statistical basis for nonparametric efficiency measures. In particular, the width of the confidence interval for the efficiency of farms located on the fringes of the data set will tend to be quite wide, indicating that the degree to which these estimates are generally based upon rather thin data and hence should be interpreted cautiously. Then, the confidence interval tend to be wide when one has a small sample and a large number of dimensions.

METHODOLOGY

Model Specification

Applying the duality theory and assuming that rice farm want to maximize the profit, normalized translog profit function includes 4 normalized input prices and one fix input.

$$\begin{aligned}Ln\pi^* = {} & \alpha_0 + \beta s * \ln PS + \beta c^* \ln PC + \beta f^* LnPF + \beta_L{}^* LnPL + \beta_A{}^* LnA + \tfrac{1}{2}\sigma_{SS}{}^* LnPS^2 + \tfrac{1}{2}\sigma cc^* LnPC^2 + \\ & 1/2\,\sigma ff^* LnPF^2 + 1/2\,\sigma_{LL}{}^* LnPL^2 + \tfrac{1}{2}\sigma_{AA}{}^* LnA^2 + \theta_{BSC}{}^* LnPS^* LnPC + \theta_{BSF}{}^* LnPS^* LnPF + \\ & \theta_{BSL}{}^* LnPS^* LnPL + \theta_{BSA}{}^* LnPS^* LnA + \theta_{BCF}{}^* LnPC^* LnPF + \theta_{BCL}{}^* LnPC^* LnPL + \\ & \theta_{BCA}{}^* LnPC^* LnA + \theta_{BFL}{}^* LnPF^* LnPL + \theta_{BFA}{}^* LnPF^* LnA + \theta_{BLA}{}^* LnPL^* LnA + \varepsilon_i \end{aligned} \quad \text{..... (13)}$$

where π^* is restricted normalized profit from paddy production per farm as total revenue less variable cost normalized by price of paddy; PS,PF, PC and PL are the normalized price of seed, fertilizer, pesticide and man-day wage respectively; A is area on hectare; α, β, σ are parameters to be estimated and ln represents the natural logarithms.

Further, share equation for seed, fertilizer, pesticide, and labour obtained by differentiating the normalized restricted translog profit function with respect to logs of input price are the negative input share equations. The elasticity of input demand and output supply were estimated when the parameter estimates of profit function and variable inputs share were obtained. These elasticities were expressed as the linear transformation of the parameter estimates of profit function at averages of the relevant S_i and, at given levels of variable input prices. The own-price elasticity for variable input demand function are expressed as follow.

In SFA, Cobb Douglas and transcendental logarithm (translog) functional forms were included which were Cobb Douglas functional form employed the simplicity which was associated with the number of restrictive properties across all farms in sample and elasticity of substitution is assumed equal to one. Then, the functional form of translog model imposes no restriction upon return to scale or substitution possibilities. The empirical model of Cobb Douglas and Translog frontier production function could be written as follows:

Cobb Douglas Frontier Production Function

……(14)

Translog Frontier Production Function

……..(15)

where β_0 is the constant, β_i, β_{ii}, β_{ij} are the production function parameters to be estimated for each input, yi and xi represent the quantity of output paddy in ton/ha, land in hectare, seed in kg/ha,
.fertilizer in kg/ha, pesticide in liter/ha, labour in man-day during the production period, and ln represents the natural logarithms. Further, the generalized likelihood ratio (LR) statistic test was applied to obtain the information on which of the Cobb-Douglas and translog function is the representative in the analysis

Data and Analysis Method

A total of 523 respondents were surveyed that included three regions in Peninsular Malaysia that is East Coast Region, Northern Region and Central Region. Data was collected using a structured questionnaire on farmer's production activities including input and output on paddy farm as well as socio-economic characteristics. The estimated parameter of normalized restricted profit function is obtained from Seemingly Unrelated Regression due to large number of common explanatory variables that likely to be correlated contemporaneously. Further, the elasticity of output supply and input demand are calculated and both estimations are conducted using the software SAS 9.2. Stochastic Frontier Analysis and Data Envelopment Analysis that improved by bootstrapping method were applied to measure the level of technical and scale efficiency using the software package FRONTIER version 4.1 and FEAR 1.11 developed by Wilson (2006).

RESULT AND DISCUSSION

Table 1 presents the descriptive statistics for output and inputs that categorized into three regions and Peninsular Malaysia. Paddy production ranged from 0.65 to 6.38 ton/ha with the average production at 2.01 ton/ha. Comparing paddy production among three sampled regions, average production for North Region was the highest, while fertilizer used for this region was the lowest. It indicated the higher productivity of fertilizer input in this region. However, this finding also revealed that farmers in North Region was likely to use pesticide and labour intensively as the use of both inputs were the highest at 3.52 liter and 25.41 man days respectively. The average production for East Coast Region, conversely, was the lowest at 1.81 ton/ha although the use of fertilizer in this region was quite higher at 349.14 kg/ha. Besides, the use of seed in East Coast Region was the lowest compared to other regions and Peninsular Malaysia and this could be one source of lowest paddy production for this area.

Before proceeding to the measure on output supply and input demand elasticity, we conducted joint hypothesis test to validate the profit maximization and constant return assumption and hence it would confirm the reliability of output supply and input demand equation. Profit maximization represented by the homogeneity and symmetry restriction which indicated by the equal corresponding parameters of input share and profit function. Then, constant return assumption represented by null hypotheses of Cobb Douglas imposed to the transcendental logarithm profit function. Result of F-test statistics for both joint hypotheses is shown in Table 2.

Table 1. Descriptive Statistics for Output and Inputs

Study Area		Production (ton/ha)	Land (ha)	Seed (kg)	Fertilizer (kg)	Pesticide (liter)	Labour (manday)
EAST	average	1.81	9.74	52.85	349.14	1.62	18.03
COAST	std.deviation	0.87	4.56	10.12	32.48	0.49	14.22
	minimum	0.70	3.17	36.96	308.95	1.06	6.71
	maximum	6.38	25.00	78.57	480.84	3.04	66.67
NORTH	average	2.30	7.49	71.43	339.26	3.52	25.41
	std.deviation	1.03	3.05	13.51	51.23	3.66	20.04
	minimum	0.65	3.00	50.14	270.15	1.11	4.6
	maximum	6.21	17.61	116.49	494.18	22.28	82.97
WEST	average	1.95	9.13	64.43	349.43	2.37	18.04
	std.deviation	0.67	2.95	13.80	37.85	0.80	12.20
	minimum	0.76	4.50	43.98	290.36	1.35	4.66
	maximum	3.61	16.33	99.22	462.35	5.06	66.03
Peninsular	average	2.01	8.39	62.28	343.94	2.14	15.21
Malaysia	std.deviation	0.83	4.11	18.67	55.98	2.05	14.72
	minimum	0.65	3.00	36.96	270.15	1.06	4.66
	maximum	6.38	25.00	116.49	494.18	22.28	66.03

The calculated F-value on profit maximization for East Coast, Northern and Central Region were lower than critical F-value at 5 and 1 percent of significance level. It means the equality of common parameters between share equation and profit function cannot be rejected. Thus, profit maximization assumption was valid in the restricted translog profit function. Furthermore, the second test on constant return show that calculated F-value for all regions were higher than critical F-value and hence the hypothesis on Cobb Douglas was rejected. For that reason, translog restricted profit function was more suitable for analysis on output supply and input demand elasticity.

Table 2. Validity Test of Restricted Transcendental Logarithm Profit Function

Region	SSE Restricted	SSE Unrestricted	Calculated F-Value	Critical F-Value 0.05	Critical F-Value 0.01	Decision
Profit Maximization						
East Coast	61.50	59.60	0.18	1.56	1.57	Ho cannot be rejected
Northern	107.40	105.40	0.10	1.58	1.90	Ho cannot be rejected
Central	43.73	39.66	0.40	1.62	1.97	Ho cannot be rejected
Constant Return						
East Coast	66.26	59.60	2.54	2.06	2.73	Reject Ho
Northern	123.60	105.40	3.72	2.07	2.76	Reject Ho
Central	48.90	39.66	3.60	2.10	2.82	Reject Ho

As shown in Table 3, paddy output supply was responsive to the changes of paddy price except for Central Region. It was presented by the significant elasticity of output supply at less than 5 percent significance level. Further, regarding the input demand, paddy

farms in all regions were responsive to the changes of pesticide price. In addition, fertilizer demand for paddy farms in East Coast Region was also responsive to the changes of its price, while demand for seed and labour were not statistically significant. It plausible since farmers did buy pesticide from the shop while seed was commonly delivered to the farm as the government subsidy. Further, the significant fertilizer elasticity in East Coast Region indicated that farmers in this region had purchased additional fertilizer for their farms other than fertilizer subsidy they received.

Nevertheless, the value of both elasticity revealed that output supply and input demand were not elastic to the change of its price. It suggested that farmers continued to sell their production at the current price as the source of family income. In this condition, price support program was very useful to stabilize the farmer's income. Similar with output supply, inelastic of input demand suggested that farmers continued to purchase input as required although there was an increase in input price as they had to apply those inputs in the right time along the paddy growing season to obtain the maximum production. This practice is common in most of production in agricultural sector.

Table 3. Elasticity of Output Supply and Input Demand, Peninsular Malaysia

Elasticity	East Coast Region	Northern Region	Central Region	Peninsular Malaysia
Output Supply				
Price of Paddy	0.4371***	0.3545**	0.3459	0.5265***
	(0.1431)	*(0.2016)*	*(0.2086)*	*(0.2151)*
Own Price Elasticity of Input D emand				
Seed	-0.2345	-0.2814	-0.1441	0.3725
	(0.3530)	(0.2453)	0.5354	*(0.6498)*
Fertilizer	-0.2822*	-0.2503	-0.2412	0.5787
	(0.2009)	(0.2142)	0.4758	*(0.5172)*
Pesticide	-0.1592**	**-0.1734*** **	-0.1659***	**-0.292** **
	(0.0941)	**(0.0723)**	0.0167	***(0.1124)***
Labor	-0.1555	-0.1097	-0.1778	-0.2207
	(0.2393)	(0.1795)	0.2118	*(0.6424)*

Note : Figures in parenthesis are t-stat
4. significant at 1 percent level
6. significant at 5 percent level
5. significant at 10 percent level

Based on three approaches applied in this study, on average, paddy farms in all regions were not fully technically efficient. As presented in Table 4, the average technical efficiency scores for paddy farms in Peninsular Malaysia was 0.505 and 0.560 obtained from Stochastic Frontier Analysis (SFA) and Data Envelopment Analysis (DEA) respectively. This result suggested the substantial potency to increase production by 49.5 percent to achieve the potential output and being fully technical efficient farms.

Further, SFA revealed that paddy farms for Northern Region had the highest technical efficiency score at 0.607 and the lowest is for those in East Coast Region at 0.480. It indicated that farmers in Northern Region were more efficient in production technical practices compared to farmers in other region. Meanwhile, DEA showed the quite different result whereas paddy farms for Central Region, on average, was more technically efficient than others at the score 0.572. Thus, in order to obtain the potential output, paddy farms in Northern, East Coast and Central Region should increase production by 39.3 percent, 52 percent and 42.8 percent of current production respectively.

Table 4. Technical and Scale Efficiency Scores Based on Parametric, Non Parametric and Bootstrapped DEA, Peninsular Malaysia

Study Areas		Technical Efficiency Score			Confidence Interval		Scale Efficiency Score
		Parametric SFA	Non Parametric DEA	Bias Corrected	Lower Bound	Upper Bound	
East Coast Region	Average	0.480	0.556	0.279	0.280	0.387	0.780
	Std Dev	0.234	0.185	0.177	0.196	0.323	0.216
	Minimum	0.122	0.089	0.037	0.035	0.038	0.177
	Max	1.000	0.861	0.829	0.769	0.991	1.000
Northern Region	Average	0.607	0.566	0.279	0.279	0.384	0.858
	Std Dev	0.257	0.202	0.180	0.196	0.321	0.164
	Minimum	0.089	0.008	0.037	0.035	0.038	0.087
	Max	1.000	0.890	0.829	0.769	0.991	1.000
Central Region	Average	0.537	0.572	0.276	0.276	0.380	0.828
	Std Dev	0.254	0.180	0.175	0.194	0.320	0.165
	Minimum	0.110	0.111	0.037	0.035	0.038	0.283
	Max	1.000	0.883	0.829	0.769	0.991	1.000
Peninsular Malaysia	Average	0.505	0.560	0.280	0.280	0.386	0.837
	Std Dev	0.213	0.186	0.179	0.197	0.324	0.134
	Minimum	0.166	0.112	0.038	0.036	0.040	0.360
	Max	1.000	0.859	0.802	0.748	0.991	0.997

Bootstrapping methods provides the corrected bias TE scores due to sample variation. This method depicted that TE scores for each region reduced substantially to less than 0.3 and hence, paddy farms should increase production by more than 70 percent of current production. In addition, bootstrapping methods also indicated that both parametric and non parametric approaches were overestimate and it could be confusing the evaluation on paddy farm performance. Further, confidence interval on average for those regions ranged between 0.279 to 0.387 and none of SFA and DEA TE score lied on that interval.
Thus, result of both approaches was not statistically significant. In this condition, bias corrected TE was more robust since it could adjusted the sample variation in the field.

Scale efficiency score describes the scale or the size of operation for paddy farms whereas score of 1 indicates the optimal scale of operation. Based on result in Table 4, those regions generally were closed to optimal scale since only 22 percent, 14.2 percent, 17.2 percent and 16.3 percent additional productivity gains is feasible for East Coast, Northern and Central Region as well as Peninsular Malaysia respectively to achieve that optimal scale by assuming no other constraint factors. Besides, there were some farms in those regions have achieve the optimal scale with the score of 1. In addition, average scale of efficiency scores for those regions were higher than technical efficiency scores and it suggested that

inefficiencies were mostly due to inefficient technical practices rather than the scale of production or the size of operation.

CONCLUSION AND RECOMMENDATION

Paddy output supply was responsive to the changes of paddy price as shown by paddy farm in East Coast Region, Northern Region and Peninsular Malaysia. Regarding the input demand, paddy farms in all regions were responsive to the price changes of pesticide since farmers did purchased pesticide from the shop. The significant own price elasticity of fertilizer demand for East Coast Region indicated that farmers had purchased extra fertilizer in addition to subsidized fertilizer. However, the value of elasticity revealed that both output supply and input demand were not elastic to the change of its price. Generally, paddy farms in three regions were not fully technically efficient. Based on parametric approach, the average technical efficiency scores ranged between 0.480 and 0.607, while based on non parametric approach, the average technical efficiency scores ranged between 0.566 and 0.572. However, after correcting the bias in the bootstrapping method, technical efficiency score reduced sharply to 0.280 and depicted that parametric and non parametric approaches were overestimate. Thus, rice farms areas should increase production by 72 percent to achieve the potential output. In addition, average scale of efficiency scores were higher than technical efficiency scores and it suggested that inefficiencies were mostly due to inefficient technical practices rather than the scale of production or the size of operation. Therefore, production increase by improving technical efficiency of rice farms could be gained by optimal utilization of production inputs. In this context, extension program with regards to optimal input used should be emphasized.

ACKNOWLEDGEMENT

This research was financially supported by the LRGS Food Security: Enhancing Sustainable Rice Production through innovative Research, Vot. Number 5525017, Universiti Putra Malaysia. The authors would like to express thanks for their support in the conducting of the surveys in the studied areas in Malaysia.

REFERENCES

_____. (2013). *Booklet of Crop Statistics*. Ministry of Agriculture and Agro Based Industry. Malaysia.

Abdullah, N. (2000). The Effects of Price-support Programme on Farm Tenancy Patterns and Farm Profitability: Some Evidence from Malaysia. *The Pakistan Development Review* 39 ,1, 51-72.

Aigner, D.J., Lovell, C.A.K. and Schmidt, P. (1977). Formulation and Estimation of Stochastic Frontier Production Function Models. *Journal of Econometrics*, 6, 21-37.

Banker, R.D., A.Charnes and W.W. Cooper. (1984). Some Models for Estimating Technical and Scale Inefficiency in Data Envelopment Analysis. *Management Science*, 30,1078-1092.

Battese, G.E and Coelli, T.J. (1992). Frontier Production Function, Technical Efficiency and Panel Data: With Application to Paddy Farmers in India. *Journal of Agricultural Economics*, 21(3),167-179.

Christensen, L.R., DW Jorgensen and L.J. Lau. (1973). Transcendental Logarithmic Production Frontier. *Revie Economics and Statistics*, 55, 28-45.

Coelli, T.J, D.S.Prasada Rao, Christopher, J.O and George E.Battese. (2005). *An Introduction to Efficiency and Productivity Analysis*. 2nd Edition, Springer Science and Business Media, Inc, New York

Farrell, M. J. (1957). The Measurement of Productive Efficiency. Journal of the Royal Statistical Society – Series A (General), 120,3, 253–290.

Helfand, S. M. &Levine, E. S. (2004). Farm Size and The Determinants of Productive Efficiency in the Brazilian Center-West. *Agricultural Economics,* 31,2-3, 241-249.

Lau, L.J., and Pan, A.Y. (1972). "Profit, Supply and Factor Demand Function". *American Journal of Agricultural Economic*, February 1972; pp11-18.

McFadden, D.L. (1978). "Cost, Revenue and Profit Functios" in *An Econometric Approach to Production Theory, ed* D.L. Mc Fadden. Amsterdam, North Holland.

Nastis, S.A., Evangelos, P. and Savvas, Z. (2012). Productive Efficiency of Subsidized Organic Alfalfa Farms. *Journal of Agricultural and Resource Economics,* 37,2, 280-288.

Radam, A and Shamsudin, M.N. (2001). Production Frontier and Technical Efficiency: The Case of Paddy .Farm in Malaysia. *Journal of the Indian Institute of Economy,* 43, 315-323.

Simar, L and Paul W.Wilson. (2000). A General Methodology for Bootrstrapping in Non Parametric Frontier Models. *Journal of Applied Statistics,* 27, 6, 779-802.

Thean, L.G., M.M.Ismail, M. Harron. (2012). Measuring Technical Efficiency of Malaysian Paddy Farming: An Application of Stochastic Production Frontier Approach. *Journal of Applied Sciences* 12, 15, 1602-1607.

Wilson, P.W. (2006). FEAR: A Software Package for Frontier Efficiency Analysis with R, Retrieved November 21,2012 from http://www.clemson.edu/faculty/wilson/software/ FEAR/fear.html.

THE TECHNICAL EFFICIENCY (TE) OF MANGO FARMER IN PERLIS, MALAYSIA

Salina Main (GS 35704)

Supervisor Committee
Chairmain : Dr. Juwaidah Sharifuddin
Members : Dr. Ismail Abd Latif & Dr. Nolila Md Nawi

Introduction

Fruit industry is one of the aspects emphasized in National Agrofood Policy; 2011-2020 (NAP) to ensure that productivity can be improved. Fruit that have high potential for the international market have been identified such as pineapple, starfuit, watermelon, papaya, banana, mango, jackfruit, guava, durian, rambutan and mangosteen (Ministry of Agriculture and Agrobased Industry Annual Report, 2011).

Referring to NAP (2011-2020), planning to strengthen the fruit industry are as follows; fruit Industry production is projected to increase to 2.6 million tonnes with the productivity improvements yielding to 12.9 tonnes per hectare in 2020. More new areas and non-granary area will be developed specifically for fruit crops. R&D will focus on the development of high production varieties, seeds and quality planting materials, crop pest and disease control. Fruit cluster development for potential fruit is one of the government's program to promote the latest and existing technology at selected farm. This technology promotion emphasizes fruits selected for export markets such as Mangga Harumanis, rambutan and durian (Ministry of Agriculture and Agrobased Industry Annual Report, 2011).

Mangga Harumanis is the selected fruit for technology promotion by government. The characteristics of this fruit is the rind is green to yellow when ripe, thick orange flesh, sweet, savory and aromatic. This fruit requires a relatively long dry season which is 1 and a half to 2 months to promote the production of flowers, fruit set and increases fruit set adhesiveness. Prolonged dry weather conditions in Perlis, causing it suitable for planting Mangga Harumanis (Department of Agriculture Mannual for Mangga Harumanis Crop, 2013). High demand for this fruit has resulted in customers willing to pay higher prices. The farm price is around RM15/kg and can reach up to RM20-30/kg at the retail level. Among the reasons is the limited production which is only once a year and the growers not able to produce lots may be due to several factors.

Justification

Since the Mangga Harumanis production is still low and cannot meet the market demand, there may be several factors involved that need to be studied. There are many factors involved influence the production of agriculture products such as labour, capital, government

involvement or farmer itself. Farmer also can be used as a guide for the improvement of agricultural production because they are directly involved with the production. Conducting

research on Mangga Harumanis farmers in Perlis to determine whether the farmer is utilised the technical efficiency (TE) or not. It is intended to review and determine whether this technical efficiency are the factors that lead Mangga Harumanis cannot be produced on a large scale. Thus to determine the level of technical efficiency on mango farmer is required.

Literature Review

A crosstabulation is a joint frequency distribution of cases based on two or more categorical variables and known as contingency table analysis (Sakmarb Yahya, 2011; SI Çelebi, 2011). Pearson chi-square test for relationship between two variables with set up significant confidence level and probability-value (OJ Bittar et al., 2014).

Methodology

The study focuses on the mango farmers in Perlis. 66 respondents were taken representing all planting area in Perlis. The sample taken focusing on commercial farmers only. Face to face interviews with respondents was conducted in the survey. A constructed questionnaire consisting of closed ended with multiple choice questions was selected for the study and comprised two sections. The first section was designed to capture the sosio-demographic profile. In the second section was about the farm management. The questions were derived for cost of production and yield, good agriculture practices and about the government support. The respondents were asked to indicate their opinion for each statement.

Result and Discussion

1.0 Descriptive Analysis

The characteristics of the participants are described in relation to age, gender, race, marital status, number of household, and their educational level. Of the 66 participants involved in the study, 93.9% of participants (n=62) were male, 97% of participants (n=64) were Malay, 89.4% (n=59) of participants were married, 66.7% of participants (n=44) have attend up to secondary level. The average age of participants is 55.14 years old with standard deviation of 10.58 years, while the mean of the number of household is 4.48 with standard deviation of 1.638.

2.0 Crosstab and Chi Square

About 59% of farmers agreed Good Agriculture Practices (GAP) give a good results with the increasing of Gross Marginal Analysis (GMA) value and 64% finding shows not agreed of GAP and give negative impact for their GMA value. At significant level 5%, Chi-square value = 2.892, p-value = 0.089>0.05, fail to reject hypothesis null. It means there no relationship between GMA value and overall opinion on GAP.

Summary

There are still more factors to be tested such as cost of input and labour, government support etc. to give real picture about the technical efficiency on mango farmer. All the factors involved will be tested with other tools analysis for identifying the technical efficiency.

References

Bittar, Odoyo J., and Nyonje O. Raphael. "Impact of Manufacturing Equipment on Growth of Smallholder Agro-Processing Industry in Bureti District, Kericho County,

Kenya." *Proceedings of Sustainable Research and Innovation Conference*. 2014.

Çelebi, Serra Inci. "The effects of the mass media and demographics on pre-purchase, purchase and post-purchase activities." *Analysis and Metaphysics*10 (2011): 67-80.

Department of Agriculture; Mannual Procedures for Mangga Harumanis

Gianatti, T. M., & Llewellyn, R. S. (2003, September). Characteristics of successful farmer driven farming systems groups in Western Australia. *In Proceedings Australian Farming System Conference, Toowoomba, Qld.*

Ministry of Agriculture and Agrobased Industry Annual Report 2011

National Agrofood Policy (2011-2020)

Yahya, Shaidatul Ak'mar Binti. *An Empirical Investigation On The Acceptance And Adoption Of E-Commerce*. Diss. Universiti Utara Malaysia, 2011

Modelling of boom and bust of cocoa production systems in Malaysia

Abragimov Abdulla, Fatimah Mohamed Arshad and B.K. Bala

ABSTRACT

Shaded plantation of cocoa is not only a promise for chocolate and cocoa farmers but also shaded cocoa production can significantly support biodiversity. However, boom and bust of cocoa production systems due to pest and diseases have prompted the farmers to abandon the cocoa cultivation. In this study system dynamics model is presented to address the boom and bust of cocoa production systems Malaysia. The simulated results indicate that the collapse of cocoa production systems can be avoided through biodiversity conservation and insect control resulting sustainable production systems and implementation of such policy demands adequate subsidy to retain high biodiversity, control pest and disease and attain acceptable yields through extension services through farmers field schools.

1. Introduction

The cocoa tree (*Theobroma cacao L*.) is an understorey forest species which evolved in the Amazon (Motamayor et al., 2008) and it is currently grown in many countries of the humid tropics. The largest cocoa producing countries are Cote d Ivoire, Ghana, Indonesia, Nigeria, Cameroon, Brazil, Ecuador and Malaysia and these contribute 90% of world production (Latiff, 2007). Cocoa beans are primarily exported to Europe and North America to be processed to produce cocoa and chocolate.

Cocoa was introduced into Malaysia for commercial cultivation in 1950, became the third major commodity products in Malaysia after palm oil and rubber and was considered to be a crop for agricultural diversification in the Five Year Malaysian Plan in 1975. The availability of superior planting materials, planting technology and the implementation of the government policy to encourage the growing of cocoa as an intercrop with coconuts coupled with the high favourable prices led to the rapid expansion of the cocoa planting industry in Malaysia (Fig. 1). The area planted increased to 123,855 ha in 1980 and 414, 236 ha in 1989. The high plantation rate is attributed to the unprecedented high cocoa bean prices in the 1970s and 1980s. (Lee, 2013). But post 1980s marked decrease in cocoa planting area with decline cocoa production due to poor world cocoa prices, labour constraints, competition for land use from oil palm cultivation and the severe spread and infestation of the Cocoa Pod Borer (Lee, 2013). The cultivated area decreased sharply from 393,465 ha in 1990 to 190,127 in 1995 and it continued till 2005 and the area was reduced to 33,398 ha due to severe pest infestation. By 2013, the cocoa planted area was reduced to only 13,728 ha. Fluctuations with small decline in cocoa areas were noted from 2005 (33,398 ha) to 2013 (13,728 ha) and during this period strong government support was provided for cocoa planting especially in the rural and outlying areas to improve livelihood and elevate income with poverty reduction with targeted area of 40,000 ha by 2020 (MPIC, 2011).

However, there is an apparent uptrend of cocoa dried bean prices throughout the three regions of Malaysia as that of world cocoa prices. Malaysia has been dropped to 12th position from 4th position in the world cocoa production. However, Malaysia today is the fifth largest cocoa grinder in the world and grinding is expected to continue and expand further in future in between 350,000 to 400,000 tons (Lee, 2013).

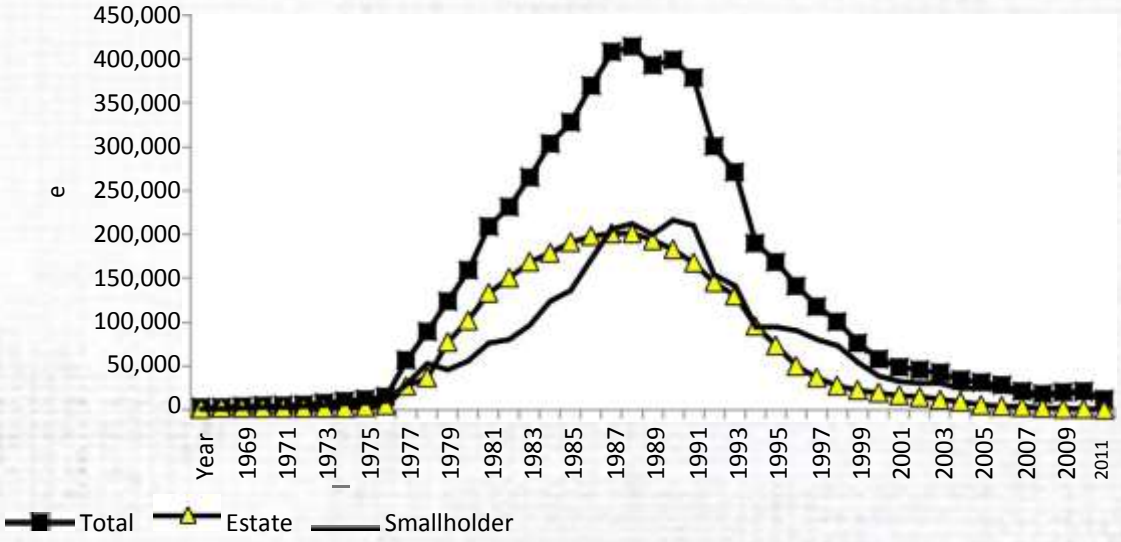


Fig. 1 Cocoa cultivation by type of holdings in Malaysia (Source: Dept. of Statistics, Malaysia, 2013).

Questions remain to answer what caused the boom and bust of cocoa plantation in Malaysia in particular? Why cocoa plantation exhibit extremely unstable pattern of development with ecological damages of biodiversity resulting outbreak of severe pest infestation and diseases? What should be the policy for sustainable development of cocoa production systems in Malaysia?

Several studies have reported on boom and bust of agricultural commodities like shrimp aquaculture industry (Arquittet al. 2005; Bala and Hossin 2010; Prusty et al. 2011). In these cases from systems perspective we can conclude that when the industry is prone to exceed and consume its environmental carrying capacity, boom and bust type of development results in. Clough et al. (2009) reported a qualitative model of the boom and bust of the cocoa production systems as shown in Fig. 2. Franzen and Mulder (2007) highlighted the important ecological, economic and social considerations for sustainable cocoa production. This clearly indicates that there is large research gap to understand the boom and bust and to search for policies for sustainable development of cocoa production and marketing in Malaysia.

Cocoa trees can be planted in the forest or under planted shade, but most cocoa plantations are planted into thinned forests. Shade removal increases the yield in the short run which damages ecosystems and reduces the biodiversity. As the boom busts, the plantation area falls sharply to a very low level due to extremely low productivity. Underlying production busts are failures of the industry participants particularly the policy makers to understand the problem and take effective measures. However, boom and bust of cocoa production in Malaysia has been well documented (Lee, 2013). Current cocoa production systems are not sustainable because of non-eco-friendly production of cocoa beans, although there is demand of cocoa in chocolate industries. Sustainable development of cocoa production and marketing is a major concern for the policy makers and authorities who are searching for a sustainable planning to accomplish the targeted goals.

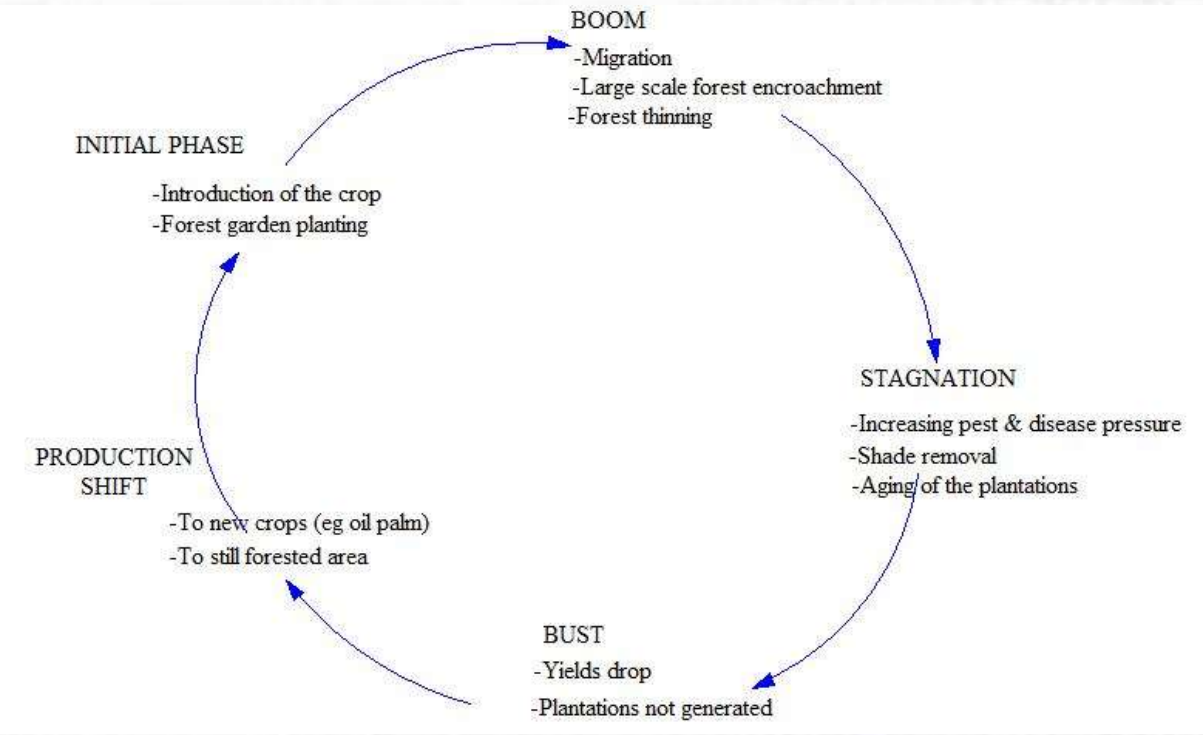


Fig. 2 Cocoa boom and bust model (Source: Colough et al. 2009)

Although boom and bust is the major concern, in addition, the sustainable development aims to achieve social, economic and ecological success in the cocoa production. However, sustainability cannot be achieved unless the ecological imbalance is rectified. The sustainable production should increase profit within the framework of ecological conservation of biodiversity. This study aims to cover this gap of understanding of boom and bust and designing sustainable production of cocoa beans and proposes a realistic model which can add not only knowledge of boom and bust but also the implementation knowledge of sustainable production of cocoa in Malaysia. The overall objective of this study is to develop a system dynamics model to examine the underlying causes of boom and burst of cocoa production systems in Malaysia and develop policies for sustainable development of production of cocoa in Malaysia.

2. Methodology

We propose to apply system dynamics methodology developed by Forrester (Bala, 1999) starting from problem articulation over the design of a dynamic hypothesis, formulation, and testing to evaluation essentially applying the best practices of system dynamics modelling (Martinez-Moyano and Richardson, 2013). System dynamics (SD) is a computer-aided approach to policy analysis and design. It applies to dynamic problems arising in complex social, managerial, economic, or ecological systems -- literally any dynamic systems characterized by interdependence, mutual interaction, information feedback, and circular causality. The proposed model is intended to provide two deliverables: short term insights of the boom and burst and long term insights of sustainable development.

In system dynamics, a system is represented by feedback loops which simulate the dynamic behaviour of the system. The problem or system (e.g., political system, mechanical system, or cocoa plantation area) is first represented as causal loop diagram as well as a stock and flow diagram. The system dynamics modelling is conducted in two phase: modelling building and model testing.

The best way to undertake the system dynamics modelling is considered and consists of six stages: (1) problem identification and definition, (2) system conceptualization, (3) model formulation, (4) model testing and evaluation, (5) model use, implementation, and dissemination and (6) design of learning strategy/infrastructure.

Triangulation and participatory approach has been used to identify and fully understand thechallenge of boom and bust of cocoa production systems in Malaysia. Focus group discussions were conducted with the stakeholders and documents related to the project were collected and the information collected are analysed to develop and discuss the dynamic hypotheses and how expected it to replicate the observed behaviour of the boom and burst. Historical data of the boom and bust are crucial to understand the dynamics of the underlying challenge. Data are used to identify and analyse past behaviour of the main variables by establishing the reference mode and to calibrate the model as a part of validation of the model.
Cocoa production is a highly complex system starting from plantation to export of grindings (cocoa beans). Our starting hypothesis about the boom and bust of cocoa plantation should be something to do with the consequences of production of cocoa with intensification and subsequent ecological effect resulting from shade removal and severe infestation of pest and diseases. The low productivity after bust motivates the growers to palm oil or still forest. It is necessary to understand the complexity at a basic level. Also it is important to know the policies needed to continue cocoa production and expand in future.

Dynamic hypothesis

The dynamic hypothesisis a conceptual model typically consisting of a causal loop diagram, stock-flow diagram, or theircombination. The dynamic hypothesis seeks to define the critical feedback loops that drive the system‟s behavior. When quantified in a simulation model, theendogenous feedback structure of aconceptual model should be capable of reproducingthe reference behavioral mode based on theassertionthat “structure causes behavior.” Thus, in this study the system structure in the form of causal loop diagram and stock-flow diagram is hypothesized to generate the observed dynamic behaviour.

Causal loop diagrams

The key factors influencing cocoa production are: yield, thinning of shading trees and area under cultivation. When production of cocoa and thinning generate profit for the producers, these motivate them to continue cultivation generating feedback loop to work. Area under cultivation and thinning of shading trees which creates ecological imbalance invites insect infestation. When insect infestation becomes intolerable and cocoa beans are damaged significantly, the cocoa production is affected negatively. The dynamic interaction between cocoa production and ecology give rise to the feedback loops. The causal loop diagrams of cocoa production systems are shown in Fig. 3 which shows the initial dynamic hypothesis of boom and bust of cocoa plantation and it is based on standard assumptions how cocoa production system typically works. If our hypothesis is correct, the model will be able to reproduce the general historical pattern of boom and bust followed by the simulated boom and bust of cocoa plantation

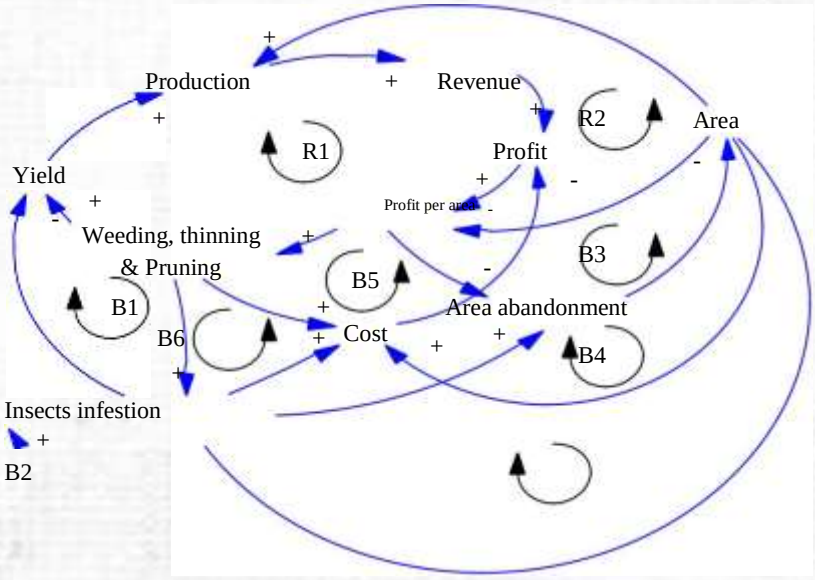


Fig. 3 Causal loop diagrams of cocoa production system.

Stock –flow model

Dynamic systems consist of interconnected feedback loops and the feedback loops simulate dynamic behavior of the systems. There two fundamental types of variable elements within each loop which are the building blocks of a system dynamics model. These building blocks are stock and flow. The stock is a state variable and it represents the state or condition of the system at any time t. The flow shows how the stock changes with time. The flow diagram shows how stocks and flows are interconnected to produce the feedback loops and how the feedback loops interlink to create the system. Fig. 4 shows the stock-flow diagram of the boom and bust of cocoa production systems in Malaysia. The relationships represented in the flow diagram are expressed in terms of integral and algebraic equations and these equations are solved numerically to simulate the dynamic behavior (Forrester, 1968; Bala, 1999). The mathematical equations that describe stock(stock(t)) and flow structures are represented by integral equations:

$$stock\,(t) = stock\,(t-1) + \text{inflow} \times \Delta t - outflow \times \Delta t \qquad (1)$$

The stock(t) is a state variable at any time t and it is represented by a rectangle. The flow shows how the stock changes with time and it is represented by valve symbol. The flow with arrow towards the stock indicates inflow and the flow with arrow outwards indicates outflow. The lines with arrow are influence lines and the direction indicates the direction of information flow. The variable/factor at the starting point indicates the variable/factor affecting the variable/factor at the terminating point and this in essence shows how one variable/factor influences other variable/factor with direction of information flow. In Fig.4 cocoa plantation area is a stock variable and cocoa plantation rate is inflow into the stock – cocoa plantation area. Fundamental equations that correspond to major state variables shown in Fig.4 are as follows:

Cocoa plantation area is increased by cocoa plantation rate based on profitability of cocoa plantation and also cocoa plantation area is abandoned based on yield and profit. This is expressed as:

$$cocoa\ plantation\ area\,(t) = cocoa\ plantation\ area\,(t-1) + cocoa\ plantation\ rate \times \Delta t$$

– *abandon rate of cocoa* × Δ*t* (2)

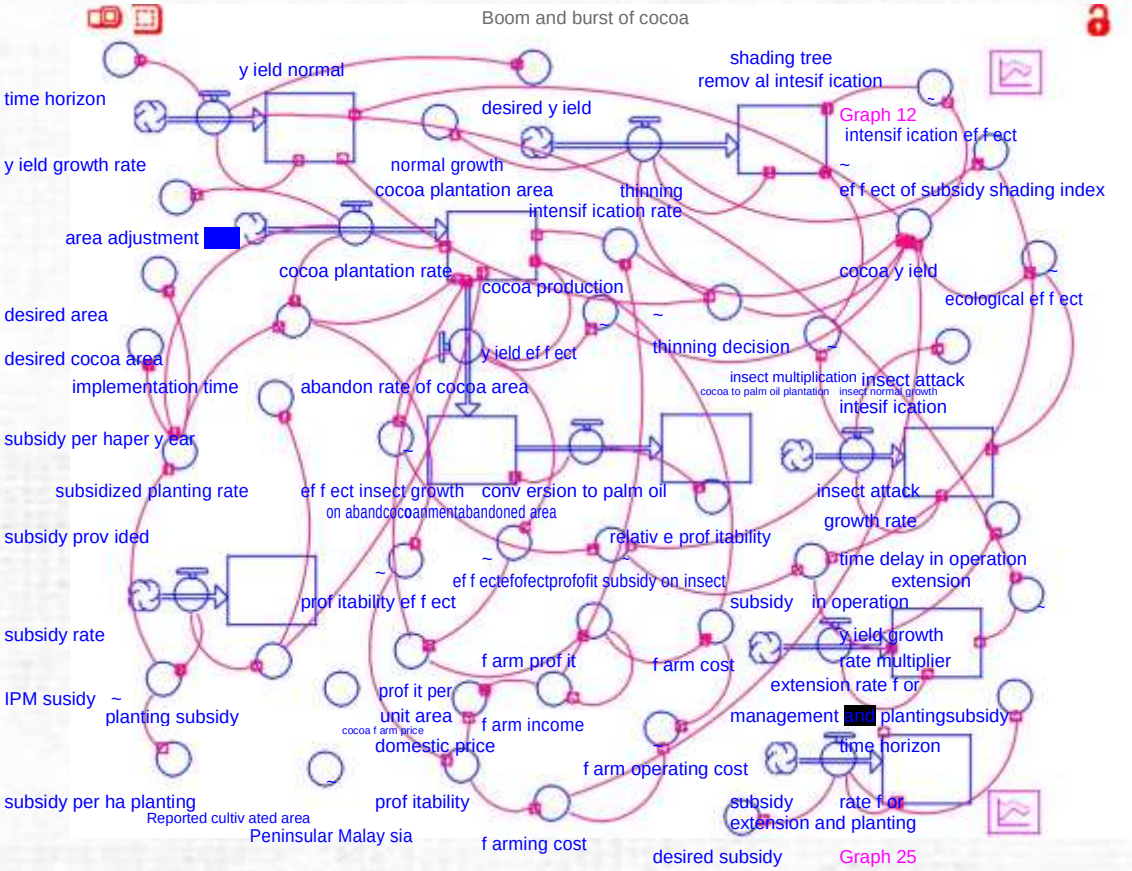


Fig. 4 Stock-flow diagram of cocoa production system (continued)

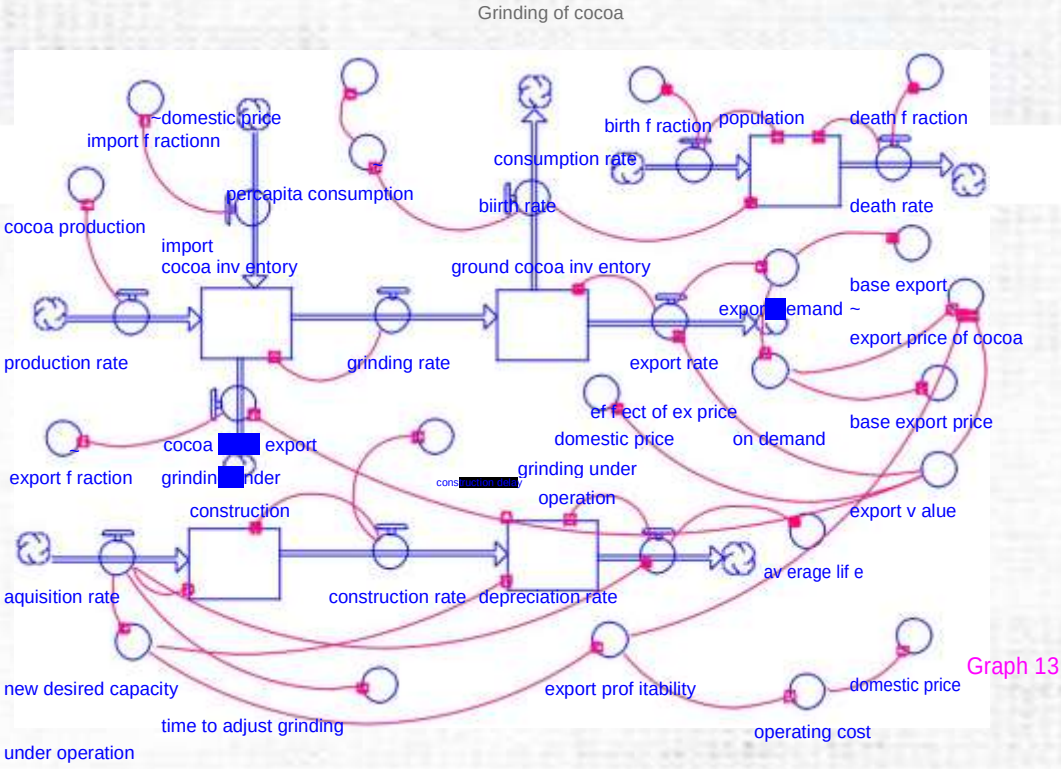


Fig. 4 Stock-flow diagram of cocoa production system (continued)

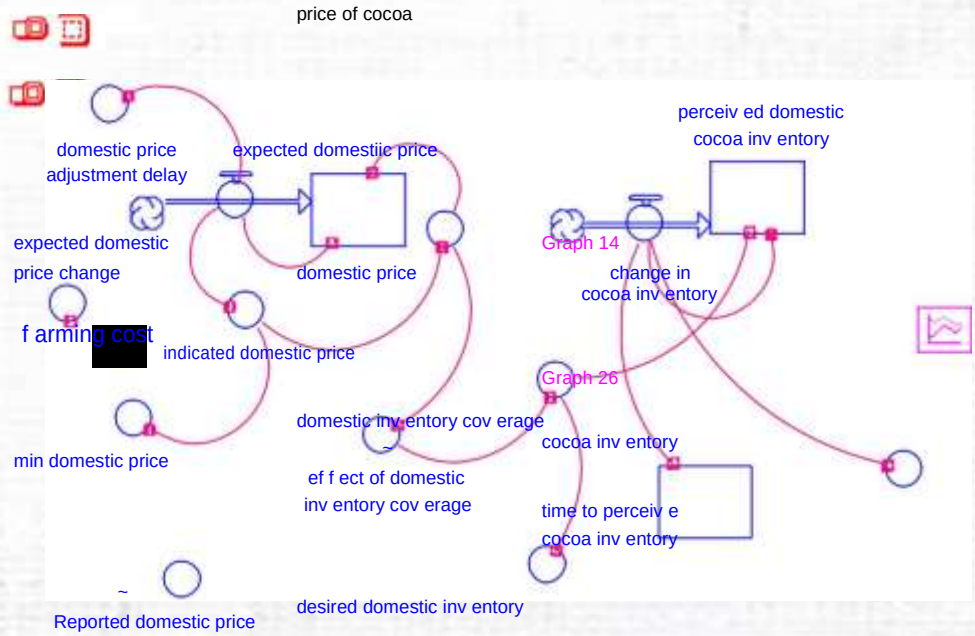


Fig. 4 Stock-flow diagram of cocoa production system (continued)

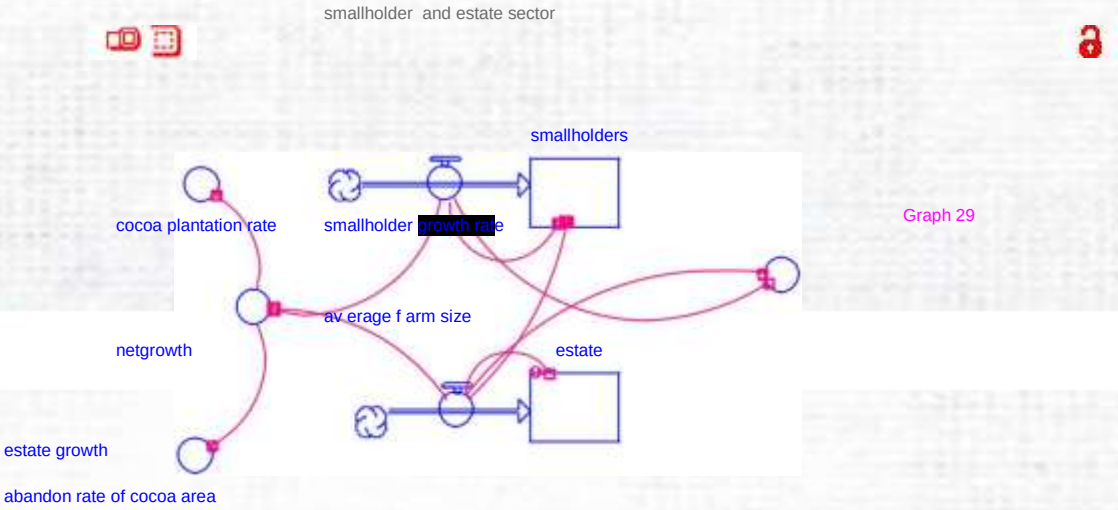


Fig. 4 Stock-flow diagram of cocoa production system

Cocoa plantation rate depends on present level of cocoa plantation area, desired cocoa area and the time delay to reduce the gap between desired cocoa area and level of cocoa plantation area and it is expressed as:

cocoa plantation rate = *MAX* (0, (*desired cocoa are – cocoa plantation area*) / *area adjustment time*) (3)

Desired area is computed from the level of cocoa plantation area and profitability effect as:

desired cocoa area = cocoa plantation area × profitabil ty effect (4)

Abandon rate of cocoa area depends on the level of cocoa plantation area, yield effect and effect of profit and it is expressed as:

abandon rate of cocoa area = cocoa plantation area × yield effect ×effect of profit (5)

Cocoa yield is increased by development of new hybrid varieties of cocoa through research and development and also it depends on ecological effect resulting from insect infestation due to liming the shading index and intensity of shading index. This is described as:

cocoa yield =yield normal×eco log *ical effect* ×int *ensificati on effect* (6)

Yield normal is increased by development of new high yielding/hybrid varieties through research and development.

Shading index reduction increases the yield in the short – run but large scale reduction of shading index invites insect infestation which results in ecological degradation in the long-run. Shading index is reduced by thinning the trees for higher yields in case of cocoa plantation under forest trees and also shading index can adjusted by changing the plant to plant distance of the coconut tree in case of cocoa plantation under coconut plantation and the shading removal intensification is expressed as:

*shading tree removal*int *ensificati on* $(t) = $*shading tree removal*int *ensificati on* $(t-1)$
(7)
$+$*thinning* int *ensificati on rate*$\times\Delta t$

Shading tree and cocoa plants invite the insects and the severity of insect damage depends on the intensity of insect attack and the insect attack intensification is expressed as:

in sec *t attack* int *ensificati on* $(t) = $*in* sec *t attack* int *ensificati on* $(t-1)$
(8)
$+$*in* sec *t attack growth rate*$\times\Delta t$

Cocoa production in Fig. 4 depends on cocoa yield (tons/ha) as well as on area under cocoa plantation and it is computed as:

cocoa production =cocoa yield ×cocoa area (9)

The coverage of the subsidy and extension through farmer field schools are expanded with a broad policy of high biodiversity and acceptable yields for sustainable development. These are describes as:

subsidy cov *ered* $(t) = $*subsidy* cov *ered* $(t-1) +$ *subsidy growth rate* $\times\Delta t$
(10)

and

extension cov *ered* $(t) = $*extension* cov *ered* $(t-1) +$ *extension growth rate* $\times\Delta t$
(11)

These systems of equation are solved by Runge Kutta forth order method using STELLA software and the detailed STELLA equations are given in the APPENDIX-A.

Model validation

Initial values and the parameters were estimated from the primary and secondary data collected from different research reports, statistical year books of Malaysia and field visits. Tests were also conducted to build up confidence in the model. Tests for building confidence in system dynamics models essentially consist of validation, sensitivity analysis and policy analysis (Bala, 1999). The two important notions of the building confidence in the system dynamics models are testing and validation of the system dynamics models. Testing means the comparison of a model to empirical reality for the accepting or rejecting the model and validation means the process of establishing confidence in the soundness and usefulness of the model. In the behaviour validity tests emphasis should be on the behavioural patterns rather than on point prediction (Barlas, 1996).

Researchers (Grant et al., 1997; Vanclay and Skovsgaard, 1997) have advocated the terminology „model evaluation" instead of „model validation". This term emphasizes relative utility of a model. A model that is useful for one purpose may be misleading for other purposes.

To build up confidence in the predictions of the model, various ways of validating a model such as model structures, comparing the model predictions with historic data, checking whether the model generates plausible behaviour and checking the quality of the parameter values were considered.

Fig.5 to Fig.7 show the comparisons of simulated behaviours of plantation area of cocoa with the historical data. The historical data of cocoa plantation area in Malaysia Peninsular, Sabah and Sarawak show the boom and bust of cocoa production area in Malaysia. Simulated behaviours are numerically sensitive to parameters and shapes of the table functions. However, the basic patterns of the historical and simulated behaviours agree adequately and model predictions represent reality.

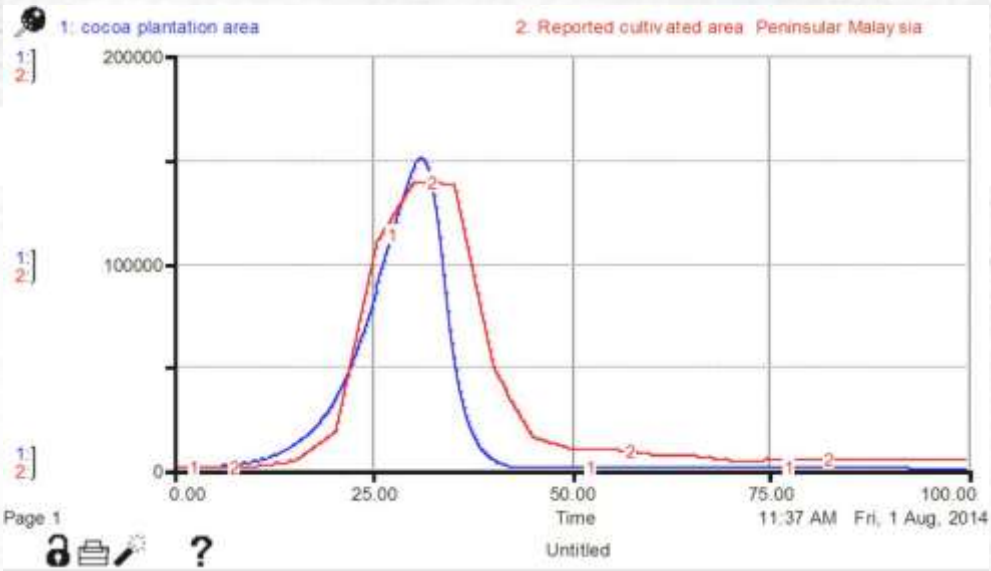


Fig. 5 Simulated and historical patterns of boom and bust of cocoa production systems in Malaysia peninsular.

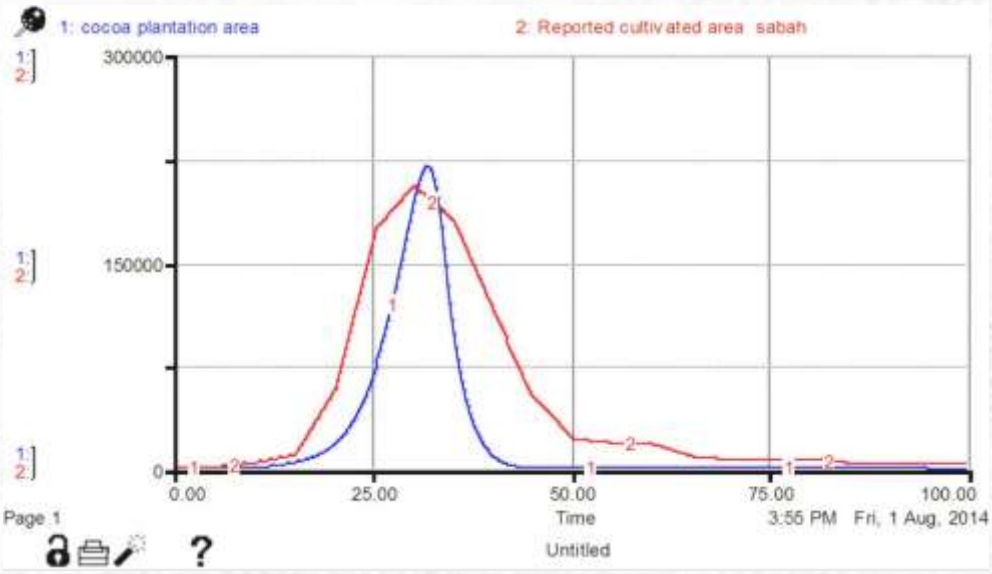


Fig. 6 Simulated and historical patterns of boom and bust of cocoa production systems in Sabah, Malaysia.

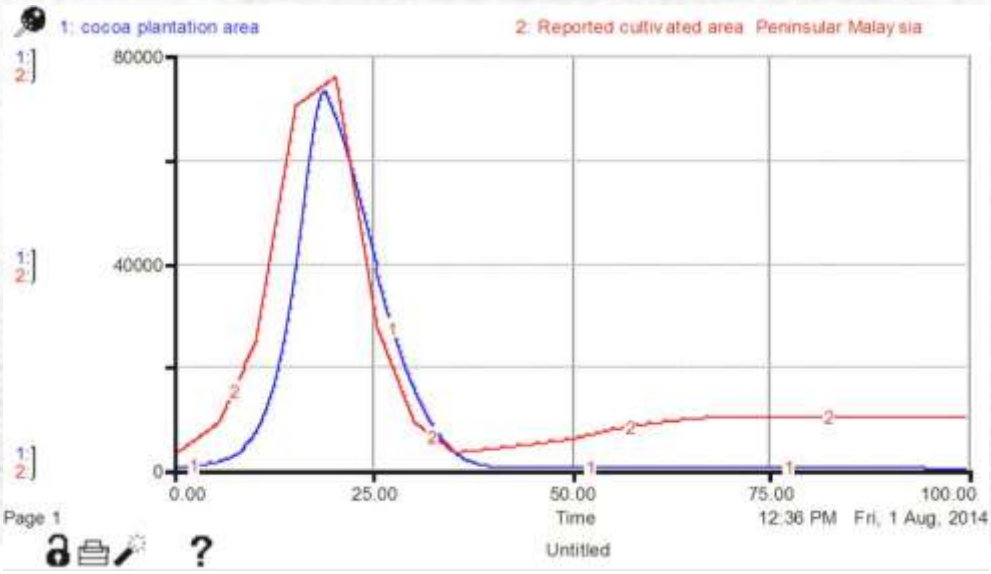


Fig. 7 Simulated and historical patterns of boom and bust of cocoa production systems in Sarawak, Malaysia.

3. Policy Analysis

The model will be simulated to assess short term and long term policy options for sustainable development of cocoa production and marketing systems in Malaysia to help the policy planners and decision makers. The model was first simulated to address the sensitivity issues of policy of subsidy for extension services through farmers field schools and then the model was simulated to assess the short term policy targets of 2020 and long term sustainable development.

Fig. 5-7 show the collapse of cocoa production systems which may be attributed to mainly the reduction of the shade level which reduces the biodiversity and resulting large scale insect infestation. The model was simulated to test how cocoa plantation changes with the changes in subsidy for maintaining high biodiversity, attain acceptable yields and IPM-FFS for pest management. Fig.8 shows the simulated cocoa plantation area for full subsidy, 80% subsidy and 60% subsidy of the cost to cover conservation practices and insect control. The system is sustainable for full subsidy since financial support is provided for joint trade-off of biodiversity and yield along with IPM pest control through FFS, but the sustainability decreases with the degree of reduction of subsidy as lesser opportunities available to maintain biodiversity and insect control in terms of financial support. Waldron et al. (2012) also suggest a simple development help specifically targeted at cocoa smallholders, as the best short-term means to improve the long-term stability of the production in a sustainable environment, together with cocoa smallholders,, economic status.

The model was also simulated for integration of subsidy with extension through farmer field schools to retain high biodiversity and attain acceptable yields along with proper integrated pest management for sustainable development of cocoa production systems in Malaysia. The model was simulated for two options: (i) starting the joint program of subsidy and extension at the peak of the boom and (ii) staring the joint program of subsidy and extension at the beginning of the boom cocoa. Fig. 9 shows reported results and simulated cocoa plantation area with subsidy and extension through farmer field schools at the peak of boom while Fig. 10 shows simulated cocoa plantation area with subsidy and extension through farmer field schools at the beginning for coverage of the cocoa plantation with subsidy and extension through farmer field schools with 5 years of time horizon for implementation of the subsidy and extension program. In both the cases the cocoa plantation area becomes stabilized. The cocoa production with subsidy and extension through farmer field schools at beginning of the production cycle not only stabilizes the system but also returns to the stable condition much more quickly. The achievement of the stable cocoa production system largely depends on the success of integrated subsidy and extension program to attain high biodiversity and acceptable yields through farmer field schools.

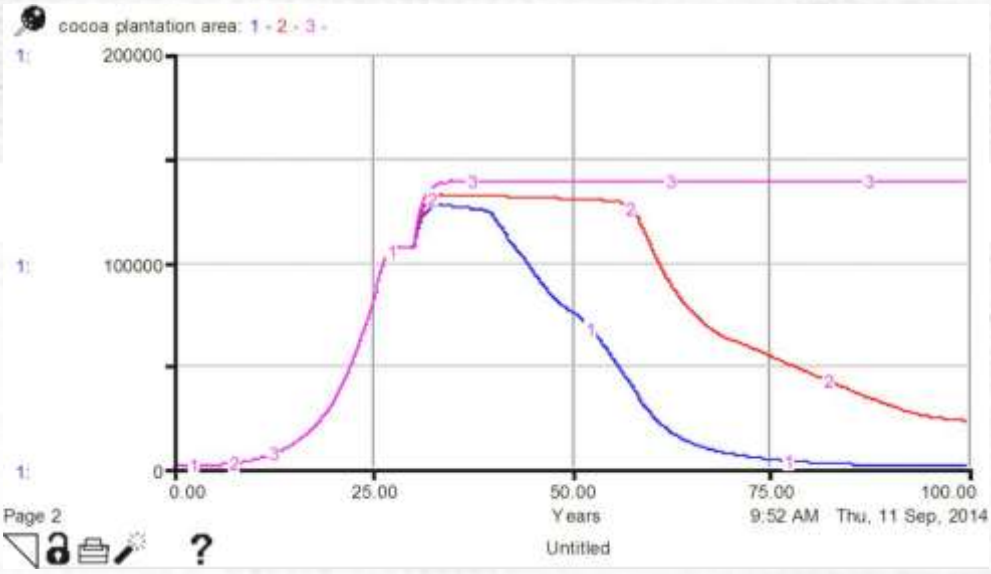


Fig.8 Sensitivity analysis of subsidy for cocoa production systems in Malaysia

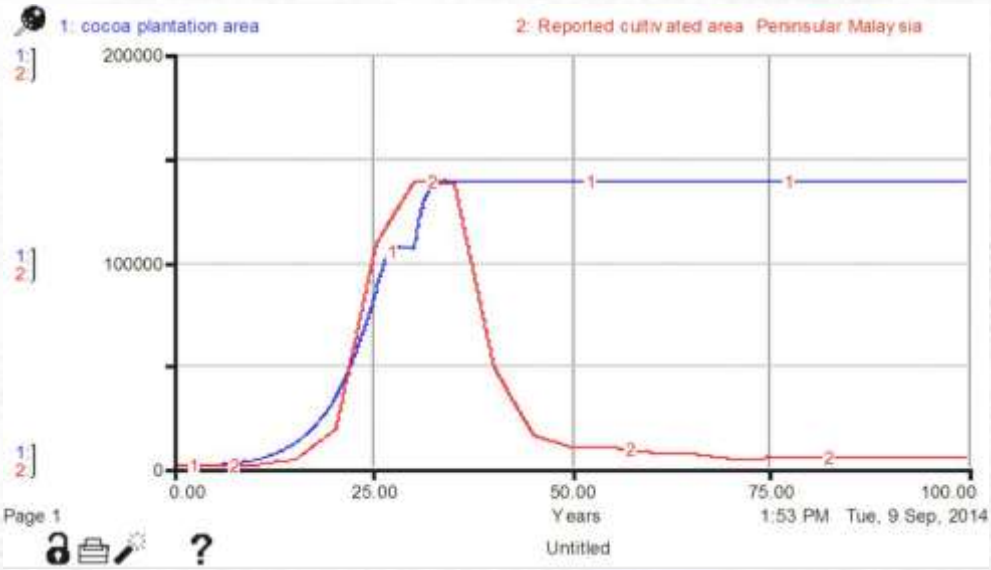


Figure 9. Simulated results for subsidies for thinning and insect control

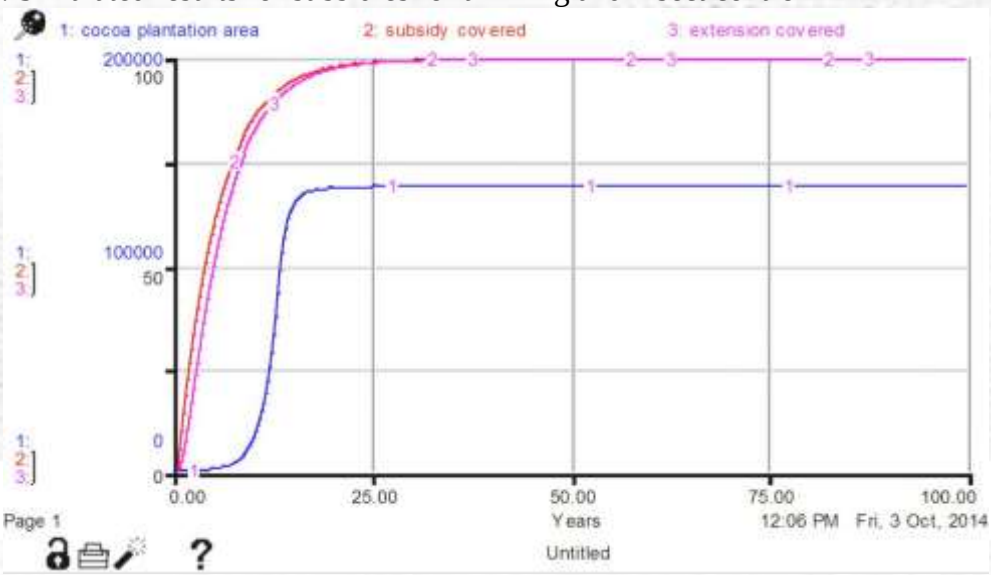


Fig.10 Simulated cocoa plantation area, subsidy covered and extension covered for cocoa production systems in Malaysia

It is to be noted that coconut based agroforestry systems are one of the main components of small-scale farming in Malaysia and these systems associate coconuts (*Cocos nucifera*) with cocoa (*Theobroma cacao*). The canopy of the shade trees provide shade and shelter to cocoa planation and in Malaysia, coconut is used a shade tree. Coconut has very versatile uses and has been relied upon to generate additional income for farmers. An acceptable trade - off is needed to retain high biodiversity, attain acceptable yields along with proper integrated pest management and storing a significant amounts of carbon to mitigate the climate change optimizing shade canopy. The level of biodiversity hosted by cocoa agroforests generally depends on the quality and quantity of shade provided

Ruf (2011) reported the importance of considering that at least medium-density shade is probably needed for meaningful biodiversity conservation. Farmers would naturally shift towards shade level which provides the highest yield in the short-run: unfortunately, this may correspond to the lowest conservation benefit level. Waldron et al. (2012) emphasized the importance of a joint analysis of trade-offs between shade/production and shade/biodiversity. Shade canopy design is crucial for optimizing theses trade offs (Somarriba and others 2012).

The instability of agro-ecosystems of cocoa production considered the strongest manifestation of pest problems is one of the consequences of the expansion of crop monocultures at the expense of the natural vegetation, thereby decreasing local habitat diversity. Plant communities that are modified to meet human needs become subject to pest damage, whose harmfulness expands in direct proportion to the intensity of these changes. This is because the inherent self-regulation characteristics of natural communities are lost (Altieri, 1999).

Integrated pest management (IPM) is a system whereby farmers use various methods to control pests and diseases, to overcome chemical pesticides need. These include good farming practices (growing a combination of different crops, managing shade, etc.), using chemical pesticides carefully and only when necessary and protecting non harmful insects and insects that feed on harmful insects. This combination of methods to control pests reduces the need to use agro-chemicals which are for the most part harmful to the environment (Altieri, 1999).

Agricultural extension services through farmer field schools learning by doing of ecological management of shading along with pest management i.e. integrated pest management can significantly lower the insecticide use and has important environmental and health implications. One of the main objectives of IPM-FFS training of the farmers is to encourage the farmers to lower their reliance on chemical insecticides as the main method for controlling pests in the farms (Yorobe and others 2011) and there is evidence that farmers participating in the IPM-FFS programs have reduced their use of insecticides, enhanced their yield and increased their income (Pontius et al, 2002). In general, only those participating in the IPM-FFS program directly benefit from the intensive training with high knowledge retention on the more complex IPM practices (Rola and others 2002; Feder and others 2004).

The model was simulated for gradual transition to 100 % coverage subsidy and extension services through farmers field schools within a planning horizon of 10 years with a potential yield of 3.50 tons per ha which is less than the yields reported during field visits (4 tons /ha). To achieve the target set for 2020 subsidy for planting cocoa in addition to the subsidy for production are needed for trade off of attaining high biodiversity and acceptable yields along with major task of insect control with minimum chemical pesticides. Subsidy for production is termed here as IPM subsidy. The potential yield which can be achieved under most efficient management through extension services through farmers field schools is termed here as normal yield and the actual yield achieved in the fields is termed as the cocoa yield. The yield was targeted from 0.50 ton per ha to 1.50 ton per ha by 2025. Simulated cocoa area, cocoa production and yields are shown in Fig. 11. Coco plantation area, cocoa production and

cocoa yield attains 14,094 ha, 15,255 tons and 1 tons per ha respectively in scenario business as usual (bau)(Table 2). Thefollowingtabledescribesdifferentpolicyscenarioswhichthemodelissimulated:

Table 1. Different policy simulation scenarios

Scenario	Productivity	Extension	Subsidy
Baseline	0.5	1:150	100
S1	0.5	1:100 (1:95)	100
S2	0.5	1:50 (1:59)	100
S3	0.5	1:50 (1:52)	100

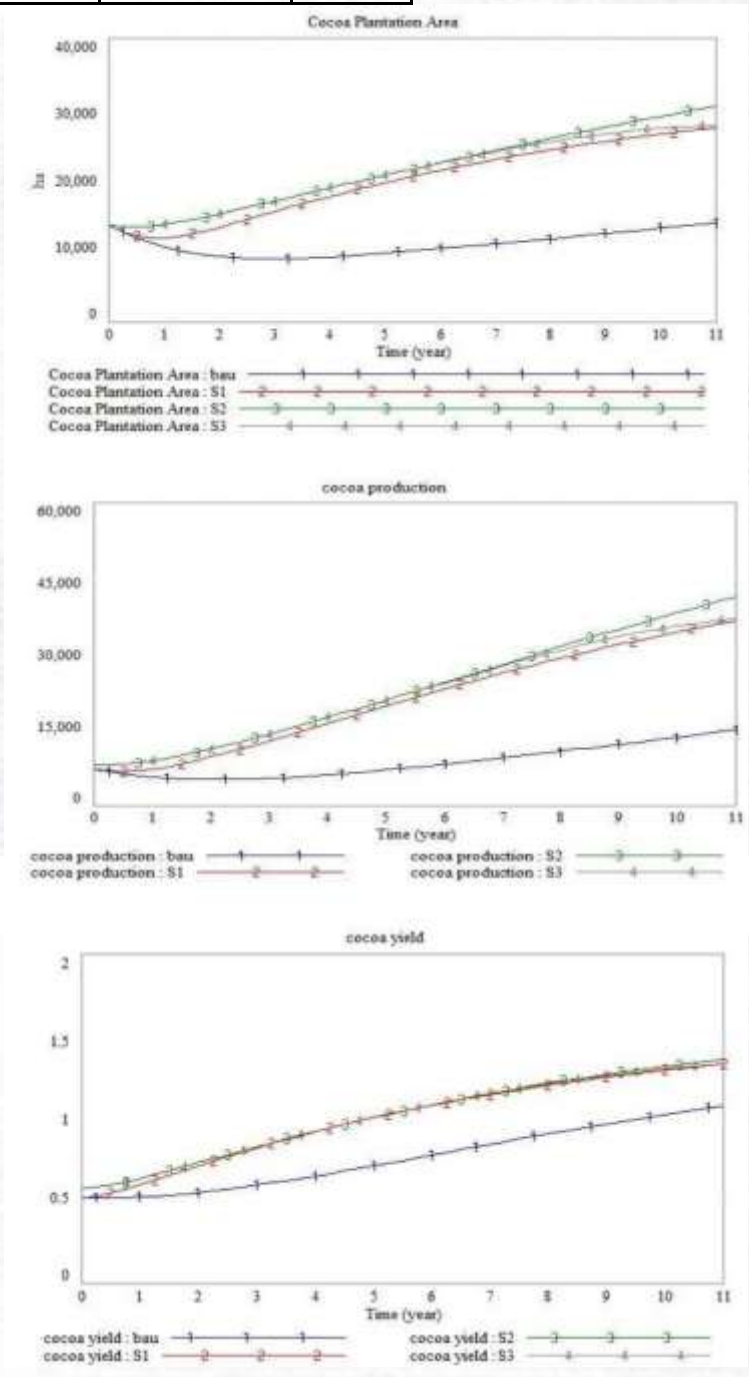


Fig. 11 Simulated cocoa plantation area, cocoa production, yield normal and cocoa yield in Malaysia

Table2.Targetachievedataglance

Variable	Current	Target	Achievement			
			bau	S1	S2	S3
Area (ha)	13,728	40,000	14,094	27,464	30,433	27,733
Production (tonnes)	2,809	60,000	15,255	36,689	41,463	37,101
Yield (tonnes/ha)	0.5	1.5	1	1.3	1.4	1.35
Smallholders	9025	37,500	13,236	21,963	23,886	22,138
Estates	729	2500	748	1,552	1,751	1,569
Exports (RM billion)	3.6	6	6.8	7.24	7.3	7.26

Two subsidies are required one for sustainable cocoa production termed as IMP subsidy and another for achievement of targeted plantation area 40,000 ha within 11 years termed planting subsidy.The plantingsubsidy is a short time arrangement but IPM subsidy through extension services through farmer field schools is a long term arrangement. Simulated subsidy, extension, IPM subsidy and subsidized planting rate shown in Fig. 12.The IPM i.e. production subsidy follows the pattern of plantation area since it is based per ha of plantationarea.

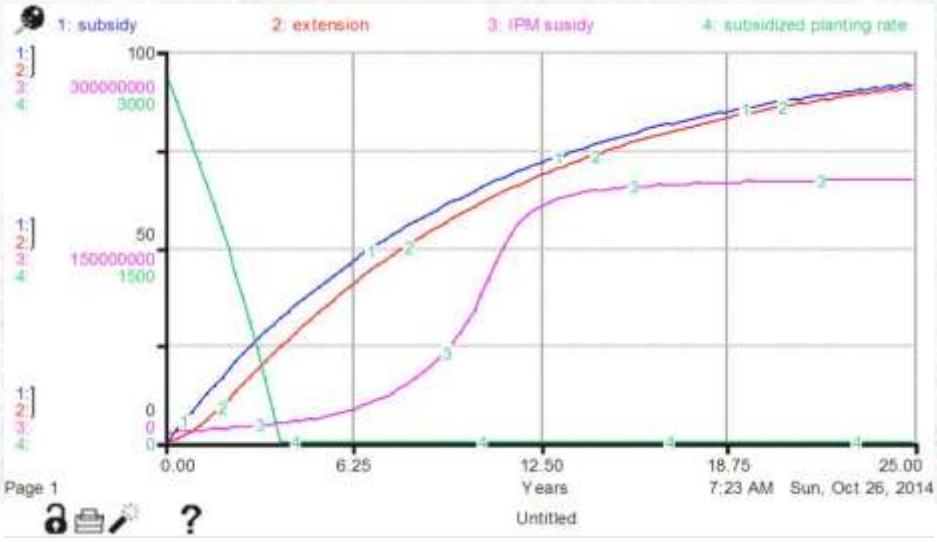


Fig.12Simulated subsidy, extension, *IPM* subsidy and subsidized planting rate

Both smallholders and estate plantation areasof cocoaincrease with coverage of subsidy with extension and becomes sustainable within 11 years. Simulated smallholders and estate in ha are shown in Fig. 13. The targets achieved by 2025 for smallholders and estate plantation are 13,236 and 748 ha under the scenario bau respectively. Although the smallholdersattains high value, still it is lower than the target value. The smallholders and estates attain reasonable target (Table 2) under three different policy scenarios (Table 1).

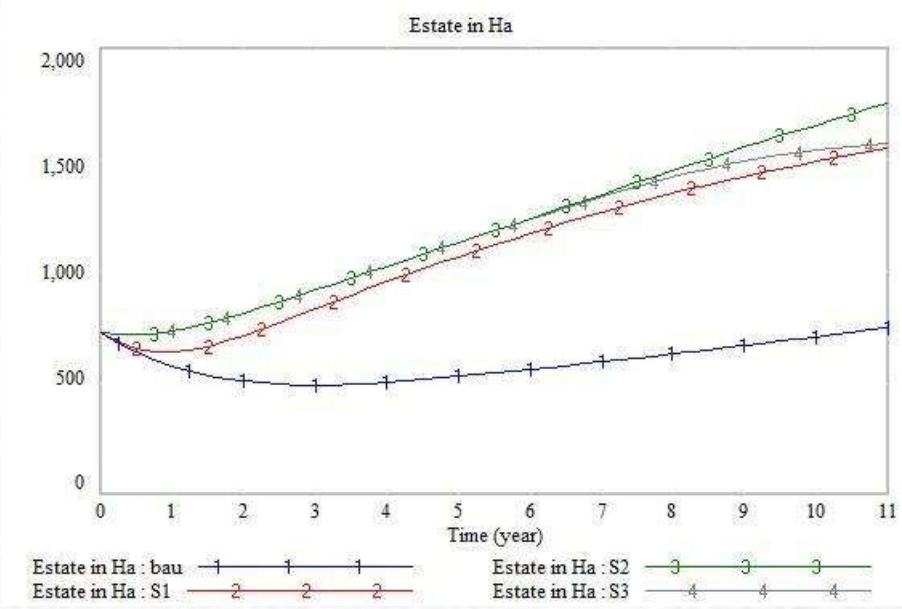
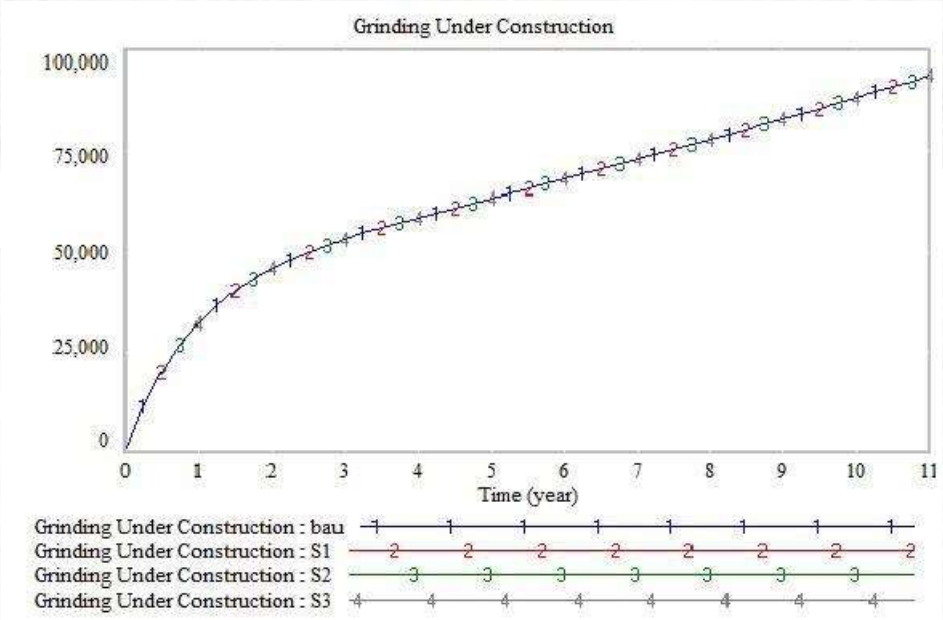


Fig.13Simulated smallholders and estates (ha)

Simulated grinding under operation and also under construction and export values of cocoa products are shown in Fig. 14. The grinding under operation and also under construction and export values of cocoa products increases with time. Export value of cocoa products attains the target set for 2025 resulting from higher production from subsidy integrated extension and higher export prices. This results in quick achievement of the targeted plantation area. The export value achieved by scenario bau by 2025 is RM 6.8 billionwhichis higher than the target value.



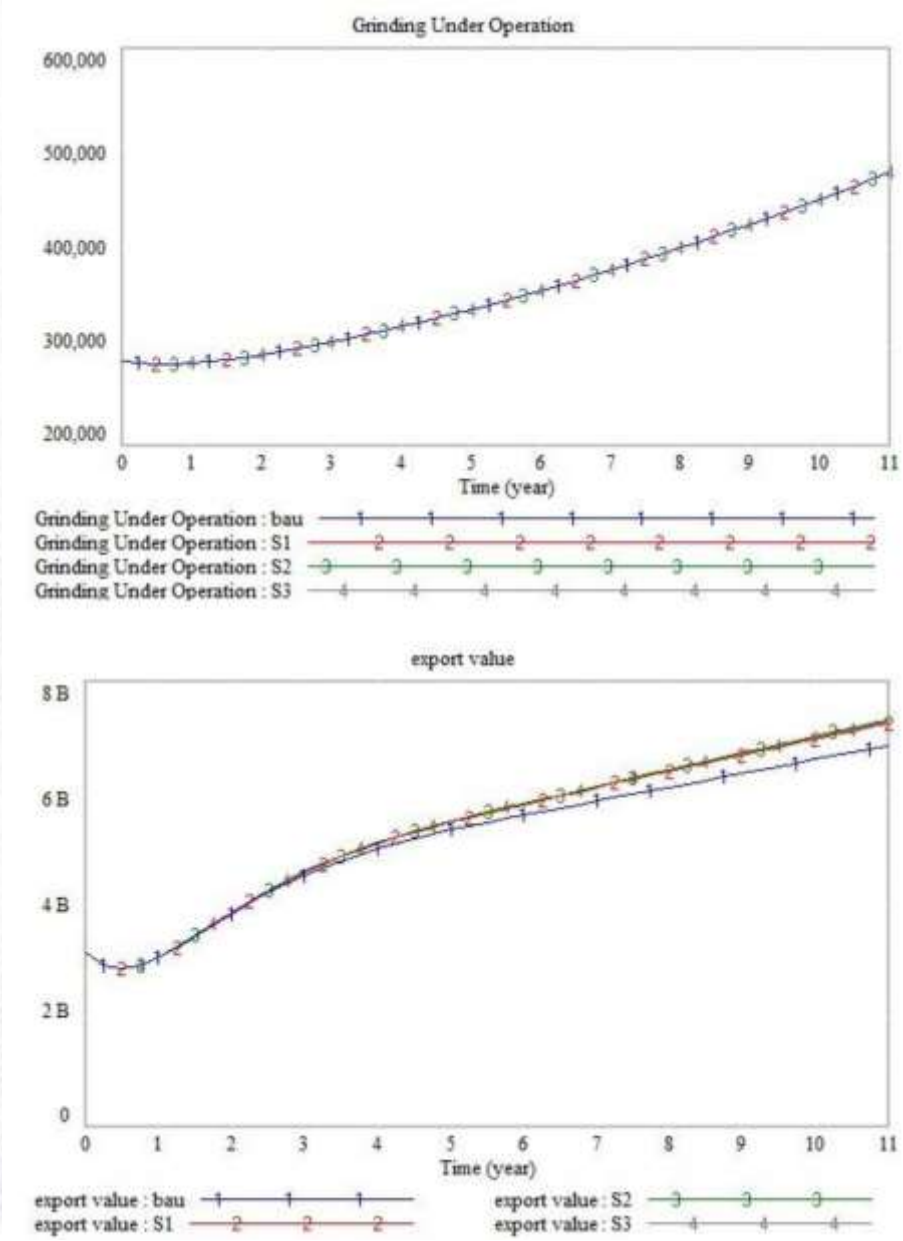


Fig. 14 Simulated cocoa grinding in operation and under construction, and export value in RM

The targets achieved at a glance are shown in Table 2. Finally, tradeoffs of high biodiversity and acceptable yields through extension integrated subsidy can make the cocoa production systems sustainable from the risk boom and bust of the system.

4. Policy Implications

Based on the sound understanding of the boom and bust of cocoa plantation a policy model for sustainable development of cocoa production is developed ultimately and structural and dimensional consistency has been checked at each and every stage of the modelling. The entire modelling revolves around sustainable development of cocoa production in Malaysia. The model was simulated the policy options for sustainable development of cocoa production systems in Malaysia to help the policy planners and the sustainable development policy requires subsidies to the farmers for adopting the suggested conservation and insect control practices through extension services through farmer field schools by learning by doing. Of course, the subsidy must be sufficient to cover the cost of conservation and insect control

practices. Here conservation practices discourages the reduction of shading index to reduce insect infestation i.e. limit the reduction of shading index and thereby accumulation of carbon sinks which conserve biodiversity. The policy implementation must be started either at the beginning of the cocoa production cycles or before the collapse of the plantation area starts. The suggested shading index can be achieved by limiting thinning of forest trees in case of cocoa plantation under forests and maintaining plant to plant distance of coconut trees in case of cocoa plantation under coconut plantation. The action programs for implementation of subsidy programs for extension services through farmers field schools are summarized as follows:

(1) Farmers field schools should be conducted in the fields for training of the trainers and the farmers for learning by doing in the fields.
8. Trade offs of high biodiversity and acceptable yields should include possible in intercropping in designing of shading canopy for high biodiversity to provide additional income.
9. Design of shading tree for biodiversity is crucial and recent developments should be updated in the fields time to time.
10. IPM based pest management should be adopted to reduce the use of chemicals and also to reduce the environmental hazards.
11. Finally, subsidy for extension services through farmers field schools should be prioritized for adopting farmers field schools and hence outputs realized.

5. Conclusion

The boom and bust of cocoa production is one of the consequences of the short –term benefit of higher yield at the expense of reducing the biodiversity, thereby decreasing local habitat diversity and subsequently inviting pest and diseases. The subsidy policy proposed limits cocoa production to ecological carrying capacity which can be achieved by maintaining a joint trade-off between the shading index and proper actions for insect control of the cocoa production systems and acceptable yields. Simulated results support that suggested policy can lead to a sustainable production system. The Malaysian case study of boom and bust of cocoa production system gives an opportunity to develop hypothesis of cocoa boom and bust and provided structure for policy simulation for sustainable development. Of course, adequate subsidy with effective extension of technologies from R & D for policy implementation is needed.

References

1. Altieri, M. A. 1999. The ecological role of biodiversity in agro-ecosystems. Agriculture, Ecosystems & Environment, 74(1-3): 19-31.
2. Arquitt, S., Hongang, X. and Johnstone, R. 2005. A system dynamics analysis of boom and bust in the shrimp aquaculture industry. System Dynamics Review, 21: 305-324.
3. Bala, B. K. and Hossain, M. A. 2010. Modeling of food security and ecological footprint of coastal zone of Bangladesh. Environment, Development and Sustainability, 12: 511-529.
4. Bala, B. K. 1999. *Principles of System Dynamics*. Agrotech Publishing Academy, Udaipur, India.
5. Barlas, Y. Formal aspects of model validity and validation in system dynamics. System Dynamics Review. 12 (1996) 183-210.
6. Colough, Y., Faust, H. and Tscharntke, T. 2009. Cacao boom and burst: sustainability of agroforests and opportunities for biodiversity conservation. Conservation Letters, 2: 197-205.

7. Department of Statistics (2014). Malaysia Economic Statistics - Time Series 2013. Putrajaya: Department of Statistics, Malaysia.

8. Forrester, J. W. 2007. System dynamics – the next fifty years. System Dynamics Review, 23(2-3): 359-370.
9. Feder, G., Murgai, R. and Quizon, J. B. 2004. The acquisition and diffusion of knowledge: the case pest management training in farmer field schools, Indonesia. Journal of Agricultural Economics, 55: 221-243.
10. Franzen, M. and Mulder, M. B. 2007. Ecological, economic and social perspectives on cocoa production worldwide. Biodiversity and Conservation, 16: 3835-3849.
11. Grant, J. W. Pedersen, E. K., and Marin, S. L. 1997. Ecology and Natural Resource Management: System Analysis and Simulation. Addison-Wesley, Reading, UK.
12. Latiff, I. A. 2007. Cocoa industry of Malaysia In: 50 years of Malaysian Agriculture: Transformational issues, Challenges and Direction Edited by Fatimah Mohamed Arshad, Nik Mustapha R Abdullah, Bisant Kaur and Amin Mahir Abdullah. Universiti Putra Malaysia, Serdang.
13. Lee, C. H. 2013. Planting cocoa- challenges and realities.
14. Martinez-Moyano, I. J. and Richardson, G. P. 2013. Best practices in system dynamics modeling. System Dynamics Review, 29(2): 102-123.

15. MPIC (Ministry of Plantation Industries and Commodities). 2011. National Commodity Policy (2011-2020). Putrajaya: Ministry of Plantation Industries and Commodities
16. 15.Motamayor, J. C., Lachenaud, P., Silva da and Mota, J. W. 2008. Geographic and genetic population differentiation of the Amazonian chocolate tree (*Theobroma cacao L.*)PLoS One, 3, e3311.
17. Ooi L.H. and Chew P.S. 1985. Some important agronomic and agricultural practices in cocoa estates. TDMB Plantation Management Seminar, Kuala Trengganu
18. Pontius, J. C., Dilts, R. and Bartlett, A. (Eds), 2002. Ten years of IPM training in Asia-from Farmer Field School to Community IPM. FAO, Bangkok, Thailand.

19. Prusty, S. K., Mohapatra, P. K. J. and Mukherjee, C. K. 2011. Sustainable growth strategies for Indian shrimp industry: Multiplr perspective. Proceedings of the 29th International Conference of the System Dynamics Society, held on 24-28 July July, Washington, DC.
20. Rola, A. C., Jamias, S. B. and Quizon, J. B. 2002. Do farmer field school graduates retain and share what they learn? An investigation in Iloilo Philippines. International Journal of Agricultural Extension Education, 9: 65-76.

21. Ruf, F. O. 2011. The myth of complex cocoa agroforests: the case of Ghana. Human Ecology, 39(3): 373-388.

22. Somarriba, E., Deheuvels, O and Cerda, R. 2012. Off productivity, biodiversity and carbon Storage. Cirad, France.

23. Vanclay, J.K. Skovsgaard, J. P. 1997. Evaluating forest growth models. Ecological Modeling. 98 (1): 1–12.
24. Waldron, A., .Justicia, R., Smith, L., Sanchez, M. (2012). Conservation through Chocolate: a win-win for biodiversity and farmers in Ecuador's lowland tropics. Conservation Letters, 5(3): 213-221.
25. Yorbe Jr, J. M., Rejesus, R. M. and Hammig. M. D. 2011. Insecticide use impacts of Integrated Pest Management (IPM) Farmer Field Schools: Evidence from onion farmers in Philippines. Agricultural Systems, 104: 580-587

IMPLEMENTATION OF SUPPLY CHAIN MANAGEMENT IN MOCAV CLUSTER AGROINDUSTRY

By

Evita Soliha Hani
ita_hani@yahoo.com
Agribusiness Department
Faculty of Agriculture, University of Jember, Indonesia

ABSTRACT

The purpose of this study was (1) to investigate the implementation of supply chain management related to mocav cluster industry and (2) to know the response of owners of mocav industrial clusters to mocav supply chain management. The investigated aspects are product/goods flow, information flow and cash flow. This study was basically using a descriptive method and the judgmental method. In understanding the interaction of mocav supply chain management used the qualitative modeling approach, namely "rich picture building". To analyze the second purpose was conducted by summarizing and presenting the data using tables. The results showed that the owners' response of mocav industrial clusters to both goods flow and finance flow was good, meanwhile the information flow was moderate.

Key words: mocav, supply chain management, cluster agroindustry

BACKGROUND

The concept of Supply Chain Management (SCM) is the right concept to be applied in the business world to survive. SCM is coordinating or integrating a number of goods-and servises-related activities among supply chain participants to improve operating eficiencies, quality and costumer service among the collaborating organizations [9] According to Heizer and Render [5], SCM is the integration of the activities that procure materials and services, transform them into intermediate goods and final products, and deliver them through a distribution system. Important activities include determining: transportation vendors, credit and cash transfers, suppliers, distributors, accounts payable and receivable,

warehousing and inventory, order fulfillment, sharing customer, forecasting, and production information.

Jack. GAJ van der Vorst [6] and Mentzer *et al*.[7] argued that SCM is a set of three or more entities (organizations or individuals) who are directly involved in the upstream and downstream flows of products, services, financial and or information from a source to a customer. The physical flow of a supply chain is basically represented by the product flow features of the chain. The financial flow includes a series of money exchange relationships between participants in the chain, which is reflected by the cash flow across the participants and processes. The information flow involves the market signalling amongst the supply chain members regarding end-user preferences. Important elements of this dimension are the accuracy of messages including whether messages are signals or noise, the strength of these messages, the cost of messaging, the speed of transmitting and receiving messages, and the openness to sharing rather than retaining critical information among participants. The knowledge flow in the supply chain is the brain-ware of the chain that leads to added value in a product or service.

The phenomenon of Supply Chain Management (SCM) dominates not only in the manufacturing sector but also in agriculture (agribusiness) sector. In fact, the issue of supply chain in the agriculture (agribusiness) sector is relatively complex due to the characteristics of the sector. Some of typical characteristics are durability product (primarily in the non-processes agri-product), seasonality, and variability. To some extent, the importance of supply chain in this sector is due to the inappropriateness between production and marketing (Austin in [3]).

In Indonesia, the flour is an important food after rice. Domestic flour demand tends to increase each year, reaching an average of 6%. High wheat consumption growth fueled by several factors, including rising prices of rice and wheat industry grows downstream products. This increase automatically boosted imports of flour and raw materials, namely wheat seed. Wheat seed industry can produce 3.6 million tons of wheat flour, while demand is 4.7 million tons in 2013. Flour industries require about 5 million tons of wheat that everything has to be imported [1]. Based on these conditions, it is necessary to alternate flour. Mocav is flour alternative as a substitute for wheat flour.

Mocav (Modified Cassava Flour) is cassava flour modified in its manufacture through the process of fermentation, so that the produced flour has better physical properties and taste

than those of ordinary cassava flour. Mocav agroindustry was first established in East Java-Indonesia in Trenggalek Regency, beginning in 2006. Mocav agorindustry in Trenggalek Regency consists of industrial clusters which are home industries that produce slices of dried cassava as semi-finished materials of Mocav. Mocav processed in flouring agroindustry, such as Bangkit Cassava Mandiri (BCM, LTd). The agroindustries are interrelated [2].

The total demands of Mocav reach 1000 tons per month. Mocaf demands predictably increase along with the Decree of Minister of Trade of the obligations of importers of wheat flour to make a substitution with local wheat [2]. The increased demand of mocav can not be balanced by the increased production. The mocav production by BCM, LTd in Trenggalek is only about 100-150 tons per month. According to Handriadi and Mursito [5] that the low production capacity of BCM, LTd is caused by, among others, a small production capacity of clusters which have not been in line with the expectation. To reach a production capacity, the firm needs about 100 clusters. In fact, Data of GRLJ Cooperative show a decrease in the number of active mocav agro-industry clusters, i.e. 60 clusters which operated in 2012 to 15 clusters which were active in 2013. This condition is one of the causes of the imbalance of mocav production and market demands [2]. This condition will require supply chain of mocav works well.

Since mocav is an agricultural product which many people need quickly, mocav agroindustry certainly involve many actors with their interest in it. SCM is a great system that involves many actors (commonly manufacturer – distributor/wholesaler - consumer) to distribute the product to the consumer. It requires a strong coordination between one actor and another. As suggested by Heizer and Render [5] that the supply chain covers activities in material procurement, transformation (processing), and delivery to customers. Thus, the purpose of this study was (1) to investigate the implementation of supply chain management related of mocav cluster industry and (2) to analyze the response of owners of mocav industrial clusters to mocav supply chain management.

RESEARCH METHOD

The research was conducted in Trenggalek Regency, considering that the area is the center of the agroindustrial clusters of mocav. The population in this study was the owners of mocav agroindustry clusters supervised by Gemah Ripah Loh Jinawi Cooperative of

Trenggalek Regency and casava farmers. The total number of population was 15 cluster industries. Samples were taken by total sampling. Method sampling used to know mocav supply chain was snowball method. Data were collected from primary data and secondary data. This study was basically using a descriptive method and the judgmental method. The approach used to address the first objective was the rich picture building of supply chain management that is, seeing the implementation of goods flow, information flow and finance flow. The response of owners of mocav indsutrial clusters to implementation of mocav supply chain management was conducted by summarizing and presenting the data using tables. It will be categorized into three categorizes, namely "good" if the value is between 67 and 100%, "quite good" if the value is 33%-66%, and "less good" if it is less than 33%.

RESULTS AND DISCUSSION

1. Implementation of Supply Chain Management in Mocav Agroindustry Cluster

In understanding supply chain management and activities carried out by institution in mocav agroindustry cluster used the rich picture building. To see the implementation of supply chain management in mocav industry cluster, the supply chain is viewed from 3 flows, i.e. the flow of goods, information and finance. The results showed the following circumstances:

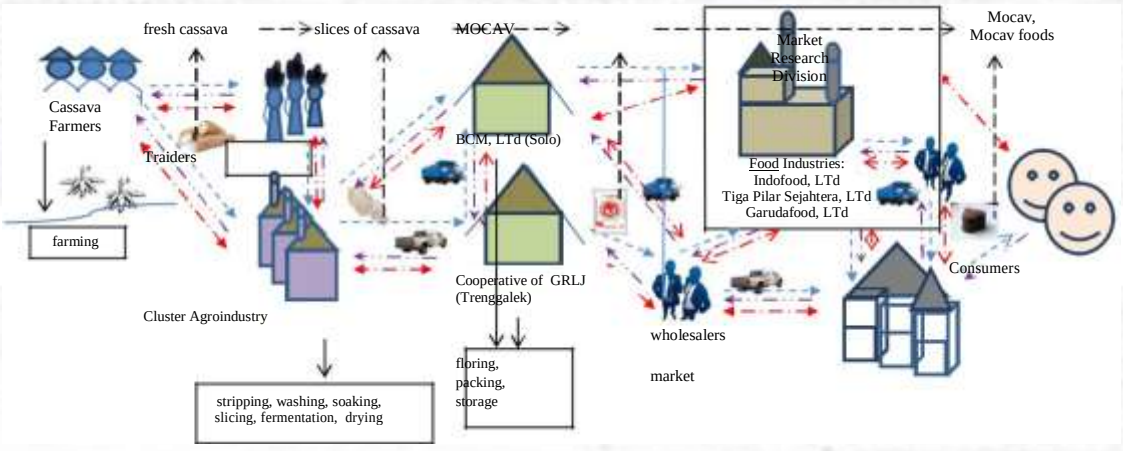


Figure 1. Rich picture building of mocav agribusiness supply chain management, Trenggalek Regency, East Java, Indonesia

Figure 1 can discribe some activities in mocav agirbusiness. There are some actors in the business, namely farmer, trader, cluster agroindustry, cooperative, wholesaler, flour

industry, food industry, market and consumer. Agroindustri related to mocav in Trenggalek Regency is divided into two types, namely industries that produce raw materials for flouring (ie industry that produces slices of dried cassava) and flouring industry as raw material mocav. These industries that produce slices of dried cassava are a privately owned industry of farmers, hereinafter referred to as agroindustrial clusters. Flouring industry is a cooperative named "Gemah Ripah Loh Jinawi (GRLJ)" in cooperation with Bangkit Cassava Mandiri, LTd (BCM, LTd). BMC, LTd is a private company that does flouring too. In this study, the determination of the direction of movement of the respondents came from the industrial cluster by using the snowball method. The activities carried out by market participants associated with mocav can be seen in Table 1.

TABLE 1
THE ACTIVITIES CARRIED OUT BY MARKET PARTICIPANTS ASSOCIATED WITH MOCAV, TRENGGALEK REGENCY, EAST JAVA, INDONESIA

Num.	Market participant	Activities carried out
1	Casava Farmer	Farming
2	Trader	Distribute casava to cluster industry
3	Cluster industry	Stripping, washing, soaking, slicing, fermentation, drying
4	Bangkit Cassava Mandiri (BCM)	Flouring, packing, storage, distribute mocav
5	Cooperative "Gemah Ripah Loh Jinawi"	Flouring, packing, storage, distribute mocav
6	Wholesaler	Distribute mocav to market and food industry
7	Food industry	Mocav processing into food, packing, storage, distribute food mocav to wholesaler, market, and conduct to market research.
8	Market	Distribute mocav flour and food mocav to consumer
9	Consumer	Final user and give information about mocav food to food industry's researcher

For an explanation of the good flow, flow information and flow finance can be described as follows:

A. Goods Flow

Each agribusiness must define how to move and distribute the product to customers. Product distribution channel is associated with traces of production distribution from producer to end consumer. Based on Figure 1, goods flow from farmer until consumer in Trenggalek can be seen on Figure 2.

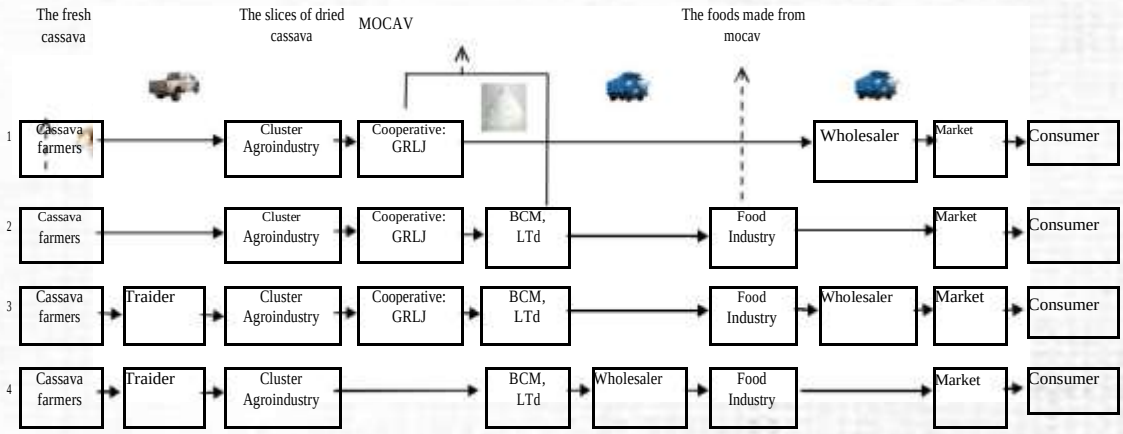


Figure 2. Goods flow in mocav agribusinees, Trenggalek Regency, East Java

Figure 2 shows there are four patterns of distribution channels associated with mocav. All those patterns, the channels of distribution of products related to mocav are started from farmers as producers of cassava. There are two ways of cassava farmers to distribute their products to industrial clusters, which sell directly to industrial clusters and sell its products through trader. The cassava transportation used was truck. In the industrial cluster, cassava is processed into slices of dried cassava. Then, products are distributed to flouring industry, namely to the cooperative “Gemah Ripah Loh Jinawi (GRLJ)” and

Bangkit Cassava Mandiri, LTd (BCM, LTd) by pick up or truck. In flouring industry, the slices of dried cassava are processed into mocav. The mocav will be distributed to the market and the food industry through wholesaler by truck.

The interesting thing of this study is that the farmers harvest cassava just as much as the order of cluster agroindustries or trders. The interesting thing about this study is going to harvest cassava farmers in accordance with the request. Likewise, the industry cluster will produce dried cassava slices on demand. They reduce the risks. Farmers do not want to keep at home because they do not have the storage space. Every two weeks they harvest cassava as much as 1.5 tons. The reason of the cluster agroindustry not to keep cassava is that the cassava drying tools are still traditional, i.e. using drying by relying on sunlight. If it is raining or no sunlight, then slices of cassava turn to be blueblack and not white like when using drying machines. This surely will have an impact on the quality.

B. Information Flow

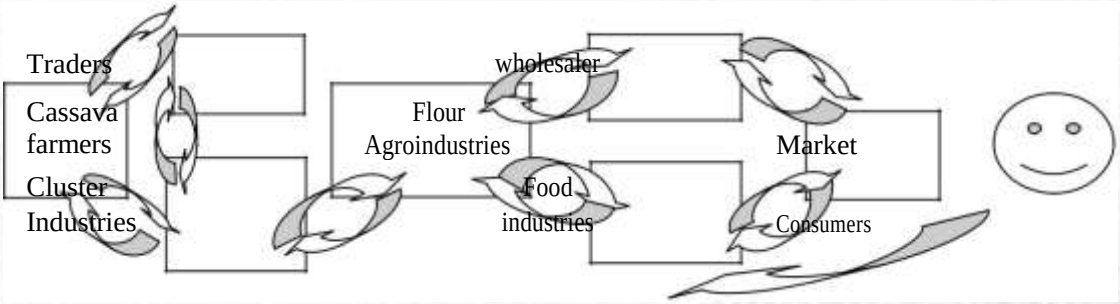


Figure 3. Information flow in mocav agribussiness

Referring to Figure 3, it appears that all market participants in agribusiness mocav inform each other. The information flow is along with the flow of goods. However, there is a difference, namely (1) if the flow of goods moving from farmers to consumers, but the flow of information moving preferably, from consumers to farmers and (2) if the flow of goods occurs in one direction but the flow of information occurs two-way communication, unless the consumer. Information provided by the market participants to other market participants may be equal or unequal. Information about the price and quantity of goods is always communicated by agribusiness related mocav. Information quality is only in the food industry and information about consumer tastes in consumer.

C. Finance Flow

Finance flow is the picture of money flow from the consumers as buyers which then flows into the distribution chain which ends on farmers. This flow along with the flow of goods, but the direction of movement is reversed. Initial direction of movement of financial flows is the same direction as the direction of the information flow, which is derived from consumers. In the case of financial flows, e of the flow of money does not involve eating the food industry because the industry produces goods made from mocav very varied. As a result, the price is varied. This will be complex. Therefore, the flow of money that will be discussed is the flow of money from mocav consumers to cassava farmers. The financial flow in mocav agribusiness can be shown in Figure 4.

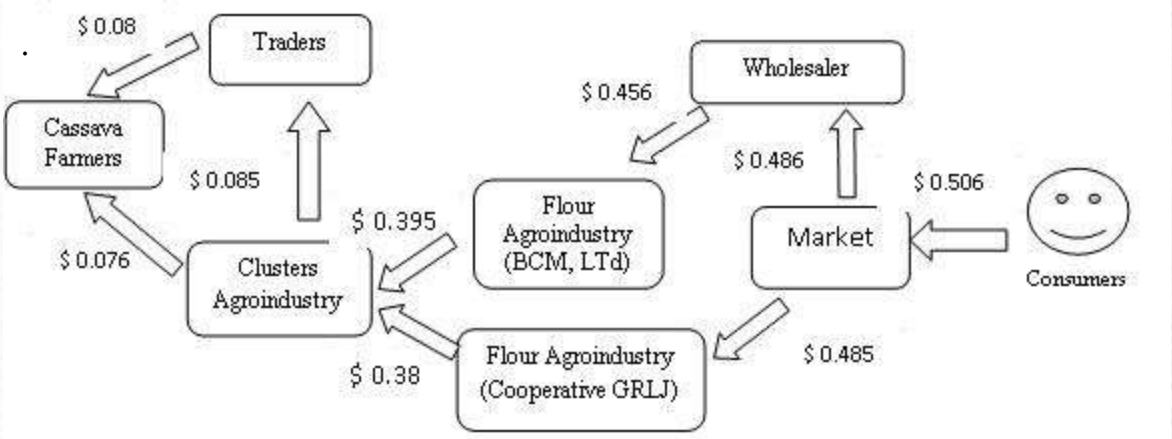


Figure 4. The financial flow in mocav agribusiness, Ternggalek, East Java, Indonesia

According to Figure 4, Consumers spend money on buying flour (mocav) to the market by USD 0.506/kg. The markets' money flows to the wholesalers by USD 0.486/kg or to the Cooperative GRLJ by USD 0.485/kg. Further, the wholesalers distribute money to flour agroindustry (BCM, LTd) by USD 0.456/kg. Both BCM, LTd and cooperative GRLJ buy slices of dried cassava to clusters industry. Cooperative GRLJ drain money into industrial clusters in order to obtain dry cassava slices of USD 0.38/kg, while the BCM to spend money of USD 0.398/kg. BCM, LTd expenditure is higher than the cooperative because the location of the BCM in Solo district, Central Java, while cooperative GRLJ located in Trenggalek a district with industrial clusters. The industry clusters spend money to buy fresh cassava directly to farmers of USD 0.076/kg or through traders of USD 0.085/kg. Next, the money flows from traders to cassava farmers by USD 0.08/kg. Finally, money received casava farmers from the buyers of cassava will be channeled to the family to buy the daily necessities and be flowed to the farm stores to buy production inputs.

1. The response of Cluster Industry on The Implementation of Mocav Supply Chain Management

TABLE 2
THE RESPONSE CATEGORIES IN THE IMPLEMENTATION OF MOCAV SUPPLY CHAIN MANAGEMEN, TRENGGALEK, EAST JAVA, INDONESIA

Flow of Supply Chain Management	The response categories in the implementation of mocav Supply Chain Management (%)		
	Good	Moderate	Low
Goods flow	73.33	13.33	13.33
Information flow	20.00	46.67	33.33
Finance flow	66.67	13.33	20.00

Based on Table 2, most (73.33%) owners of industrial clusters said that the flow of goods, both cassava fresh and slices of dried cassava is good. Farmers sent cassava smoothly asordered. Similarly, industry clusters sent slices of dried cassava to flouring industry smoothly as well. Most (47%) of respondents argued that the implementation of information flows is moderate. The informations received by the respondent were price and quantity of goods. In fact, respondents want more information than that, for example, about training, how to develop the business and others. For finance flow, most (66.67%) of respondents said that finance flow is good.

CONCLUSION

Supply Chain Management (SCM) of agricultural products is one of the driving forces of agribusiness system. Flow of materials, information, and finance in supply chain management makes every agribusiness actor continue to run their activities smoothly. Mocav is flour alternative as a substitute for wheat flour. There are some actors in the business, namely farmer, trader, cluster agroindustry, cooperative, wholesaler, flour industry, food industry, market and consumer. Whereas, there are three important parties namely cassava farmer, cluster industry, and flouring industry. The implementation of goods and finance flow is good but information flow is moderate.

REFERENCES

2. Aptindo (Asosiasi Produsen Tepung Terigu Indonesia). 2013. Total Investasi Industri Terigu Nasional [On line]. www.aptindo.go.or.id. [04 Februari 2013].

3. Bappenas, 2009. Pengembangan Agroindustri Pangan dalam Persektif Pembangunan Perdesaan - Laporan Kajian Pembangunan Perdesaan dan Pertanian berbasis Ketahanan Pangan dan Pengembangan Agroindustri. Jakarta : Bappenas.

4. Hadi Paramu, Ida Bagus Suryaningrat, and Dewi Prihartini, Management-Based Clustering in Fishery Agroindustries Products: A Case Study of Jember Regency, Journal of Economics, Business, & Accountancy, 14 (2011) 133-148.

5. Handriadi, C and Mursito. 2009. PT Bangkit Cassava Mandiri dan Pasar Yang Masih Terbuka Lebar [on line]. http://bekerjamerdeka.blogspot.com/2009/09/modified-cassava-flour3.html?m=1. [12 Februari 2013].

6. Heizer, Jay and Render, Barry. 2004. Operations Management, Seventh Edition, Pearson Prentice Hall, New Jersey.

7. Jack G.A.J van der Vorst, et all. 2007. Agro-industrial Supply Chain Management: Concepts And Applications. Agricultural management, marketing and finance occasional paper. Food and Agriculture Organization of The United Nations. Rome

8. Mentzer JT, DeWitt W, Keebler J, Min S, Nix N, Smith C, Zacharia Z. 2001. Defining Supply Chain Management. Journal of Business Logistics Volume 22 No. 2.

9. Trubus. 2012. Cara Jitu Jadi Raja Singkong. Jakarta : PT Trubus Swadaya.
10. [9] Wisner, Joel,D., Keah-Choon tan, G. Keong Leong. 2012. Principles of Suply Chain Management, Third Edition, South-Western Cengage Learning, Mason,Ohio,USA, p. 8.

- **FOOD SAFETY AND NUTRITION**
- **FOOD AND AGRICULTURAL MARKETING**
- **FOOD AND AGRICULTURAL POLICY ANALYSIS**

THE ROLE OF GMP AWARENESS AND CERTIFICATION IN DETERMINING THE ENTREPRENEURS INTENTION TOWARDS GREEN PRACTICES IN MALAYSIA.

Viduriati Sumin[1], Golnaz Rezai [2], Zainalabidin Mohamed[2], Mad Nasir Shamsudin[2] and Juwaidah Sharifuddin[2].

[1]*Faculty of Plantation and Agrotechnology, Universiti of Technology MARA, (UiTM) Sabah, Locked Bag 71, 88997 Kota Kinabalu, Sabah.*

[2] *Dept. of Agribusiness and Information Systems, Faculty of Agriculture, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor.*

Email: viduriati@gmail.com

Key words: Role, GMP Awareness and certification, entrepreneurs, intention and green practices.

Introduction

The World Bank estimates the global market for herbal products in 2008 amounted to USD 200 billion and is projected to increase to USD600 billion in 2020. Local herbal industry market reach RM10 billion in 2008 and is projected to grow by 15% annually over the next 10 years. This growth is based on the increasing acceptance of traditional herbal products, functional foods, health supplements, natural personal care products and organic foods. The number herb production is expected to increase from 17 thousand tonnes to 73 thousand tonnes with a growth rate of 15.4% per annum and the total exports of processed herbs covering products is expected to increase from RM152 million to RM1.3 billion in the same period (National Agro-Food Policy (NAFP). In the National Agro-Food Policy, production of high-value herbs through encouragement to get Good Manufacturing Practices (GMP) certification was emphasized to meet GMP processing activities and compete in the international market. Factories that meet GMP standards will serve as a leader through effective contract manufacturing of small and medium enterprises. In addition, GMP requires clean handling, high quality, consideration of worker's safety and health, environment and others. According to World Health Organization (WHO), GMP, guideline is through handling, processing of herbal products to the highest quality level. The fact is, not all manufacturers of health supplement products operated in Malaysia have GMP certificate registered under the National Pharmaceutical Control Bureau (NPCB). This resulted the government's aim to encourage the entrepreneurs in this business to dominate the international market as specified in the National Agro-Food Policy (2011-2020) could not being implemented successfully. The promulgation of these GMP will help ensure consumers that safety and quality standards are followed throughout the manufacturing processes. Therefore, this study aimed to determine the relationship between the status GMP obtained by the entrepreneurs with the intention towards green practices. These insights enable the government, stakeholder and policy maker to set a better benchmarking on the GMP practices in herbal-based industries in Malaysia. The extended of Theory of Planned Behaviour (TPB) model will be used in order to predict the intention and willingness towards green practices by the entrepreneurs in Malaysia.

Methodology

In this study, the Structural Equation Model technique with AMOS SPSS 21 was used to identify the moderation effect between the exogenous and endogenous variables. The endogenous variable (intention) construct represents the dependent variable whilst, exogenous variable represents independent variable such as relative advantage, complexity, attitude, social norm and perceived behavioural control in the present study. Moderation effect is a moderator variable that alters the strength of the causal relationship between independent and dependent variables. In the present study, the certification obtain by the entrepreneurs (GMP) moderate the causal effects of all of the exogenous constructs (perceive relative advantage, complexity, attitude, subjective norms and perceived behavioural control) and the endogenous construct (intention).

In this test, the analysis involves splitting the data into groups based on the moderator. Generally, the moderator is a categorical variable; however, it can also be a continuous variable. After the process of splitting groups, the next step in the moderator analysis is by using the multi group analysis. Multi group analysis can test moderation effects of the moderator on the overall model and the individual paths. In this study, the status of GMP certification obtained by the entrepreneur act as the moderator of the relationship between exogenous and endogenous constructs. The GMP status certification will lead the entrepreneurs to follow the procedures in accordance with the green status or environmental management systems. This indirectly provides exposure and provides impetus for these local entrepreneurs to adopt green practices. In the analysis of Amos output, the moderation effect analysis results can be established by comparing the unconstrained (variant group) against measurement residual (invariant-group). If the unconstrained model is better than the measurement residual model, then we can conclude that there is moderation effect of the certification status and the global networking on the overall model.

Result and Discussion

In the moderation test of GMP certification, results show that a total of 168 respondents obtained GMP certification while 84 respondents did not. One of the requirements for registration with the NPCB is the GMP certificate, although in some cases, the entrepreneurs may still register if they have internationally recognized certifications. Thus in this moderation test, GMP were tested as moderator factors in the relationship between the exogenous and endogenous constructs. The moderation effect could be established by comparing the unconstrained (variant-group model) against measurement residuals (invariant-group model). The AMOS output showed that both models were significant ($p <$ 0.001).

The smaller value of $\chi 2$ or CMIN indicated a better model. The $\chi 2$ value indicated that the unconstrained model was better than the measurement residuals model as showed in the Table 1.

Table 1: Model Fit Summary for GMP certification status

Model	NPAR	CMIN	DF	P	CMIN/DF
Unconstrained	110	509.492	352	0.000	1.447
Measurement residuals	55	609.411	407	0.000	1.497

The second method to test the significance of differences between the two models utilized the output results of "assuming model unconstrained to be correct" as indicated in Table 2. The results showed that the difference was significant ($p < \alpha$): $\chi 2 = 99.919$ (609.411- 509.492); df = 55 (407 – 352); p = 0.000. Therefore, it was concluded that there was some form of moderation effect of entrepreneurs who obtain GMP ecrtification on the overall model.

Table 2: Model Comparison: Assuming model unconstrained to be correct

Model	DF	CMIN	P	NFI Delta-1	IFI Delta-2	RFI rho-1	TLI rho2
Measurement weights	15	17.487	0.291	0.006	0.007	-0.002	-0.002
Structural weights	22	29.273	0.137	0.01	0.012	-0.001	-0.001
Structural covariances	32	51.83	0.015	0.018	0.02	0.002	0.002
Structural residuals	34	53.535	0.018	0.019	0.021	0.002	0.002
Measurement residuals	55	99.919	0	0.035	0.039	0.007	0.008

As it was proven that the GMP certification status had a moderation effect in some form on the overall model, the next step was to test its moderation effect on the individual paths. To test this, estimates were used from AMOS text output to ascertain which path/s acted as moderators. The regression weghts for both entrepreneurs who obtain the GMP certification and entrepreneurs do not have the certification were compared. In reference to Hair et al., (2010), the GMP certification status was identified as a moderator to the relationship between

the four paths, namely; Complexity-Attitude, Perceived Behavioral Control-Intention, Attitude-Intention, Perceived Relative Advatange - Intention. The perceived relative advantage – attitude, subjective norms - intention and complexity – intention path showed that no moderation effects existed. Table 3 indicates the standardized parameter measures for the group of entrepreneurs obtain GMP certification and Table 4 for the entrepreneurs with not obtain GMP certification. Thus, it was concluded that the GMP certification of the entrepreneur moderates the relationship between attitude, perceived relative advantage and perceived behavioural control construct and intention to adopt green practices.

Table 3: Regression weight for entrepreneurs who obtain GMP certification (Unconstrained)

Paths			Estimate	S.E.	C.R.	P
ATT	<---	COM	0.297	0.093	3.207	0.001a
ATT	<---	PRA	0.161	0.09	1.789	0.074 c
INT	<---	ATT	0.095	0.143	0.665	0.506
INT	<---	PBC	0.387	0.148	2.62	0.009a
INT	<---	SUB	0.475	0.079	5.997	***
INT	<---	COM	0.096	0.143	0.671	0.502
INT	<---	PRA	0.061	0.137	0.448	0.654

Note: *** significant at 0.001 level
2) significant at 0.01 level
3) significant at 0.05 level
4) significant at 0.10 level

At this point, the effect of moderation was accepted in the constructs for Complexity-Attitude, Perceived Behavioral Control-Intention, Attitude-Intention, Perceived Relative Advantage - Intention path as shown in the results in Table 5 for hypothesis testing of the moderation effect of entrepreneurs of GMP certification status.

Table 4: Regression weight for entrepreneurs who were not obtain GMP certification (Unconstrained)

Paths			Estimate	S.E.	C.R.	P
ATT	<---	COM	0.044	0.124	0.359	0.719
ATT	<---	PRA	0.393	0.136	2.88	0.004a
INT	<---	ATT	0.374	0.179	2.091	0.036b
INT	<---	PBC	0.211	0.241	0.875	0.381
INT	<---	SUB	0.399	0.139	2.871	0.004a
INT	<---	COM	0.143	0.178	0.802	0.423
INT	<---	PRA	-0.409	0.209	-1.955	0.051c

Note: *** significant at 0.001 level
12. significant at 0.01 level
13. significant at 0.05 level
14. significant at 0.10 level

Table 5: Result of Hypothesis Testing of the Moderation Effect of GMP certification status.

Hypothesis	Hypothesis Statement	Result
H1	GMP certification status moderates the relationship between perceived relative advantage and attitude to adopt green practices.	Not supported
H2	GMP certification status moderates the relationship between complexity and attitude to adopt green practices.	Supported
H3	GMP certification status moderates the relationship between attitude and intention to adopt green practices.	Supported
H4	GMP certification status moderates the relationship	Supported

	between perceived relative advantage and intention to adopt green practices.	
H5	GMP certification status moderate the relationship between complexity and intention to adopt green practices	Not supported
H6	GMP certification status moderates the relationship between perceived behavioural control and intention to adopt green practices.	Supported
H7	GMP certification status moderates the relationship between subjective norms and intention to adopt green practices.	Not supported

Conclusion

There were Good Manufacturing Practices (GMP) and Halal logo obtained by the herbal-based entrepreneur. As discussed earlier, it was compulsory for the entrepreneur particularly for the manufacturer who registered under National Pharmaceutical Bureau (NPCB) to obtain GMP certificate. Those entrepreneurs engaged with distributing and retailing of the herbal products as well needs to comply with this requirement set by NPCB. These to make sure that all of the herbal-based products produced and distributed in the Malaysian market were qualified in terms of quality, safety and hygienic.The results of GMP as moderator showed there was a significant effect on the paths relationship between Complexity-Attitude, Perceived Behavioural Control-Intention, Attitude-Intention, and Perceived Relative Advantage – Intention. Thus the entrepreneur believed that GMP certification would help their intention to adopt environmental facilities and practices easily. In addition, they agreed GMP certificate strengthen of the company image to build trustworthy to the customers. Overall, the responded positively and intended to implement green practices in the near future because of the regulation stipulated by NPCB by obligating GMP to all herbal-based entrepreneur. Thus, showed the characteristics of entrepreneurs involved in the business based on traditional herbal medicinal products must comply with some of the procedures and regulations stipulated by the Ministry of Health Malaysia such as clean and hygiene handling, being well-organized besides producing high quality products. This was observed by Tzschentke (2008) who stated that the main factors that motivated entrepreneurs in the industry to adopt green technology in their business activities were based on the priorities and needs of the companies. In this context, as discussed earlier, the characteristics of the traditional herbal medicine products lead the entrepreneurs' in this industry intention to adopt green practices.

References

Hair, J. F., Black, W. C., Babin, B. J., and Anderson, R. E. (2010). *Multivariate data analysis (7th Edition)*. New Jersey: Pearson Prentice Hall.

Tzschentke, N. A., Kirk, D. and Lynch, P. A. (2008), "Going Green: Decisional Factors in Small Hospitality Opearations," *International Journal of Hospitality Management*, vol. 27(1), pp. 126-133.

Ministry of Agriculture and Agro-Based Industry. National Agro-Food Policy (NAFP), 2011-2020. 2011. Percetakan Watan Sdn. Bhd. Kuala Lumpur.

FACTORS UNDERLYING FOOD CHOICE MOTIVES AMONG MALAYSIAN ADULTS

Ismawati Sharkawi[1], Zainalabidin Mohamed[2], Golnaz Rezai[2], Juwaidah Sharifuddin[2], and Mad Nasir Shamsudin[2]

[1] Faculty of Agriculture and Food Sciences, Universiti Putra Malaysia
[2]Faculty of Agriculture Universiti Putra Malaysia
Correspondence author: Ismawati Sharkawi ; Email: ismawat@upm.edu.my

Keywords: Factor analysis, food choice motives, Malaysian adults

Introduction

The food choice motives (FCM) was introduced by Steptoe *et al*. (1995) to understand the multidimensional measures of people‟s food choice to assess the perceived importance of different motives that influence their decisions. The motives were derived by the assumption that health concern was not the only factor people consider in their food choice decisions. Following this cue, the food choice questionnaire (FCQ) consists of 36-item was developed by Steptoe *et al*. (1995) including nine measurements: health concern, convenience, price, sensory appeal, natural content, mood, familiarity, ethical concern, and weight control. Other than the original nine dimensions, some studies incorporate additional items in an attempt to modify the FCQ. For example, Lindeman and Väänänen (2000) has added religion, political values and ecological welfare into the FCQ and concluded that all of the new items were mostly rated as less important than many of the original items in the food choice motives.

Some studies have succeeded in determining new factor structure from the original nine dimensions of FCQ. Following the work of Lindeman and Väänänen (2000), a revised FCQ was applied to Irish adolescents to determine their food choice motivations (Share and Stewart-Knox, 2012). The principal component and reliability analysis has resulted with five factors: health; price/convenience; mood; religion; and animal rights. Another study by Jauregui-Lobera and Rios (2011) among relatives of school students in Spain yielded seven factors: mood, health and natural content, sensory appeal, weight control, convenience, familiarity, and price.

In Malaysian context, while the food industry in the country grows steadily since the 1990s, little is known on the motivations behind the food choice decisions of the populations. Despite the widely used of the FCQ among different populations around the globe, there are limited studies in Malaysia to understand the motives behind food choice decisions made by the adults‟ population. One of the earlier studies was conducted by Prescott *et al*. (2002) at a cross-cultural stage comparing food choice motives in Japan, Taiwan, Malaysia and New Zealand. Another study was carried out by Asma *et al.* (2010) to compare the food choice motives between Malay spouses in an urban community. To the best of our knowledge, there is no empirical study has been done in Malaysia to measure the underlying factors of food choice motives. Therefore, this study aims to determine the underlying factors of food choice motives among Malaysian adults.

Materials and Methods

A survey was carried out throughout Malaysia among 1,719 adults aged 18 and above. This study adapted the FCQ with adding two additional items to suit to the cultural values of the respondents. The two items were "has *halal* certification from the government" and "is permissible by my religion". The respondents were asked to rank the degree of importance for the 38 items according to the following question, "It is important to me that the food I eat on a typical day...". Examples of the items were: "is nutritious", "contains natural ingredients", and "comes from the countries I approve of politically". The 7-point scale was used in this study instead of the original 4-point by Steptoe *et al*. (1995), ranging from 1 = "not important at all" to 7 = "very important".

The exploratory factor analysis (EFA) was conducted to achieve the objective. Thirty eight items measuring the food choice motives were analyzed to identify underlying structure of relationships among individual items. Principal axis factoring (PAF) with promax rotation was employed.

Results and Discussion

Majority of the respondents were female (1009, 58.7 percent) and 710 were male. In terms of ethnic distribution, majority were Malays (62.5 percent), followed by Chinese (21.6 percent), other ethnic (8.2 percent), and Indians (7.6 percent). Similar with the population statistics, more than half of the respondents were Muslims (68.0 percent), 13.6 percent were Buddhists, 12.7 percent were Christians, and slightly more than five percent were Hindus.

With regard to the factor analysis, four factors were proposed with items ranging from two to eleven for each factor (Table 1). Items which have low factor loading or cross-loaded were eliminating thus leaving 24-item to be retained in the final analysis. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was .940 indicating an excellent value for factor analysis (Tabachnick and Fidell, 2007). The overall significance of the correlation matrix was 0.000 with the value of Bartlett‟s test of sphericity at 24424.722. This further indicates that the data could be ideal for factor analysis.

The four suggested factors explained 23.85 percent, 15.77 percent, 9.78 percent and 7.19 percent of the variance respectively. Overall, these factors explained 56.59 percent of the total variance, which is acceptable as it is common to consider the percentage of variance explained at 60.0 percent or less in the social science disciplines (Hair *et al*., 2010).

The four-factored solution demonstrated acceptable factor loadings on all factors (above .5). Factor 1 consisted of eleven items with factor loadings ranging from .601 to 0.723. This factor was labelled as „health and natural content‟ which included items associated with health considerations and the natural content of the food. Factor 2 was made up of seven items with factor loadings from .569 to .683, and was named as „convenience and price‟. The items included in this factor were related to convenience, cost, mood and taste of the food. Factor 3 consisted of four items related to familiarity, sensory appeal and mood and was labelled as „familiarity and sensory appeal‟ with factor loadings from .518 to .701. Finally, factor 4 which included two items was named as „religion‟ with factor loadings of .871 for item „is permissible by my religion‟ and .765 for item „has *halal* certification from the government‟. The four-factored scale was further checked individually to examine overall internal consistency of each factor using Cronbach‟s alpha. The Cronbach‟s α coefficient for the four factors ranged from .795 to .929, indicating good to excellent internal reliability.

Table 1: Factor Structure of the Food Choice Motives

Food Choice Motives	**1**	**2**	**3**	**4**
1. Health and natural content (23.85% variance, 10.30 eigenvalues, cronbach's α = .929)				
Is high in fibre	.723			
Is low in fat	.715			
Contains natural ingredients	.707			
Is low in calories	.703			
Is nutritious	.697			
Contains lots of vitamins and minerals	.674			
Contains no artificial ingredients	.664			
Helps me control my weight	.651			
Keeps me healthy	.627			
Contains no additive	.601			
Is high in protein	.601			
2. Convenience and price (15.77% variance, 2.05 eigenvalues, cronbach's α = .880)				
Is easily available in shops and supermarkets		.683		
Can be cooked very simply		.678		
Is good value for money		.671		
Cheers me up		.617		
Is easy to prepare		.598		
Is not expensive		.575		
Tastes good		.569		
3. Familiarity and sensory appeal (9.78% variance, 1.60 eigenvalues, cronbach's α = .795)				
Looks nice			.701	
Helps me relaxed			.641	
Is like the food I ate when I was a child			.586	
Is what I usually eat			.518	
4. Religion (7.19% variance, 1.24 eigenvalues, cronbach's α = .865)				
Is permissible by my religion				.871
Has *halal* certification from the government				.765

The factor structure shows somewhat similar findings as in previous literatures attempting to modify the FCQ such as in Share and Stewart-Knox (2012) and Jauregui-Lobera and Rios (2011). This therefore confirmed that health and natural content is the most important factor people considered in their food choice decisions, not only in other populations but also among Malaysian adults‟ population. Other factors including convenience and price, and familiarity and sensory appeal are also important in the people‟s food choice motives.

The religion factor is derived from this study and understandable due to the fact that majority of the respondents were Muslims and strictly adhered to the Islam *syariah* in food consumption. The finding confirmed earlier study by Asma *et al*. (2010). The findings of this study are useful in exploring the consumers‟ motivation on food choice and thus beneficial to food marketers in segmenting market, targeting promotions and positioning healthy and *halal* food products that can satisfy the consumers‟ motives for food choice.

References

Asma, a, Nawalyah, a G., Rokiah, M. Y. and Mohd Nasir, M. T. (2010). Comparison of Food Choice Motives between Malay Husbands and Wives in an Urban Community. *Malaysian Journal of Nutrition*, *16*(1), 69–81. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/22691854

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E. and Tatham, R. L. (2010). *Multivariate Data Analysis*. Prentice Hall.

Jauregui-Lobera, I. and Bolanos Rios, P. (2011). What motivates the consumer‟s food choice? *Nutr Hosp*, *26*, 1313–1321. doi:10.1590/s0212-16112011000600018

Lindeman, M. and Väänänen, M. (2000). Measurement of ethical food choice motives. *Appetite*, *34*, 55–59. doi:10.1006/appe.1999.0293

Prescott, J., Young, O., O‟Neill, L., Yau, N. J. and Stevens, R. (2002). Motives for food choice: a comparison of consumers from Japan, Taiwan, Malaysia and New Zealand. *Food Quality and Preference*, *13*(7-8), 489–495. doi:10.1016/S0950-3293(02)00010-1

Share, M. and Stewart-Knox, B. (2012). Determinants of food choice in Irish adolescents. *Food Quality and Preference*, *25*(1), 57–62. doi:10.1016/j.foodqual.2011.12.005

Steptoe, A., Pollard, T. M. and Wardle, J. (1995). Development of a measure of the motives underlying the selection of food: the food choice questionnaire. *Appetite*, *25*, 267–284. doi:10.1006/appe.1995.0061

Tabachnick, B. G. and Fidell, L. S. (2007). *Using multivariate statistics*. *PsycCRITIQUES* (Vol. 28, p. 980). doi:10.1037/022267

SOCIO-DEMOGRAPHIC PROFILE ROLE IN AWARENESS AND PREFERENCE TOWARDS NATURAL AND SYNTETIC FUNCTIONAL FOOD IN MALAYSIA

***Phuah Kit Teng,** Golnaz Rezai, Zainalabidin Mohamed, Mad Nasir Shamsudin
Department of Agribusiness and Information Systems, Faculty of Agriculture,
Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia
*Corresponding author. E-mail: **phuahkitteng@gmail.com**

Abstract

The concept of functional food is not new to Malaysian people. Traditional medicines have made tremendous contributions over the last centuries. However, some of the remedial formula for tradition foods and drinks has been forgotten due to the advent of pharmaceutical technology and industry. Therefore, consumers have started to consume synthetic functional food. Natural functional food in this study refer to food that do not need any modification, are derived from natural sources such as traditional food and drinks, herbs, fruits and vegetables. On the other hand, synthetic functional food include modified food, medical food and food for special dietary use or those that provide health benefits in addition to nutrient contributions.

The growth in the economy, coupled with a strong desire among the Malaysian consumers to maintain a healthy lifestyle and the growing awareness of functional ingredients is driving the functional food and beverages market. Although the consumption of functional food is increasing, relatively little is known about consumer awareness towards these products and their preference towards natural and synthetic functional food in Malaysia. Therefore, to gain success in the functional food market, all firms involve in the food industry need to explore consumers' preference towards functional food with natural or synthetic compounds and their awareness towards these type of food. The objective of this study is to determine Malaysian consumers' awareness and preference towards natural and synthetic functional food.

A survey was conducted in Malaysia where 2004 household were interviewed by using structured questionnaires and systematic random sampling was used in this study. Figure 1 shows the conceptual framework of this study used to investigate the socio-demographic variables that influence consumers' awareness and preference towards functional foods. Therefore, socio-demographic profile such as marital status, area, household size, age, education level, gender, income and child under 18 are used in this study to determine the relationship between consumer awareness and preference and socio-demographic profile of consumers.

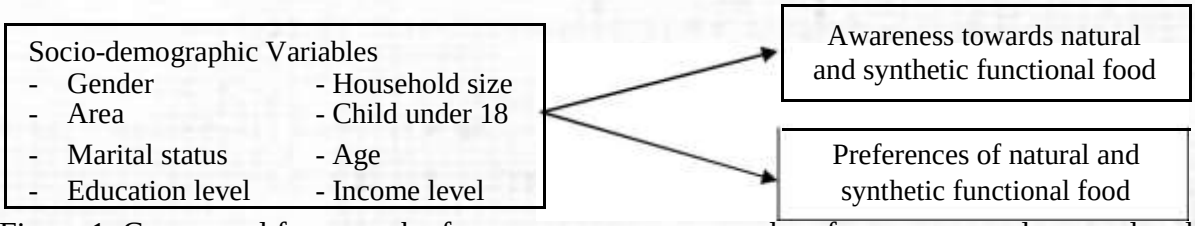


Figure 1. Conceptual framework of consumer awareness and preferences towards natural and synthetic functional food

The focus of this research is to find a significant relationship between variables which influenced consumers' awareness and preference on natural and synthetic functional food.

Therefore, Chi-square analysis was used to analyze the data collected and three hypotheses are tested in this study.

Hypothesis 1: There is no significant difference between respondents' socio-demographic profile and their awareness towards natural functional food.
Hypothesis 1: There is no significant difference between respondents' socio-demographic profile and their awareness towards synthetic functional food.
Hypothesis 2: There is no significant difference between respondents' socio-demographic profile and consumer preference towards natural and synthetic functional food.

The result of this study show that Cronbach's alpha value was 0.943 which means there was consistency among the conceptual framework items and therefore the model is fit for this study. Moreover, the results of Chi-square test indicate that some of the selected socio-demographic variables have significant relationship with consumers' awareness and preference towards natural and synthetic functional foods in Malaysia.

Table 1 shows the chi-square value and the consumers' awareness towards natural functional food. The result shows that race, area, marital status, education level, age, income level and child under 18 year old have significant different with their awareness towards natural functional food. It shows that consumers from urban areas are more aware about natural functional food than consumers from suburban areas (χ^2 = 16.933, p <0.01). The results also shows that respondents who were Chinese (χ^2 = 29.930, p <0.01), married (χ^2 = 35.468, p <0.01), younger (26 to 35 years old) (χ^2= 76.208, p <0.01), have at least a tertiary education (χ^2= 20.318, p <0.05), income level between rm1501 to rm3000 (χ^2= 52.352, p <0.01) and have child under 18 year old more aware about natural functional foods than others (χ^2= 22.536, p <0.01).

Table 1. Relationship between Demographic Profile and Consumer Awareness towards Natural Functional Food

Socio-demographic Variables	Chi-square	Socio-demographic Variables	Chi-square
Gender	2.257	Age	76.208***
Race	29.930***	House hold size	10.039
Area	16.933***	Income Level	52.352***
Marital Status	35.468***	Child under 18	22.536***
Education Level	20.318**		

***Statistically significant at the 0.01 level and **at the 0.05 level

Table 2 shows the chi-square value and the consumers' awareness towards synthetic functional food. The result shows that race, area, marital status, education level, age, household, income level and child under 18 year old have significant different with their awareness towards natural functional food. It shows that consumers from urban areas are more aware about synthetic functional food than consumers from suburban areas (χ^2 = 17.778, p <0.01). The results also shows that respondents who were Malay (χ^2 = 30.631, p <0.01), married (χ^2 = 46.490, p <0.01), younger (26 to 35 years old) (χ^2= 61.128, p <0.01), household size between 5 to 6 person (χ^2= 61.413, p <0.01), have at least a tertiary education (χ^2= 43.217, p <0.01), income level between rm3001 to rm4500 (χ^2= 64.089, p <0.01) and have child under 18 year old more aware about synthetic functional foods than others (χ^2= 33.126, p <0.01).

The information presented in Table 3 shows the chi-square test results for the socio-demographic variables and consumer preference towards natural and synthetic functional food.

Table 2. Relationship between Demographic Profile and Consumer Awareness towards Synthetic Functional Food

Socio-demographic Variables	Chi-square	Socio-demographic Variables	Chi-square
Gender	5.081	Age	61.128***
Race	30.631***	House hold size	61.413***
Area	17.778***	Income Level	64.089***
Marital Status	46.490***	Child under 18	33.126***
Education Level	43.217***		

***Statistically significant at the 0.01 level

The result shows that race, area, marital status, education level, age, household, income level and child under 18 year old have significant different with their awareness towards natural functional food. It shows that consumers from urban areas more prefer natural functional foods than synthetic functional food (χ^2 = 92.355, p <0.01). The results also shows that respondents who were Malay (χ^2 = 28.694, p <0.01), married (χ^2 = 17.585, p <0.01), age between 26 to 35 years old (χ^2 = 108.269, p <0.01), household size between 5 to 6 person (χ^2 = 7.119, p <0.10), have at least a tertiary education (χ^2 = 55.836, p <0.01), income level between rm1501 to rm3000 (χ^2 = 73.509, p <0.01) and have child under 18 year old more prefer natural functional food than synthetic functional foods (χ^2 = 44.085, p <0.01).

Table 3. Relationship between Demographic Profile and Consumer Preference between Natural and Synthetic Functional Food

Socio-demographic Variables	Chi-square	Socio-demographic Variables	Chi-square
Gender	1.136	Age	108.269***
Race	28.694***	House hold size	7.119*
Area	92.355***	Income Level	73.509***
Marital Status	17.585***	Child under 18	44.085***
Education Level	55.836***		

***Statistically significant at the 0.01 level and *at the 0.10 level

In conclusion, functional food is becoming increasing importance for the food industry particularly in Malaysia. However, some of the functional food was produce in the mass foodstuff market with references typified by general information about the function and not being specific enough in Malaysia. They are generally displayed amongst the conventional food products, packaged and shared the same top line brand as the non-functional food versions. Therefore, consumers are not aware that they are consuming functional food. Companies should display functional food products differently with other food so that the consumers can differentiate it from other food products. Marketing strategy for natural and synthetic functional food must take into consideration the market segmentation as each product has its own niche market. The marketing strategy for natural functional food and synthetic functional food is different depending on their sale conditions and distribution. The synthetic functional food either can be sold as a prescriptions drug at the pharmacies which may need the health professional advice or it can be sold as a health food such as energy drink or cholesterol lowering margarines at the supermarkets such Giant, Tesco, AEON BIG and AEON. On the other hand, natural functional food can be found in traditional markets and super markets as a herbs, oils and spices

Keywords: Awareness, natural functional food, preference, synthetic functional food

EFFECT OF DEMOGRAPHIC PROFILE ON CONSUMER BEEF PREFERENCE

Sitihawa, J., Golnaz, R., Juwaidah. S., Rika.T and Zainalabidin, M.
Department of Agribusiness and Information System
University Putra Malaysia, Serdang, Malaysia
Corresponding e-mail: merahjambu1218@gmail.com

Abstract
The purpose of this study is to understand the relationship of the demographic profile such as gender, living area, age, education and income level from chi-square analysis on the effect of demographic profile on consumer beef preference. The study was conducted in Peninsular Malaysia where 1164 consumers were interviewed by using survey questionnaire. Descriptive analysis, reliability test and chi-square analysis were used in this study. The result shows that beef freshness and beef from local will influence the consumer beef preference.

Keywords:
Preference, beef, demographic profile, chi-square analysis, freshness

Introduction

The livestock industry in Peninsular Malaysia comprises two major sectors; a highly commercialized pig and poultry sector, and a comparatively lagging ruminant sector. Livestock sub-sectors were an important and integral component by providing gainful employment and producing useful animal protein food for the population in agriculture sector (FAO, 2004).

In real fact, per capita consumption of poultry was much higher at 33.8 kg compared to per capita consumption of 5.8 kg for beef in 2003 (FAO, 2007). The high per capita consumption of poultry relative to beef is not only because poultry is the cheapest form of meat available and homogeneous to all races in Malaysia but is also reflective of consumer health concerns. This is probably well explained by Clancy (1986) who stated that there are relationships between saturated fats and nutrition and health, highlighting the possible health diseases due to the consumption of beef. Increased health awareness has motivated western beef producers to produce modern lean or organic red meat, which is trimmed of visible fat. Malaysia is heavily dependent on imports, as local beef production is unable to meet the increased in national demand for beef. The preferences of beef has cause consumer aware to get the best quality of beef to consume. Each consumer may have their own preference and it may be vary from preparation, price, texture, taste, color, freshness and also the country of origin. Food safety and food hygiene also become important factors for beef attribute and preference by consumer. It is consistent with study from Ted (2007) that food safety concerns have had dramatic impacts on food markets in general and beef markets in particular in recent years.

According to a research done by Suria and Sabri (2013), freshness play an important role in capturing the customer's heart. Freshness usually refers to the fresh state of food and appears to be related to crispiness, juiciness, and aroma (Peneau et al., 2006). It is important to purchase fresh food to maintain good health and enjoy the taste of food. How the product looks is important to judge the freshness of the meat, especially when meat has been packaged in retail outlets (Warriss, 2000). It was found that freshness of food as a crucial intrinsic quality cue of food (Jaksa et al, 1999; Johns and Tyas, 1996; Acebron and Dopico, 2000). At the time of purchase, consumers rely entirely on visual cues. For instance, in determining the freshness of beef, the meat was expected to have a bright red color (Chamburi and Batt, 2009). Additionally, freshness was often cited as one of the most influential variables impacting on the consumers'

decision to purchase fresh meat (Verbeke and Viaene, 2000). Today as Malaysian become more affluent the demand for beef, thus it is inevitable to investigate the significant difference between the demographic profile and consumer beef preference.

Materials and Methods

This study was conducted in Peninsular Malaysia from April 2013 until May 2014. Systematic random sampling methods were used and survey questionnaire were designed. A total of 1164 consumers were interviewed using structured questionnaire. Seven point likert scale of 1 to 7 (1 represent strongly disagree and 7 represent strongly agree) and dichotomous questions were use in the structured questionnaire.

Descriptive statistics, reliability test and chi-square analysis were use to achieve the objective of the study. Descriptive analysis was used to summarize the socio- demographic profile of the respondents while chi-square analysis is to identify the relationship between demographic profile and beef preference dimension. Cronbach's alpha is used to measure the internal reliability consistency.

Results and Discussion

Cronbach's alpha value was obtained from reliability analysis and the value was 0.924. Therefore, we can conclude that the model is fit for this study.

Demographic profile of the respondents

In this study, the demographic analysis result shows that the most of the respondents are females 676 (58.1 percent) and stay in urban area (62.0 percent). Since more Malaysian population is educated, majority of the respondents have at least a tertiary or higher tertiary education level (62.0 percent) and majority of the consumer were Malay (83.0 percent). With regard to age, half of the respondents are between 26 to 40 years old (57.0 percent), 28.2 percent between 41 to 60 year old, 9.7 percent are below 25 years old and only 5.1 percent are above 61 years old. In terms of income distribution, 54.2 percent of the respondents earned between RM 2001 – RM 3500 per month, 25 percent earned below RM2000, 15.8 percent earned between RM3501 to RM5000 and only 5.0 percent of respondents had monthly income above RM 5001.

Chi-square analysis

Consumer preference on beef is different from country to country. Therefore, it is interesting to find the relationship between the demographic profile of the consumer such as gender, living area, age, education level and income with the consumer beef preference.

Table 1 shows the results of chi-square test between the respondent demographic characteristic and preference for local beef. The results shows that only one demographic profile which are household size were not have a significant relationship with the preference for local beef. Female respondents and married are preferred local beef as their consumption. While for geographical area, respondents who lived in urban area they are consume beef more regular than others. According to the table 1 the result also indicates that gender of respondents shows statistically significant difference with consumer preference for local beef. Based on the cross tabulation respondents who were above 36 years old are prefer to consume more local beef compare to other. In respondents with higher education are more likely preferred to consume local beef. While respondents who have higher income they are more choose local beef as their choices.

Table 1 Relationship between Demographic Profile and preference for local beef

Variables	X^2
Gender	21.269**
Age	39.360**
Area	20.895**
Marital status	36.627***
Education Level	39.830**
Income Level	56.250***
Household size	7.799

(***Statistically significant at the 0.01 level, ** 0.05 level and *0.10 level)

Information presented in Table 2 shows the chi-square results in testing the relationship between demographic profiles and choosing freshness when purchasing beef. The results of Chi-square test of independent showed that there is a significant relationship between gender, age, marital status, education level and income level with the consumer preference the freshness when purchasing beef. Female respondents and married stated that they prefer freshness when purchasing beef. The consumers who have higher education level are more prefer freshness while purchasing beef products. Furthermore, the respondents who have higher income seem to have a higher preference towards the freshness when purchasing beef. The result showed that the respondents who were from urban areas are more concerned about the food safety and quality in terms of freshness when making purchasing behavior than the respondents lives in suburb areas. In addition, oldest respondents who were above 36 year old have high preferred towards freshness when purchasing beef than younger respondents. On the other hand, residential area and household size did not show any significant difference with the respondents' prefer freshness when purchasing beef.

Table 2 Relationship between Demographic Profile and the freshness of beef as the main attribute when purchasing beef

Variables	X^2
Gender	42.299***
Age	52.001***
Area	7.190
Marital status	11.633**
Education Level	61.915***
Income Level	54.605***
Household size	7.483

(***Statistically significant at the 0.01 level, ** 0.05 level and *0.10 level)

In summary, there is a strong relationship exists between gender, age, marital status, income and education level with preference for local beef and freshness of beef as the main attribute when purchasing beef. Residential areas are found not all have significant association to those preference dimensions. However, household size is the only variable that has no significant relationship towards the preference for local beef and freshness of beef among the consumers.

Discussion

The result of this study shows that Malay demand more beef than other races. Due to religion beliefs, only small population of Chinese and Indian consume beef in Malaysia. Based on the result in the study, it is shown that local beef and freshness of beef have significant association between demographic profile and those preferences. The recommendation of this study is marketers or producer should concentrate on segmenting beef according to those preferences among Malaysian. The segmentation can be useful tool to develop different marketing strategies for each segment of the market.

References

Chamburi, N., and P.J. Batt., (2013), International Food and Agribusiness Management Review, 8-20.

Yeong-Sheng Tey, and Mad Nasir Shamsudin and Zainal Abidin Mohamed and Amin Mahir and Alias Radam. (2008), Demand for meat products in Malaysia, *Munich Personal RePEc Archive.*

Ahmad Hanis, I.A.H, Jinap, S., Mad Nasir, S.and Alias, R.., (2013), Consumers' Demand for Red Meat Attributes in Malaysia, *Journal of Economics and Management*, 7(1): 17 – 27 (2013).

Roger D. Hanagriff.,Ryan D. Rhoades.,D.Wilmeth., (2009), Consumers' Consumer Preferences in Purchasing Beef and the Values they Attribute to Branded Beef Products.

Nik. Mustapha R. Abdullah and A. Z. Baharomshah, (1988), Meat demand in Malaysia; Testing for Habit formation and structural change, *Journal of agriculture economic.*

Jayson L. Lusk and Natalie Parker., (2009), Consumer Preferences for Amount and Type of Fat in Ground Beef, *Journal of Agricultural and Applied Economics, 41,1:75–90*

EFFECTS OF SOCIO-DEMOGRAPHIC CHARACTERISTICS ON CONSUMERS' PURCHASE INTENTION TOWARDS SEAWEED-BASED PRODUCTS IN MALAYSIA

Nurliyana, A.M., Juwaidah. S.,Zainalabidin, M.,and Golnaz, R.
Department of Agribusiness and Information Systems,
Universiti Putra Malaysia, Serdang, Selangor
Corresponding Email: myz1189@gmail.com

Abstract

Seaweed industry is one of the main potential high value industries to be commercialized in Malaysia. Many marketers tap into this industry by producing various type of seaweed-based products. Prior to the release a lot more of new seaweed-based product, it is vital to ensure that the product meet the consumer expectation. Therefore, this study aims to understand the relationship between socio-demographic profile and consumers' purchase intention towards seaweed-based health supplements. Data from 1200 respondents was collected using self-administered questionnaire. Descriptive analysis and Chi-square analysis were used to accomplishthe objective of the study. The findings revealed that selected socio-demographic profile such as gender, age, and area of living are significantly influenced consumers' purchase intention towards seaweed-based health supplements. The results from this study will hopefully serves as a guide for the marketers and help them in planning appropriate marketing approaches in targeting the consumers.

Keyword
Seaweed, Health Supplement, Purchase Intention

Introduction

Seaweed is marine macro algae which possess a great variety of bioactive compound with a broad spectrum of biological activity that benefits human health (Suhaila, 2011). In third National Agriculture Policy, seaweed has been highlighted as one of the most important aquaculture commodity in Malaysia with the production value estimated to reach around RM 1.45 billion in 2020 (Sabah Times, 2013). In 2013, Sabah dominated the seaweed industry with earning of RM 66 million as the production increase from 23 940 metric tons in 2012 to somewhat of 35 000 metric tons 2013 (DOF, 2013). *KappaphycusalvareziiEucheumaspinomus*is main type of seaweed produced in Sabah which has intensive application especially in food and health industry (MIMA, 2009). With the growing interest in the use of seaweed as an active component (Jeff *et al*., 2011), it has driven a development of new commercial product such as seaweed-based health supplement. Demand growth especially for healthcare product with functional value is likely to be sustained by a better economic performance, growing concern of healthy lifestyle, and wider product availability. Hence, attention to the need for assessment of consumer behavior and to the application of health supplement with seaweed based is devoted.

Material and Method

Total of 1200 completed and useable set of questionnaires was obtained. Based on the market share and store observation, the most available product with seaweed-based which is health supplement product was chosen as targets for the questionnaire. The questionnaire comprises of 63 questions with three parts containing both Likert scale and binary items. Prior to data analysis, descriptive statistics, reliability test, and chi-square analysis were used to attain the objective of the study. Cronbach's alpha reliability coefficient is used to determine the consistency of the data. The Cronbach's alpha test was determined and the value obtained was 0.899. This indicated that the survey instrument (questionnaire) is fit for this study.

Results and Discussion

From descriptive statistics analysis, it shows that most of the respondents are female which comprised 54.7% of the total respondents. In terms of age, 82.1% of the respondents age from 18 to 44 years old, which considered the active working age. 52.7% of the respondents were Malay while the other 47.3% of the respondents' ethnicity are Chinese, Indian, and others. With regard to the education level, 65.3% of the respondents are degree and diploma holders, while 17.5% of respondents have master degree or better. Monthly income of the respondents is highest for the range between RM1001 to RM3000 (58.27%) and RM3001 to RM5000 (29.84%). 71.2% of the respondents are from the urban area, while 28.8% of them are from sub-urban area.

The descriptive data including mean, and standard deviation of consumers' purchase intention was obtained and shown in Table 1. Seventy one percent of the respondents are planning to buy seaweed-based health supplements and 59.1% of respondents are thinking to purchase seaweed-based supplement sometimes in future. Moreover, 64.1% of the respondents agree with the statement that they are likely topurchase seaweed-based health supplement.

Table 1: Respondents' Purchase Intention towards Seaweed-based Health Supplement

Statement	Likert Scale (%)					Mean	Standard Deviation
	1	2	3	4	5		
I plan to buy seaweed-based health supplement.	1.6	3.9	23.6	46.2	24.8	3.89	0.878
I have not bought seaweed-based health supplement in the past, and I'm thinking about purchasing seaweed-based health supplement now or sometimes in future.	0.1	2.8	38.1	41.7	17.4	3.74	0.777
It is likely that I will purchase seaweed-based health supplement.	0.9	4.4	30.6	45.6	18.5	3.76	0.833

To find the relationship between socio-demographic profiles of the respondents and their purchase intention towards seaweed-based health supplement product, Chi-square was used. Table 2 shows that only three socio-demographic characteristics which are gender, age, and area of living have a significant relationship with consumers' purchase intention towards seaweed-based health supplement. Female respondents (X^2 = 58.987, $p<0.01$) have a more positive intention to purchase seaweed-based health supplement compared to male respondents. In terms of age, respondents who are between 25 to 34 years of age have more positive intention towards seaweed-based health supplement than the other respondents (X^2 = 11.394 , $p<0.05$). The results also shows that consumer who live in urban area (X^2 = 49.888, $p<0.01$) are likely have a higher purchase intention towards seaweed-based health supplement compared to respondents live in sub-urban area.

Table 2: Chi-square Value and Respondents Purchase Intention towards Seaweed-based Health Supplement

Socio Demographic Variable	X^2	Decision
Gender	58.987**	Reject H_o
Age	11.394*	Reject H_o
Race	2.494	Fail to reject H_o
Education Level	4.306	Fail to reject H_o
Monthly Income	7.474	Fail to reject H_o
Area of Living	49.888**	Reject H_o

** Significant at 1% level * Significant at 5% level

Conclusion

This study sought to estimate consumers' purchase intention towards seaweed-based health supplement. The results of the study indicated that there are relationship between the selected socio-demographic profile and intention to purchase seaweed-based health supplement. The major factors which are significant in predicting the intention of Malaysian consumers in purchasing health supplement with seaweed-based are gender, age, and area of living. This study suggest that female consumers who aged between 25 to 34 years old and live in urban area are likely to have higher purchase intention towards seaweed-based health supplement. The socio-demographic profiles are very useful in defining the target audience for the marketing. For such reason, this information might be beneficialfor marketers of seaweed-based product in targeting their consumer. Moreover, this study can be used as the basis for marketing campaign promoting seaweed-based product.

Reference

Jeff, T., Alan, T., Lynn, M., Scott, A., & Allan, F. (2012).On land cultivation of functional seaweed products for human usage.*Journal of Applied Phycology, 24,* 385-392.

Krystallis, A., Maglaras, G., & Mamalis, S. (2008). Motivations and cognitive structures of consumer in their purchasing of functional food.*Food Quality and Preferences*, 19, 525-538.

MALAYSIA: Seaweed industry eyes RM 1.45 billion in total revenue by 2020 (2013, February). *Insight Sabah newsletter*.Retrieved from http://www.scoop.it/t/alieia-info/p/3997638505/2013/02/28/malaysia-seaweed-industry-eyes-rm-1-45-billion-in-total-revenue-by-2020.

MIMA, Maritime Institute of Malaysia. (2009). *Seaweed Culture and Utilisation in Malaysia:Status, Challenges and Economic Potential: 2009.* Retrieved from http://www.mima.gov.my/mima/wp-content/uploads/seaweed%20report%20-%20bullet%2039.pdf

Phang, I., Lee, I., & James, E. (2010).The influence of consumer characteristics on the acceptance of new seaweed food products. *Journal Kemanusiaan, 15*, 97-107.

Suhaila, M. (2011).Healing Power of Malaysian.*Seaweeds Synthesis: R & D Digest of Universiti Putra Malaysia*, 1 (1). ISSN 0127-9394.

Urala, N., &Lahteenmaki, L. (2007).Consumers' Changing attitude towards functional food.*Food Quality and Preferences*, 18, 1-12.

FOOD SECURITY CHALLENGES IN NIGERIA: A PARADOX OF RISING DOMESTIC FOOD PRODUCTION AND FOOD IMPORT

Haruna U.; Ahungwa, G. T*; Abdullahi M. A. and Muktar B.G.

Department of Agricultural Economics and Extension, Federal University Dutse, P.M.B. 7156, Dutse-Nigeria.

* Corresponding author: +234(0)7036819123, e-mail: ahungwagt@yahoo.com

Abstract

The paper examined the food security challenges vis-á-vis the paradox of increased domestic food production and food import in Nigeria. The study used time-series data from National Bureau of Statistic, Central Bank of Nigeria, Nigeria's National Dailies and CIA Factbook reports. The trend analysis showed that the share of agriculture to the total Gross Domestic Product, GDP had a downward trend, especially from 1960-1979, where food import hovered around 2.92% from 1960-74 and up to 9.85% in 1975-79 of GDP. The result depicts an undulating trend in the contribution of agriculture and food import values to 2009 where food import rose astronomically from ₦2.6trillion (3.83%) in 2005-2009 to about ₦20.6trillion (25.02%) in 2010-2012. Results of the regression analysis confirmed that agriculture has a positive relationship with GDP, and contributes significantly with a coefficient of 0.852. The paradox however is that food import negates the a priori expectation as it is found to be positively related to the GDP: as food production increases marginally, food importation increases asymptotically. The paper recommends that reliance on food import could be minimized through increased budgetary allocation to the agricultural sector, and improvement in postharvest management practices that have hitherto, aggravated food insecurity in the country.

Keywords: Food security, Paradox, Domestic food production, Food import, Nigeria.

Introduction

The United Nations Food and Agriculture Organization (FAO) has warned repeatedly of catastrophic food shortages in Africa, because the average per capita calorie intake in majority of African countries has now fallen below the minimum nutritional standards, considering the relatively poor performance of the agricultural sector. The warning outlined one of the important challenges for agriculture in development as the neglect of this sector in the development priorities of the governments of African countries (Ehigiamusoe, 2012). This development has predisposed the continent to the twin jeopardy of severe poverty and a glaring state of food insecurity.

Recent statistics depicts that, the agricultural sector in Nigeria has not been able to fulfill its traditional roles of feeding the population, meeting the raw materials needs of industries, as well as providing substantial export earnings for the economy. Indeed, the contribution of the sector to total Gross Domestic Product (GDP) has been falling, not necessarily because a strong industrial sector is displacing agriculture but as a result of low productivity. The largely subsistence agricultural sector has failed to keep up with rapid population growth of Africa's most populous country - once a large net exporter of food, but now a net food importer (Nwajiuba, 2012).

It is on record that Nigeria faces huge food security challenges as about 70 percent of her population lives on less than US$ 1.25 per day, thus, suffering from hunger and poverty (Nwajiuba, 2012). Nigeria's claim to remain an agrarian economy hinges on two key facts: the first is the share of agriculture in the Gross Domestic Product (GDP) and the second is the proportion of the population engaged in the agricultural sector. On both scores, the agricultural sector contributes more than any other sector of the economy, providing over 40% of GDP while the population of Nigeria involved in agriculture is between 60 and 70% (Nwajiuba, 2012). However, according to the Nigeria's senate President, David Mark as quoted in *Thisday* Newspaper (May, 3, 2012), and Govenor Mimiko as reported by

Okocha and Akinsuyi, (Thisday live 28 Sept, 2011), Nigeria still spends about N24.5 trillion on food importation per annum.

Nigeria is naturally blessed with abundant land and water resources, which have given the nation's agricultural sector high potentials for increased growth, but these potentials are not being fully realized, prompting the nation to set up the Vision 2020 wherein, agriculture is pivotal to its realization of positioning herself amongst the 20th world leading economies by the year 2020. Despite all these obvious abundant human and natural resources, the country is still unable to feed its' citizens, producing for instance, about 500,000 tons of rice while the annual consumption is about 2.5 million tons, hence Nigeria is the world's second-largest rice importer after Singapore. Over the past 20 years, food production increase has not kept pace with population growth, resulting in rising food imports and declining levels of national food self-sufficiency (FGN, 2009).

It is on record that no country can truly be a sovereign nation if it is not capable of ensuring food security for its citizens. Histories have shown that no nation has actually become great without developing its agriculture and its concomitant institutions (Isife and Abert, 2009). Experts have argued that significant food and nutrition problems exist in Nigeria (Olayide, 1982; Famoriyo, 1998; Okuneye 2002; Ahungwa *et al*, 2013). Recent estimates put the number of hungry people in Nigeria at over 53 million of the country's total population and that 52 per cent of the populace lives below the poverty line (Azubike, 2012).

Statistics have shown that Nigeria has become a floodgate for food imports. For a country that has the potentials of supporting a wide range of agricultural ventures, still spends over ₦635 billion on import of wheat, ₦356 billion on import of rice, ₦217 billion on sugar importation and despite the huge marine resources, spent N97 billion importing fish as of 2010 (Adesina as quoted by Azubike, 2012). At the moment, Nigeria's food import has risen from $3 billion in 2009, $11 billion in 2010/11 to N24.5 trillion in 2012 as affirmed by Corporate Nigeria, (2009), Osagie (2013) and the Nigeria's senate president, David Mark (2012) and Okocha and Akinsuyi (Thisdaylive 28 Sept, 2011). The loss of food sovereignty and the dependence on food importation are also making the country quite susceptible to fluctuations in global food crisis. This explained why Nigeria was strongly affected by the global food crisis in 2007/2008.

The immediate response to the recent food crisis in the country propelled the Federal Government, through the ministry of agriculture and water resources then, to facilitate the development of a National Food Crisis Response Programme (NFCRP), The Food Security Thematic Group (FSTG), established in 2009 and the Food and Agricultural Organization (FAO) was invited to provide guidance. The Agricultural Transformation Agenda and Growth Enhancement Support Scheme were also introduced with the primary objective of import substitution to deal with the hidden hunger crisis confronting the country (Osagie, 2013).

Despite demonstrated efforts at building institutions to address hunger and poverty in the country, no further step has since been taken to consolidate set agenda. It is in this light that the paper seeks to examine the paradox of the Nigeria's massive food import amidst plenty opportunities of domestic food production.

Conceptual and Empirical Issues

Agricultural production was the mainstay of Nigeria's economy and a source of food. In the colonial era and briefly after independence, agriculture played a dominant role in the nation's economy from the standpoint of adequate food for its population. According to Akande (1998) at independence agriculture was able to match the expectation ascribed to it as regards food security.

Today, domestic food production is on the rise in Nigeria but it is not enough to meet the national food demand, worst is, still losses of produced crops are on the rise because processing and storage of crops are not adequately done (FGN, 2009). Nutritious foods are limited by low income, and poverty stricken citizens; most nutritious food is often expensive, food intake and nutritional wellbeing of many households is of relatively low quantity, and is affected by their low economic status. According to FAO (2011) households' food insecurity, under nutrition and micro nutrient deficiencies are found throughout Nigeria.

Ogen (2003) posits that during the first ten years after independence Nigeria could be seen as an agricultural economy because agriculture was the engine of growth of its overall economy, during this time Nigeria was the world's second largest producer of cocoa, and highest producer and exporter of palm-kernel and palm-oil. According to Lawal (1997) then Nigerian farmers produced 70% of Nigerian export and 95% of its food needs, thus helping to contribute immensely to the maintenance of a healthy population; and a source of food and nutrition for households in Nigeria. However, it has not done well enough, especially from the time the country started the production of crude oil in commercial quantity in the mid 1960's till now.

It was observed that, the volume of commodity output is inconsistent, even when it increases marginally and this showed poor performances of agricultural sector. However, a lot was said on the reasons of these poor performances, for example Abdulrahaman (2013) and Iganiga and Unemhilin (2011) attributed the problem to low budgetary allocation to the sector. In his opinion, Aditoloye (2012) blamed insufficient funds and how these funds are disbursed to the farmers by Agricultural Credit Guarantee Scheme. On the contrary, Iwuchukwu and Igbokwe (2012) put the blames on poor policies and agricultural programs.

Food Security in Nigeria

The food security in Nigeria hangs on a very delicate balance of domestic food production and volatile food imports, as asserted by many experts. Although the number of people faced with the problem of acute starvation in the country may not be alarming at the moment, like it is in some parts of the world, especially in the horn of Africa, a jolt on Nigeria's food supply system could push the country into a hunger challenge of adverse proportion.

Analysts have always noted that Nigeria's current food security is by no means sustainable. The most populous black nation on earth became a net importer of food, squandering $11 billion importing basic food commodities including wheat on which N635 billion was expended yearly and rice, on which Nigeria spent N356 billion annually, amounting to about N1 billion per day. So, although Nigeria is not currently enmeshed in famine, extreme lack of food or starvation, it is mainly for one reason only, and that is because every day, it still sells enough crude oil to purchase sufficient food to salvage its population from the brink of starvation. But this clearly is not a sustainable way to feed about 170 million people (Osagie, 2013).

A lot has been written on food crisis in Nigeria, a country once considered as a major food exporter now found itself in the midst of food importation. Adeniyi *et al* (2009), Adebayo (2010) and Abdulrahaman (2013), confirmed the existence of food insecurity in Nigeria. What causes the crisis is a subject of debate among scholars. For example Abdulrahaman (2013) is of the opinion that, the amount of statutory allocation given to the sector is too small for the sector to achieved its primary objective. Adeniyi *et al* (2009) pointed at poor agricultural policies and programs and the ways and procedures on how agricultural loans are disbursed to the farmers respectively are responsible for low agricultural productivity. In his contribution Adebayo (2010) blamed the effects of deregulation policies on agricultural sector as a consequence to food security. Other factors include high increase in the prices of food stuffs and the hand-work of hoarders in sabotaging enough food in the market.

Methodology

***Source of Data*:** This study is aimed at examining the interplay of domestic food production and food importation to the overall Gross Domestic Product (GDP) of Nigeria's economy (a proxy measure of the nation's wellbeing) using the time series data between 1960-2012. The data used in the study are the sectoral component shares of the Nigerian GDP, component shares of agriculture to the overall GDP (as a proxy value of domestic food production), and the values of food import (in N million). Data were obtained from the National Bureau of Statistics and Central Bank of Nigeria Annual report (CBN Statistical Bulletin, 2010); CIA Factbook (2013) and NPC annual report (2012).

***Data Analysis and Model Specification*:** Trend analysis and multiple regression analysis were used to examine the effects of component shares of agricultural production and food imports on the gross domestic product of the nation which serves as a pseudo measure of the nation's ability to meet the food needs of the populace.

***Double_Log Regression analysis*:** The model is explicitly expressed as:

$$LnGDP = Ln \propto + b_1 LnX_1 - b_2 LnX_2 + Ln\varepsilon$$

Where

$LnGDP$ = Gross Domestic product (at current basic prices, 1960-2012), = Intercept, $b_1 - b_2$ = regression coefficients, LnX_1 = log contribution of Agriculture to GDP (in N m), LnX_2 = log of annual food import bill (in N m) and $Ln\varepsilon$ = log of white noise error term assumed to be 1.

Results and Discussion

***Trend Analysis*:** Table 1 and Figure 1 show the contribution of agriculture and naira values of food import as the percentage of GDP of Nigeria. The contribution of agriculture depicts a downward trend from 1960 to 1979 (61.65 to 23.80%), whereas, the value of food imports were relatively stable at about 2.92% between 1960-1974; This observation is consistent with earlier findings by Ahungwa *et al* (2014) and Anyanwu *et al* (2013) which showed the dominance of agriculture share of GDP in the first two decades, though at a declining rate. The reason could be attributed to the fact that the nation's only alternative to economic sustenance was agriculture. Then, agriculture was able to play its traditional roles of food provision, earning of foreign exchange and provision of raw materials to the industries. However, there were drastic changes especially in the amount of food importation resulting from the neglect of the agricultural sector prior to the discovery of oil and also the resultant effect of the civil war in 1967-1970. Agricultural production declined and food importation rose sharply from 9.85% to 10.62% in 1975-1979 and 1980-1984, respectively. The sudden increase in food importation could also be linked to the windfall from oil sector and sudden change in taste for foreign food by an average Nigerian.

Agricultural sector continued to strive, contributing annually to the nation's GDP at an undulating rate between 31.30% in 1980-84 to 37.02% in 2010-2012. Food importation however, decline from 10.62% in 1980-84 to 5.21% in 1990-94. The situation was reversed, between 1995-1999 food import rose to 10.52% again. The advent of political dispensation ushered in a new dimension to the agricultural sector with introduction of a number of agricultural programmes and initiatives that generated so much interest among farmers. However, according to FGN Vision 20:20 (2009) such initiatives lacked concurrent provisions for storage and processing facilities, thus resulting in large postharvest losses and apathy on the side of the farmers.

The situation become alarming within the interval of 2010-2012 wherein agricultural share to GDP was 37.02% with an amazing figure of food import of 25.02%. Principal reason for such could be attributed to the resultant effect of the 2012 flood that affected over 12 states of the federation. Within this interval, the actual monetary values of food import rose from N4.2trillion to N24.5trillion, an amount five times the nation's annual budgets.

Table 1: Values of Agriculture and Food imports in relation to the total GDP of Nigeria (1960-2012)

Year	Total GDP	Agriculture		Value of food import (excluding vegetable oil and animal fats)	
	N'm	GDP N'm	%	N'm	%
1960-1964	2568.40	1579.64	61.65	45.04	2.87
1965-1969	3088.58	1640.26	53.27	42.1	2.55
1970-1974	9314.62	3268.40	39.69	104.58	3.13
1975-1979	31233.22	7328.64	23.80	760.62	9.85
1980-1984	51809.44	16426.78	31.30	1602.04	10.62
1985-1989	119632.20	44270.86	38.12	1575.04	3.69
1990-1994	539207.30	181622.32	32.55	9429.96	5.21
1995-1999	2668070.00	920018.08	34.32	94025.02	10.52
2000-2004	22500196.0	2734641.32	37.05	159706.6	6.80
2005-2009	20560630.0	6929310.42	33.50	264868.0	3.83
2010-2012*	37129386.5	12368898.7	37.02	2057333.3	25.02

Sources: CBN Statistical Bulletin, 2010; *NPC (2013); *CIA Factbook (2012)

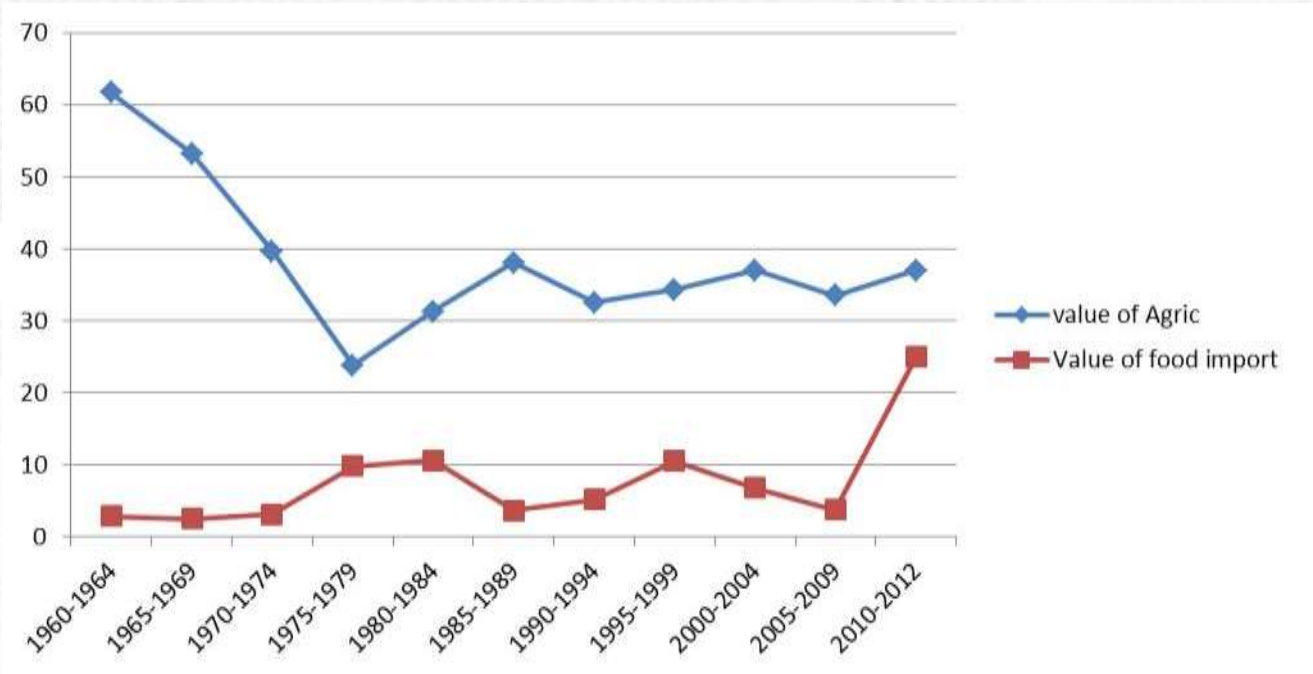


Fig.1: Values of the contribution of Agriculture to GDP and food import (1960-2012)

***Regression Results*:** The Double-Log regression model was used to explain the impact of the shares of agricultural sector and the values of food import on the GDP. The results of the regression shows that there is a positive relationship between the dependent variable (GDP) and the share of agriculture which also conform to the *a priori* expectation that agriculture is positively related to the GDP. The magnitude of the coefficient of agriculture (0.852) is statistically significant at 1% level. This implies that a percent increase in the share of agriculture will contribute to about 85.2% change in the GDP of Nigeria. The findings further confirm the pivotal role of agriculture to the Nigeria' economy (Kola, 2011; Umaru and Zubairu, 2012; Anyanwu *et al*., 2013, and Ahungwa *et al*. 2014).

The paradox however, is that the coefficient of food import, expected to be inversely related to the GDP was found to be positive, though not statistically significant. This negates the findings of Muhammad and Atte (2006) which indicated that as food import increases, domestic agricultural production decreases. Nonetheless, statistical figures available showed otherwise. Whereas the domestic food production was on a marginal increase, especially in the recent years, due to government renewed efforts in agriculture, food importation is rather on the increase. Deductively, it could be averred that food import is contributing rather to the GDP through raised import duties and tariffs (e.g. 100% on rice), as well as internally generated revenues from such business ventures. Empirically, the negation could be attributed to the facts that the various government initiatives that generated interest in agricultural production were without concurrent provisions for storage and processing, thus resulting in large postharvest losses and apathy on the side of the farmers (FGN, 2009). Moreso, the population increase that has jumped from 160 million in 2006 to about 170 million in 2012, thus bringing Nigeria to the 7^{th} most populous nation, is not accompanied with corresponding domestic food production. This is in consonance with the view of Nwajiuba, (2012) that domestic food production is unable to feed the growing population.

The R^2 of 0.994 implies that 99.4 percent of total variance in GDP is explained by the regression equation. Coincidentally, the goodness of fit of the regression remained same after adjusting for the degrees of freedom as indicated by the adjusted R^2 (R^2 = 0.987 or 98.7%). F-statistics 1960.46, which is the measure of the joint significance of the explanatory variables, is found to be statistically significant at 5 percent as indicated by the corresponding probability value (0.000).

Table 1: Parameters of regression results of agriculture and food import of the GDP against total GDP

Variables	Coefficients	t-statistics	Sig.
(Constant)	-	2.892	.006**
Agriculture	.852	10.548	.000*
Food Import	0.144	1.783	.081
R-square	0.994		
Adjusted R-Square	0.987		
F-statistic	1960.457		.000*

* = Significant at 1%, **= Significant at 5%

Conclusion and Recommendations

The Nigeria food equation hangs on a delicate balance of domestic food production that is heavily dependent on natural forces and volatile food imports that is only sustainable as long as the proceeds from the oil sector keep flowing. The concurrent increase in domestic food production and

food import were as a result of monumental postharvest losses resulting from inadequate storage and processing facilities, growing consumer population and overdependence of the agriculture on weather that is highly unpredictable.

The paper recommends that to minimise the increasing reliance on food import, it is essential that productivity enhancing measures be implemented in the agricultural sector such that food production can expand at a rate that is commensurate with food deficit caused by increasing population. This could be achieve through increased budgetary allocation to the agricultural sector, raising of embargo on food produce that the nation has comparative advantages to produce and introduction of postharvest saving mechanism that will minimize wastages that have hitherto, exacerbated food security in the country.

Reference

Abdulrahaman, S. (2013): Expenditure on Agricultural Sector and Food Security in Nigeria *International Journal of Social Science Tomorrow, Vol. 2 (1) Pp 1-6.*

Adebayo, A. A (2011). Food security status in Nigeria: pre and post Economic deregulation review, Int'l Journal of Economic Research and Investment, Vol1, No. 1, 2010, Pp 132-150).

Adeniyi, I. M.; AbdulRasheed, A. and Bello, A. I. (2009). Agricultural Credit Guarantee Scheme and Food Security in Nigeria. *Journal of International Economic Review. Vol. 2 (1-2) Pp167-176.*

Adetiloye, K. A. (2012) Agricultural Financing in Nigeria: An Assessment of the Agricultural Credit Guarantee Scheme in Nigeria (1978-2006) *J Economics, Vol. 3 (1) Pp 39-48*

Agriculture in Nigeria (2011) State of Food Security in Nigeria. Retrieved on 2nd October, 2011 from http://aricultureinnigeria.blogspot.com/2011/04/state-of-food-security-innigeria. html Time 5:25pm

Ahungwa, G.T; J.C Umeh and Muktar, B.G (2013). Empirical analysis of food security status of households in Benue State, Nigeria, *International Organisation of Scientific Research Journal of Agriculture and Veterinary Science (IOSR-JAVS),* **6** (1): 57-62.

Ahungwa, G.T; U. Haruna and Rakiya Y. A. (2014). Trend Analysis of the Contribution of Agriculture to the Gross Domestic Product of Nigeria (1960 - 2012). *International Organisation of Scientific Research Journal of Agriculture and Veterinary Science (IOSR-JAVS),* **7** (1): 50-55.

Akande S.O. (1998). Public policy in Nigeria agriculture In Institutional reforms for agriculture development. Oludimu O.L. and Imodu P.B. (eds) Triumph Books Publishers PP 20-54

Anyanwu, S.O., U.S. Offor., O.M. Adesope and Ibekwe U.C. (2013). Structure and growth of the GDP (1960-2008): implication for Small and Medium Enterprises in Nigeria, *Global Advanced Research Journal of Management and Business Studies*. 2(6): 342-348.

Azubike, G (2012). Nigeria: Food Insecurity as a time bomb, March 2012 (http://allafrica.com/stories/201203110293.html), accessed 25/11/2013.

CBN (2010). Central Bank of Nigeria: Statistical Bulletin, 2010 Edition

Corporate Nigeria (2009). The Business, Trade and Investment Guide 2010/2011, www.corporate-nigeria.net, accessed 1/22/2014

Ehigiamusoe, U.K (2012). A Comparative Analysis of Agricultural performance between the Military and Civilian Regimes in Nigeria.*International Journal of Humanities and Social Science Intervention.***1** (1): 13-23.

Famoriyo, O. A. (1998). Institutional Framework for Agriculture and Food Production in Nigeria: Future Prospects. *Applied Tropical Agriculture,* 3(1), 1-9

FGN (2009). Report of the Vision 2020 National Technical Working Group on Agriculture and Food Security, July 2009.

Food and Agricultural Organization (2011). Global food losses and waste: Extent, causes and prevention. Study conducted for the International congress (FAO) Rome.

Iganiga, B.O. and D.O. Unemhilin (2011). "The Impact of Federal Government Agricultural Expenditure on Agricultural Output in Nigeria". *Journal of Economics*, 2(2): 81-88.

Iwuchukwu, J.C and Igbokwe, E.M (2012) Lessons from Agricultural Policies and Programs in Nigeria, Journal of Law, Policy and Globalization (online) retrieved on 10th January, available from www.iiste.org. Vol. 5 (2012)

Isife B.I and C. O. Abert (2009). Issues in developing a natural policy on agricultural extension services in Nigeria: *The perception of Extension Professionals Agric Journal* 4:22-26

Kola, D. (2001). "Non-oil Exports' Promotion: Concepts, Issues and Prospects" Bullion Publication of Central Bank of Nigeria, 25 (3): 32-38.

Lawal A.A (1997). The economy and the state from the pre-colonial times to the present. In Osuntokun, A and Olukoya A (eds). Nigeria People and culture Ibadan; Davidson.

Muhammad, L.A., and O.A Atte (2006). Analysis of Agricultural production in Nigeria. *African Journal of General Agriculture,* 2(1): *Pp132-150.*

Nwajiuba, C (2012). "Nigeria's Food Security Challenges", www.nestinterative.org, accessed, 11/25/2013.

Ogen O (2003). Patterns of Economic growth and development in Nigeria since 1960. In Arifalo S.O. and Ajayii (eds) (2003). Essays in Nigerian contemporary History. Lagos: first academic publishers

Okunneye, P. A. (2002). Rising Cost of Food Prices and Food Insecurity in Nigeria and Its Implication for Poverty reduction. *CBN Economic and Financial Review,* 39 (4), 6

Olayide, S. O. (1982). *Food and Nutrition Crisis in Nigeria.* Ibadan: Card.

Osagie, C (2013). Year 2013: The Struggle to Stem Indiscriminate Food Importation, Thisday Newspaper, 31 Dec. 2013. www.thisdaylive.com/news accessed, 6/3/2014.

Umaru, A. and A. A. Zubairu (2012). An Empirical Analysis of the Contribution of Agriculture and Petroleum Sector to the Growth and Development of the Nigerian Economy from 1960-2010, *International Journal of Social Science and Education*. 2 (4): 12

COST AND RETURN OF POULTRY SUBSECTOR IN COMPETITIVE MARKET ENVIRONMENT

Zuliana Zainal Abidin[1],Zainalabidin Mohamed[1], Ismail Abd Latif[1]and Abu Hassan bin Md Isa[2]
[1]Department of Agribusiness and Information Systems
Faculty of Agriculture Universiti Putra Malaysia
43400 UPM Serdang, Selangor, Malaysia
[2]Faculty of Economics and Business
Universiti Malaysia Sarawak
94300 Kota Samarahan, Sarawak, Malaysia
Corresponding e-mail: zam@upm.edu.my

Abstract

Poultry sub-sector is the most viable livestock sector in Malaysia. The rapid progresses of this subsector were partly due to technology, genetically improved breed and structural changes in the industry where private sector plays an important role in its research and developments. The primary data for this study was collected via face-to-face interview in peninsular Malaysia. A total of 200 poultry farmers have been selected by using stratified random sampling which was stratified into small, medium, and large size farm.The cost and return approach was used to analyze the data. It wasrecognized that large broiler farm will gain more revenue compared to medium and small broiler farm. Meanwhilechanges in feed cost, MVS cost, livestock purchase and fuel cost willaffectrevenueof the farm. The results of the study indicates that small broiler farm will incur losses if the cost of production was increasedby 10%, meanwhile for medium and large scale broiler farm the profit will decreasedby 75% 31% respectively.

Keywords:
Poultry, peninsular Malaysia, cost and return,feed cost, profit, revenue

Introduction

Agriculture is one of the largest sectors in the Malaysian economy. It contributed 7% to the gross domestic products (GDP) in 2013[excluding industrial crops such as oil palm, rubber and etc.]. The livestock sector alone contributing about 11.7% to the overall performance of the agriculture sector in 2012. Among all the livestock sub-sector, poultry is the most viable in Malaysia and due to its

commercialized and integrated in its production systems. The poultry productivity is the highest amongst the other livestock sectors and very close to international standards. The rapid progresses of this subsector were partly due to technology, genetically improved breed and structural changes in the industry where private sector plays an important role in its research and developments. The production in the country is more than sufficient to meet domestic demand since 1984 and this condition provides opportunities for poultry products to be exported. This industry is also expected to integrate and consolidate further to become more efficient and more productive in order to capitalize on the export market. However, this sub-sector is still very dependent on imported inputs such breeding stock, feed grain [especially corn], other feedstuffs and animal vaccines that make it uncompetitive to the changes in world price of such inputs. Thus it is inevitable to gauge whether the poultry sub-sector can be as competitive in future given the cost of inputs are increasing and the non-tradability of the inputs are almost zero.

Materials and Methods

The study was conducted in Peninsular Malaysia. The primary data was collected via face to face interviewed using structured questionnaire comprising the farmer's socio demographic profile, production cost including fixed cost and variable cost and the reconciliation table on production data. A total of 200 poultry farmers have been selected by using stratified random sampling. The production system for the poultry subsector was stratified based on farm size i.e. small, medium, and commercial size as defined by Department of Veterinary Services (DVS).The cost and return approach was used to calculate profit. Profit is given by the difference between the total revenue (TR) and the total cost (TC).Sensitive analysis was conducted based on changes in cost of production specifically in cost of feed, MVS, livestock purchased and fuel.

Results and Discussion

The results presented in Table 1 indicatethat the revenue levels were quite different between small, medium and large scale farm size. The cost of feed, MVS, fuel and livestock purchased apparently affects the revenue earned in the broiler production. The cost and return were calculated onaverage. Onaveragecommercial size broiler farm produced the highest revenue about RM4, 025,281.82, medium farm RM246, 681.60 and small farm only RM226.81for the accounting year of 2013

Table 1: Cost and return data for the accounting period of 2013 for different farm size

	Commercial farm	Medium farm	Small farm
Total Cost (TC)	12,893,388.00	1,898,458.32	713,944.37
Total Revenue (TR)	16,918,669.82	2,145,139.93	714,171.18
Profit	4,025,281.82	246,681.61	226.81

Source: survey

Sensitivity analysis was conducted by changing the price of feed and othervariables. Theresults indicate that small broiler farm incurred losses severely if the cost of production is increase 10%. Meanwhile for medium broiler farm the profit will decrease by 75% and large scale farmers decreased by 31 %(see Table 2). It is important to maintain the cost production or decreased the cost because it shows that small farmers cannot survive if the cost keeps increasing.

Table 2: Changes in cost of production

	Commercial farm	Medium farm	Small farm
Total Cost (TC)	14,145,880.30	2,083,107.94	782,032.77
Total Revenue (TR)	16,918,669.82	2,145,139.93	714,171.18
Profit	2,772,789.52	62,031.99	(67,861.59)

Source: survey

Conclusion

The results of the study indicate that the dominant factors affecting the cost of production for broiler subsector are the cost of feed, MVS, livestock purchased and fuel.The Malaysian broiler subsector is now facing increasing cost in term of feed due to its reliance on imported feedstuff. In the same token, increasing crude oil price will also cause utility and transportation cost to increase. In addition to feed cost farmers in this industry also experiencing with increase in cost of Medicine, Vaccine and Supplement (MVS).The costs of MVS is increasing overtime and currently is RM0.20-0.40 per birds.Due to the increasing in cost of production [especially the feed price], large and medium farm may still make profit but the small farm will incur losses. The Government must provide incentives and policies that facilitate the production of alternative feedstuffs using available domestic resources like PKC and Rice Bran in the broiler diet. This will help in reducing production costs.

Acknowledgements

We would like to offer our deep appreciation to the Ministry of Education (MOE) for providing grant 5526005 needed to finance the research.

References

Fatimah, M. A., Nik Mustapha, R.A., Bisant, K., and Amin, M. A. (2007).*50 Years of Malaysian Agriculture: Transformational Issues, Challenges and Direction.* Universiti Putra Malaysia, pp. 585-610.

Zainalabidin, M., Mad Nasir, S., and AnjahAmzah,A.R (2004)*Comparative Advantage Indices of Selected Livestock Production Sectors in Brunei Darussalam, Journal of International Food & Agribusiness Marketing*, 15:1-2, 77-92,

Zainalabidin, M., Mad Nasir, S., Chiew, F.C. Livestock and Feedstuff Sector: Is There a Comparative Advantage? *The Malaysian Journal of Agriculture Economics* vol.9 (1992), pp.29-43.

A.S. Shaikh and Y.C. Zala. *Production Performance and Economic Appraisal of Broiler Farms in Anand District of Gujarat, Agricultural Economics Research Review Vol. 24 July-December 2011 pp 317-323*

H.Tijjani, B. A.Tijani, A. N.Tijjani and M. A.Sadiq, *Economic analysis of poultry egg production in Maiduguri and environs of Borno State, Nigeri,Scholarly Journal of Agricultural Science Vol. 2(12), pp. 319-324, December, 2012*

FACTORS INFLUENCING CONSUMER'S RETAIL FORMATS CHOICE FOR FRESH FRUITS PURCHASE IN KLANG VALLEY MALAYSIA

Abdullahi Auwal Gindi[1], Amin Mahir Abdullah[1],Mohd Mansor Ismail[1], Nolila Mohd Nawi[1]

[1]Department of Agribusiness and Information Systems, Faculty of Agriculture,Universiti Putra Malaysia,43400 UPM, Serdang, Selangor

Abstract

This study covered fresh fruits consumers in Klang Valley area, Malaysia. Six hundred (600) respondents were randomly selected using multi- stage cluster sampling technique and questionnaires were used for data collection. Descriptive statistics and factor analysis techniques were used in analyzing the data. The demographic characteristics result of the respondents includes their educational level, income level, marital status as well as their age groups. From the result of the study, night market and super market have the highest number of fresh fruits consumers' patronage. In term of consumers' preference among retail formats, result shows that very much preferred retail formats in their ranking order are night market and supermarket. The product attributes considered most important by the fresh fruits consumers are level of ripening (72%), size and shape of the fruit (65%) and color of the fruits (63%). Convenience, formats location are the most important attributes considered by the fresh fruits consumers in choosing the retail format to purchase fresh fruits (FF). Freshness, safety of the product and product quality are the three factors yielded from the factor analysis. Likewise, convenience, entertainment and good services are the factors yielded from the data of retail formats attributes considered by the fresh fruits consumers. The finding of this research will help the retail formats managers and policy makers on the salient issues to be considered in fresh fruits marketing strategies as well as the ways their will improve in fulfilling fresh fruits consumers' needs and wants and hence it will help in retaining the customers to particular format.

Keywords: Retail formats, Fresh fruits, Consumers, Preference

Introduction

The coexisting of many different retail formats in Malaysia indicate that there are certain different attributes between these retail formats which satisfy consumers' needs and wants and probably for different purposes. This might be contributed by different psychographic profiles of present consumers. Fresh fruits consumption and purchase decisions for instant are influenced by these psychographic variants, and has somewhat shifted the marketing landscape which include retail sector. With this shift in the psychographic demographic makeup of the Malaysian consumers, it is imperative that retailers start to dissect and understand the important attributes considered by every segment of fresh fruits consumers in the markets so that necessary marketing strategies can be formulated. As such a critical question needs to be address. What factors influence or motivate consumers' choice of retail format when purchasing FF? In market place, consumers loyal to multiple retailers and hence retailers attributes and purchase purposed might influence their preferences. These factors or attributes needs to be identified and determined, and hence the objective of this study is to identify attributes or factors influencing consumers' retail formats choice in FF purchase

Literature Review

Retail formats in Malaysia can be divided into two categories, each category with its own type of outlets having similar characteristics. The traditional retail outlets which comprise wet markets, night markets and farmers markets, these are popular among consumers when purchasing fresh food and are oldest food distribution channel (Chamhuri and Batt, 2013). The modern retail outlets comprise supermarkets, hypermarkets, convenience or departmental store (Kiran & Jhamb, 2011). The emergence of these modern retail outlets in Malaysia began since early 1990s (Worsley, et al., 2010). To differentiate traditional retail formats from the modern outlets, the former has little control or organization, lack of refrigeration, agglomerations of small vendors, where each vendor specialized in one fresh food line (meat, fish, fruits and vegetables) or in a sub line (fruits and vegetables) (Chamhuri and Batt, 2013). The survey conducted by (Hino, 2010), pointed out that, most of traditional outlets are close proximity to home and have option of purchasing on credit, bulk of fresh fruits and vegetables have been sold (Yiridoe, et al., 2007). The Stand alone outlets, lack of cooling facilities in the FF section are among the characteristics of traditional retail formats outline by Schipmann & Qaim,(2011). Retailing research council Asia (Keith Bartlett, W., & Damodar M.P, 2006) made a very good distinction between modern and traditional retail formats. The differences depend on how the consumers are served, whether it is independent or part of the chain of store and ownership structure. Modern retail stores are self service offerings, typically part of a chain store and belong to an organization that has corporate structure.

At the consumer level, household shoppers consistently report the two dominant factors that impact upon their decision to purchase fresh fruits in retail outlets are the competitive price and quality. quality could be viewed as extrinsic attributes (freshness, color, size and shape), intrinsic attributes (taste, flavor, texture and mouth feel), credence attributes (method of production) and service attributes which associated with shopping experience itself such as customer advice, ambience, convenience and credit facilities (Hwa, 2006). A review of retail formats literature and consumer patronage identified three outputs (functional, social and entertainment) that influence consumers' choice of retail formats, also Consumer tend to choose to buy product by considering characteristics such as location, price, assortment, personnel, store image and service etc. (Boone, L. E., & Kurtz, 2006).

In determine the preferred place to shop FF, consumer's decisions involve set of attributes (Deliza et al., 2008). Chamhuri &Batt,(2013) distinguished consumer's store choice behavior when purchasing food and non food items. Freshness is a factor attracting consumers to purchase FF from both modern and traditional retail outlets (Chamhuri & Batt, 2013). Same situation reported by Zinkhan et al., (1999) at Sao Paulo street market, Brazil, that there is deep –seated impressions about perceived freshness of the produce offered at the traditional markets. Another study carried out in Hong Kong on wet market, all

respondents considered food products purchased in the wet markets as '' fresher and cheaper'' than those purchased in supermarkets (Goldman et al, 1999). Freshness was perceived by nearly all respondents as a major advantage of wet markets over supermarkets. Hong Kong consumers were also on the opinion that wet markets offer better quality products for FF, their reason was based on the services offered by the retailers of constantly trimmed, sprayed, cleaned and sorted of the fruits. But this is contrary to the consumers from Thailand, where consumers confidence in quality products solely obtained in supermarkets and specialty store was a positive and significant factor in purchasing fresh produce from modern retail outlets, this was linked to the health attributes of safety and quality food (Lippe, 2010). Convenience is one of the most important attribute used by the consumers in choosing retail formats for their FF purchase. The concept of convenience has different meanings, depending on which retail outlet was chosen and also demographic profile of the consumers. (Geuens, et al., 2009) in Chamhuri, et al, (2013) described the convenience of shopping from modern retail outlets in terms of the facilities provided such as car parking, trolley and baskets, proximity to other shops, extended trading hours and

good presentation of the products. Others described convenience as one-stop shopping. Some consumers prepare to pay higher price to purchase their FF in supermarkets because of convenience while others prepare local markets and perceived it as more convenience because it was close to where they lived (Chamhuri & Batt, 2013). Another store attribute being considered by the consumers in chosen retail outlets for their FF purchase is the services delivered by the retailers. Goldman et al., (1999) confirmed that wet markets serve consumers more efficiently than do supermarkets. Traditional market retailers are in direct contact with customers, respond fast to consumer's request, these contrast sharply with the limited personal contact with the consumers in modern markets. Buyers are welcome to touch and taste the products prior to making a purchase decision, have ability to negotiate the price all these provide interaction between buyers and retailers and between buyers and products (Zinkhan, et al., 1999). Despite the superiority of traditional retail formats over modern ones as reported by (Goldman, et al., 1999), he further reported its major weakness as viewed by the Hong Kong consumers who perceived traditional retail formats as dirty, slippery, crowded, smelly, unorganized, noisy, dishonesty and rudeness of retailers, inconvenience of opening hours are associated with traditional retail formats.

Methodology

Klang Valley area was purposively selected for this study. Cluster sampling technique was employed because the data was collected in six regions of the study area. Initially, it involves the clustering of the entire population in to six clusters based on the number of the regions in the study area. The six clusters include Kuala Lumpur, Putra Jaya, Petaling, Klang, Gombak and Hulu Langat. In each region, one city area was randomly selected. The selected areas are Kuala Lumpur, Putra Jaya, Shah Alam, Selayang town, Klang and Kajang. Multi stage cluster sampling was used in determining the sample size. The respondents were selected based on the use of random sampling technique, 100 respondents were randomly selected from each area, making a total of 600 respondents and 598 completed questionnaires from the randomly selected respondents were analyzed.

A structured questionnaire was developed for the study as survey instrument which sought to gather information regarding the demographic characteristics of the respondents and their retail formats preference. Respondents were asked if they were aware of the existence of different retail formats in their areas and also if they used to purchased fresh fruits for themselves and their family together with the number of visits.

The method used in collecting data on fresh fruits' consumer is similar to the one used by Green and & Srinivasan, (1978);Gineo, (1990). The method is referred to as full- profile approach. What make our method different is that instead of asking respondents to rank the retail formats base on the selected attributes, the respondents were asked to rank the type of retail formats in order of their preferences while

purchasing fresh fruits; and then the list of attributes (both products and stores) sought to be those that considered by the respondents while purchasing the products were listed and ask respondents to tick on the attributes they considered importance while purchasing fresh fruits.

Respondents were also presented with the list of items which gathered from the literatures sought to be the characteristics of the fresh fruits considered by the respondents in choosing the retail formats for fresh fruits purchases. Also from the questionnaire, a list of the items sought to be the characteristics of the stores considered by the respondents in choosing the retail formats for their fresh fruits purchases was displayed. Respondents were asked to tick the characteristics of both fruits and stores they considered in choosing the retail formats for their fresh fruits purchases.

Respondents were also presented with a number of statements which sought to measure the product attributes, store attributes as well as the characteristics of the different retail formats considered and preferred for them in choosing the retail formats for fresh fruits purchase. A seven point scale was utilized where respondents were required to indicate the extent to which they agreed with each statement, where '1' was strongly disagree to '7' was strongly agree.

Data was analyzed using SPSS ver. 21. The techniques used in data analysis include descriptive statistics and exploratory factor analysis. Exploratory factor analysis was applied to the adapted and modified scales that have been used from the previous researchers (i.e. Steenkamp, 1990; William, et al., 2005; & Chamhuri and Batt, 2013) as the determinants or the criteria considered by the consumers in their choice or preferences of the stores for fresh fruits purchasing. The objective of using exploratory factor analysis is to reduce the data set to a much smaller number, but at the same time retaining as much information as possible (Field, 2009). In the analysis, the correlation matrix was examined and KMO and Bartlett's Test of sphericity was performed. Principal component analysis with varimax rotation was employed in identifying the factors. Eigen value and scree plot criteria were used in retaining the number of factors, and only those items with factor loading greater than 0.4 were retained. Also the reliability of each factor was evaluated using Cronbach's alpha, where a value greater than 0.7 were considered acceptable (Field, 2009).

Result and Discussion

Demographic characteristics of the fresh fruits consumers were depicted in Table 1. The result shows that majority (73%) of the respondents were from the Malay ethnic group, followed by 14% from the Chinese while only 8% and about 5% were from other ethnic group and India respectively. The result from Table 1, also presents the marital status of the respondents, in which about 58% and 42% of them are single and married respectively. Likewise, the gender, the population of male and female respondents is almost equal. The educational level of the respondents, majority (77%) have either college or University level of education while 20% and 2% have secondary and primary level of education respectively. The income level of the fresh fruits consumers as depicted in Table 1, indicates that, majority (48%) of the sample population earn between 700 and 2999 Malaysian Ringgit per month while the remaining 39% and 13% of the sample population earn between 3000 – 4000 and 4001 – 7000 of the Malaysian Ringgit per month respectively.

Table 1: Demographic Characteristics of the Respondents (N= 598)

Variables	Frequency	Percent
Ethnicity		
Malay	438	73.20
Chinese	84	14.00
India	28	4.70
Others	48	8.00
Gender		
Male	300	50.30
Female	297	49.70
Marital Status		
Single	345	57.80
Married	252	42.20
Educational Level		
Primary	14	2.30
Secondary School	122	20.40
Collage/University	460	77.10
Income (RM/Month)		
700 – 2,999	289	48.30
3000 – 4000	232	38.80
4001 – 7000	77	12.90
>7000	0	0.00

Source: Field survey, 2014

A frequency of retail formats visits was depicted in Table 2. From Table 2, the number of times respondents used different formats for fresh fruits purchases was depicted, From the table(2) respondents were asked to indicate the number of times (from daily visit, ones in a week, twice in a week, ones in a fortnight and no visit at all) they used the formats for their fresh fruits purchases. From the Table 2, supermarket, hypermarket, and convenience store have the highest number of visits which is about 13%, 10% and 9% respectively. There is no report on daily visits from night and farmers markets, this is because, the two markets operate only twice or once in a week. From the Table 2 also, visits per week for fresh fruits purchase, night market, supermarket, and farmers market have the highest frequency of about 29%, 18%, and 14% respectively. From the Table 2 also, the percentage of the respondents not using the formats for their fresh fruits purchases was depicted, it was shown in the Table, fruit stall (64.5%) and convenience store (63%) have the highest number of the respondents who do not patronize them in their fresh fruits purchases. Also from table2, night market has the least number of the respondents who do not use it in their fresh fruits purchases (38%), followed by the supermarket (42%). From this, one can conclude that the level of patronize by the fresh fruits consumers between night market and supermarket are almost at the same level.

Table 2: Frequency of Retail Formats Visit for Fresh Fruits Purchase (N= 598)

Retail Format	Daily		Ones in a week		Twice in a Week		Ones in a Fortnight		No visit at all	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Wet market	32	5.40	95	15.90	60	10.00	100	16.70	311	52.00
Night market	-	-	174	29.10	111	18.60	86	14.40	227	38.00
Farmers market	-	-	83	13.90	117	19.60	73	12.20	325	54.00
Supermarket	76	12.70	108	18.10	78	13.00	82	13.70	254	42.50
Hypermarket	57	9.50	74	12.40	64	10.70	85	14.20	318	53.20
Conven. Store	56	9.40	50	8.40	47	7.90	66	11.00	377	63.00
Fruits stall	38	6.40	55	9.20	46	7.70	72	12.00	386	64.50

Source: Field survey, 201

After the respondents have indicate their frequencies of visit, the list of the different retail formats were written in the questionnaire, respondents were asked to make choice between retail formats at their preference among the formats in a ranking order between '1' not preferred at all to '6' very much preferred. The respondents who show no different between the formats were excluded for the analysis. The result from Table 3, shows that convenience store, fruits stall, wet market, and hypermarket have the highest frequency of the respondents who do not preferred them at all for their fresh fruits purchases, with frequencies of 65, 61, 39 and 34 respondents respectively. From Table 3 also, the frequency of respondents that preferred very much to buy fresh fruits between different formats was presented. Supermarket, farmers market and night market have the highest frequencies of 121,119 and 114 respondents respectively. From Table 3, one can concludes that very much preferred retail formats for fresh fruits purchases by the respondents in their ranking order of preference are night market (16%), supermarket (15%) and wet and farmers market (14%)respectively. The rest of the retail formats have the same ranking (13%) by the respondents for fresh fruits purchases.

Table 3: Consumer Preference for Retail Formats Choice in Fresh Fruit Purchase

	Ranking order							
Retail Format	**1**	**2**	**3**	**4**	**5**	**6**	**N**	**%**
Wet market	39	41	102	75	55	76	388	14.10909
Night market	27	37	57	74	132	114	441	16.03636
Farmers market	15	45	69	88	69	119	405	14.72727
Supermarket	12	29	83	78	95	121	418	15.200
Hypermarket	34	45	65	68	70	87	369	13.41818
Convenience store	65	86	61	60	47	42	361	13.12727
Fruits stall	61	41	51	62	53	100	368	13.38182
							2750	100.00

1=Not preferred at all to 6= very much preferred, N is the sample size
Source: Field survey, 2014

Respondents were asked to indicate their agreement or disagreement between the listed items sought to be the characteristics of the fresh fruits considered by the respondents when purchasing the product. Table four (4) indicates the frequencies and percentages of the agreement and disagreement of each variable. From the Table 4, majority of the respondent (72.2%) considered the level of ripening of the fruits while purchasing the product, followed by 65.2% and 62.9% of the respondents who considered size and shape of the fruits and color of the fruits respectively as the important characteristics while purchasing the product. The least important characteristics considered by the respondents are graded fruits, labeled fruits and braded fruits with 22.7%, 22.4% and 17.1% respectively. As color of the fruits is very important variable, Frank, et al., (2001) make conclusion from their research on consumer preferences for color, price and vitamin C content of Bell peppers that the overall consumer sample used viewed color as more important in purchasing decision than retail price and vitamin C content. This work also is in line with that of Wadolowska et al., (2008) who confirmed and reported that the greatest influence factors on food choice (fresh fruits and vegetables) depend mostly on freshness and taste.

Table 4: Frequency of the respondents showing characteristics of fresh fruits considered when purchasing the product

Item Names	N=598	Frequency Yes	%	No	%
Level of ripening of the fruits		435	72.7	162	27.3
Size and shape of the fruits		390	65.2	208	34.8
Color of the fruits		376	62.9	222	37.1
Fresh looking of the fruits		350	58.5	247	41.3
Absence of spots/holes on the fruits		309	51.7	289	48.3
Smell and taste of the fruits		302	50.5	296	49.5
Safety of the product		275	46.0	323	54.0
Packaging of the fruits		203	34.0	394	66.0
Locally produced fruits		220	36.0	378	63.2
Imported fruits		155	25.0	443	74.1
Graded fruits		136	22.7	462	77.3
Labeled fruits		134	22.4	464	77.6
Branded fruits		102	17.1	496	82.9

Source: Field survey, 2014

Likewise, respondents were asked to indicate their agreement or disagreement between the listed item in Table five (5) sought to be the characteristics or attributes of the store considered by the respondents in choosing the type of retail format for their fresh fruit purchases. From the Table 5, the most important attribute considered by the majority (71.6%) of the respondents was the convenient store location, followed by the distance of the store from the respondents' residential area (58%). The least important characteristics considered by the respondents were availability of refreshment/entertainment facilities (14.7%) and availability of the public toilets (21.7%). Being convenience as the most important attribute considered by the fresh fruits consumers, the finding of this research was similar to the previous research of Chamhuri & Batt, (2013) who reported one segment of the fresh produce as ''transient shoppers'' with the characteristics of not demonstrating any preference with regard to retail format types, rather there consideration were on which retail format is perceived to be most convenient to them at the time of purchasing the fresh produce.

Table 5: Frequency of the respondents showing characteristics of the store considered when purchasing fresh fruits

Item Names	N = 598	Frequency Yes	%	No	%
One stop shopping convenience		263	44.0	339	55.9
Convenient store location		428	71.6	170	28.4
Distance of the store		374	58.0	251	42.0
Time taking to reach the store		251	42.0	347	58.0
Convenient accessibility		294	49.2	304	50.8
Easy entry and exit within the store		288	48.2	310	51.8
Enough parking space		255	42.6	343	57.4
Convenient opening and trading hours		237	39.6	361	60.4
Availability of sales personnel to respond to my request/query		264	44.1	334	55.9
Provision of information of the products by the sales personnel		157	26.3	440	73.6
Offering personalize service		105	17.6	493	82.4
Availability of refreshment/entertainment facilities		88	14.7	509	85.1
Decorative features of the store		150	25.1	448	74.9
Availability of public toilets		130	21.7	468	78.3

Source: Field survey, 2014

Principal component analysis revealed three factors each from the product and store attributes, explained 66% and 68% of the variance observed in the respondents' decision for product and store while purchasing the fresh fruits (Table 6, and Table 7).

From the result of the product attributes in Table 6, The Keiser-Meyer-Olkin (KMO) measure of sampling adequacy achieved meritorious level of 0.827, while the Bartlett's test of sphericity give significant level at P< 0.0001, confirmed appropriateness of the factor model. From the Table 6, factor one (1), with an Eigenvalue 36.67, captured four items and accounted for 29% of the variance.
Collectively these five items were described as ''freshness of the product''. This factor comprised items related to freshness such as size and shape of the fruits, good smell and taste, color and level of ripening of the fruits. The Cronbach's alpha of this factor was 0.891 which is relatively indicating high reliability.
Factor two (2) capture three items and has Eigenvalue of 16.63 and Cronbach's alpha of 0.705 indicating satisfactory reliability of the measurement. These three items were collectively described as ''safety of the product'' which include absent of any sign of contamination from the fruits, availability of organic product and how nicely the fruits are arranged. The factor three has the Eigenvalue of 12.7, Cronbach's alpha of 0.70 and percentage of variance explained of 17.9. These items were collectively described as ''quality of the product'' which also include considering of branded fruits and imported one.

Table 7 also revealed three factors captured from the principal component analysis. The Keiser-Meyer-Olkin (KMO) measure of sampling adequacy achieved satisfactory level of 0.735, while the Bartlett's test of sphericity give significant level at P< 0.0001, confirmed appropriateness of the factor model. From the table7, factor one consists of three items with Eigenvalue of 32.5 and about 25 percentage of variance explained. This factor was described as ''convenience of the store'' and they include good layout, ample parking space and one stop shopping while making decision in choosing the retail formats to buy fresh fruits. Factor two has Eigenvalue of 22 and its Cronbach's alpha of 0.73 with percentage of variance explained of 24.46. This factor was described as ''Entertainment of the store''. The last factor also captures three items with about 13 Eigenvalue and Cronbach's alpha of 0.776. This factor was described as ''good service of the store''.

Table 6: Number of factors extracted for Product attributes considered by the consumers for fresh fruits purchase

	Factor		
	1	**2**	**3**
Item Names			
Size and shape of the fruits is my priority when purchasing the product	0.820		
Good smell and taste of the fruit is important in making decision to buy the product	0.813		
Color of the fruits is important in making decision to buy the product	0.804		
I always concerned about the level of ripening of fruits while purchasing	0.763		
I always ensure there is no any signed of contaminations from the fruit before making decision to buy the fruit		0.805	
I always consider availability of organic fruits in making decision to purchase the product		0.799	
*I don't care about how nicely the fruits are arranged stalls while making decision to buy the product		0.736	
*I don't consider branded fruits as my priority in making decision to buy the product			0.868
*Branding is not an indication of fruits quality			0.818
*I don't have interest in purchasing imported fruits			0.775
Eigenvalues	36.67	16.63	12.744
Percentage of variance	29.38	18.76	17.902
Cumulative Percentage of Variance	29.38	48.15	66.052
Cronbach's Alpha	0.891	0.705	0.701

*****These are negative questions; they were revised before performing the analysis

Source, Field survey, 2014

Table 7: Number of factors extracted for store attributes considered by the consumers for fresh fruits purchase

	Factor		
	1	**2**	**3**
Item Names			
Good layout of the store make it easier for me to find whatever I need	0.870		
I prefer to go to stores with ample parking space while buying fresh fruits	0.845		
I always want to get everything in one stop shopping	0.775		
Decorative features of the store influences my decision in choosing the store for fresh fruit purchase		0.883	
Presence of children play area make me to choose the store for fresh fruits purchasing		0.853	
Attractive merchandise display influences my decision in choosing the store to buy fresh fruits		0.764	
*Looking how hygienic the vendors/retailers are is not my concerned when purchasing fresh fruits			0.761
Looking how hygienic the premises are is important in making decision to purchase fresh fruits			0.753
I prefer to choose self service store while purchasing fresh fruits			0.675
Eigenvalues	32.519	22.754	12.919
Percentage of variance	24.991	24.46	18.731
Cumulative Percentage of Variance	24.991	49.460	68.191
Cronbach's Alpha	0.70	0.739	0.776

*****This is negative question; it was revised before performing the analysis

Source, Field survey, 2014

Summary and Conclusion

This study covered fresh fruits consumers in Klang Valley area, Malaysia. The existence of different retail formats in the area, providing different varieties of services to the fresh fruits consumers indicate the presence of different attributes used in fulfilling and satisfying different segment of fresh fruits (FF) consumers. There is need in understanding these important attributes considered by every segment of fresh fruits consumers for necessary marketing strategies and hence is the objective of this study. Six hundred (600) respondents were randomly selected using multi-stage cluster technique and questionnaires were used for the data collection. Descriptive statistics and factor analysis techniques were used in analyzing the data. The demographic characteristics results of the respondents include their education level, income level, marital status as well as their age groups. Majority (77%) have either college or university level of education. About 48% of the respondents earn between RM 700 to 2999 per month and majority (53%) is within age group of 18 to 35 years.

From the result of the study, night market and super market have the highest number of fresh fruits consumers' patronage with 62% and 58% respectively. In term of consumers' preference among retail formats, result shows that very much preferred retail formats in their ranking order are night market (16%) and supermarket (15%). The product attributes considered most important by the fresh fruits consumers are level of ripening (72%), size and shape of the fruit (65%) and color of the fruits (63%). Convenience, formats location are the most important attributes considered by the fresh fruits consumers in choosing the retail format to purchase fresh fruits product. Freshness, safety of the product and product quality are the three factors yielded from the factor analysis. Likewise, convenience, entertainment and good services are the factors yielded from the data of retail formats attributes considered by the fresh fruits consumers.

In conclusion, from the result of this study, it appears that, even though, modern retail formats patronized majority of consumers, in fresh fruits purchasing the situation is totally different, majority of the consumers are still loyal to traditional retail formats for their fresh fruits purchasing. The finding of this research will help the retail formats managers and policy makers on the salient issues to be considered in fresh fruits marketing strategies as well as the ways their will improve in fulfilling fresh fruits consumers' needs and wants and hence it will help in retaining the customers to particular format.

Reference

Boone, L. E., & Kurtz, D. L. (2006). Principles of marketing. Ohio: Thomson Southwestern.655pp.

Chamhuri, N., & Batt, P. J. (2013). Understanding the Relationship Between Perceived Quality Cues and Quality Attributes in the Purchase of Meat in Malaysia. *Journal of International Food & Agribusiness Marketing*, *25*(3), 187–208. doi:10.1080/08974438.2013.723999

Deliza, R., Rosenthal, A., Hedderley, D., Macfie, H., Frewer, L. J., & Alimentos, E. De. (2008). The Importance of Brand, Product Information and Manufacturing Process in the Development of Novel Environmentally Friendly Vegetable Oils. *Journal of International Food & Environment*, *10(3)*, 67–77.

Field, A. (2009). Discovering Statistics Using SPSS: Avance technique for the beginner.Sage publications, London. 496pp

Frank, A.C. & Robert, G.N. (2001). Consumer preferences for color, price, and vitamin C content of Bell peppers. *Journal of Horticultural Science* 36(4), 798-800

Geuens, M., Weijters, B., & De Wulf, K. (2009). A new measure of brand personality. *International Journal of Research in Marketing*, *26*(2), 97–107.

Gineo, W. M. (1990). A conjoint/logit analysis of nursery stock purchases. *Northeastern Journal of Agricultural and Resource Economics*, *19*(1), 49-58.

Goldman, a., Krider, R., & Ramaswami, S. (1999). The Persistent Competitive Advantage of Traditional Food Retailers in Asia: Wet Markets' Continued Dominance in Hong Kong. *Journal of Macromarketing*, *19*(2), 126–139. doi:10.1177/0276146799192004

Green, P. E., & Srinivasan, V. (1978). Conjoint analysis in consumer research: issues and outlook. *Journal of Consumer Research*,1(2) 103–123.

Hino, H. (2010). Antecedents of supermarket formats' adoption and usage: A study in the context of non-western customers. *Journal of Retailing and Consumer Services*, *17*(1), 61–72. doi:10.1016/j.jretconser.2009.09.005

Hwa, Y. S. (2006). Conjoint analysis: an application in eliciting patients' preferences. *Bull Malays Math Sci Soc.*, *2*(1), 187–201.

Keith Bartlett, W., Damodar M.P, raghu P. (2006). *Food Retail Formats in Asia* "Understanding Format Success. Report of Coca-Cola Retailing Research Council Asia (CCRRCA) p. 64.

Kiran, R., & Jhamb, D. (2011). A Strategic Framework for Consumer Preferences towards Emerging Retail Formats. *Journal of Emerging Knowledge on Emerging Markets*, *3*(1), 1–18. doi:10.7885/1946-651X.1058

Lippe, R. S. & I. S. (2010). *Consumption Patterns for Fresh Fruits and Vegetables from different Retail outlets among Urban Housholds in Thailand* (pp. 21–23). Vietnam.

Wadolowska, L., E.B.,Zielinsk, Jolanta, C. (2008). Food choice models and their relation with food preferences and eating frequency in the Polish population: POFPRES study *Journal of food policy*, *33*(2008) 122-134

Schipmann, C., & Qaim, M. (2011). Modern Food Retailers and Traditional Markets in Developing Countries: Comparing Quality, Prices, and Competition Strategies in Thailand. *Applied Economic Perspectives and Policy*, *33*(3), 345–362. doi:10.1093/aepp/ppr018

Steenkamp, J. B. E. (1990). Conceptual Model of the Quality PerceptionProcess. *Journal of Business Research*, *21*(4), 309–333.

William, C., E, Galvz-Nogales, G., W. (2005). Meeting Consumers' need and Preferences for Fruits and Vegetables. In *Food and Agriculture Orgarnization of the United Nation* (p. 200). Rome.

Worsley, A., Wang, W. C., & Hunter, W. (2010). Baby boomers' food shopping habits. Relationships with demographics and personal values. *Appetite*, *55*(3), 466–72. doi:10.1016/j.appet.2010.08.008

Yiridoe, E. K., Bonti-Ankomah, S., & Martin, R. C. (2007). Comparison of consumer perceptions and preference toward organic versus conventionally produced foods: A review and update of the literature. *Renewable Agriculture and Food Systems*, *20*(04), 193–205. doi:10.1079/RAF2005113

Zinkhan, George M., Fontenelle, Suzana de M., Balazs, A. L. (1999). The Structure of Siio Paulo Street Markets : Evolving Patterns of Retail Institutions. *Journal of Consumer Affairs*, *33*(1), 3–26.

EFFECTIVENESS OF GO GREEN CAMPAIGN: AN EMPIRICAL INVESTIGATION ON INTENTION TO PURCHASE GREEN FOOD

Masoumeh Hosseinpour, Department of Agribusiness and Information System, Universiti Putra Malaysia, Selangor 43400, Kuala Lumpur, Malaysia . sanamhosseinpour@yahoo.com

Zainalabidin Mohamed*, Department of Agribusiness and Information System, Universiti Putra Malaysia, Selangor 43400, Kuala Lumpur, Malaysia.zainal.mohamed@gmail.com

GolnazRezai, Department of Agribusiness and Information System, Universiti Putra Malaysia, Selangor 43400, Kuala Lumpur, Malaysia.rgolnaz@gmail.com

Mad Nasir Shamsudin Department of Agribusiness and Information System, Universiti Putra Malaysia, Selangor 43400, Kuala Lumpur, Malaysia.mns@upm.edu.my

Ismail Abd Latif, Department of Agribusiness and Information System, Universiti Putra Malaysia, Selangor 43400, Kuala Lumpur, Malaysia.ial@upm.edu.my

Key Words: Go greencampaign, Environmental Attitude, Green Food, Intention, Chi-Square

Abstract:

There is an association between the food consumption patterns with the environmental impacts. Green food stands for supporting the consumers' life quality in addition to green food productions with less harm to the environment. While, it should be considered that green food consumption is a difficult task which demands governmental policies, educational and promotional programmes or convenient values. Among the educational programmes the ones such as go green campaigns could be employed to promote green food consumption among consumers. This paper aims to explore the effectiveness of these types of campaigns on consumers' behavioural intention to purchase green food. Based on the Theory of Planned Behaviour (TPB), the conceptual model is proposed. The results of study show that there was an association between the gender and intention towards green food purchasing as the results of go green campaigns.

Introduction:

In order to reach the sustainable development, Clark (2007) believes that the efforts should go beyond the cleaner production to sustainable consumption. Generally, sustainable consumption covers the buying behaviour in terms of green products purchasing which is able to bringfewer hazards to the environment during production (OECD, 2002). Furthermore, it is said that in order to achieve the sustainable consumption patter, there is a need to change the lifestyles and consumption patterns in consumers.

Food consumption is recognised as a behaviour which directly affects the environment. Additionally, for sustainable food consumption achievement, a collaborating production consumption system is essential(Partidario*et al*.,2007). Since the environmental degradation such as greenhouse gases are contributed from the food production, transportation and consumption (Carlsson, 1998).

Food is a basic need of human which cannot be renounced or substituted. In sustainable consumption, dietary choices play crucial roles. Additionally, with the daily food choices which consumers make, there are some vital impacts on the environment as a result of their decisions (Tobler*et al*., 2011). Nowadays, greening food consumption pattern which is not an easy endeavour is becoming globally an issue (Spaargaren& Mo 2008). Therefore, to promote green food consumption pattern in the developing countries such as Malaysia, some educational tools like go green campaigns are employed. Basically, the employment of these tools in terms of green food consumption is to build the green food purchasing behaviour. Limited studies on green food consumption via go green campaigns concentrating among the literatures. Therefore, to deep understanding of how go green campaigns are able to build up the intention among the individuals to purchase green products is essential.

Literature Review:

Environmental Attitude

In the review of psychology literature on consumer behaviour, attitude is known as a powerful predictor (Kaiser *et al* ., 1999) yet the concept requires more studies. Getting to know the individual's feelings towards purchasing or using an object is more valuable than knowing one's evaluation of the object itself (Ajzen&Fisbein, 1980). Schultz and Selezy (2000) defines environmental attitude as ― attitude of environmental concerns are rooted in a person's concept of self and the degree to which an individual perceives him or herself to be an integral part of the natural environment‖.

Several studies including (Kotchen & Reiling, 2000) have been examined the association between the environmental attitude and consumer behaviour like organic food purchasing(Grunert & Juhl, 1995). Mostly the green foods such as organic foods are assumed as the healthier, more nutritious and sustainable than conventional foods (Chen, 2007). Therefore, the attitude of consumers towards the green food is able to affect their purchasing behaviour.

However, it is observed that the programmes such as go green campaigns can shape the attitude towards the environment (Farrelly et al., 2000). Furthermore, these campaigns can influence the target group to change their behaviour by focusing on affecting behaviour and panning to benefit individuals and families. However, the recent study by Zen et al .(2013) shows that though consumers can carry a positive attitude towards go green campaign, there can be a gap between the campaign goal and the consumers' behaviour.

Socio-demographic Characteristics

In the review of consumer purchase behaviour, the roles of demographic characteristics including age, gender, and educational level has been observed. Performing behaviour is not the same for two genders as men and women do not have the same attitude (Konrad et al., 2000). For instance, in the study conducted by Han et al. (2009), it is observed that women are strongly different in terms of possessing environmentally friendly behaviour than men. Furthermore, Laroche et al.(2001) conclude that not only women are more environmentally concerned but their willingness to pay for green products is more. In the study by (Tobler*et al* ., 2011), in terms of ecologically food friendly

consumption, it is observed that women in terms of eco-friendly pattern consumption are totally different from men. This shows that women perceived more environmental benefits as the results of these products consumption.

Mostly consumers prefer to make rational decisions while purchasing the environmentally friendly products (Cheah&Phau, 2009) therefore they need to be fully informed about their purchasing behaviour. In this regards,Laroche*et al*.(2000) believes that there is a correlation between consumers being environmentally friendly and the educational level.Bryunina&Khodadad (2011) concludes that the intention to purchase organic productis influenced by educational level and higher educated respondents perform this behaviour more. However, green food purchasing can be considerably different by considering the consumers' age gap. Mostly it is observed that the younger citizens are more likely to be concerned about the environment (Aytulkasapoglu&Ecevit ,2002).

In addition, in terms of green product purchasing, Tarkiainen et al. (2011) concluded that there are other influential factor on consumer' intention to select these products. For instance, in a study conducted by Smith &Paladino (2010) on organic food purchasing, it was observed that health consciousness and environmental concerns are positively effective on intention.

Furthermore, respondents with different backgrounds show different reactions to the campaigns. As an example the study by Mills &Schleich (2012) shows that the demographic factors including educational level, family structure, and age are the influential factors to follow the go green campaigns.

In lieu of the above discussion, the first objective of this study is to evaluate the association between the environmental attitudes of consumers towards purchasing green foods which is shaped via go green campaigns and assume green foods as the healthy foods with their intention to purchase green foods. Moreover, by the second objective, it is aimed to explore the associations between the socio-demographic characteristics of consumers including gender, educational level and age with their intention to purchase green foods as the results of go green campaign.

Conceptual Framework and Empirical Methods

Understanding the major determinates of performing a behaviour has been gotten attention of scholars in the social and decision making science. Mostly the assumption about the link between intention and behaviour is that the human behaviour in the majority situations is under volitional control (Ryan,1970). In this regard, Bagozzi*et al*. (1989) believe that intention is the single best able predictor of a behaviour.

Conceptually, green food purchasing behaviour can be explained by the Theory of Planned Behaviour (TPB) by Ajzen (2002). According to the TPB three factors of attitude, subjective norms and perceived behavioural control determine the intention to perform the specific behaviour. In this paper, attitude is the main focus to discover the intention of consumers to purchase green foods. Additionally, in the present study the role of go green campaigns as an external factor on attitude of consumers to purchase the green foods is considered. Thus, given the conceptual framework the following hypothesis is presented:

H_{01}: There is an association between the attitude towards green food as the healthy foodsas the influences of go green campaign and the intention of purchasing green foods.

Moreover, as mentioned earlier, the role social demographic on the intention to perform the behaviour cannot be neglected. This study has been selected gender, educational level and age as the demographic characteristics. Therefore, it is hypothesis that:

H_{02}: There is an association between the demographic characteristics of consumers including gender, educational level and age and their intention to purchase green foods via go green campaigns.

In order to gather the essential information about the influence of go green campaign on attitude of the consumers to have intention to purchase green foods the survey was conducted. Nine hundred and ninety (990) consumers were selected via simple random sampling and were interviewed via structured questionnaire in order to measure their intention to purchase the green food via go green campaign. The selected area of data collection was Klang Valley in Malaysia, and the supermarkets such as Tesco, Aeon, Big Aeon, Ecosave and Giant have been selected as locations of data collecting. A Likert scale of 1 to 7 (1 represents strongly disagree and 7 stands for strongly 7) was applied to measure the consumers' green food purchasing intention which is affected by go green campaigns.

The collected data were analysed applying descriptive analysis and chi-square analysis. The descriptive analysis was employed to describe the profile of consumers and their attitude towards purchasing green foods. Thereby, chi-square analysis was applied to uncover the association between the environmentalattitude towards green foodwhich is affected by go green campaigns and assume these foods as the healthy ones and the intention to purchase these foods. Moreover, this analysis was employed to discover the association between the selected demographic characteristics such gender, educational level and age of consumers with their intention to purchase green foods.

Results:

In order to gauge the reliability of the study the Cronbach alpha value was applied. The value was 0.937 which shows the consistency among all the questions in the questionnaire; consequently, the model is fit for the study.

Descriptive Statistic Analysis

Table 1 presents the socio-demographic characteristics of the consumers. The percentage of female of the study was 66.9 per cent. Out of 990 consumers, 69.6 per cent were the residences of the urban area following by 30.4 per cent who were suburban areas residence. In terms of educational level, the majority of the sample were educated by secondary and tertiary levels(90.3 per cent). In regards to the age of the consumers, most of the respondents were related to the age group 27-37 years old followed by age group 38-48 years old.

Table 1: Socio-demographic characteristics of the consumer

Characteristics	Percentage	Characteristics	Percentage
Gender		**Residential Area**	
Female	66.9	Urban area	69.6
Male	33.1	Suburban area	30.4
Educational level		**Age**	
Primary	9.7	<26	12.4
Secondary &Tertiary	90.3	27-37	40.4
		38-48	34.3
		>49	12.8

However, in terms of the attitude towards purchasing green food which is influenced by go green campaigns, it is appeared that the role of go green campaigns has been effective on consumers' intention. The results illustrate in the Table 2. According to the Table 2, the highest mean score is for the statement that ―the go green campaigns taught me by consuming green foods, me and my family might be healthier‖ which is 84.9 per cent. The agreement shows that go green campaign could be practically successful to build the essential attitude on respondents to assume the green food as healthier one. Furthermore, based on the Table 2, it can be observed that not only go green campaigns are able to develop this attitude but the campaigns able to develop that attitude that green food consumption can benefit the environment by reducing the negative effects(86.5 per cent) . Overall, more than 62 per cent of the consumers carry a positive towards go green campaigns indicating that go green campaigns are a successful programme to have the intention to purchase the green foods.

Table2. Consumers' attitude towards green foods as the result of go green campaign

Statement	Likert Scale Scores(Percentage) 1*	2*	3*	4*	5*	6*	7*	Mean
1.The go green campaigns taught me by consuming green foods, me and my family might be healthier	1.2	.5	1.2	4.2	8	37.1	47.8	6.28
2.Go green campaigns taught me that green food consumptioncanbenefitthe environment by reducing the negative effects	.2	.2	.4	2.1	9.6	35.7	50.8	6.18
3. Go green campaigns are a successful programme to have intention to purchase the green foods	1.4	3.8	4.9	13.8	14.4	21.2	40.8	5.63

Chi-Square Analysis

The association between the effectiveness of go green campaigns on the consumers' attitude which is affected by go green campaignsand consider the green food as the healthy foodswith their intention to purchase green food could be interesting. The results indicate that there is an association between the attitude towards green foods (via go green campaign) and their intention to purchase these products (χ^2 =36.558, p<0.01).

Table 3.Chi square values and consumers' attitude towards green food purchasing via go green campaign with intention to purchase green foods

Intention to purchase green food via go green campaign	χ^2
Attitude towards green food as the healthy foods	16.102**

Level of significant : ** p<0.05

The result of chi-square analysis in testing the association between the socio-demographic characteristics of the consumers including gender, educational level and age and their intention towards purchasing green food via go green campaign are presented in Table 4. According to the result the consumers who were female (χ^2 =16.102, p<0.01), and had higher educational (χ^2 =35.357,p<0.01) carried higher intention to purchase the green food as the results of go green campaigns.

Table 4.Chi square values and consumers' intention towards green food purchasing via go green campaign

Socio-economic profile	χ^2
Gender	16.102***
Age	95.923***
Educational level	35.357***

Level of significant : *** p<0.00

Discussion

The TPB was employed in this study to evaluate the effectiveness of go green campaign on the intention of the consumers to purchase the green foods. Apparently, the intention of the consumers to purchase green food can be estimated by their attitude. In fact consumers' attitude is shaped via go green campaigns. Moro importantly, the socio-demographic characteristics of the consumers can play role on their intention to purchase green food. However, respondents with different social background showed different reaction to the go green campaigns.

The results of the study show that the respondents whose attitude is affected by go green campaigns carried higher intention to purchase the green foods. Additionally, it was observed that the female and higher educated respondents were more likely to have intention to purchase green foods via go green campaigns.

There is a fact that go green campaign are employed as the educational tools to the public to change their behaviour to be more friendly to the environment. It was observed that these campaigns are able to change the attitude of the target group to have intention to purchase green food. Therefore, it could be useful for the campaign organisers of both governmental sector and Non-Governmental Organisations to set up and promote these campaigns more publicly to encourage more respondents to change their purchasing behaviour. Apparently, it could be useful for these campaign organisers to popularised the campaigns more widely to aware and motivate the respondents with different socio-demographic characteristics. Consequently, if the goal is to nationalise the green food purchasing, it is essential consumers with different demographic characteristics to be informed to reach this goal.

References:

Ajzen, I. (2002). Perceived behavioural control, self-efficacy, locus of control, and the Theory of Planned Behavior. *Journal of Applied Social Psychology*,32(4): 665-683.

Ajzen, I., &Fishbein, M. (1980).*Understanding attitudes and predicting social behaviour*.Englewood Cliffs, NJ: Prentice-Hall.

Aytulkasapoglu, M., & Ecevit, M. C. (2002).Attitudes and behaviour toward the environment: The case of lake burdur in turkey. *Environment and Behavior*.34(3):363–377. doi:10.1177/0013916502034003005

Bagozzi, R., Baumgartner, H., & Yi, Y. (1989).An investigation into the role of intentions as mediators of the attitude–behavior relationship. Journal of Economic Psychology, 10, 35–62.

Bryunina, D., &KhodadadSafaei, S. (2011). *The Influence of Eco-labeled products on consumer buying behavior: By focusing on eco-labeled bread.D*octoral dissertation.Mälardalen University.

Carlsson-Kanyama, A. (1998). Climate change and dietary choices—How can emissions of greenhouse gases from food consumption be reduced? Food Policy, 23(3-4), 277–293.

Cheah, I&Phau,I. (2009). Attitudes towards environmentally friendly products.The influence of ecoliteracy, interpersonal influence and value orientation.*Marketing Intelligence & Planning*, 29 (5) 452-472

Chen, M.F. (2007). Consumer attitudes and purchase intentions in relation to organic foods in Taiwan: Moderating effects of food-related personality traits, *Food Quality and Preference* , 18 (2007) 1008–1021

Clark, G. (2007). Evolution of the global sustainable consumption and production policy and the United Nations Environment Programme's (UNEP) supporting activities. Journal of Cleaner Production, 15(6), 492–498.

Farrelly, M. C., Healton, C. G., Davis, K. C., Messeri, P., Hersey, J. C., &Haviland, M. L. (2002). Getting to the truth: evaluating national tobacco countermarketing campaigns. *American Journal of Public Health*. 92(6): 901-907.

Grunert, S&Juhl, H. (1995).Values, environmental attitudes, and buying of organic foods.*Journal of Economic Psychology*, 16,39-62.

Han, H., Hsu, L. T. J., & Lee, J. S. (2009).Empirical investigation of the roles of attitudes toward green behaviors, overall image, gender, and age in hotel customers' eco-friendly decision-making process. *International Journal of Hospitality Management*. 28(4): 519-528.

Laroche, M., Bergeron, J., &Barbaro-Forleo, G. (2001).Targeting consumers who are willing to pay more for environmentally friendly products. *Journal of consumer marketing*. 18(6): 503-520.

Kaiser,F.G., Wolfing, S &Fuhrer, U. (1999). Environemntal attitude and ecological behaviour. *Journal of Environmental Psychology*, 19, 1-19.

Konrad, A. M., Ritchie Jr, J. E., Lieb, P., &Corrigall, E. (2000). Sex differences and similarities in job attribute preferences: a meta-analysis. *Psychological bulletin*. 126(4):593-641.

Kotchen,M &Reiling, S.D. (2000). Environmental attitudes, motivations, and contingent valuation of nonuse values: a case study involving endangered species. *Ecological Economics*, 32(1), 93-107.

Mills, B., &Schleich, J. (2012). Residential energy-efficient technology adoption, energy conservation, knowledge, and attitudes: An analysis of European countries. *Energy Policy*.49:616-628.

OECD (2002). Policies to promote sustainable consumption: An overview. In ENV/EPOC/WPNEP(2001)18/FINAL. Paris: OECD.

Partidario, P. J., Lambert, J., & Evans, S. (2007). Building more sustainable solutions in production–consumption systems: The case of food

Ryan, T. A. (1970). Intentional behavior: An approach to human motivation.New York: Ronald.

Schultz, P.W. and Zeleny, L.C. (2000).Promoting environmentalism.*The Journal of Social Issues*, *56*,
443-457.

Smith, S., &Paladino, A. (2010). Eating clean and green? Investigating consumer motivations towards the purchase of organic food. *Australasian Marketing Journal (AMJ)*, 18(2): 93-104.

Spaargaren, G., &Mol, A. P. J. (2008). Greening global consumption: Redefining politics and authority. Global Environmental Change – Human and Policy Dimensions, 18(3), 350–359

Tarkiainen, A., &Sundqvist, S. (2005). Subjective norms, attitudes and intentions of Finnish consumers in buying organic food. *British Food Journal*,*107*(11): 808-822.

Tobler. C., Visschers, V.H.M &Siegrist,M. (2011). Eating green.Consumers' willingness to adopt ecological food consumption behaviors.*Appetite* 57, 674–682

Zen, I. S., Ahamad, R., & Omar, W. (2013). No plastic bag campaign day in Malaysia and the policy implication. *Environment, Development and Sustainability*. 1(15):1259-1269.

CONSUMERS' WILLINGNESS-TO-PAY (WTP) FOR ORGANIC RICE BASED ON THEIR SOCIO-DEMOGRAPHIC PROFILES

Ibitoye Olusola Olugbenga, Nolila Mohd Nawi, Nitty Hirawaty Kamarulzaman and Norsida Man Department of Agribusiness and Information Systems, Faculty of Agriculture
Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia
Corresponding e-mail: nolila@upm.edu.my

Abstract

Much of the literature focused on consumers' Willingness-To-Pay (WTP) for organic food with limited information on their WTP for organic rice. This paper estimates theWTP a price premium by consumers for organic rice in Klang Valley, Malaysia based on their socio-demographic profiles. Structured questionnaireswere administered to 834 respondents using mall intercept technique.Contingent Valuation Method (CVM) was used to elicit information from these consumers to estimate their WTP premium price for organic rice. The Chinese (271) were the majorityamong other races in Malaysia that showed WTP. The middle income group(411)also were more WTP a premium price among the other income groups. Out of 458 respondents WTP, majority (347) are with college and university education. Age, gender, race, and household income were statistically significant in predicting WTP premium price for organic rice. The middle income class forms the majority population of any society, building up market demand for any good and or services. Stakeholders' knowledge about consumers WTP along their socio-demographic profile for organic rice is key to developing the industry. It is thus suggested that the Government should facilitate policies to creating conducive business environment that could foster local production of organic rice. Hence, resources used for importing organic rice can be put into more productive use.

Keywords:
Organic rice, Willingness-To-Pay (WTP), Klang Valley, Contingent Valuation Method (CVM)

Introduction

Due to increasing awareness of the adverse effect of conventional agricultural systems,which is based on excessive use of inorganic inputs (Raducuta & Doroftei, 2009), consumers are becoming more concern about their environment, health and food safety issues.In effect, demand for organically produced food has soared (Haghjou, Hayati, Pishbahar, Mohammadrezaei, & Dashti, 2013)as organic agriculture represents an alternative to conventional agriculture (Canavari, Ghelfi, Olson, & Rivaroli, 2007). It claims to have the potential to provide benefits in terms of improved food quality, conservation of renewable resources, and environmental protection all devoted to maintaining ecological harmony (Lampkin & Padel, 1994)with minimum or no use of chemical fertilizers, herbicides and pesticides (Koocheki, 2004).According to Siriphand, organic rice and other organic products are in high demand by health-conscious consumers because they are considered as premium goods (Pratruangkrai, 2011). Likewise in the Malaysian context, organic food consumption is on the rise as the Malaysian consumers are becoming more health conscious regarding food intake (Ibrahim, Razak, Shariff, Abas, & Ruslan, 2013) as well as the growth of the organic agricultural industry in the country(Mohamad, Rusdi, & Hashim, 2014).Certain socio-demographic characteristics have been identified in past literature as affecting or influencing consumer's WTP for organic food products.

Knowledge and information obtained about these socio-demographic characteristics avail opportunity for decision and policy making towards seizing market segments and capturing potential consumers (Hui, May, Wei, & Li, 2013). According to Scheewe, there is an increasing demand for organic rice especially in Malaysia, Singapore and the Philippines (Renzenbrink, 2012).However, Tiraieyari, Hamzah, & Samah(2014)in their study found out that adoption rate for organic farming is still very low among Malaysian farmers.The future of organic rice industry to a large extent will depend on consumer demand and their motive for paying extra price for consuming organically grown rice. Thus, understanding consumers' WTP for organic rice is important to better understand the market and for pursuing better management of organic rice farming. Thus, the aim of this paper is to determine consumers' WTP for organic rice based on their socio-demographic profiles.

Methodology

The study was carried out in Klang Valley, Malaysia through a primary survey of 850respondents, with 834 questionnaires well completed and usable. The structured questionnaire was designed to estimate individual respondents Willingness-To-Pay (WTP) for organic rice using Contingent Valuation Method (CVM).CVM is a methodology widely used by researchers to evaluate values of unpriced goods and services especially environmental related goods (Frykblom, 1997). In estimating WTP using CVM in the study, a hypothetical market was set as respondents select from a given range of values indicating the additional amount to the price of conventional rice theywould be willing to pay for organic rice. Sample respondents were drawn using a mall intercept technique. Klang Valley was chosen as the study location because of its features of varying socio-demographic characteristics among potential consumers. It has a population of about 7.5 million as of 2012 (Anonymous, 2013). Also Klang Valley was chosen because consumers from all works of life do their shopping there while most shopping malls and supermarkets are located within the Klang Valley area. More so, according toStanto, Emms & Sia (2011), about 65% of organic market sizes are located in the Klang Valley area.

Results

The objective of the study is to estimate the premium price consumers would be willing to pay for organic rice products. Table 1 shows the distribution of socio-demographic profile of respondents and their WTP and not willing to pay (nWTP) responses toward organic rice.

Table 1: Socio-demographic Profiles of Respondents& their WTP/nWTPResponses

Demographic variables	Total		WTP		nWTP	
	N	(%)	N	(%)	N	(%)
All respondents	834	100	458	54.9	376	45.1
AGE						
20-29	318	38.1	138	16.5	180	21.6
30-39	262	31.4	151	18.1	111	13.3
40-49	147	17.6	96	11.5	51	6.1
50-59	82	9.8	56	6.7	26	3.1
≥60	25	3.0	17	2.0	8	1.0
GENDER						
Female	417	50.0	242	29.0	175	21.0
Male	417	50.0	216	25.9	201	24.1
RACE						
Malay	304	36.5	137	16.4	167	20.0
Chinese	415	49.8	271	32.5	144	17.3
India	85	10.2	37	4.4	48	5.8
Others	30	3.6	13	1.6	17	2.0
HOUSEHOLD INCOME						
≤RM2,000	59	7.1	14	1.7	45	5.4
RM2,001-4,000	233	27.9	92	11.0	141	16.9
RM4,001-6,000	215	25.8	120	14.4	95	11.4
RM6,001-8,000	169	20.3	110	13.2	59	7.1
RM8,001-10,000	91	10.9	63	7.6	28	3.4
RM10,001-12,000	30	3.6	26	3.1	4	.5
>RM12,000	37	4.4	33	4.0	4	.5
EDUCATION LEVEL						
Never been to school	11	1.3	4	0.5	7	1.0
Primary	29	3.5	18	2.2	11	1.3
Secondary	160	19.2	89	10.7	71	8.5
College/University	634	76.0	347	41.6	287	34.4

Source:*Field Survey (2014)*

Majority of the respondents are below the age of 30 (38.1%), followed by ages 30-39 years (31.4%) while age 60 years (3.0%) upwards are the least.The sample respondents are 417 (50%) for both males and females respectively. The highest number of respondents captured in the study is from the Chinese race (49.8%), followed by Malays (36.5%), Indians (10.2%), while other races captured accounted for 3.6% of the total sample. Monthly income of thehousehold in range of RM2,001-12,000 was received by about 738 (88.5%) of the sample respondents, 37 (4.4%) of the respondents received above RM12,000, while 59 (7.1%) received RM2,000 and below. Majority of the respondents had university education 634 (76.0%), about 160 (19.2%) already completed secondary education, 29 (3.5%) had only primary education, while 11 (1.3%) had never gone to school before. In the age category, majority (151) of the respondents between aged 30-39 years are WTP a premium price followed by 20-29 years age category (138). The study also shows that majority (180) of respondents within age category 20-29 years are not nWTP a premium price for organic rice. Of the 25 respondents of age category ≥ 60 years captured in the study, only (17) of them were WTP a premium price. More females (242) than males (216) showed WTP premium price for organic rice. The results also indicated that Chinese (271) showed more WTP for organic rice followed by Malays (137), Indians (37) and other races (13). Based on the report by Household Income Survey (HIS) of 2012 (N/A, 2013), income group is classified into low (<RM2,000), middle (RM2,000-12,000) and high (RM>12,000) categories. Respondents in the middle income category were more WTP as 411 of them in the middle income category indicated more interest in WTP premium price. Likewise, this same middle income (327) category indicated more respondents not WTP (nWTP) price premium for organic rice out of the three categories. Majority (347) of the 458 respondents that were WTP premium price for organic rice had college and university education. Likewise, 287 of the 376 respondents' nWTP premium price for organic rice had university education.

Socio-demographic Factors affecting Consumers' WTP for Organic Rice

Binary logistic regression model was used to determine impact of selected socio-demographic characteristics based on literature as they predict WTP or nWTP for organic rice. These characteristics used for the purpose of the study were: age; gender; race; household income; education; occupation; and marital status. Only the independent variables or characteristics that made a statistically significant contribution to the model were shown in table 2.

Table 2: Result of Binary Logistic Regression for Factors Influencing WTP for Organic Rice

Demographic variables	**B**	**S.E.**	**Wald**	**Df**	**Sig.**	**Exp (B)**	**95% C.I. for EXP (B)**	
							Lower	**Upper**
Age			8.164	4	.086			
30-39yrs	.361	.231	2.453	1	.117	1.435	.913	2.255
40-49yrs	.667	.296	5.087	1	.024**	1.948	1.091	3.477
50-59yrs	.717	.353	4.125	1	.042**	2.049	1.025	4.095
≥60yrs	1.287	.591	4.735	1	.030**	3.621	1.136	11.541
Gender	-.338	.160	4.470	1	.035**	.713	.521	.976
Race			21.580	3	.000**			
Chinese	.727	.185	15.417	1	.000**	2.068	1.439	2.973
Indian	-.166	.278	.359	1	.549	.847	.491	1.460
Others	.040	.430	.009	1	.926	1.041	.448	2.419
Household income			56.532	6	.000**			
RM2,001-4,000	.688	.369	3.475	1	.062	1.990	.965	4.104
RM4,001-6,000	1.339	.370	13.120	1	.000**	3.815	1.849	7.872
RM6,001-8,000	1.665	.384	18.844	1	.000**	5.285	2.492	11.208
RM8,001-10,000	1.712	.421	16.947	1	.000**	5.539	2.425	12.653
RM10,001-12,000	3.105	.674	21.219	1	.000**	22.301	5.952	83.565
>RM12,000	2.912	.657	19.663	1	.000**	18.401	5.079	66.667

Note: ***Significant at 5%*

Source: *Field survey (2014)*

These are age (40-49yrs, 50-59yrs, ≥60yrs), gender, race (Malay and Chinese), and monthly household income categories (except RM2001-RM4000 income category). Monthly household income category of RM10,001-RM12,000 was the strongest predictor of respondents' WTP higher price for organic rice, which recorded an odd ratio (exp B) of 22.301. This implied respondents who had monthly household income between RM10,001-RM12,000 were over 22 times more likely to report WTP higher price for organic rice than those who were nWTP higher price controlling for all the other factors in the model. Other statistically significant monthly income categories are interpreted in similar manner as the aforementioned. This suggests respondents with the significant income categories should be the target of marketers due to their likelihood of increasing WTP higher price for organic rice. The finding is supported by the works of Piyasiri&Ariyawardana (2002); Valerian, Domonko, Mwita, &Shirima (2011). They found out consumers with high income have more influence on the purchase of organic vegetables and organic food products.

Discussion

It has been found that younger consumers are more likely to be WTP for organic food products (Liu, Zeng & Yu, 2009). This supports the finding of the study that respondents of younger age categories were more WTP for organic rice. It is expected that older age categories should show more WTP for organic food as they are more concerned about their health than younger age categories as found out by Gil, Gracia, & Sanchez (2000).From the findings, more females than males showed WTP premium price for organic rice. This could be as a result of females being more health conscious than males(Radam, Yacob, Bee & Selamat, 2010) and are more likely to agree to purchase organic foods (Ahmad & Juhdi, 2010). The findings of Sung (2012) supports the result of the study that Chinese are more WTP a price premium for organic rice as compared to other races. In the study of Ara (2003), the high income group has higher WTP than the middle income group in general. However, he further stated that the high income group WTP for reduced health risk level attributes in organic riceconsumption is lower than for the middle income group. This may support the finding in this study that the middle income category showed greater WTP premium price for organic rice. The middle income class forms the majority population of any society, building up market demand for any good and or services. Individuals with high level of education were more WTP premium price for organic relative to conventional products (Strzok & Huffman, 2012). Thissupports the findings of the study that majority of respondents with college/university education indicated WTP price premium.The statistically significant socio-demographic characteristics will help in determining potential market niche and segment thus avail marketers with necessary information in defining the market. More so, findings of this study have important implication in understanding potential consumer's purchasing decision and choicesfor organic rice along their socio-demographic profiles. Having knowledge and understanding of this would help respective marketers and stakeholders in the organic rice industry fashion out strategic plans in promoting the industry.It is suggested that the Government of Malaysia should facilitate policies that would encourage and possibly enhance the business environment towardslocal production of organic rice. The huge limited resources put to its importation could be invested into otherproductive use.

References:

Ahmad, S. N. B., & Juhdi, N. (2010). Organic Food : A Study on Demographic Characteristics and Factors Influencing Purchase Intentions among Consumers. *International Journal of Business and Management*, *5*,(No. 2), 105–118.

Ara, S. (2003). Consumer Willingness to Pay for Multiple Attributes of Organic Rice : A Case Study in the Philippines. In *25th International Conference of Agricultural Economists, August 16-22, 2003, Durban, South Africa* (pp. 1–15). Durban, South Africa.

Canavari, M., Ghelfi, R., Olson, K. D., & Rivaroli, S. (2007). A Comparative Profitability Analysis of Organic and Conventional Farms in Emilia-Romagna and in Minnesota. In M. Canavari & K. D Olson (Eds.), *Organic food. Consumers' Choices and Farmers' Opportunities.* (pp. 31–45). New York: Springer Science+Business Media. doi:10.1007/978-0-387-39582-1_3

.

Frykblom, P. (1997). Hypothetical Question Modes and Real Willingness to Pay. *Journal of Environmental Economics and Management*, *34*(3), 275–287. doi:10.1006/jeem.1997.1015

Gil, J. M., Gracia, A., & Sanchez, M. (2000). Market segmentation and willingness to pay for organic products in Spain, *3*, 207–226.

Haghjou, M., Hayati, B., Pishbahar, E., Mohammadrezaei, R., & Dashti, G. (2013). Factors Affecting
Consumers' Potential Willingness to Pay for Organic Food Products in Iran: Case Study of Tabriz. *Journal of Agricultural Science Technology*, *15*, 191–202.

Ibrahim, M. A., Razak, M. I. M., Shariff, S., Abas, N. M., & Ruslan, R. A. M. (2013). The Trends In Consumption Of Organic Foods In Malaysia: An Overview. In *Paper Proceeding of the 5th*
Islamic Economics System Conference (iECONS 2013), "Sustainable Development Through The Islamic Economics System",Organized By Faculty Economics And Muamalat, Universiti Sains
Islam Malaysia, Berjaya Times Square Hotel, Kuala L (pp. 4–5). Kuala Lumpur.

Liu, Y., Zeng, Y., & Yu, X. (2009). Consumer Willingness to Pay for Food Safety in Beijing: A Case Study of Food Additives. In *International Association of Agricultural Economies Conference, Beijing, China* (pp. 6–15). Beijing, China.

Mohamad, S. S., Rusdi, S. D., & Hashim, N. H. (2014). Organic Food Consumption Among Urban Consumers: Preliminary Results. *Procedia - Social and Behavioral Sciences*, *130*, 509–514. doi:10.1016/j.sbspro.2014.04.059

Pratruangkrai, P. (2011). Export focus shifts to organic rice: Thailand is focusing on promoting organic rice in developed nations to capture more income and ensure export growth in those markets. Retrieved from http://www.nationmultimedia.com/business/EU-demand-for-organic-rice-high-30175395.html

Radam, A., Yacob, M. R., Bee, T. S., & Selamat, J. (2010). Consumers ' Perceptions , Attitudes and Willingness to Pay towards Food Products with " No Added Msg " Labeling. *International Journal of Marketing Studies*, *2*(1), 65–77.

Raducuta, I., & Doroftei, F. (2009). Research on the Evolution and current state of Organic Agriculture worldwide. *Lucrări Ştiinţifice - Seria Zootehnie*, *57*, 215–220. Retrieved from www.uaiasi.ro revista oo ro documente Pdf ol... I Raducuta.pdf

Renzenbrink, A. (2012). Rising world demand for Cambodian organic rice. *Open Development Cambodia (OPC)*. Retrieved October 12, 2013, from http://www.opendevelopmentcambodia.net/about/

Stanton, Emms, & Sia. (2011). *Malaysia's Markets for Functional Foods, Nutraceuticals and Organic Foods:*. *Agriculture and Agri-Food Canada* (pp. 1–38). Retrieved from http://www.ats-sea.agr.gc.ca/ase/pdf/5842-eng.pdf

Strzok, J. L., & Huffman, W. E. (2012). *Willingness To Pay For Organic Food Products and Organic Purity: Experimental Evidence*. Ames, Iowa.

Tiraieyari, N., Hamzah, A., & Samah, B. A. (2014). Organic Farming and Sustainable Agriculture in Malaysia: Organic Farmers' Challenges towards Adoption. *Asian Social Science*, *10*(4), 1–7. doi:10.5539/ass.v10n4p1

UNDERSTANDING THE KNOWLEDGE OF AFLATOXINSCONTAMINATION IN PEANUT-BASED PRODUCTS AMONG STAKEHOLDERS: MANUFACTURER'S PERSPECTIVE

Nur Nazurah MohdAzaman[1], Nitty Hirawaty Kamarulzaman[2*], Mad Nasir Shamsudin[3], Jinap Selamat[4]

[123]Department of Agribusiness and Information Systems,
Faculty of Agriculture
[4]Food Safety Research Centre (FOSREC)
Faculty of Food Science and Technology
Universiti Putra Malaysia
43400 UPM Serdang, Selangor, MALAYSIA
**Corresponding e-mail: nitty@upm.edu.my*

Abstract

Aflatoxins are naturally occurring mycotoxins found on foods and feeds and have been demonstrated to be carcinogenic in many experimental models. The presence of aflatoxins in human foods and animal feeds has been reported widely. Unfortunately, there were only few cases involving humans and animals that aflatoxins contamination in peanut-based products can cause negative impacts especially to human health were reported. More than 90% of peanuts in Malaysia are imported from foreign countries particularly from China. Most of imported peanuts have been reported to be contaminated if no precautions to reduce or eliminate aflatoxins contamination are carried out. However, information and knowledge of the danger of aflatoxins contamination in peanuts is still lacking among manufacturers. Thus, the aim of this study is to assessmanufacturer's knowledge level of aflatoxins contamination in peanut-based products. In this study, face-to-face interviews were conducted using a semi-structured questionnaire with 20 respondents representing by peanut-based manufacturers. Based on this preliminary survey, the result showed that majority of the respondents had an adequate level of knowledge in regard to aflatoxins contamination in peanut-based products in terms of HACCP implementation and inspection activities.

Keywords: Aflatoxins, peanut-based products, knowledge

Introduction

Aflatoxins iswell known as contaminant that produced by food-bourne fungi known as *Aspergillus flavus* and *Aspergillus parasiticus* (Aycicek *et al*., 2005). Aflatoxins has been associated with the increasing incidence of human gastrointestinal and hepatic neoplasms particularly the aflatoxins B1 strain, which is immunotoxic, carcinogenic, and mutagenic substances (Moss, 1998) and they were classified as Group 1 carcinogen by the International Agency of Research on Cancer (IARC, 1993). The Hepatocelullar carcinoma (HCC) or liver cancer is the third leading cause of cancer deaths worldwide, which higher in developing countries than developed countries with prevalence 16-32 times (Liu & Wu, 2010). Besides, several other signs of acute aflatoxicosis including depression, abdominal pain, jaundice, decreased levels of serum vitamin A and E, diarrhea and even death (Johnson *et al*., 2010). Aflatoxins production is fostered by the hot and humid conditions that are favorable conditions for the growth of fungi in the foodstuffs (Arzandeh *et al*., 2010; Leong *et al*. 2011). Agricultural commodities such as maize and peanuts become contaminated with aflatoxins during pre- and post-harvest conditions including improper storage of food commodities (Arzandeh *et al.*, 2010). Other products like corn, peanuts, and tree nuts are also easily contaminated, however, aflatoxins are mostly occurred in maize and peanuts (Bankole *et al*., 2010).

Since aflatoxins is still cannot be simply removed or eliminated from the diets, but it can be reduced to an acceptable level for humans and animal through an early intervention. It is essential to increase public awareness for instance through the knowledge to educate people about the presence of aflatoxins in their daily diet. Risks from aflatoxins can be minimized through information diffusion by awareness campaigns (Strosnider*et al*., 2006). Hence, knowledge on aflatoxins is crucial among manufacturers. The Department of Agriculture, Malaysia (DOA) reported that most of the peanuts in Malaysia are imported from foreign countries such as China, India, and Vietnam, which aflatoxins has been detected mostly from the imported peanuts. These findings are in line with Wu(2004) who found that China is one of the nations that experience the highest serious economic challenges with aflatoxins in peanuts.

Thus, manufacturers' knowledge on good quality in peanuts is important, as it is one of the initial ways to minimize contamination of aflatoxins. This preliminary study therefore aims to identify knowledge level of aflatoxins contamination in peanut-based products among manufacturers in Selangor, Malaysia.

Materials and Methods

This preliminary study was aimed to explore the knowledge level of aflatoxins contamination in peanut-based products among manufacturers. This study involved 20 companies consisting of peanut-based manufacturers in Selangor. Face-to-face interviews were carried out using a semi-structured questionnaire consisting of open and close-ended questions including the company profiles and knowledge of aflatoxins contamination in peanut-based products. In the context of this study, all targeted respondents were obtained through stratified random sampling in which the manufacturers' details were provided by the Ministry of Health (MoH). In regard to the knowledge of aflatoxins contamination in peanut-based products, relevant statements were developed and they were measured on a three-point scale of answers (1= do not know, 2=not sure, and 3=know). For each correct answer a score of one (1) was given while zero (0) score for incorrect answer. For those manufacturers who chose '2=not sure' as their answer, the score was also given as zero (0). This is to measure the respondents have adequate or inadequate knowledge on that particular statements regarding aflatoxins. The scales of manufacturers' knowledge level were adapted from Muhammad Nor (2001), where the knowledge level was calculated based on a total score. For manufacturers who achieved a total score between 14 to 20, they were considered to have adequate knowledge level, while those who were achieved a total score below than 13 was considered as inadequate knowledge level regarding aflatoxins contamination. Data were analyzed using descriptive analysis in order to get better understanding of companies' background. Besides, mean ranking analysis was carried out to identify the knowledge level of respondents towards aflatoxins contamination in peanut-based products.

Results and Discussions

Company's profiles

Table 1 shows the companies profiles of 20 manufacturers who participated in this preliminary survey. The result showed that 7 companies were located in Selangor (35%), followed by 5 companies inPenang (25%), 4 companies inPerak (20%), 2 companies inMalacca (10%) while Negeri Sembilan and Pahang represented by one company at each state and accounted for 5% of responses respectively. Other than that, most of the manufacturers interviewed were executive (5), which accounted for 25% of total response. Most of the companies (15) followed the Standard of Procedure (SOP) at their production line that accounted for 75%. In terms of types of peanuts product by each company, most of them were produced peanut snacks (6) and groundnuts (4), which accounted for 30% and 20% respectively. Furthermore, market of company's product showed that 13 companies marketed their product in the both market, which were local and international markets. This study further indicated that half of the total manufacturers (10 companies) procuredpeanutsupplies from China, followed by India (7 companies), whichaccounted for 35%, and 3 companies from local suppliers thataccounted for 15%).

Table 1: Companies Profiles

Profiles	Frequency (n)	Percentage (%)	Profiles	Frequency (n)	Percentage (%)
State			**Types of peanut product produced**		
Malacca	2	10			
Negeri Sembilan	1	5	Groundnuts	4	20
Pahang	1	5	Peanut Kernels	3	15
Perak	4	20	Roasted Peanut	3	15
Penang	5	25	Peanut Snacks	6	30
Selangor	7	35	Peanut Sauce	1	10
			Peanut Cookies	3	15
Job description					
General Manager	2	10	**Product's market**		
Production Manager	4	20	Local	6	30
Marketing Manager	1	5	International	1	10
Executive	5	25	Both	13	65
QA Manager	2	10			
QC Manager	3	15	**Country of peanut supplier**		
Supervisor	3	15			
			Local	3	15
Follow SOP			China	10	50
Yes	15	75	India	7	35
No	5	25			

Note: n=20

Knowledge level towards aflatoxins contamination

Table 2 shows the result of manufacturers' knowledge level towards aflatoxins contamination in peanut-based products. Knowledge level about aflatoxins contamination in peanut-based products was measured based on 15 statements. Based on the result in Table 2, most of the manufacturers have high knowledge towards aflatoxins contamination in peanut-based products in which had an overall mean score of 2.580and standard deviation was 0.583. Mean score above 2.0 showed that the respondents in this survey have an agreement that they have knowledge about aflatoxins contamination.

The result further showed that about 18 manufacturers (90%) were agreed and have knowledge based on their responses on statements such as '*inspection must be taken when receive peanut kernels at the plant premises*' and '*the preventive approach of HACCP can improve food safety and quality management systems*'.Based on these two statements, the mean scores revealed were 2.85 respectively. This shows that most of the manufacturers knew and aware about inspection activities are important when peanut kernels received from suppliers in order to minimize aflatoxins contamination to other goods at their plant premises. By conducting regular inspection, peanuts that show any signs of mould growth or insect damage peanuts will not be used by the companies for further production activities. Besides that, HACCP programs are very useful and important to follow to manage risks associated with potential contamination in food for instance aflatoxins (Park *et al*., 1999).

Meanwhile, the lowest mean score of 1.90 wasreferring to the statement of '*small amount of aflatoxins can adverse health effects*'. About 7manufacturers (35%) were not aware that aflatoxins could harm human health even they are exposed to a small amount of aflatoxins in peanuts (Jolly *et al*., 2006).

Table 2: Mean Score of Statements on Manufacturers' Knowledge towards Aflatoxins Contamination in Peanut-based Products

	Statements	1*	2*	3*	Mean	SD
1.	Inspection must be taken when receive peanut kernels at the plant premises.	5% (1)	5% (1)	90% (18)	2.85	0.489
2.	The preventive approach of HACCP can improve food safety and quality management systems.	5% (1)	5% (1)	90% (18)	2.85	0. 489
3.	Special precautions must be taken to reject peanuts that show sign of mould growth.	5% (1)	10% (2)	85% (17)	2.80	0. 523
4.	The packaging of processed peanuts should be packed in clean and proper manner.	5% (1)	10% (2)	85% (17)	2.80	0. 523
5.	The warehouse for storage of peanut kernels should not contain any openings.	10% (2)	5% (1)	85% (17)	2.75	0.638
6.	Have you heard about aflatoxins?	10% (2)	5% (1)	85% (17)	2.75	0.639
7.	Do you know that aflatoxins present in some food items?	10% (2)	10% (2)	80% (16)	2.70	0.657
8.	Do you know that aflatoxins presents in groundnut?	10% (2)	10% (2)	80% (16)	2.70	0.657
9.	Transport vehicle should be examined for cleanliness, insect infestation, dampness or unusual odours.	10% (2)	10% (2)	80% (16)	2.70	0.657
10.	Do you know that intake of peanuts with aflatoxins have adverse health implications?	10% (2)	20% (4)	70% (14)	2.60	0.681
11.	A proper implementation in the management system can reduce level of aflatoxins in peanuts.	10% (2)	20% (4)	70% (14)	2.60	0.681
12.	Sorting activities can remove defective kernels.	20% (4)	25% (5)	55% (11)	2.35	0.813
13.	Does fungi cause aflatoxins?	25% (5)	30% (6)	45% (9)	2.20	0.834
14.	Do you know the importance to follow CODEX?	25% (5)	35% (7)	40% (8)	2.15	0.813
15.	Small amount of aflatoxins can adverse health effects.	35% (7)	40% (8)	25% (5)	1.90	0.788
	Overall mean score (n=20):					**2.5800.583**

**Note: 1= do not know, 2=not sure, and 3=know*

Table 3 shows the results on the manufacturers' knowledge level towards aflatoxins contamination in peanut-based products. Based on the result, about 75% (n=15) of manufacturers had inadequate level of knowledge regarding aflatoxins. About 25% (n=5) of respondents had adequate level of knowledge towards aflatoxins contamination in peanuts. These manufacturers responded that they had attended training programs and courses provided by companies, especially about hygiene and sanitation. Besides, the programs provided them with updated information and relevant knowledge about aflatoxins contamination.

Table 3: Manufacturers' Knowledge Level towards Aflatoxins Contamination

Level	Frequency (n)	Percentage (%)
Adequate	5	25
Inadequate	15	75
Total	**20**	**100.0**

Conclusions

This preliminary study was aimed to investigate manufacturers' knowledge level of aflatoxins contamination in peanut-based products. In essence, the result revealed that about 75% of the manufacturers had insufficient knowledge level regarding aflatoxins contamination in peanut-based products. Based on the result, most of the manufacturers aware about the important of inspection activities and they are criticalto be carried out when peanut kernels received from supplierstо avoid peanuts from being further contaminated by the danger of aflatoxinsto human health. Besides that, HACCP programs are very advantageous and at the same time to improve food safety and quality of management systems as well as produced higher quality of peanut-based products.On the other hand, some of the manufacturers in this studywere still lacking about some important issues like aflatoxins can adverse health effect even exposed to a small amount of aflatoxins.

Knowledge about aflatoxins contamination is important and necessary especially to the manufacturers of peanut-based products particularly those companies who imported peanuts from other countries. Improving the knowledge level among manufacturers regarding aflatoxins contamination can be done by many ways including seminars and training courses about hygiene and sanitation. Furthermore, manufacturing companies can increase their efficiency level in monitoring and surveillance from food safety and quality division in order to help to minimize aflatoxins contamination in peanuts and peanut-based products.

References

Arzandeh, S., Selamat, J., & Lioe, H. N. (2010) Aflatoxin in raw peanut kernels marketed in Malaysia.*Journal of Food and Drug Analysis*, 18 (1). pp. 44-50. ISSN 1021-9498.

Aycicek, H., Aksoy, A., & Saygi, S. (2005). Determination of aflatoxin levels in some dairy and food products which consumed in Ankara, Turkey. *Food Control*, *16*(3), 263-266.

Bankole, S., Schollenberger, M., & Drochner, W. (2006). Mycotoxins in food systems in Sub Saharan Africa: A review. *Mycotoxin Research*, *22*(3), 163-169.

IARC Working Group on the Evaluation of Carcinogenic Risks to Humans. (1993). *Some naturally occurring substances: food items and constituents, heterocyclic aromatic amines and mycotoxins*. Retrieve October 3, 2014 from http://bases.bireme.br/cgi-bin/wxislind.exe/iah/online/?IsisScript=iah/iah.xis&src=google&base=WHOLIS&lang=p&nextAction=lnk&exprSearch=9283212568&indexSearch=ID.

Johnson, N.M., Qian, G., Xu, L., Tietze, D., Marroquin-Cardona, A., Robinson, A., Rodriguez, M., Kaufman, L., Cunningham, K., Wittmer, J., Guerra, F., Donnelly, K.C., Williams, J.H., Wang, J., Phillips, T.D. (2010). Aflatoxin and PAH exposure biomarkers in a U.S. population with a high incidence of hepatocellular carcinoma. *Science of the Total Environment*, *48*(23), 6027-6031.

Jolly, P., Jiang, Y., Ellis, W., Awuah, R., Nnedu, O., Phillips, T., Wang, J., Afriyie-Gyawu, E., Tang, L., Person, S., Williams, J., & Jolly, C. (2006). Determinants of aflatoxin levels in Ghanaians: Sociodemographic factors, knowledge of aflatoxin and food handling and consumption practices. *International Journal of Hygiene and Environmental Health*, *209*(4), 345-358.

Leong, Y. H., Rosma, A., Latiff, A. A., & Ahmad, N. I. (2011). Exposure assessment and risk characterization of aflatoxin B1 in Malaysia. *Mycotoxin Research*, *27*(3), 207-214.

Moss, M. O. (1998). Recent studies of mycotoxins. *Journal of Applied Microbiology*, *84*(s1), 62S.

Muhamad Nor, S. N. A. (2001). Knowledge, attitude and practices towards the use of child restraint devices (CRDs) in motor vehicles among the academic and support staff of Universiti Putra Malaysia (Unpublished Master's thesis). Universiti Putra Malaysia. Park,

D. L., Njapau, H., & Boutrif, E. (1999). Minimizing risks posed by mycotoxins utilizing the HACCP concept. *Food Nutrition and Agriculture*, 49-54. . Retrieve October 13, 2014 from http://www.fao.org/3/a-x2100t/X2100t10.pdf.

Strosnider, H., Azziz-Baumgartner, E., Banziger, M., Bhat, R. V., Breiman, R., Brune, M. N., DeCock,K., Dilley, A., Groopman, J., Hell, K., Henry, S. H., Jeffers, D., Jolly, C., Jolly, P., Kibata, G. N., Lewis, K., Liu, X., Luber, G., McCoy, L., Mensah, P., Miraglia, M., Misore, A., Njapau, H., Ong, C., Onsongo, M. T. K., Page, S. W., Park, D., Patel, M., Philips, T., Pineiro, M., Pronczuk, J., Rogers, H. S., Rubin, C., Sabino, M., Schaafsma, A., Shephard, G., Stroka, J., Wild, C., Williams, J. T., & Wilson, D. (2006). Workgroup report: public health strategies for reducing aflatoxin exposure in developing countries. *Environmental Health Perspectives*, 1898-1903. . Retrieve October 5, 2014 from http://www.jstor.org/discover/10.2307/4119604?uid=3738672&uid=2&uid=4&sid=21104276671071.

Wu, F. (2004). Mycotoxin risk assessment for the purpose of setting international regulatory standards. *Environmental Science and Technology*, *38*(15), 4049-4055

IDENTIFICATION OF TECHNICAL DIFFICULTIES IN IMPLEMENTING AGILITY USING CLUSTER ANALYSIS

Mukherjee, A., Kamarulzaman, N. H*, Shamsudin, M. N., and AbdLatif, I.

Department of Agribusiness and Information Systems, Faculty of Agriculture Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia *Corresponding author: nitty@upm.edu.my

ABSTRACT

This paper explores the diversity upon identifying meaningful patterns of agility hindrances in a well-defined group at the Malaysian palm oil industry. Four distinct clusters are identified using cluster analysis and the responses have been described based on criterion variables and set of additional questions that have not been used to produce the cluster solution. All the groups give an insight to the character of cluster members. Hence, scientific approach is necessary. The findings of the study will be useful for decision makers to formulate a strategic plan for the implementation of agility in the organisation.

Keyword: Cluster Analysis, Agility, Barriers, Malaysian Palm Oil Industry

INTRODUCTION

The concept of agility has grown and has been given importance in the business. Agility has been identified as one of the most important aspects for long term performance. In the survey conducted by the Economic Intelligence Unit, around 90% of the organisation believe agility is critical for business success (Glenn, 2009). Agility has always been linked to profitable growth. According to the survey done by the Massachusetts Institute of Technology, agile firms grow their revenue by 37% faster and generate 30% higher profits than non-agile organisation (Hart, 2013). Today‟s business environment has become complex and highly competitive and is rapidly changing. The agile organisation is always ready to handle these changes and can adapt to meet the customer demands. The majority of business wants to overcome these challenges and want to create an organisation, which have a customer-oriented environment. As the customer‟s expectation is increasing, the ability to change and adapt are the key to long-term success. Hence, it is important for an organisation to be agile and the demand for adopting new principles and technologies is fundamentally changing the basic demands of organisation strategy.

Hart (2013) stated that most of the organisations admit that they are not agile to respond quickly, positively and completely. This raises the question as to whether the organisations in the Malaysian palm oil industry (MPOI) are agile and if they are non-agile then what are the impediments for their agility. Therefore, there has been a need to identify the key barriers in implementing agility and to find the patterns of identifying the barriers using person-centred approach and understand the different ways in which the constructs are configured within individuals. Barriers negatively affect the readiness to implement and commence. Barriers are more specifically defined as either real or perceived individual, interpersonal or contextual factors which prevent them to implement (Sallis & Owen, 1999). The aim of this study is to identify the different clusters of agility barriers.

LITERATURE REVIEW

An agile business is the one that has the capacity to maximise the value of every opportunity and to determine the focus of any business on its core strengths (Black, 2012). In response to the implementation of agility in the business, the solution is a well-known characteristic which is required to implement thereby controlling, robustness gain flexibility and rapid change. Otherwise, the company loses its competitive advantages. Earlier research has proposed agility at different levels. As

Overby, Bharadwaj, and Sambamurthy (2006) have defined agility as "the ability of the firms to feel the environmental changes and respond radically" (p. 121). This makes the organisation to incorporate agility that has the ability to detect, anticipate and feel the market potential and is ready to adapt the changes. It will enhance the effectiveness and efficiency of the organisation in response to the changes in the operations. Hence, for this we identify the firm characteristics as company size would be enabled to respond and sustain the competitive advantages.

It is suggested that the companies with the same profile will be easy to take a decision on implementing agility principles. There are some of the internal barriers to prevent the organisation from being agile include resistance to change, poor decision making, lack of alignment around strategies, vision and values, and to have a holistic mindset. The organisation has understood the growing importance of implementing the agility in the organisation. Thus, an inability to understand the trend has led to worrying the wide-spread of the companies. The aim of implementing agility in the organisation be an agile organisation is about increasing responsiveness and maintaining flexibility through a determined focus on improvements to the entire supply chain.

The barriers are being categorised between internal and external barriers (Ziebland, Thorogood, Yudkin, Jones, & Coulter, 1998). The internal barriers encompass more individual and psychologically based factors, whereas the external barriers consist of environmental factors that are out of the control. It has been noted that there area direct and indirect effects of the barriers to positive behaviour change. Thus, clustering techniques is used to identify the respondent importance of choosing and what are the obstacles in implementing agility in the organisation.

METHODOLOGY

Measurement Development

The measurement development for technical issues in the agility implementation process involves five stages: (1) discussion with technical experts, (2) operationalization of research constructs, (3) quantification, (4) item development, and (5) validity tests. The first stage for the development of questionnaire items was discussion with the experts from the MPOI. The aim is to identify and explore the areas that are considered subsequently in the research. The strategy implemented for the discussion with the experts were semi-structured questionnaire and asking open question as "*What do they think would be the problems or issues in implementing the agile principles in the organisation or at the plantation level*?" The experts were identified using purposive sampling and more precisely snowball sampling techniques. The second stage was kept to identify the existing measurement from the past research and modify the existing items as per the requirement that suit the context of the study. The third stage is to perform quantification from the discussion with the expert from the industry in the form of qualitative approach, and upon quantification, the creation and modification of the measurement items. The questionnaires were then sent to the technical experts from Malaysian palm oil industry through email to verify the complete questionnaire by the technical expert for final data collection from the plantation managers.

Research Design

The structured questionnaire consists of three sections. The first section was about the company profile and people working with them, the second section dealt with the knowledge about the agility and its importance and the third section asked about the barriers in implementing agility in the organisation consisting of 15 measurement items. The measurement items were measured in 7-point Likert scales from „1=strongly disagree" to „7=strongly agree". Around 85 plantation managers were invited to participate in this survey, and a total of 42 complete data samples was achieved and after removing the incomplete data and other inappropriate data 33 samples were used for the cluster analysis. The response rate was around 38.8% for the analysis. The reliability test was conducted in order to examine the internal consistency of all barriers variables of 15 items, and barrier variables were found to be reliable as the Cronbach"s Alpha was 0.929.

To address the research question, cluster analysis was applied to analyse the data, which is person-centric analysis, which outlines the profile of the sample based on certain patterns for the development of constructs. The survey was designed to based comprehensively on the respondents. Cluster analysis will identify a set of groups that minimise within-group variation and maximise between group variance. The cluster was performed to identify groups of respondents with similar barriers to implement the agile principle in the organisation and build a profile. The cluster analysis was used to measure the similarity between the cases that was squared through Euclidean distance and is recommended for calculating the distance using Ward‟s method (Hair, Black, Babin, & Anderson, 2010). As the data sample is small (less than 100) it is better to perform a hierarchical procedure to identify the number of clusters (Everett, Landau, & Leese, 2001). Ward‟s method will help the cluster to be of equal size as it minimises the within-group variation (Hair *et al.*, 2010). The clustering visualisation by the dendrogram has suggested that the optimal cluster solution could be between 2 to 7 clusters. After identifying the approximate number of clusters, the non-hierarchical of K-means clustering techniques applied to the cluster solution ranging from 2 to 7 clusters. The final cluster was determined by applying a measure of heterogeneity. The means of each cluster are studied by using ANOVA to assess how distinct the clusters are from each other. Levene‟s test for equality was conducted on ANOVA basic condition to find out whether the variances of both the samples are equal. Higher value of Levene‟s statistics will help to find the significant differences between the clusters; Robust Test of Equality of means and Welch F statistics is used to verify the differences between the clusters are significant. This will help to find the optimal cluster solution. Then, two-step cluster techniques are used to find out the predictor importance for each of the clusters.

RESULTS AND DISCUSSION

Descriptive statistics was performed to find out the information about the respondent and its distribution. The statistics show that the organization from where the data were collected in terms of states, company size, types of organization and its ownership. The data were collected from different parts of the states the maximum number of samples was collected from Negeri Sembilan with 33.3% and then followed by Terengganu with 24.2%. There were 81.8% of the respondents were from small companies, whereas 18.83% of the respondents were from medium sized companies.

The profile data described the features of the respondent who took part in the study. The results showed that the majority of respondents were from plantation (87.8%) with their designation as plantation managers (69.7%) and area managers (30.3%). About 36.4% of the respondents had a total experience in the organization between 31 to 35 years and about 33.3% of the respondents with an experience of 6-10 years in the age group in the current position.

Cluster Analysis Results

The number of clusters was identified by the dendrogram diagram and was found to be 7clusters, but after performing the k-means of clustering techniques it was found that 4 clusters were to be an optimal cluster. The cluster centroids that represented the mean values is shown in Table 1.

Table 1: Final Clusters Centroids

	Cluster 1 (n=7)	Cluster 2 (n=9)	Cluster 3 (n=9)	Cluster 4 (n=8)
Factor 1	4.99	3.88	3.88	4.37
Factor 2	2.32	1.81	1.81	2.02
Factor 3	1.22	0.95	0.95	1.06

Table 2 shows a Levene‟s test for homogeneity of variance. Higher the value of Levene‟s statistics shows that the cluster is significantly different which is being calculated as the ratio of between the groups variance to within the group variance and Robust Test of Equality of Means and the Welch F statistics was used to verify the differences between the clusters are significant. The significance value for all the three factors with four clusters for Welch F Statistics were less than 0.05 and we concluded

that they are statistically significant difference between the clusters which shows that at least one of the mean is different from the other group mean and is significant.

Table 2: Test of Homogeneity of Variances

	Levene Statistics	df1	df2	Sig.
Factor 1	2.390	3	29	.089
Factor 2	2.896	3	29	.052
Factor 3	6.620	3	29	.002

Table 3 shows the output ANOVA of the cluster centres, the clustering variables means differ significantly across all the segments except the variable "Effects of organization interest" which failed to reject the null hypothesis and the remaining variables rejected the null hypothesis

Table 3: ANOVA Output

	Cluster Mean Square	df	Error Mean Square	df	F	Sig.
Lack of understanding between internal and external activities	20.407	3	1.026	29	19.894	.000
Poor supply chain management planning and understanding	15.240	3	1.270	29	12.002	.000
Lack of trust	10.121	3	2.316	29	4.371	.012
Top management low commitment	18.163	3	1.684	29	10.784	.000
IS/IT deficiencies	18.854	3	1.544	29	12.213	.000
Organizational structure / culture	13.335	3	1.444	29	9.236	.000
Lack of supply chain measurement	12.451	3	1.604	29	7.761	.001
Lack of alliance guidelines	19.972	3	1.184	29	16.874	.000
Strict budget	13.375	3	2.788	29	4.798	.008
Staff resistance	14.197	3	1.700	29	8.353	.000
Lack of competent staff	28.598	3	0.868	29	32.941	.000
Slow decision-making process	12.169	3	1.863	29	6.530	.002
Effects of organization interest	**5.854**	**3**	**2.172**	**29**	**2.695**	**.064**
Laid back attitude of employees	16.977	3	1.955	29	8.682	.000
"Wait and See" syndrome	12.491	3	2.187	29	5.710	.003

Figure 1 shows a model summary of the cluster that was used to identify the each item that is of importance of implementing the agile principles in the organization. The Silhouette average for the cluster quality was 0.4 and which is in the fair band with the highest valve to be 0.5.

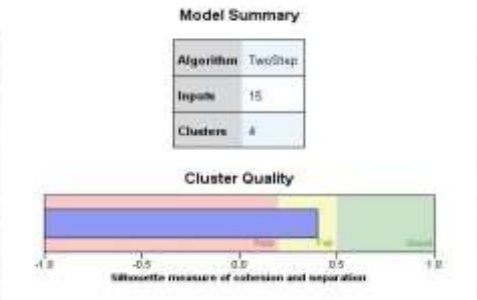


Figure 1: Model Summary with Cluster Quality

The clusters help to see the degree of interrelationship between the statements. Smaller the cluster, the greater is the interrelationship between the statements and vice versa. According to Butler and Sellbom (2002), barriers affect the rate of adoption and prevent individuals, groups or an organization from adopting the principles. The formation of clusters and the managers view for the implementation of agility is identified as "Laid back attitude of the employee" as the most important factor and the

least important are “Slow decision making process” and “Effects of organization interest”. Whereas for each cluster formation that differ, they were found to be the most important factor from each other. For cluster 1 the most important factor that the managers think and was grouped together as “Strict Budget” and the least factor was “Lack of Trust” and in the similar manner the most important ingredient for the formation of cluster 2, cluster 3 and cluster 4 were “Laid back attitude of the employee”, “Staff resistance”, and “Lack of understanding between internal and outside activities” respectively. Whereas the least significant component that the cluster is used for grouping the respondent were “Effects of organization's interest”, “Lack of understanding between internal and outside actions” and “Staff resistance” for the cluster 2, cluster 3 and cluster 4 respectively.

CONCLUSIONS

The purpose of this study was to identify the most important predictive factor that the respondent thinks about the implementation of agility in the organisation and results depict that there are four different ways that the respondent think about the implementation of agility in the MPOI. The clustering techniques were used to perform segmentation of the people thinking, so that organisations can use this cluster to make some strategies for the concerns or to plan out strategies to overcome the issue of implementing agility in the organisation.

This study adds to the growing literature that focuses on implementing agility in the organisation among the managers in the organisation. The person-centred analytic approach explained the ways in which the relation between the different managers thinks, and that can bring about changes for the implementation of agility in the organisation. The growing knowledge base can be useful and informative to different stakeholders in the MPOI to plan strategies that seek to address the issues for radical change and be adaptable.

ACKNOWLEDGEMENT

This research was funded by the Ministry of Education (MOE) under the Fundamental Research Grant Scheme (FRGS, 2013-2015).

REFERENCES

Black P (2012). Enabling business agility with Production Allocation in the Cloud. Retrieved on 24 December, 2014 from http://www.energysys.com/wp-content/uploads/2012/06/Enabling-business-agility-with-Production-Allocation-in-the-Cloud-NV.pdf?d026ba

Butler, D. & Sellbom, M. (2002). Barriers to adopting technology for teaching and learning. Educause Quarterly, 2, 22–28.

Everett, B., Landau, S., and Leese, M., (2001). Cluster Analysis, 4th Edition. London: Edward Arnold Publishers Ltd

Glenn, M. (2009). Organisational agility: how business can survive and thrive in turbulent times. A report from the Economist Intelligence Unit, The Economist, March Issue Retrieved on 23 December 2014 from website http://www.emc .com/collateral/leadership/organisational-agility-230309.pdf

Hair, J. F., Black, W.C., Babin, B.J. and Anderson, R.E. (2010). Multivariate Data Analysis. Prentice-Hall, New Jersey

Hart J (2013). Creating a culture of agility should be the CEO's top strategy. Retrieved on 23 December, 2014 from http://www.senndelaney.com/hart_agility_winter2013_v2.html

Overby, E., Bharadwaj, A., & Sambamurthy, V. (2006). Enterprise agility and the enabling role of information technology. *European Journal of Information Systems*, *15*(2), 120-131.

Sallis, J. F., and Owen, N. 1999. Physical activity and behavioral medicine. Thousand Oaks, CA, Sage.

Ziebland, S., Thorogood, M., Yudkin, P., Jones, L. and Coulter, A. (1998) Lack of willpower or lack of wherewithal? „Internal“ and „external“ barriers to changing diet and exercise in a three year follow-up of participants in a health check. Social Science and Medicine, 46, 461–465.

A MARKET MODEL OF THE MALAYSIAN COCOA: AN IMPACT ASSESSMENT OF THE PALM OIL PRICES

Amna Awad Abdel Hameed and Fatimah Mohamed Arshad

Institute of Agricultural and Food Policy Studies, Universiti Putra Malaysia, Putra Infoport, 43400 UPM Serdang, Selangor.
Email : amna.awad@gmail.com
Correspondent address and email
Amna Awad Abdel Hameed, Institut Kajian Dasar Pertanian dan Makanan (IKDPM), Putra Infoport, 43400 UPM Serdang, Selangor.
Tel (office) : 03-8947 1092 Tel (mobile) : 017-2113389
Fax : 03-89471087

Extended Abstract

Though being undermined in the recent decades, the Malaysian cocoa industry has undoubtedly made significant contributions towards the domestic economy as well as to the world cocoa market. The industry has undergone drastic change during the last two decades, mainly the reduction of land devoted for this crop which has been justified by the decline in the relative profitability with respect to other crops specially palm oil. Recently, with increasing cocoa beans prices and anticipated growth in the demand for cocoa products, there are calls on reconsidering the government policies towards this industry. This study, therefore, attempts to identify the influential factors that shape the performance of this industry. For the most part, it tries to find out whether the declining cocoa area or shift away from investing in cocoa is a result of its declining prices (which seem to be illogical with the recently increasing cocoa beans prices) or due to the attraction or pulling effect by the oil palm with its increasing prices. The answers to these questions can be reached by formulating a market model representing cocoa production, import Demand, domestic consumption, export demand and prices in addition to a stock equation as a closing identity. The model is estimated using two-stage least squares utilizing annual data extending over the period 1980-2013.

According to the results, the planted area under both the estates and small holdings sectors are significantly affected by the previous year planted areas. The farm prices of cocoa beans and palm oil also turned out to be statistically significant but the planted area proved to have weak response to those prices in both cases. A one percent increase in the producer price of cocoa beans increases the area planted under estates by about 0.26% and expands the small holding area under cocoa in the by 0.32%. Conversely, a one percent increase in the palm oil producer price reduces the area planted under cocoa in the states and smallholdings by 0.3% and 0.5% respectively. It is noticed that in both cases the elasticities with respect to palm oil prices are higher than those with respect to cocoa prices. This might explain the tendency towards shifting to oil palm growing despite the increase in the cocoa beans prices. The wage rates of plantation workers turned to be a statistically significant determinant of the area planted by both sectors but its effect (according to the elasticities of area with respect to this factor) on the estates (-0.4) is more pronounced since this sector, unlike the smallholder sector (-0.3), depends heavily on hired labour. The government expenditure on rural development was included in the small holders' area planted been dropped from the model to avoid redundancy as it was statistically insignificant i.e. it has no statistical explanation. Likewise, it was dropped from the Estates model as it produced erroneous results for other variables. The interest rate on loans to the farmers was included in the initial running of both models but it was found to be statistically insignificant and thus, it has proved to be an unimportant factor in determining the planted area by both sectors.

The national yield of cocoa beans is highly affected by its previous year's level. That might be explained by continuing effects of factors not specified in the model. The lagged fertilizer prices have negative effect on yield and it is statistically significant. This is a logical result as the farmers try to economise when the fertilizer prices go up by reducing the fertilizer doze which will, consequently deteriorate the yield but the elasticity shows that 1% increase in the fertilizer price will reduce the yield by 0.01%. The results also suggest that the development of technology in the form of better practices etc., represented by a positive trend, has high significant effect on the national yield of cocoa beans. A dummy variable was included in the model to account for the outlier effect caused by the exceptionally high yield achieved in 2008 and 2009, which affect the model performance. Furthermore, the results imply that the harvested area of cocoa depends on the previous year harvested areas and the current planted area.

The domestic demand represented by cocoa bean grinding turned out to be influenced by the previous year demand. Another determinant of the domestic demand is the industrial production index of Malaysia which means that a higher industrial productivity boosts the demand for cocoa, one percent increase in the Malaysian production index will boost the demand of cocoa beans by about 0.3% which is inelastic. However, the demand is negatively affected by its own local price, which is consistent with theory. Although this variable is highly statistically significant but the demand elasticity with respect to this variable is low. The expansion in the cocoa processing and cocoa products manufacturing represented by a dummy variable was an important factor in boosting the local demand of cocoa beans in Malaysia.

The results also show that the import demand for cocoa beans is significantly affected by the Malaysian GDP as well as its previous year imported quantity. One percent increase in the Malaysian GDP will boost the demand of cocoa beans by about 3% which is highly elastic. However, the world price is statistically insignificant and the import demand shows low elasticity to this variable. It is worth mentioning that the stock and exchange variables were included in the primary running of the model but have been dropped from the final model as it was found that the inclusion of those variables would produce misspecification problem.

The effect of the world coca price on the export demand is significant and it falls under the inelastic range, which reflects the lack of substitutability of cocoa with other products in the world market. Likewise, the demand showed strong income elasticity represented by the world GDP, which was also found to be statistically significant. This finding supports the claims that increasing income levels (especially by the fast growing economies), will boost the demand for cocoa. The results suggest that the export demand was highly influenced by the previous year's exports that brought about a positive effect on the demand. The significant negative trend variable reflects the tendency towards reducing the unprocessed cocoa beans to make use of its value added when processed locally and the downstream products are exported.

The local cocoa bean price in Malaysia is significantly affected the world price as well as its previous level. Those variables have almost equivalent effect on the local price. The producer price is affected by the local price level from the previous discussion we conclude that domestic as well as the import demand for cocoa are inelastic to its own local and world prices, respectively, as there are no substitute commodities for cocoa beans. This means that the grinding industry is threatened by the volatility of those prices as they cannot shift to other substitute. Moreover, the world cocoa prices might be subject to changes in the exporting counties' trade policies. Therefore, this study recommends less reliance on imports of cocoa beans to promote the successful processing industry through increasing the production of this crop through increasing productivity and area planted. Since the magnitude of the palm oil price is stronger than that of the cocoa price on deciding the planted area under cocoa, policy makers and other parties involved in the cocoa industry must give careful consideration to the trends and forecasts of this variable when formulating their strategies to improve the industry.

Key words: Econometric Model, Malaysian Cocoa industry

AWARENESS AND KNOWLEDGE OF AGRICULTURE FRESH PRODUCE TRACEABILITY AMONG PRODUCER AND WHOLESALER IN MALAYSIA

By

Juliana Ritonga, Saipul Jannah

Supervisor:
Associate Professor Dr. Norsida Man
Dr. Ismail Abd. Latif

Introduction

Agriculture is the third engine growth in Malaysia. It contributes 7.3% of Gross Domestic Income in 2010 and it is been expected that agriculture will contribute RM 49.1 billion in GDI of Malaysia (MOA, 2010). Agriculture also been taken seriously by the Malaysian Government as they made a policy for agriculture started with National Agriculture Policy and Agro-Food Policy.

National Key Economic Area (NKEA) is one of the national agenda towards becoming developed country in 2020. Under the NKEA there is 16 Economic Entry Point (EPP) and EPP7 is focusing on capacity development for fruit production and vegetables market for premium. The Government intends to increase the production of fruits and vegetables for higher quality, better and meet the food safety standards, thus allowing access to premium markets in the Middle East and Europe. Various tropical fruits such as papaya exotic premium, pineapple, rock melon, star fruit, jackfruit, banana and three types of highland vegetables, the tomatoes, capsicum and lettuce will be the core of agricultural products.

Problem Statement

Food safety is one of the eight (8) main ideas to perform the Agro-Food Policy. The government emphasized in produces safety food product weather it is a fresh produce or process product. Food safety is a major concern for consumers, food producers, manufacturers and regulatory authorities. It is concerned with ensuring that food available to consumers is safe for consumption. In Malaysia, food safety and quality is an increasingly important issue. Various factors such as improper use of pesticides, physical contamination, microbiological contamination, heavy metal contamination and environment factor have caused severe food related diseases in this country. Based from the Yearly Report of Food Safety and Quality Division (FSQD) 2011, Ministry of Health (MOH), there is incident of food safety happen in Malaysia, such as food poisoning from the consumption of Ultra High Temperature (UHT), Pesticide Residues, Drug Residues and etc. Traceability is the ability to trace the history, application or location of that which is under consideration (ISO 9001: 2000). As mentioned by Setboonsarng, Sakai and Vancura (2009), traceability is becoming an increasingly common element in many more complex supply chain management systems, such as those that monitor regulatory compliance, quality control, environmental impact, or food safety. In order to slowly implement the traceability among the produce and wholesaler in Malaysia, the respective department or agencies need to know the level of awareness and knowledge among the implementer. Awareness and Knowledge are required for the implementer in order to make a judgment weather the traceability are benefit to them and it will result the behavior.

Literature Review

The increasing number of food safety problems occurring worldwide in recent years has heightened consumers' food safety awareness and has caused public distrust of the increasingly complex and globalized food production and trading system. International organizations, governments, and private companies are all facing the necessity of responding to these fears and minimizing further risk to the supply of safe food. Establishing a food traceability system is one strategy governments and companies can use to win the confidence of consumers and to address the documentation requirements required under multinational and bilateral trade agreements (Setboonsarng, Sakai and Vancura, 2009). Previous studied have shown that there are various definition of traceability. Golan et al., 2004;

Fonsah, 2005 said "Traceability is a record keeping system designed to track the flow of product or product attributes through the production process or supply chain

In Malaysia, traceability is still in infant stage. Until now, there is no full practice of traceability in food product. In many agencies, it still in gathering information and strengthening stage the concept of practicality. However, the responsible department and agencies are working into the implementing food chain traceability in sector of agriculture.

Model/theory

The awareness and knowledge of producer, collector and exporter about traceability is a start journey of acceptance or not acceptance the practices. Based on Theory of Applied Behavior, behavior of human contributes by the behavioral intention. There three (3) factors influence the behavioral intention; attitude to the behavior, subjective norms and perceived behavioral control (Ajzen I. 1991). Behind all the three (3) factors, knowledge is the main thing play a role here and awareness creates the intention of knowledge.

Methodology

Respondents: 200 respondents among selected farmers and wholesalers (involve in fresh product). Questionnaire Design: Collect the quantitative data through researchers-developed questionnaire:

5) Part A: Demographic of sample collected
6) Part B: They will be asked about traceability. How far they aware and know about it
7) Part C: They will be asked the intention in implementing traceability in their process of work.
8) Others

Analysis Techniques: Descriptive, Correlation, Regression, Factor Analysis.

Dependent Variable: Intention in acceptance of traceability concept

Independent Variables

15. Demographic factors
16. Knowledge
17. Awareness
18. External Factors

Result and Discussion

The method used in this study is a quantitative method that involves numerical data which survey method is selected as the design of the study. This study was conducted in two states for the respondent manufacturer and wholesale markets for respondents Kuala Lumpur wholesalers. Respondents in each category are 100 people. Data were analyzed using descriptive analysis reported in the form of mean, standard deviation, frequency distribution and percentage. While inference analysis reported by the study objectives.

Demographic Profile
The demographic and socio-economic profile of fresh wholesalers; include gender, race, age, education level, status of involvement, income per year and year of experience in agriculture. The data provides a general view of the situation of the samples conducted for this study.

The demographic profile of fresh producers (A) and wholesalers (B) shows that most of the respondents were males (97-A, 89-B). Malaysia's ethnically consists of three major ethnicities: Malay, Chinese and Indian as well as other citizens. Fresh vegetable's producers are Malay (83 persons) and wholesalers were Chinese (94 persons). Most of the survey respondents were aged between 41 to 50 years and have an experianced more than 10 years. Only few of them have an Diploma or Degree qualifications. Average income for all the respondents is less Rm100,000 per year.

Level of Awareness and Knowledge about Traceability among Producer and Wholesaler
Results from the survey shows that the level of awareness and knowledge among producers and wholesalers are moderate. Which is about 56% producers and 79% wholesaler know and aware about traceability moderately. 35 % producers and 17 % wholesaler know and aware about traceability in a high level and the other respondents know and aware about traceability in a low level.

Factor Analysis
There are six (6) external factors that might influence the intention in acceptance of traceability concept. Business Profile, Market Channel, Financial, Reputation, Policy and Infrastructure are the six external factors that been study. In the factor analysis it shows that among the producers all the variance can explain about 83% of the intention in traceability concept acceptance and for wholesaler it explain about 80%. It also shows the value of Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy is 0.720 for producers and 0.70 for the wholesaler which is acceptable.

Conclusion
The level of awareness and knowledge among fresh produce producer about traceability are moderate. It also happen to the fresh produce wholesaler which is the level of awareness and knowledge about traceability are moderate.

The study on the relationship between factor of socio demographic towards perception on traceability shows that for producer, only age and level of education have significant relationship towards perception of traceability. For the wholesaler only one (1) socio demographic factor that have significant relationship towards perception of traceability that is income

There are six (6) factors that been study to identified factors that influences the producers and wholesalers to have an intention in accepting traceability concept. Among those six (6) factors, the most influence factor for the producers is reputation that represent 38.11% for the study. For the wholesaler the most influence factor is financial which is represent 30.83 % in this study.

In general, the results of analysis have provided evidence supporting the fact that Malaysian people who involved in agriculture sector (producer and wholesaler) are aware and know on food safety issues, but they just aware and know moderately about traceability concept.

Recommendation
In future, the study about the awareness of traceability can be expand to the other main player in the traceability chain such as exporter/importer and processor. This is because in order to apply traceability in fresh produce sector successfully, the level of awareness and knowledge among the player need to be identified.

The related agency of government can plan and identified an effective action that can be taken to raise the awareness and knowledge among the producers and wholesalers about traceability concept and make it clear to them. They also can identified the focus group that they need to give a special intention to deliver the knowledge affectively.

References

Bandura, A., Adams, N. E., Hardy, A. B., & Howells, G. N. (1980). Tests of the generality of self-efficacy theory. Cognitive Therapy and Research, 4, 39ó66.

Ensuring Traceability of Fresh Produce, USDA. PTI Implementation Checklist for Growers/Packers/Shippers 1 Updated: April 3, 2012. Source: www.producetraceability.org

Fonsah, E. G. (2006d).Traceability: Formulation and Implementation of an Economic Efficient System in the Fruit and Vegetable Industry, 21(4), 243

Golan, E., Krissoff, B., Kuchler, F., Calvin, L., Nelson, K., and Price, G. (2004). Traceability in the U.S. food supply: Economic theory and industry studies. United States Department of Agriculture/Economic Research Service, AER-830.

Ministry of Agriculture and Agro-based Industry, www.moa.gov.my

Setboonsarng, S., Sakai, J.and Vancura, L. (2009). Food Safety and ICT Traceability Systems: Lessons from Japan for Developing Countries. ADBI Working Paper 139. Tokyo: Asian Development Bank Institute. Available: http://www.adbi.org/working-paper/2009/05/28/3012.ict.food.traceability.system/

Wolfgang Reinhardt1, Christian Mletzko1, Peter B. Sloep2, and Hendrik Drachsler2 Understanding the meaning of awareness in Research Networks.

- **AGRICULTURAL ENTREPRENEURSHIP EDUCATION**

- **ECONOMIC AND SOCIAL DEVELOPMENT**

- **ENTREPRENEURSHIP AND ECONOMIC DEVELOPMENT**

POSDAYA (FAMILY EMPOWERMENT): A CONCEPT OF FAMILY ENTREPRENEURSHIP TO BOOST RURAL AREA DEVELOPMENT IN THE WEST JAVA PROVINCE-INDONESIA

by

Yodfiatfinda[1], Maulidian[1] and Yoni Atma[2]

3) Lecturer at Agribusiness Department, Faculty of Bioindustry, UniversitasTrilogi-Jakarta
19. Lecturer at Food Science and Technologi Department, Faculty of Bioindustry, UniversitasTrilogi-Jakarta

Corresponding Author: **Yodfiatfinda** (yodfi@universitas-trilogi.ac.id). Address: KampusTrilogi, JalanTrilogi No. 1. Kalibata-Jakarta Selatan 12760 Indonesia

---

Abstract

This paper aims to provide an alternative development concept of rural area through family entrepreneurship, namely *POSDAYA* (family empowerment).Posdayais a bottom-up program characterized as independence,utilization of local resources and communality to find solutions of many problems existsin the village or neighborhood level.Through Posdaya, one family in a village or a neighborhood can joint together with other families to form a group andperform his functions both in economic and social activities. Especially in economic activities, Posdaya has bolstered family entrepreneurship to generate income, job opportunities and conduct environmentally friendly program. Such activities including many kind of home scale food processingindustries, handicraft and bank garbage.In the West Java Province, since 2006 more than 2000 unit Posdaya has been established which are scattered among 27 regencies, mostly in the rural area.This research is conducted through field survey and deep interview to obtain primary data. The results show that the novelties of Posdaya as a concept of development in rural area are its ability to change the mindset of people regarding to the development interventions. Originallythey perceive any outside intervention always meaningful relief, particularlymaterial or finance assistance. However, once they get to knowand join posdaya, which brought the concept of self-reliance, cooperationmutual and self-reliance, they begin to understand that any outside intervention to the community is not always connote with physical or financial aid.Posdaya is able to dynamic community lifethrough increased participation and community commitmentin development especially in rural area.

Keyword: Posdaya, development, rural area, West Java.

Introduction

The existing of regional different growth between rural and urban areas was marked with different community structure, availability of live facilities, intensityof economic activities and growth of development. Urban area is characterized by more advanced of development, industry concentration, more public facilities such as school, shopping center, transportation, hospital and leisure place. Economic activities in urban area are mainly involved in secondary industrial and services sector. On the other hand rural area is characterized by less developed regions;mostly the people are involved in primary industry and agricultural sector. However, rural area is predominantly comprised about 80 up to 90 percent of the country total wide. Ashley and Simon (2001) found that majority the poor people live in this region.

There is no debate about the important role of rural area i.e as supplier of many resources such as food, fiber, timber, quarry, mining etc..The area is marked with the natural condition, specific economic structure and activities as well as close family relationship in the community. Rural populations produce 60 percent of the food consumed by them, whereas 90 percent of urban populations depend on the market for their food consumption (McMichael, 2000).Therefore, to slim the gap of prosperity between the two regions has become interesting topic of research of economics especially in the developing countries.

Imbalance development levels between urban and rural area is the common phenomenon existin the most developing countries.Generally, the disparities caused by some factors such as natural condition, differences in demographic, socio cultural and local policy decisions. Natural factors, lead to bring differences in providing infrastructures like harbor, education, health and shopping facilities (UN, 2005).

Many countries establish development program to reduce the disparities of development level between rural and urban area. A wider disparity of the development level pushes more urbanization of inhabitants from village to city. The consequences will bring some social problems in the city and less human resources in the rural to manage and continue economic activities.

Posdaya is a new concept implemented in Indonesia as an effort to trigger family (mainly in in rural area) to utilize their own resources to be more independent, more willingness to get higher education level for the family members and to encourage the ability to solve their-self problems (Bachtiar, 2010). Posdaya initiated by the Damandiri Foundation to help government to achieve Millenium Development Goals (MDGs). This is a forum for gathering, communication, and cooperation in strengthening family functions in an integrated manner (Muljono, 2010). In certain cases it could also be integrated in family services, namely family development services in a sustainable manner, in various fields, especially health, education and entrepreneurship, so that families can grow independently in the village (Damandiri Foundation, 2013).

The research question which attempt to be answered here is, how Posdaya (family empowerment) as a concept of family entrepreneurship can boost development in rural area.

Since firstly launched in 2006 about 2000 unit Posdaya has been established in West Java and the Damandiri Foundation as initiator cooperates with more than 200 universities to implement Posdaya concept and are several researchers from abroad (such as Japan and Korea) interested to understand more about Posdaya (Damandiri Foundation, 2014).

Rural area in the West Java Province is the main source of agricultural products supplied to the city especially to the Jakarta city. Agribusiness activities in the area played by traditional traders or middlemen traders, buy fresh product on farm then sell it to wholesale market with a limited processing. Number of entrepreneur in the West Java Province amounted to 3.39 million people or 17,43% (BPS, 2014). Mostly they have education level of elementary school (47,68%), while graduated from university is 8.61% only. In such condition, Posdaya as development program by empowering family to achieve higher level of welfare, gathering spirits, help each other among member become a model to boost development in rural area.

Materials and Methods

This research is conducted through field survey and deep interview to the selected Posdaya and to the related person of their activities in West Java Province. Deep interview and structured questioner asked to the respondents consist of family who involved in Posdaya activities, the management of Posdaya at the village or neighborhood level, local government officials, academicians (the universities who are acting as the supervisor in establishment of thePosdaya) and to the informal community leader. Determination of respondent is performed by cluster system, where the Bogor Regency is considered to represent other regencies in West Java. Dataobtained in this research consist of primary and secondary data. The data then tabulated and analyzed descriptively to answer the research question. As many as 23unitPosdaya have been interviewed.

Results and Discussion

Establishment of a Posdaya in a village or neighborhood is not a top-down program, but it is a freely decision made by the community to form the group. In the implementation, the agent of empowerment (lecturer or university student),firstly disseminate the concept of Posdaya, if the community (represented by several community leaders)respond positively and theyaccept the idea, the next step is the process of implementingPosdayaprogram. However, if the communityshowed a signs of objection to the program, thenthe empowerment agent noticed looking at other areas who moreresponsive and accommodating.However, an indication of rejection canevident from their responses regarding the presence ofthe program in their territory;then the empowerment agent will procrastinationschedule a further meeting or try to other village.

Involvement family in Posdaya activity has double benefits i.e. social and economy. In social, family member obtain new information or knowledge by sharing among member or spillover from the supervisor (university lecturer or student). The knowledge including how to handle and manage good environment inside and outside housing, children care, etc. Fromthe

economic side, the family benefits with extra money from income generating activities such as food processing home industries, handicraft production and recycling garbage (garbage bank).

Number of active family in a Posdaya ranged from 10 up to 469 by an average 115 families per village (Table 1). This is afairly large number in a rural area that can play significant role as development agent. They create job and income and improve social and economic welfare especially for their own family member. It can be said that the Posdaya is family entrepreneurship especially in generating higher value added by processing raw material of agriculture.

Table 1. List of Posdaya, member and the activities

No.	Posdaya Name	Member	Economic Activities
1	Melati 1	30	Handicraft, cassava crispy,
2	Anggrek	40	Stall, cooperation, ginger instant
3.	Buana Indonesia	36	Feather seed syrup, cassava crispyPalm
4	Imaji	25	Potato crispy, cake, snack
5	Melati 2	50	Casava crispy, souvenir
6	Merpati	10	Meat ball, cake
7	Mawar I	40	Drink, cassava crispy
8	KasihIbu	450	Trading, cake, dodol
9	TerataiBaru	50	Rice shop, handicraft, services
10	Anggrek 2	25	Garbage processing, food stuff
11	Kenanga Indah	469	Cooperation, SMEs, Health clinic
12	BungaTanjung	50	Fish pond, fish processing, potato chips
13	Flamboyan	50	Garbage bank
14	MustikaKencana	150	Sunrise stall, snack
15	Mandiri	160	Noodle, juice
16	Tarusan Jaya	70	Food indystry
17	Al Hidayah	40	Fish crispy, fish meat ball
18	PermataBunda	120	Vegetable seed, garbage decomposer
19	Hidayah	200	Batik, snack
20	Sirsak	164	Trading, snack
21	Melati 3	80	Catfish, coffee, crispy
22	Puspa Lestari	150	Cooperation, cassava chip,
23	JakaKencana	200	Candy, snack

Posdaya integrates all activities of family group in the village and neighborhood level by supporting and triggering them to optimize their potential and resources available in the surrounding. The strengthening of the main functions expected to allow eachmore and more families are able to build itself into a familyprosperous, independent families and families who couldface future challenges better. Many family members actually have entrepreneurship talent, but they have no enough supporting and community to realize in real economic activities. For instance, tacit knowledge to produce snack or traditional processing food own by a family can bedeveloping to make a business by introducing packaging technology and marketing skill. By forming a group, the family easily to doing more production and sell it to stall or to traditional market. Posdaya initiator i.e. Damandiri Foundation performs a regular Sunday market (every 3 months) to collect all Posdayamembersin a regency to attend an exhibition or Posdaya SMEs fair. In this exhibition, the producers of many kind of products from Posdayasale their product and visitors (public and traders)come to make deal a business.

Main activities of Posdaya related to the income generating for the family were:

1. Food processing

Rural areas have the potential resources of varying foodstuffs raw materials that can be processed to generate higher value added. Structural problems in developing food processing industries in rural areas among others are lack of technology, limited access to market and capital, limited innovation and less management skill. Posdayacan strengthen the local economy through providing assistance from local university and research center as empowerment agent. Lecturer from relevant expert background will help SMEs in Posdaya to develop their business.

Most of the food products produced by Posdayamembers are snacks. Raw materials like cassava, banana, potato, sweet potato, tomato, chili and so on which are abundant in rural area. Others processing are some kind of beverage, syrup, jam, instant durian drink, instant ginger, mixed coffee, coffee ginger and fruit juice. There is also a dish of food products that is not made for long time marketing but is sold on special occasions just like at the bazaar, Posdayaexhibition or dinner guests who visit the village of Posdaya location. There is also Posdaya who produce organic rice, flour, and noddle. For areas of Posdaya close to the fisheries resources both marine and fresh water, they produce food processing from fish such as smoke fish, fishmeat ball, soft bone milkfish etc.

Food processing industry conducted by Posdaya member encourages development in rural area since most resources are raw material of agricultural products. Processing of the products will make the commodities more hygienic, longer expiry date,closer to the consumer's preferences and create more income to the family. Supervise addressed to the Posdaya member (by university) include all process of business since input management, production process up to packaging and marketing. After the business is running well, then Posdaya members can continue even though no longer getting assistance.

One of the constraint factors commonly facing by SMEs is lack access to capital, with not exemption businessconducted by Posdaya members. Applying credit to bank is not easy because bank usually ask some formal procedural requirements such as collateral, legal documents about the company and history transaction of bank account. These are impossible provided by any home industry with only four or five worker and small business turnover. TheDamandiri Foundation arrange memorandum of understanding with many commercial bank to give credit to Posdaya member without any collateral, but the Foundation provide guarantee. The program namely *Taburpuja*i.e.asaving and soft loan for family welfare. However the Posdaya members are fully responsible to payback the credit. If one of the membersgets difficulties, then other members will give help and sharing the responsible to repay the credit to bank. Amount of the loan is only IDR 2 million per Posdaya member, but it is given without collateral. Family who initially had trouble to obtain capital to start their business, now they are easily get it and with the help of neighbors can begin to unite to make small groups.

Since 2013, Tabur puja has been helped thousand poor families who join in Posdaya by giving the loan. At time the family is success to runhis business and completely return the loan then they can starting to make saving account and the credit can turn to other family. Hence, tabur

puja increase participation in inclusive family to build on the principle of democratic economy. These groups strengthen mutual trust between members and promised to keep in joint liability. If later someone from the members of the group is unable to pay the settlement on time, then other member of the group will pay first. Unity among his family and it became the core of mutual cooperation within the group Posdaya. Therefore tabur puja can provide unsecured loans.

Marketing of the food processed products usually is conducted traditionally. Mostly the food processing products sell to the surrounding communities; to local stall or exhibition. Research on Posdaya food processing products discloses the fact that packaging is factor that brings the products look like a poor quality. Packaging used to provide shade (containment), protection, comfort, and information of the ingredient. Packaging is comprehensive expert of art, printing and material knowledge. As the SMEs with less capital and skilled human resources, Posdaya businessmen cannot make improvement on the packaging. However some universities have Design Product Department that can give consultation about packaging to the Posdaya member.

2. Garbage Bank

Other economic activities of Posdaya are garbage management. Garbage is never ending problem both in rural and urban areas. Without any special treatment and management, garbage (domestic wastes) become a source of bad odor, disease and disturbs drainage system. Oftenly rubbish is collected in public area before it is transferred to the final landfill. Problem rises due to the much time since the rubbish out from kitchen until delivery to the landfill. About 70% of the domestic wastes are organic material and quickly fermented by microbe. In case the wastes is piled up within more than 5 days then the garbage facing decay process, spreading stench, flies swarming and sources of diseases. A lot of programs have been implemented by the local government to reduce garbage volume in public area, including establishment of Garbage bank. Posdaya members are mostly housewife. By demonstrating the principles of garbage bank, then many the Posdaya members adopt it as their program activities.

Garbage bank nowadays is a popular as solution to reduce wastes in the environment. Economic interest has been drawn participation of all family to manage rubbish before transferred to collector. Garbage bank starts by separating organic and inorganic garbage at home. Organic waste is collected and processed to produce organic fertilizer, while inorganic wastes are shorted according to the type of garbage (plastic, metal, paper, etc) then send to garbage bank kiosk,and thenweighed; its value is determined and exchanged for money. The money can be taken directly or can be credited as saving account. Establishment of a garbage bank needs an entrepreneurship of Posdaya members because cooperation from all family is necessary. All people must get explanation about the importance of the bank operation. Two benefits from the garbage banks are economic value and cleaner environment. Monthly, each Posdaya who run the garbage bank, has turn over ranged from IDR one million up to 5 million.

3. Handicraft

Inorganic wastes that collected by the garbage bank can be made to higher value goods such as table flower, bag, slipper, etc. The disposal things can be transformed by creative hand to be beautiful handicraft and sellable. About 90% of respondent from family member who join in Posdaya said that this program is significantly help them to increase income.

By training provided by the empowerment agent (student and lecturers) from university, the family groups open their mind and get knowledge to process the raw material to generate higher value added of the products.Products of handy craftwhich employ resources and garbage to produce are bag, lamp, cloth, umbrella, slipper, shoe and other art goods.

Posdaya make the "sleep" skill and entrepreneurship of the family member to move on and grow to be agribusiness activities. There is no financial aid by the agent of empowerment but they act as a trigger only for the have family to help other family in a group to establish business. The benefits of the Posdaya in the economic field include job and income generation, save environment (because production introduced is zero waste practice) and change mindset of people to be self-independent and confidence to change their prosperity better. Government officials in village level argue that Posdaya can swift the development in the rural area due to change in spirit of community member to be more productive and utilize their own skill in real business.

Model of Posdaya's Role to Boost Development on Rural Area

Posdaya is a forum family in a village to share responsibility to solve the communal problems. They act as an "enzyme" of development process in a village. Family as Posdaya member get knowledge about solving problem in their daily live such as education, health and economic and business.

Universities arrange cooperation with the Damandiri Foundation to establish Posdaya in the region where the university is located. Each activities is intended to employ local resources help poor family to increase their welfare. There are three economic activities, i.e. food processing industries, handicraft and garbage bank (services). Products resulted by Posdaya members are marketed to Senkudaya (central of regional market) and to local market as well. Benefits to the development in rural area including job creation, income and reduce social problem like garbage. Public contribute in Posdaya activities through providing inputs and buy products from market (Figure 1.).

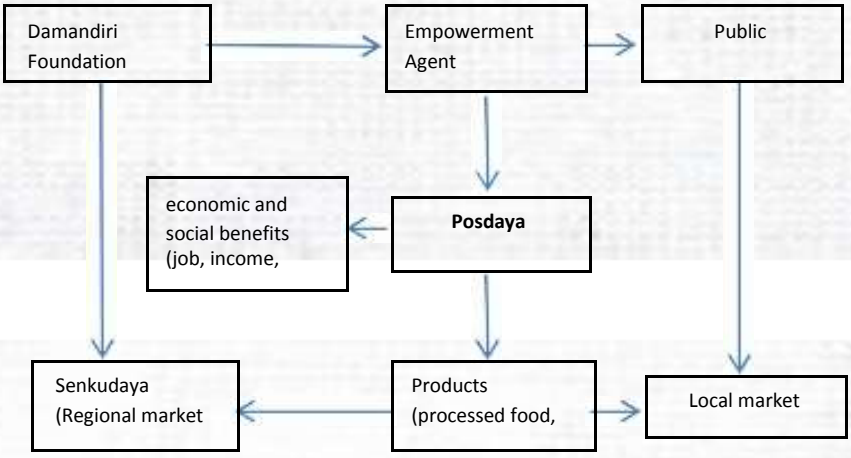


Figure 1/ Model of Posdaya Contribution to Development in Rural Area

Conclusion

Posdaya is an alternative concept to boost development in rural area through family entrepreneurship. This is a concept to group the family to cooperate and solve their real problem on the ground by their own spirit and resources. Instead of physically or financial aids like the common program, Posdayajust a trigger of community to utilize their own skill, resources and potential to generate value added. In rural area, where agricultural is main economic activity, mostly family member who involved in posdayahaving a home scale food processing industry. ThereforePosdayais one of strategic development program to increase live of family and toslim the gap of development between rural and urban region. The strategic development has shown significant positive impacts in many villagesto boost the rural economic growth. Three main activities reviewed were food processing industry, handicraft and garbage bank.

Reference

Ashley, C and Simonm, M. (2001).Rethinking Rural Development. Journal Development Policy Review.19:4

Bachtiar Y,. (2010). Posdaya: An Implementation of Bottom-Up Development Planning Paradigm on Family Basis. Center for Human Resources Development-Bogor Agricultural University. Bogor.

Damandiri Foundation. (2014). Supporting of Saving and Credit Welfare: Empowerment of Family Economic through Posdaya. Damandiri. Jakarta

Damandiri Foundation. (2013). Principles of Operation Strategic of Posdaya.PT. Citra KharismaBunda. Jakarta.

BPS of West Java.(2014). Unemployment rate in the West Java Province 2014. Available online www.jabar.bps.go.id downloaded on 20 Dec 2014

McMichael, P. (2000). The power of food.Journal of Agriculture and Human Values.17 : 21– 33,

Muljono, P. (2010). Posdaya as Model of Community Empowerment.Center for Human Resources Development-Bogor Agricultural University. Bogor.

Suyono, H. and Haryanto R. (2013).Guidelines in Establishment of Posdaya.BalaiPustaka. Jakarta

United Nation Publication. (2001). Reducing disparities: Balanced development of urban and rural area and regions within the countries of Asia and the Pacific. Economic and social commission for Asia and the Pacific.

THE ROLE OF RURAL INSTITUTIONS ON FOOD SECURITY POLICY IN EAST JAVA PROVINCE

Nuhfil Hanani[1], Rosihan Asmara[1] and Fahriyah[1]

[1] Lecturer at Socio Economic Agriculture Departement, Faculty of Agriculture, University of Brawijaya

Abstract

This study has two main objectives: (1) to identify rural institutions and their roles for supporting the implementation of food security policy in East Java Province (2) to formulate the model of rural institutions to increase their roles on food security development.This study was conducted on February, 2012 in 6 districts which represented food insecurity level. Primary data were gathered by administrators of rural institutions through participatory rural appraisal method. Descriptive analysis was used to describe rural institutions and their roles on food security implementation in East Java Province. Gap analysis used to formulate the model of rural institutions to increase their roles on food security policy. It can be concluded that there are potential 8 rural institutions (youth farmers, women farmers, farmer group, Pembinaan Kesejahteraan Keluarga, Koperasi Desa, Food barn dan Youth organization) which are potencial to support food security implementation. The roles of rural institutions on food availability aspect were indicated by providing factor production for farm activity. Meanwhile, on accessibility aspect, rural institutions provide sufficient information of agriculture product price and strengthen bargaining position of farmers. The last aspect on food security is food utilization aspect which was indicated by socialization of food diversification. In order to increase the roles of rural institutions on food security policy, organization of rural institution needs to be formed as functional institution under coordination of Rural Food Team (Tim Pangan Desa).

Keywords: Role, Rural, Institution, Food Security, Gap Analysis

INTRODUCTION

One of indicators economic development is the availability of qualified human resources who possess a high intelligence, physical and mental strength. Empirical evidence shows that those factors were influenced by good nutrient status, in particular good nutrient status were determined by the quantity of food absorption.

Therefore, food compliance of citizens is one of invesment to elevate human resource's quality. Meanwhile, regulation of food has been formally declared by the act of food no 7 1996 which declared food compliance is each human being's human right.

Moreover, the right of food is reflected on food security definition : condition of household food compliance reflected from the availability of sufficient food on its quality, quantity, spread, equity, and affordability. Good food sufficiency support good nutrient compliance in order to generate qualified young people. As a matter of fact, food security development is one of the priorities in national development.

The effort in realizing food and nutrient security requires a pioneer on rural area in order to make all plans run effectively and efficiently.In addition, some barriers which

obstruct household food security are people low awareness of food and nutrient aspect, also unoptimal role of government in giving a counseling about the importance of food and nutrient each household in rural area. Along with autonomic era and new information of food security in each region cause the uncoordinated handling of food security in each rural area. Main cause of those factors are the unavailability of food security institution on rural level. The function of the institution is the activator of rural food secuirty which is not properly identified, and with this attention, there is no role development institutionmodel for food security development on rural areas.

Hence, it is important to conduct a study of rural institution reinforcement in order to develop food security. Hopefully, this study would be able to find a model of food security institution in rural areas. The main objective of the study is to identify potential rural institution in developing food security and to formulate rural institution model in enhancing the institution's role in formulating policy.

Data and Methods

District sample taking was done based on food security condition ranking, so that six regencies were chosen, respectively 2 highly food secured regencies, 2 hold enough food secured regencies, 2 less food secured regencies. The determination was made by using Food Security and Vulnerability Atlas (FSVA) criteria that was issued by Food Security Council in the last year. In each sample district, one sub-district was chosen randomly, furthermore one rural areas will be chosen randomly. This study finally chose Jombang, Pasuruan, Jember, Bangkalan, Sampang dan Sumenep districts as sample districts.

Local institutional data were collected by participatory rural appraisal with the board in every institution at the rural areas such as PKK, Farmers Group, Women Farmers Group, Business Group, Youth organization, religious groups / indigenous. Data which collected including: institutional capacity, institutional knowledge about food and nutrition security, response to food and nutrition activities, the ability of food security implementation and nutrition as well as involvement in implementing the food security and nutrition.

RESULT AND DISCUSSION

Rural Institutional Variety Potential

The results of survey found that there are 8 kinds of institutionwhich is potential for the development of food security at the rural areas. There are farmer groups, association of farmer group, the PKK, and Youth organization. These institutions can be developed as a driving force in the development of food security in rural areas.

The existence of a potential institutions in rural areas are measured by the number of institutions at each study area. At the study area, only 33.3% had institutional farm youth while the other 66.7% do not have the institutional farm youth. In the study area, institutional women farmers also relatively inactive. (only 16.67% of institution of women farmers).

The existence of food barns in the study area is also consist of 33.3% although food barn holds important roles to support the food security program through rural food reserves, but in fact these institutions does not give contribution at all. It is because the rural areas government and the public perceive that the need for food storage only for rural areas prone and rural areas which has an obstacles in supplying food.

Knowledge Level of Rural Institution in Food Security

Level of knowledge about food security at rural institutions is measured by indicators of endurance activities that may be done in rural areas. Measurement criteria using a score from 0-100. Identification of each indicator results are presented in Tables 3, 4 and 5. In the aspect of knowledge availability (Table 3), Association farmer group and farmer groups have the highest score. It shows that both institutions have the highest knowledge of the food availability. For the information, the knowledge about food availability is not always identical with new innovations. Therefore the transfer of knowledge in society still remains to be done. While this is a relatively low knowledge possessed by farmers regarding how to make organic fertilizer, organic pesticide manufacturing and agro-industry knowledge of technology development.

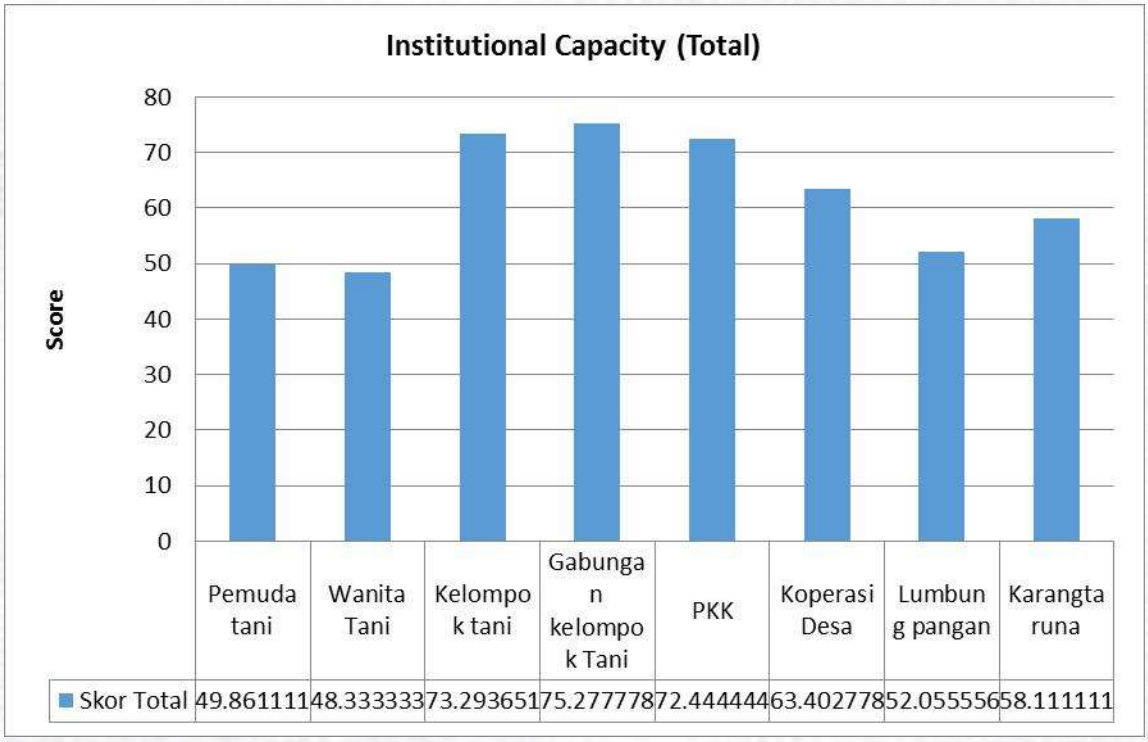


Figure 8. Score Total Potential Institutional Capacity in Rural

Rural Institutional Organization Food Security

Based on the results of the study, those indicate that the institution handling food security in the rural areas is currently engaged in partial. Therefore in future, it should be done in coordination. Forms of institutional organization in food security are functional institutions in coordinating Team Food Rural areas (TPD).

Benefits, objectives, and the TPD function are:
Benefits. (1) Increase the participation of society in the development of food security at rural areas. (2) As a means of spearheading of the government at the rural areas level,so all development plans and activities of food security can be implemented effectively and efficiently

Targets. (1) Increase the availability of food through increased production and diversification of food production both fresh and processed, (2) Increase sustainable food reserve adequacy to address the vulnerability of society, (3) Increase food access to adequate food in an order

to reduce the population prevalence of food insecurity and malnutrition toddler / bad, (4) Improve food quality and diversification of food consumption towards improving the nutritional status of the society, (5) Developing fresh and processed food businesses in an order to increase the value-added of food products, employment opportunities and incomes

Functions. (1) Plan the development of food security in rural areas, (2) Aspirations of the people to the government on the development of food security in the rural areas, (3) Implementing Warning System on Food and Nutrition in rural areas, (4) Implement development of food security in rural areas, (5) Encourage participation of society in the implementation of development activities of food security in rural areas

Based on scope of Activities, several things can be suggested to rural institutions. They are (1) increasing diversification and development of food production, (2) handling distribution and marketing of food products, (3) development of food reserves for society, (4) quality improvement and diversification of food consumption, and (5) improving nutritional status of children and society.

CONCLUSIONS AND RECOMMENDATIONS

Conclusion

9) There are 8 kinds of potential institutions for food development institution, which consist of Youth farmer, Women Farmers, Farmers Group, Association of Farmers Group, PKK, Village Cooperatives, Food Barn, and Youth Organization.

10) Based on the capacity of institutions seen from: (1) the range of services, (2) activity, (3) health administration, (4) infrastructure, and (5) the organization management, Association of Farmers Group, Farmers Group, and the PKK which has sufficient institutional capacity that higher than others.

11) Institution involvement in food security activities in aspects food availability: (1) the Farmers Group and Association of Farmers Group who participate in the activities on the farm, while in many aspects of food reserves played by Food Barn, (2) access to food is an institution of Farmers Group and Association of Farmers Group, (3) absorption of food is Women Farmers and PKK.

12) Role of institutions in the rural areas that can be cultivated for food security activities: (1) the institution is addressing the issue of food availability Association of Farmers Group, Youth, Farmers Group, Youth Farmer, Food Barn, (2) Institutions that deal with aspects of food access is a cooperative rural areas, , Association of Farmers Group, Youth Organization, Youth Farmer, Food Barn, (3) Institutions that deal with aspects of food absorption is the PKK and Women Farmers.

13) Forms of institutional organization of rural food security in a functional form of institution coordination team Food Rural areas (TPD). TPD is expected to carry out activities with the target: (a) Increasing the availability of food through increased production and diversification of food production both fresh and processed, (b) Improving sustainable food reserve adequacy to address the vulnerability in the community, (c) Improving access to adequate food community food in an effort to reduce the population prevalence of food insecurity and malnutrition toddler / bad, (d) Improving food quality and diversification of food consumption towards improving the nutritional status of the community and (e) Developing fresh and processed food businesses in an effort to increase the value-added food products, employment opportunities and incomes.

14)Food Team rural areas organizations should be equipped with: (1) Field of Food Availability, (2) Field of Distribution and Marketing, (3) Division of Food Reserves; (4) Field food diversification, and (5) Division of Community Nutrition Status.

Suggestion

20. Local governments need to follow up the East Java Governor Regulation No. 75 Year 2011 on Regional Action Plan for Food and Nutrition (RAD-PG) East Java from 2011 to 2015 through the institutional agenda of empowering food security in rural areas. Socialization aims to emphasize the importance of food security and encourages local government district and the city to develop the institutional rural food security.

21. Formulate operational guidelines of the institutional development of food security for the rural district/city governments.

22. Institutional development activities rural food security in stages starting from the pilot project, preparation, growth and development.

23. Food Security Council (DKP) East Java Provincial and district / city needs to form a technical working group to increase the role of institutional food security in rural areas, as well as policy makers and implementers in fostering the empowerment of food security in rural areas.

ENGINEERING OF AGRICULTURAL COOPERATIVE ENHANCING COMPETITIVENESS BASED ON AGRO-PRENEUR HUMAN RESOURCES

Suhartini[1)], Fahriyah[1)], Rosihan Asmara[1)]

[1)] Faculty of Agriculture, Department of Agricultural Economics, University of Brawijaya, Malang, Indonesia

Email: hartiniub@yahoo.com, ria_bgl@yahoo.com, rosihan@ymail.com

ABSTRACT

Agro-preneur in cooperative especially in food commodities are not only able to develop agri-food commodities, but also will strengthen the national food security, increase job employment and could be a new source of economic growth in the countryside. This study aims to develop a general engineering agribusiness development for food commodities through the development of agro-preneur agricultural cooperatives. Data analysis using the Gap Analysis and Multiple Regression with three districts in East Java as samples location. The study found that the skills needed in the improvement of human resource capacity of agricultural cooperatives are: (1) entrepreneurship, (2) production management and business planning, (3) marketing management, and (4) financial management. The four skills of the agricultural cooperatives human resources still need to be improved. Regression analysis on agricultural cooperatives performance showed that entrepreneur skills have larger effect on improvement of agricultural cooperatives performance than the others skill, especially the ability to identify and evaluate business opportunities.

Keywords: competitiveness, cooperatives, agro-preneur

INTRODUCTION

Agribusiness system development in Indonesia still facing many problems. One of the problemsis related to the integration between the input agro industry, farmers and processing agro industry also to the marketing system. Farmers commonly have the weak position in that system. Cooperative is one of a special business form in Indonesia economic which many people can join to Cooperative in the same kind of business, such as agricultural cooperative. It can be improve the bargaining of farmers in economic society. The agricultural cooperatives in Indonesia still have many problems.One of the problems is the limited management skill for cooperative including entrepreneurship skill.

This study aim to develop a general engineering agribusiness development for food commodities through the development of agro-preneur agricultural cooperatives.To know the need of agro-entrepreneur capacity development on food agribusiness development doing by identify the need of management skills especially on agro-entrepreneur skills of agricultural cooperatives.

METHODS

The research location was taken purposively was East Java Province, Indonesia, by taken 3 districts. The amount of sample in each district is 10 agricultural cooperatives.The data were analyzedby the Gap Analysis and Multiple Regression Analysis.

RESULTS AND DISSCUSSION

The study found that the management skills were needed on the improvement of human resources capacity of agricultural cooperatives are: (1) entrepreneurship, (2) production management and business planning, (3) marketing management, and (4) financial management. The four skills of the agricultural cooperatives human resources still need to be improved.Regression analysis on agricultural cooperatives performance showed that the entrepreneurship skills have larger effect on improvement of agricultural cooperatives performance than the others skill, especially the ability to identify and evaluate business opportunities.

The results of multiple regression analysis for the effect of the entrepreneurship skills to the agricultural cooperative performance showed that the entrepreneur skills which have significant effect to agricultural cooperative performance are: thinking innovatively, to be creative on problem solving, have the different perspective with the other competitors, to identify opportunities, and to overcome for uncertainty.

The multiple regression analysis for the effect of the production management and business planning to the agricultural cooperative performance showed that the factors which have significant effect to agricultural cooperative performance are: technology on production process, business performance evaluation and production planning on input including labor needed.

The other multiple regression analysis for the effect of the financial management to the agricultural cooperative performance showed that the factors which have significant effect to agricultural cooperative performance are: composing financial report, and financial credit planning.

The multiple regression analysis for the effect of the financial management to the agricultural cooperative performance showed that the factors which have significant effect to agricultural cooperative performance are: composing financial report, and financial credit planning. And the multiple regression analysis for the effect of the marketing management to the agricultural cooperative performance showed that the factors which have significant effect to agricultural cooperative performance are: planning marketing strategy and evaluating marketing performance.

CONCLUSION AND RECOMMENDATION

The management skills were needed on the improvement of human resources capacity of agricultural cooperatives are: (1) entrepreneurship, (2) production management and business planning, (3) marketing management, and (4) financial management.The four skills of the agricultural cooperatives human resources still need to be improved. There are needed to improving the management skills for those skills above to improve agricultural cooperatives competitiveness.

CRITICAL SUCCESS FACTORS IN ENHANCING BEEF PRODUCTION OF VARIOUS FARMING SYSTEMS

Rafidah, Y., Juwaidah, S., and Golnaz, R.
Department of Agribusiness and Information Systems, Faculty of Agriculture, Universiti Putra Malaysia, 43400 UPM, Serdang, Selangor, Malaysia.
Corresponding e-mail: rafidah.yahya90@gmail.com

Keywords:

Critical success factor, beef cattle, farming systems, farm characteristic, factor analysis

Introduction

In 2012, Malaysia has imported 131,026 metric tons of beef and 68,992 head of beef cattles to accommodate the country's demand, especially during festival season (DVS, 2013). Three type of farming systems contribute to beef production in the country. They are extensive system, semi-intensive system, feedlotting and integration systems either under oil palm or rubber plantation. Under the Third National Agricultural Policy (NAP3), ruminant livestock farming were expanded and promoted through integration in the field of rubber and oil palm plantations, especially among the smallholders and in estates. Beef subsector mostly driven by smallholder farmers who's using different types of farming system. In order to sustain and survive in this industry, they need to have good farming management systems that will lead them to success. These farming systems have different operating management system, costing, and skills. Thus this study was carried out in order to determine the critical success factor in enhancing beef production from the perspective of different beef cattle farming systems.

Materials and Method

A structured questionnaire was developed to capture critical success factors of different beef cattle farming systems in Malaysia. The survey covers every states in Peninsular Malaysia with two hundred and forty (240) respondents, each of whom practices one of the four different types of farming system, i.e. extensive, semi-intensive, integration and feedlot. They are selected using stratified random sampling.

Descriptive analysis was conducted to show respondents' socio-demographic variables and farm characteristics distribution, followed by an exploratory factor analysis (EFA) to identify the latent critical success factor by varimax method.

Results and Discussion

a. Demographic Profile of the Respondents and Farm Profile

A total of 240 respondents participated in this study. Table 1 shows a summary of demographic distribution and farm profile of the respondents.

Table 1: Demographic Profile of the Respondents and Farm Profile

Characteristic	Percentage	Characteristic	Percentage
Gender		**Primary job**	
Male	93.3	Rearing beef cattle	44.2
Female	6.7	Other	55.8
Age		**Farming system use in farm**	
35 years old and below	20.0	Extensive system	24.6
36 years old and above	80.0	Semi-intensive system	25.0
		Integration system	26.2
Education level		Feedlot system	24.2
Primary school or lower	27.9		
Secondary school	65.8	**Years of experience**	
Certificate or higher	6.2	10 years and below	53.3
		11 year and above	46.7

(Source: Survey, 2014)

As can be seen in Table 1, majority of respondents were male (93.3 %). Age was divided into two categories which were 35 years old and below and 36 years old and above. Eighty percent (80.0%) of the respondents age above 36 years old while 20.0% age below 35 years old. The highest education is from secondary school level or 65.8%, followed by education and primary school 27.9% and certificate and higher education 6.2%. Majority of the respondents were not rearing cattle as primary job, 44.2%. The respondents divided into 4 farms categories; extensive system (24.6%), semi-intensive system (25.0%), integration system (26.2%), and feedlot system (24.2%). Most of the respondent have experience 10 years and below (53.3%) and 46.7% have 11 years and above.

b. Factor analysis for critical success factor of beef farming systems

An exploratory analysis revealed four major critical success factors for each of the beef farming systems in Malaysia. The Kaiser-Meyer-Olkin (KMO) test sampling of adequacy and Bartlett's test of Sphericity were primarily performed on all the statements to confirm the appropriateness of applying factor analysis. The KMO result for different type of farming system show in Table 2. With the significance level of $p<0.000$ for Bartlett's test of Sphericity and KMO test with the value more than 0.6, it is can be accepted for factor analysis.

Table 2: Kaiser-Meyer-Olkin and Bartlett's Test

Farming System	Variable	KMO value	Bartlett's Test of Sphericity
Extensive system	Human resource management Government support Feed Production system	0.765	0.000
Semi-intensive system	Human resource management Government support Breed Production system	0.749	0.000
Integration system	Human resource management Government support Production system	0.671	0.000

	Family and friends		
Feedlot system	Planning Government support Human resource management Marketing	0.767	0.000

(Source: Survey, 2014)

The Cronbach's alpha was applied to test the reliability of the variables. The internal consistency was tested by Cronbach's alpha score. Four latent factors were uncovered that have sufficient internal consistency as shown in Table 3. It shows that, the Cronbach's alpha value achieve the minimum requirement.

Table 3: Reliability Test for The Variables

Farming System	Variable	Number of Items	Cronbach's Alpha
Extensive system	**Human resource management**	8	0.916
	Government support	4	0.805
	Feed	4	0.705
	Production system	3	0.747
Semi-intensive system	**Human resource management**	6	0.879
	Government support	5	0.862
	Breed	2	0.772
	Production system	2	0.651
Integration system	**Human resource management**	4	0.828
	Government support	3	0.804
	Production system	3	0.788
	Family and friends	3	0.771
Feedlot system	Planning	6	0.932
	Government support	6	0.929
	Human resource management	6	0.863
	Marketing	4	0.850

(Source: Survey, 2014)

The results indicate that, critical success factors (CSF) for extensive system in beef farming are human resource management, government support, feed, and production system. However, the CSFs for semi-intensive system are human resource management, government support, breed and production system. Alternatively, human resource management, government support, production system, and family and friend are the CSFs for integration system. Lastly for feedlot system, the CSFs were planning, government support, human resource management and marketing. The result underlines that, for every type of beef cattle faming system, human resource management, government support and production system is the main critical success factors.

It can be conclude that, beef cattle farmers should assigning to a specific task, give training, adequate number of labor needed to handle the farm. Labor should alert and sensitive and know the way to protect disease to ensure the farm operation going smoothly and success. Besides having good human resource management, government support also important to ensure the success of the farm. Incentive and subsidies, technical and clinical support, capital assistance and breed s helps farmers a lot to success in this industry. Furthermore, government should consistent and keep improving the agricultural policies

Similarly farmers should be sensitive, alert and proficient with farming system that they opt for. Farmers' believe that extensive system is cheap and easy to adapt by beef cattle farmers, integration system is the economical to use because it integrated with other crop and feedlot system is costly compare to other system.

However, there are several other factors that influence the critical success factor of different farming system. In extensive system feed is one of the most critical success factor compare to other farming system. Feed is important because cattle are freely grazing, so to ensure they can survive farmers should provide enough feed if they have grazing area for it. In semi-intensive system, breed is one of important factor to success where high quality breed should be available and farmers should know how to look at the sustainability of the breed to ensure they are resistance enough with the environment. In integration system, family and friend is one of the critical success factor, where to handle the cattle in integrated area with other crops, family should help to manage the farm. Family also needs to have knowledge and understanding on how to control the farm. Moral support and advice from friend in the same field influence them to success in this industry. Lastly for feedlot system, planning and marketing becomes the most critical success factor because this system is costly and to ensure they are not gain too much losses, planning and marketing is important. It is good for farmers to have business plan or planning to achieve their goal. They need to follow all the planning they had, always find way to improve farm operation to success. High demand of beef especially during festival season gives them strength to increase the production. Selling variety of beef based product such as by part helps them a lot to success. Therefore, beef cattle farmers should pay more attention of factor that can enhance the success of the farm.

References

Alsmi, Z., and Zahari, W. 2005. Beef Production for Malaysian Entrepreneurs. Malaysian Agriculture Research and Development (MARDI) Publishing.

Ruud, B.M.H., Stephen, B.H., and Aalt, A.D. 1997. Critical Success Factors and Information Needs on Dairy Farms: the Farmer's Opinion. Livestock Production Science, 48:229-238.

Damien, J.P., Amrik, S.S., and Shams-Ur, R. 2001. Critical Success Factors in Agile Supply Chain Management. International Journal of Physical Distribution and Logistics Management, 31(4):247-265.

Miller, A.J., Faulkner, B.D., PAS, Knipe, K.R., Strohhbehn, Parrett, F.D., and Berger, L.L. 2001. Critical Control Points for Profitability in the Cow Calf Enterprise. The Professional Animal Scientist, 17:295-302.

Tapsir, S., Alias, R., Mad, N.S., and Zainalabidin, M. 2008. The Efficiency of Beef Cattle Production: A Case Study in Target Area of Concentration in Johor, Malaysia. Economic and technology Management Review, 3:57-74

Muhammad, S., Tegegne, F., and Ekanem, E. 2004. Factors Contributing to Success of Small Farm Operation in Tennessee. Journal of Extension, 42(6):4-15

c. M. Mahanjana and P.B. Cronje. 2000. Factors Affecting Goat Production in a Communal Farming System in The Eastern Cape Region of South Africa. South African Journal of Animal Science, 30(2):149-154

FACTORS INFLUENCING STUDENTS' INTENTION IN BECOMING AGRI-ENTREPRENEUR

Elina W. G., Golnaz R., Rika T. and Munirah J.
Department of Agribusiness and Information System
University Putra Malaysia, Serdang, Malaysia
Corresponding e-mail: elinagom@gmail.com

Abstract

In Malaysia, the government has always been concerned regarding entrepreneurship and students are made focused to increase the number of entrepreneurs. However, only a small number of youth are entrepreneurs. The low percentage of entrepreneurs in the total workforce will therefore affect the whole economy. This study is conducted to understand the latent factors that influenced students' intention in involving themselves in agri-entrepreneurs. A total of 432 students in Faculty of Agriculture, Universiti Putra Malaysia (UPM), were interviewed using survey questionnaire. Descriptive analysis, reliability test and factor analysis were used in this study. The result shows that perceived value of students, students' attitude, perceived behavioral control and society will influenced the students' intention in becoming agri-entrepreneur.

Keywords:
Intention, students, agri-entrepreneur, factor analysis

Introduction

The best economic development strategy to develop a country's growth and sustain the county's competitiveness in facing globalization is entrepreneurship (Venkatachalam and Waqif, 2005). Malaysia is among the developing countries that are preparatory to focus more on the entrepreneurship sector due to its well known significant contribution towards Malaysian economy. Nowadays, the government is in a desperate need to help and improve local entrepreneurs who generate while sustaining the economy of this country. There is an exponential increase in the interest of entrepreneurship studies amongst both undergraduate and graduate students over the last decade (Solomon *et al.*, 2005). As reported by Ninth Malaysia Plan, approximately RM5.4 billion has been allocated by the government for youth development through various skills and training (Ninth Malaysia Plan, 2006). Based on Department of Statistic Malaysia (2009), a significant rising of 30% entrepreneurship among graduates is seen in 2003. It also stated that in 2008, among the 196.1 thousand entrepreneurs with tertiary education, 158.5 thousand of them are degree and diploma holder. This is well supported by the Ministry of Agriculture (2013) where vast variety of activities and programs were held to cultivate interest in youth agricultural entrepreneurship. The involvement of student as youth in agri-entrepreneurship is vital in the development of our country. Thus, it is important to study the factors that influencing the students' intention in becoming agri-entrepreneur.

Materials and Methods

This study was conducted among the students from Faculty of Agriculture, UPM, starting from May 2013 until July 2013. Primary data were gathered by interviewing 432 respondents with survey questionnaire based on systematic random sampling. Structured

questionnaires with closed-ended questions which consisted of seven point Likert Scale and nominal questions were chosen to make it simpler for the respondents to answer. Moreover, descriptive analysis, reliability test and factor analysis were used in this study to achieve the objective. Descriptive analysis was undertaken to discover and define the socio-demographic profile of the respondents while factor analysis was used to explore the different aspects of students' intention in involving in agri-entrepreneurship.
Cronbach's alpha, on the other hand, was used to measure the coefficient of reliability consistency.

Results and Discussion
Based on the reliability analysis, Cronbach's alpha value was 0.915 which means that this data is suitable for the study.

Students' Socio-Demographic Profile
Demographic analysis in this research shows that most of the respondents were females with the percentage of 59%. Meanwhile, 53% of the respondents were aged between 23-26 years old while 47% of them were 19-22 years old. According to the students' courses, 32% of them were from Bachelor of Science Agribusiness; 28% were from Bachelor of Science Aquaculture; 21% of them were from Bachelor of Science Agriculture and 19% of them were from Bachelor of Science Horticulture. With respect to that, most of the respondents were interested in pursuing a career in agri-entrepreneurship (81%) and 80% of them are willing to take the risk to venture into this activity. On the other hand, 44% of the respondents stated that the reason they venture in agri-entrepreneurship is because of their passion in it and 27% declared that it is because of their exposure in agriculture program. Yet, only 37% of the respondents have experienced in joining any programs regarding on agribusiness entrepreneurship and 52% are not willing to choose agri-entrepreneurship as their first choice of job.

Factor analysis
Youth involvement in agri-entrepreneurship is very important for the growth of economic in our country and the intention of student to contribute in this sector may vary. Hence, this creates an appealing basis to discover the latent factors that influenced students' intention in becoming agri-entrepreneur. Factor analysis was used to examine the important factors that influence students' intention in becoming an agri-entrepreneur. The result shows that out of 27 statements of variables, only 25 statements will influence the students' intention. Based on the KMO test, the value presented 0.914 means that the factor analysis is useful with the data studied. A total of four factors were extracted from the factor solution and these four factors were perceived value, perceived behavioral control, attitude and society influences. The factors loading for each factor were ranged from 0.824 to 0.915 (Table 1). All four extracted factors accumulated a total variance at
63.758% was considered significant with the students' intention in becoming agri-entrepreneur.

Table 1: Results of reliability test for each factor

	Cronbach's Alpha Score	Numbers of items
Perceived value	8	0.887
Attitude	7	0.915
Perceived behavioral control	5	0.883
Society influences (friends and family)	5	0.824

Conclusion

As a conclusion, majority of the respondents are interested in pursuing career in agri-entrepreneurship and from that mass of them are agribusiness students. It might be due to the fact that many of these students build passion in this activity. Most of the students are interested in pursuing a career in agri-entrepreneurship though they are not willing to choose this career as their first choice. Nonetheless, four main factors have been extracted to explain the students' intention in becoming an agri-entrepreneur which is perceived value, perceived behavioral control, attitude and society influences. Attitude of students towards agri-entrepreneurship has displayed the highest effect on their intention. This study provides an insight of effectiveness for the teaching methodology to help students to be more interested in becoming an entrepreneur. More motivational and encouraging activities regarding agri-entrepreneurship for are essential for all students.

References

Department of Statistic Malaysia. (2009). Siaran khas penyiasatan tenaga buruh: Usahawan di Malaysia. *Jabatan Perangkaan Malaysia.* Siri 4 Bil 1

Ministry of Agriculture. (2013). Chapter 15 Agriculture: Transitioning from agriculture to agribusiness. *Economic Transformation Program*.

Ninth Malaysia Plan. (2006). *Ninth Malaysia Plan 2006-2010.* The Economic Planning Unit. Prime Minister's Department, Putrajaya

Solomon, G. T., Weaver, K. M., Horst, R. V. D., King-Kauanui, Duffy, D. Malden, M. A. (2005). Pedagogical methods of teaching entrepreneurship: An historical perspective: Keystone of entrepreneurship knowledge. Blackwell Publishing Inc.

Venkatachalam, V. B. and Waqif, A. A. (2005). Outlook on integrating entrepreneurship in management education in India. *Decision*. 32 (2): 57-71.

ECONOMICS OF SMALL-RUMINANT MARKETING IN NORTHWEST NIGERIA: ANALYSIS OF PRICE DETERMINANT

Umar A. Muazu *PhD*
Department of Agricultural Education
Federal College of Education (T), PMB 1088, Gusau
Zamfara State-Nigeria
aumuazu67@gmail.com
+2348036970442

Keywords: small ruminant, marketing, price determinant, northwest Nigeria

INTRODUCTION

Prior to the oil boom era in the 1970's, agriculture was the main pillar of Nigerian economy, contributing about 70% of the Gross Domestic Product (GDP). By 1980, agriculture's contribution to GDP declined to as low as 25%, giving way to the oil sector. However, oil revenue dwindled between 1986 and 1999 as a result of the introduction of Structural Adjustment Programme of 1986. This brought agricultural sector to lime light up surging to 40% of GDP. Today its contribution to GDP has dropped to 37% . However, Agriculture still employs 65% of Nigerian adult labour force (Auwal, 2005). While human population grows at 3.2% per annum, annual crop production growth rate is 2.2%.Thus cannot match the food need of the teeming populace. Consequently, Nigeria moved from an Exporter to major Importer of Agricultural products to meet the nation's domestic food and raw materials requirements.

The livestock industry is an important component of agriculture as a key contributor to economic growth and development of Nigeria. In Nigeria, the acclaimed relevance of the livestock sub-sector of the agriculture tends to be playing a decreasing role in national development in view of its contribution to the country's agricultural Gross Domestic Product (GDP).

To improve the competitiveness of live animals and meat in Nigeria, cost-effective marketing channels and coordinated supply chains which reduce the transaction costs among different actors along the supply chain are crucial (Adugna, 2007). This will require not only the competitiveness of individual firms but also improving the efficiency of all its elements from production, to processing, handling, distribution, and marketing. However, there is little evidence for growing interests of strategic production of livestock for marketing. Information on economic aspects of livestock marketing, performance and structural characteristics of the market and competitive behavior of actors in the market chain in Nigeria is highly scanty. The central point in this process is to understand what factors determine formation of small ruminant animal prices. A focus on prices is important as prices are an important measure of livestock market performance and efficiency, which is an indicator of producer incentives and a basis of government revenues from livestock market related services (Ayele *et al*, 2009). Knowledge of these factors helps in developing strategies targeting development interventions that will enable improvement of the proportion of the total price of livestock to motivate production of better quality animals and their marketing behavior. Understanding price formation allows insight into these issues, and also provides information critical for forecasting future trends

This paper seeks to contribute in this aspect of livestock marketing by analysis of determinant of small ruminant price in some selected major livestock markets in the northwest Nigeria. This paper is organized into four parts. The first part provides the background of the paper and the second part is about the methodology used in data collection and analysis. The third part explains the results of the data analysis

while the fourth part of the paper provides conclusions and implications of the paper for both policy and development interventions.

METHODOLOGY

This study is based on a market survey conducted in five major livestock markets in Zamfara State. The markets were purposely selected based on the extent of livestock marketing taking place these markets and the difference in their market days. Each market location was visited four times in a month for a period of five months (June-October 2014). Sheep and goat information questionnaire was designed to capture information on breed, sex, animal condition, buyer type, market location and final selling price of the animal.

Simple random sampling method was also employed to select two sheep and goat traders for interview on various marketing activities on each market visit. At the end of the visits, 24 traders were interviewed on each market location. The traders responded to questions on relevant market information such as membership of the animal trade association, factors considered in pricing the animal, perceived marketing constrains types of marketing services and their costs, length of time it takes to sell- off consignment, as well as the sale price of selected animals based on various selected animal attributes. This enabled the researcher to identify how these variables influence prices of the animal. Whereas other marketing activities such as infrastructures in the markets, major categories of buyers, number of animals brought to the market for sale on each market day were narrations of observed situations.

The Regression Model;

In this study, an implicit price function was estimated to relate the price per animal to its various attributes, and the attributes of markets, buyers and sellers. The general form of the implicit price function is as follows:

$$\mathbf{P} = \mathbf{F}(\mathbf{Q},\mathbf{C}) + \mathbf{e} ,$$

Where P is the observed price of the animal, **Q** is a set of qualitative (discrete) variables or factors each with more than one category, **C** is a set of quantitative variables (covariates), and **e** is an error term.

RESULTS AND DISCUSSION

Descriptive analysis

The descriptive analyses have shown that 100% of the sheep and goat traders in the study area were males. Reason may be due to the fact that livestock marketing is a business involving stress and endurance and therefore females are not likely to endure due to their nature. The result also shows that majority of the sheep and goat traders fall within the age groups of 31-40 years (37.5%) and 41-50 years (32.5%). Age groups below 20 years and 61years and above constituted smaller number percentages. The analysis revealed that large proportion (58.3%) of sheep and goat traders had Qur'anic education and only 5.8% had both primary and post primary education. The implications of this majority not having acquired western education may be a bottleneck to the adoption of innovations such as selling of live animals on weight basis. In terms of experience in the livestock marketing result has shown that majority of the traders in the study area (53%) have been in sheep and goat business over 11 years. Margin analysis conducted

between producer price and consumer price have shown net margin N890 (USD5.56) i.e 8.4% of the total marketing cost meaning that 91.6% are regarded as the marketing cost.

Results of the Sheep and Goat Equation Model

The results of the analysis indicate best fit equations for sheep and goats model as shown in Table 1. The specified attributes explain 66% and 68% of price variation in case of sheep and goats respectively. Among the variable introduced for age of sheep and goat, the animal of age above 30 months capture the highest price premium over all other age groups and the t-statistic 1.4810 and 0.5930 are both significant ($p<0.05$), indicating that other things being equal, age of the animals had significant influence on the prices for both the sheep and goats. Meaning that price per animal increased with age but declined for older or over mature animals for both sheep and goats. The results further shows that other things being equal, price per animal was significantly higher for males compared to females in case of both sheep and goats. One possible reason is that most marketed females are old culled animals which passed their productive age.

The body condition of the animal was determined by visual assessment by the buyer it is done by feel with hand on the leg, back and tail to assess the fat content. Base on these sheep are categorized into lean, moderately fat, fat and very fat. Fat content of the animal indicates state of health and nutritional state of the animal. Very fat animals mean prices was higher for both sheep and goat and the t-statistics 1.543 and 1.938 for both sheep an goat respectively was significant ($p<0.05$).This is expected because of its high quality and quantity of meat than its lean counterparts with mean average price of N7321.1 (USD45.8) and N3570 (USD22.3) for sheep and goat respectively. Another important attribute consider is the breed. Four breeds were identified for sheep and three for goats in the study area. Price among the breeds of animals was not significantly different as shown for both sheep and goat. This may be surprising as the interview conducted with the traders shown that the *Yankasa* breed of sheep is priced higher as compared to other breeds and the Sokoto red has special features of more tasteful that many consumers like that makes it demand high as compared to *sahel* and W/African dawf breeds. The result in Table 1 concur with this as it indicated that the breed fetches high price premium than the other three breeds of sheep while the Sokoto red had high mean price than sahel and W/African dwarf goat.

Among the buyers of the animal middlemen constitutes 71% and 63% for sheep and goat respectively. The mean average price of animal paid by consumer is the highest for both sheep and goat. The price among the buyer type is significantly different for both sheep and goat. Among different types of buyers of sheep, other things being equal, fatteners paid significantly lower prices compared to traders (middlemen and merchant), consumers, and butchers. One possible reason is that fatteners here are the farmers as buyers are more prevalent in local markets while traders operate in all markets and dominate the secondary markets. In addition, farmers usually purchase animals for breeding, rearing and fattening and not for immediate resale or consumption like traders and other consumers do. Thus they may prefer small animals with lower prices. In case of goats, consumers paid significantly higher prices compared to other type of buyers. Fattener paid lower prices but the difference was not significant.

Market location has a significant influence on the price of the animal. Price among market locations for both sheep and goat is significant ($p<0.05$). Among the livestock market under this study Shinkafi is the farthest to the nearest state capital. Guasau livestock market recorded highest mean price for both sheep and goat this is not surprising since Gusau is an urban city market with majority of the buyers are consumers and restaurant owners. The lowest price offer was in Shinkafi for the sheep and Tsafe for goat.

Table 1: Results of the Analysis of the Determinants of Sheep and Goats Price in the Northwest Nigeria

Variable	Sheep			Goat		
	Mean Price (N)	Std Error of Mean	T-Values	Mean Price (N)	Std Error of Mean	T-Values
Age (Months)						
12-18	7300.0	974.67	0.193*	4300.40	162.70	1.711***
19-24	12857.1	5520.50	1.587**	6700.70	174.30	1.235*
25-30	16150.0	2432.40	1.334**	7100.00	141.70	0.701*
31>	19337.5	3846.10	1.481**	9300.70	129.60	0.593**
Sex						
Male	14780.0	2104.00	1.121*	7650.80	530.30	2.11*
Female	14733.3	2297.40	0.701*	8160.70	593.10	1.25*
Body Condition						
Very fat	18250.0	2008.00	1.154**	8511.70	102.70	1.93**
Fat	17740.0	2370.10	0.913	7413.50	137.20	2.11**
Moderately fat	16045.5	2854.30	1.279**	4870.70	106.20	3.05**
lean	7321.1	936.70	0.165**	3570.60	151.60	2.93**
Breed						
Yankasa	17722.00	3330.30	4.685	-	-	-
Balami/Sokoto	13261.60	1769.20	1.038	7160.10	909.90	1.05
Uda/Sahel	12700.10	8250.00	0.513	8410.20	298.90	0.19
W/Africa dwarf	13200.10	6621.80	1.107	7650.00	401.60	3.11
Buyer Type						
Merchant	15863.60	2211.60	1.297*	9851.70	221.56	2.71**
Middlemen	15750.00	1975.30	1.400*	7370.50	119.70	3.11**
Fattener	10522.20	3294.80	1.334*	6580.70	211.70	1.41***
Consumer	17350.00	2174.30	3.501**	7151.00	161.70	1.27**
Butcher	16750.30	3191.43	1.746**	8431.20	135.33	0.25**
Market Location						
Gusau	23591.00	3573.50	2.740**	7798.00	123.57	1.61**
K/Daji	18730.20	2278.10	1.350*	7290.60	124.28	2.11*
T/Mafara	16320.20	2081.70	2.351*	7471.50	127.68	1.25
Shinkafi	15511.40	1741.20	0.631*	7370.60	130.77	1.05
Tsafe	15751.00	1621.00	1.511***	7272.50	125.59	1.29*
R^2		0.657			0.681	
N		1147			1093	

*, ** and *** indicate significant at 10% , 5% and 1% level.

Conclusion and Recommendation

Understanding the determinant of price may be helpful for producers to understand buyer preferences for specific characteristics of animals and target breeding, fattening, time and place for sales to gain from important market opportunities. To contribute to this knowledge, price equation models were fitted to a sample of 1147 sheep and 1093 goats respectively for which data were collected from five markets in northwest Nigeria over a 5 month period. Results revealed that among the variables fitted for price only breeds of the animal shows no significant difference in price among the identified breeds in the study area for both sheep and goat. The study recommends introduction of selling the animal on weight basis.

REFERENCES

Auwal, A. (2005). Political Decisions in Nigerian Agricultural Industry. *Journal of Applied Sciences and Management,* Vol.2. Page 186.

Gezahegne Ayele., Mohammed A. Jabbar, Hailemariam Teklewold, Elias Mulugeta and Getahun Kebede. 2006. Seasonal and Inter-Market Differences in Prices of Small Ruminants in Ethiopia. *Journal of Food Products Marketing*. Volume 12, No. 4. pp. 59-78.

Teressa Adugna, 2007. Determinants of market prices of livestock: the case of cattle in Alemaya, Eastern Ethiopia, in 'Pastoral Livestock Marketing in Eastrn Africa: Research and Policy Challenges', John G., McPeack and Peter D. Little (eds) 2007.

THE INTENTION OF BSEP PARTICIPANTS TO BECOME AGRI-ENTREPRENEURS

Muhammad Mu"az Mahmud[1], Zainalabidin Mohamed[2], Golnaz Rezai[2] and Mad Nasir Shamsudin[2]

[1]Graduate Researcher Fellow, Department of Agribusiness and Information System, Faculty of Agriculture, Universiti Putra Malaysia, [2] Lecturer, Department of Agribusiness and Information System, Faculty of Agriculture, Universiti Putra Malaysia

e-mail: muaz_152@yahoo.com

Keywords: BSEP, entrepreneur, graduates, exploratory factor analysis

Introduction

The Malaysian climate and soil are suitable for multiple agricultural activities. Potential areas suitable for crop development based on schematic reconnaissance soil surveys total 4,010,933 ha. The major of crops under cultivation are rubber, oil palm, paddy and coconut. One of the most important components in the agriculture sector is the agro-based industry. In 2010, there were a number of 4,185 farmers or entrepreneurs involved in the agro-based industry project valued at a total of RM302.5 million. In 2005, only 3,472 entrepreneurs were involved in the agro-based industry project with value of RM143.3 million.

According to Abdullah and Amran (2008), the entrepreneurship development in Malaysia started from the basic trading activities that were in practice prior to independence in 1957. In 1954, there were 79,673 businesses registered in Federation of Malaya. During the Ninth Malaysian Plan (2006 to 2010), the government of Malaysia announced that agriculture should be revitalized to become the third engine of growth. The approach to be used is new agriculture involving large scale commercial farming, wider application of modern technology, high quality production as well as value-added products, unlock potential in biotechnology, increase focus on Information and Communication Technology (ICT) and involvement of entrepreneurial farmers and skilled workers.

Courses and programs related to entrepreneurship were conducted for all levels of people from school level to senior farmers. The aim was to develop new entrepreneurs as well as enhance entrepreneurial skills among existing entrepreneurs. Rezai et al. (2011) explained that informal entrepreneurship education is not able to provide the entrepreneurship skills acquisition as expected. Besides that, training should be intensified to encourage not only focus on the modern technologies but also on the fundamental changes in their attitude towards agriculture as a business. Though many courses have been conducted, conclusions cannot be made based on just a few courses which have been tested. There are still many entrepreneurial courses which have not been evaluated as yet. As mentioned by some research (e.g. Pittaway and Cope, 2007 and Galloway and Brown, 2002), the impact of entrepreneurship education at the university level has been questioned, especially the transition of intention towards to entrepreneurial behavior or entrepreneurial success. National Entrepreneurial Institute (INSKEN) is an institute organized by the government to conduct and handle entrepreneurial programs and courses. Among the courses conducted by INSKEN is Basic Student Entrepreneurial Program (BSEP). BSEP started in 2003 where 19 local higher education institutions and 1 private higher education institution were involved. Until now, BSEP has expanded to 27 Polytechnics in order to benefit the technical skills in entrepreneurship. It is expected that nearly 20,000 students have undergone this program nationwide (INSKEN, 2010). The prospect for this course is final year students in higher education institutes. The modules in this course focus the basic knowledge on how to become entrepreneurs such as entrepreneurial facts, accounting, managing a business and motivational talks. At the end of the program, participants will be given a certificate that makes them eligible to apply for the Graduate Entrepreneur Fund (TUS) (INSKEN, 2010). TUS is a

special financial facility for graduates which features loans from RM20,000 up to RM500,000 with an interest rate of 4 percent per annum on monthly rest. Though the number of entrepreneurial courses and programs increase, one area in which relatively little research has been conducted is that of assessing the impact of educational and training initiatives (Henry *et al*, 2005). The development and running of entrepreneurial courses and programs is expensive in terms of money and time, both to participants and sponsors (Storey, 2000). Thus, this research is conducted in order to uncover the factors that could influence graduates to become an agri-entrepreneur.

Conceptual Framework, Data And Empirical Method

In this study, the theoretical framework used is TPB and being modified to suit the scenario of the study conducted (Figure 1).

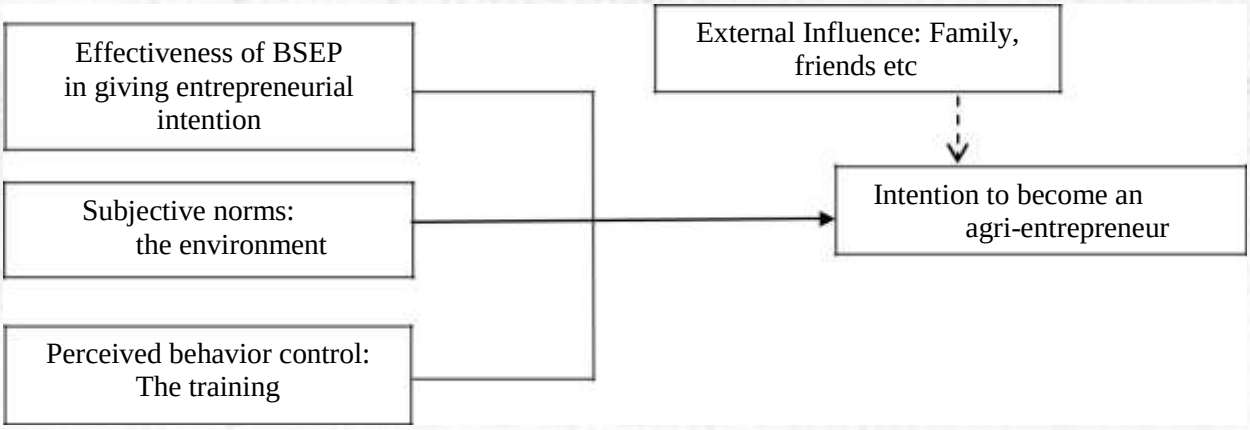


Figure 1: Conceptual Framework Based on Ajzen's Theory of Planned Behavior (TPB) (1991)

This research used primary data to be analyzed for achieving the objective of the study. A Structured questionnaire was designed to capture participants‟ perception and opinion on *BSEP* in order to realize government aspiration to be competitive in the world market. Sections of the questionnaire were divided into two (2) which are the seven (7) likert scale questions and also socio-demographic questions including age, gender, origin of respondent, state of origin, education background and family availability members involved in entrepreneurship. The method of data collection was using the stratified random sampling and collected between September 2011 and January 2012. A likert scale of 1 to 7 (1 representing strongly disagree and 7 strongly agree) was used to measure the participants‟ perception on 73 statements formulated in relation to entrepreneurship, agri-entrepreneurship and *BSEP*. The targeted respondents were students who have attended *BSEP* modules or courses from local higher educational institutions.

Empirical Findings and Conclusion

The percentage of respondents from the Northern region was 25.0% %, East coast, 34.2 %, Southern region, 22.1 % and Central region, 18.6%. In terms of age distribution, the majority of the respondents 66.80% were between 21 and 25 years old, 26.2 % of them were between 26 and 30 years old, 5.4% of the respondents were below 21 years old while another 1.5% was above than 30 years old. The age distribution indicated that majority of the respondents are in the range of graduation age which is 22 to 24 years old. Out of 1006 respondents, 38.6% of the respondents had family members who are involved in business while 61.4% of the respondents did not have family members who are involved in business. In terms of education background, 62.1% of the respondents had technical education background while only 37.0% of the respondents had social science background.

Approximately fifty eight percent (58.4%) of the respondents are from the urban area whereas 41.6% respondents are from rural area.

We conducted exploratory factor analysis (EFA) resulting in 5 latent factors as exhibited in Table 1. The Kaiser-Meyer-Olkin (KMO) measured a sampling adequacy was 0.835 which indicated an excellent value for factor analysis.

Reliability test is also use to measure the variables that selected to be used in factor analysis to test the reliability for all the items. The Cronbach‟s Alpha value greater than 0.60 means that there is consistency among the theory and the factor analysis is fit to be use for the study. The Cronbach‟s alpha value for "attitude towards BSEP program", "external influence", "and intention of participants", "risk taking and motivation" is 0.719. This showed that there is consistency among the Theory of Planned Behaviour items and therefore the model is fit for this study. Based on Table 1, the factor of "attitude towards BSEP course" has a total variation of 24.81%. The result indicates that participant‟s attitude towards BSEP plays an important role in determining the effectiveness of BSEP course itself. "External influences" also influence participants to become an agri-entrepreneur with a total variation of 8.71%. The factors of "intention of participants", "risk taking" and "motivation" are important in creating agri-entrepreneur. The accumulated total variation is 58.89%.

Empirical Findings and Conclusion

The percentage of respondents from the Northern region was 25.0% %, East coast, 34.2 %, Southern region, 22.1 % and Central region, 18.6%. In terms of age distribution, the majority of the respondents 66.80% were between 21 and 25 years old, 26.2 % of them were between 26 and 30 years old, 5.4% of the respondents were below 21 years old while another 1.5% was above than 30 years old. The age distribution indicated that majority of the respondents are in the range of graduation age which is 22 to 24 years old. Out of 1006 respondents, 38.6% of the respondents had family members who are involved in business while 61.4% of the respondents did not have family members who are involved in business. In terms of education background, 62.1% of the respondents had technical education background while only 37.0% of the respondents had social science background. Approximately fifty eight percent (58.4%) of the respondents are from the urban area whereas 41.6% respondents are from rural area.

We conducted exploratory factor analysis (EFA) resulting in 5 latent factors as exhibited in Table 1. The Kaiser-Meyer-Olkin (KMO) measured a sampling adequacy was 0.835 which indicated an excellent value for factor analysis

Reliability test is also use to measure the variables that selected to be used in factor analysis to test the reliability for all the items. The Cronbach‟s Alpha value greater than 0.60 means that there is consistency among the theory and the factor analysis is fit to be use for the study. The Cronbach‟s alpha value for "attitude towards BSEP program", "external influence", "and intention of participants", "risk taking and motivation" is 0.719. This showed that there is consistency among the Theory of Planned Behaviour items and therefore the model is fit for this study. Based on Table 1, the factor of "attitude towards BSEP course" has a total variation of 24.81%. The result indicates that participant‟s attitude towards BSEP plays an important role in determining the effectiveness of BSEP course itself. "External influences" also influence participants to become an agri-entrepreneur with a total variation of 8.71%. The factors of "intention of participants", "risk taking" and "motivation" are important in creating agri-entrepreneur. The accumulated total variation is 58.89%.

Table 1: Exploratory factor analysis: factors that influence the Basic Student Entrepreneurial Program (BSEP) participant's intention to become agri-entrepreneurs

FACTOR	1	2	3	4	5
MOTIVATION					
After meeting some successful agri-entrepreneurs, I"m encouraged to become one	.719				
I want to help farmers	.701				
Available business opportunities in agriculture field encourages me to become agri-entrepreneurs	.696				
By becoming an agri-entrepreneur, I can fulfill my aim of developing the agricultural sector to become self-sufficient	.680				
After attending BSEP, it influenced me to become an agri-entrepreneur instead of depending on jobs offered by the government/private sector	.664				
I want to utilize the natural sources that we have (Agriculture)	.632				
Variance explained	**24.813**				
ATTITUDE TOWARDS BSEP COURSE					
BSEP will provide me with the proper business practices needed		.738			
BSEP develops my interest towards entrepreneurship		.713			
BSEP has been successful in cultivating entrepreneurial characteristics among participants		.708			
BSEP motivates me to become an entrepreneur		.698			
BSEP has potential to reduce the unemployment rate among graduates		.656			
Variance explained		**12.971**			
EXTERNAL INFLUENCE					
My friends influence is important in being an entrepreneur			.754		
People who are important to me want me to become entrepreneurs			.753		
Since my parents/in-laws are entrepreneurs so I also want to be an entrepreneur			.748		
Variance explained			**8.714**		
RISK TAKING					
The agriculture sector is as profitable as other entrepreneurial sectors				.817	
It is easier to deal with living things (eg. Goats, cows, paddy) compared to others (eg. Hotels, manufacturing, IT)				.812	
Variance explained				**6.638**	
BECOMING AN AGRI-ENTREPRENEUR					
I intend to become an agri-entrepreneur because the nature of the job suits me					.838
It was my ambition since I was a kid to become an agri-entrepreneur					.773
Variance explained					**5.752**

Discussion

The study provides an important exploratory analysis to evaluate the effectiveness of BSEP course among the local university graduates who has undergone the training program in entrepreneurship development. The results show that there is positive perception on the BSEP in enhancing the agri-entrepreneurial intention among young graduates. Besides, participants perceived that BSEP is able to; develop their interests in agri-entrepreneurship, provide participants with proper business practices, help government to increase agri-entrepreneurs and reduce unemployment. Although a small number of participants disagree with positive effects of the BSEP course, the careful consideration on curriculum in design involving with diversity, creativity, quality and equality will lead young graduates to develop their agri-entrepreneurial skills and traits. More Innovative strategies need to be developed to encourage university students to attend the BSEP course in order to develop the interest to become entrepreneur or agri-entrepreneur. As years passes by, the number of graduates will increase and the job market is unaffordable to accommodate all of these graduates. Thus, it is inevitable that certain number of graduates have to become entrepreneurs or agri-entrepreneurs. The resources and opportunities available for entrepreneurship are still wide open. Thus, the governments as well as private sectors have to work together in order to achieve certain number of entrepreneurs. The big number of entrepreneur courses does not represent the number of entrepreneurs develop. What‟s needed are quality entrepreneurial courses and not only considering the quantity. The near future is promised with more sophisticated technology, which makes it a challenge on how to educate graduates to face the real world instead of addicted to technology disasters such as Facebook and Twitter.

Agriculture is an important issue in Malaysia. Whatever happens to agriculture in this country will affect all of us. This is due to the fact that agriculture produces food and everybody needs to eat. Agriculture nowadays has been an „unpopular‟ sector to venture in. The environment or workplace of an agri-entrepreneur includes fields, farms and estates are sometimes uncomfortable. Plus, the stereotype mentality among youngsters nowadays that see agriculture as a sector that are for old people and not a wealthy sector. They are more interested to work in corporate sectors where offices are more comfortable. If this trend becomes unstoppable, Malaysia would not be able to produce graduates that are competitive and able to help strengthen the economy of the nation. Agri-entrepreneurs are known for being mentality strong and able to bear uncertain risks. In addition, current graduates are the future leaders. Agri-entrepreneurship will keep the economy of the country stable and hopefully in the near future, Malaysia will become a fully develop country.

References

Abdullah, Syahida and Muhammad, Amran. 2008. The Development of Entrepreneurship In Malaysia: Stateled Initiatives.

Ajzen, I. 1991. The theory of planned behavior. *Organizational Behavior and Human Decision Processes*. 50, 179–211.

Galloway, L. and Brown, W. 2002. Entrepreneurship education at university: a driver in the creation of high growth firms. *Education + Training.* 44 (8/9), 398-405.

Henry, C., Hill F. & Leitch C. 2005. Entrepreneurship education and training: can entrepreneurship be taught, Part II. *Education & Training*, 47 (3), 158-170.

INSKEN. 2010. Retrieved on Jun 3, 2010 from http://www.insken.gov.my/programkeusahawanansiswa.

Pittaway, L. and Cope, J. 2007. Entrepreneurship education – a systematic review of the evidence. *International Small Business Journal.* 25(3), 479-510.

Rezai, G., Mohamed, Z., Shamsudin, M.N. 2011. *Informal education and developing entrepreneurial skills among farmers in Malaysia*. Paper presented at International Conference on Economics, Business Management and Marketing. 24 June-26 June. 1881-1889. Paris, France.

Storey, D.J. 2000. Six steps to heaven: evaluating the impact of public policies to support small business in developed economies. in Sexton, D. and Landstrom, H. (Eds), *The Blackwell Handbook of Entrepreneirship*, Blackwell, Oxford, 176-93

PERCEPTION OF THE GAZETTEMENT OF MARINE PARK AREA OF PULAU TINGGI AND PULAU SIBU AND ITS IMPLICATIONS ON LOCAL COMMUNITY

Hamzah, N.A.[1], Kamarulzaman, N.H.[2*], Latiff, I.A.[3] and Yusoff, F.M.[4]

[123]Department of Agribusiness and Information Systems, Faculty of Agriculture,
[4]Institute of Bioscience,
Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia
**Correspondingauthor: nitty@upm.edu.my*

ABSTRACT

PulauTinggi and PulauSibuare located in the south of Peninsular Malaysia in Johor. No-take Marine Protected Area (MPA) was established in Malaysia since 1994 under the Fisheries Act 1985 including PulauTinggi and PulauSibu to protect the natural heritage and conserve the marine ecosystem. The declaration of these islands as an MPA also has shifted the local community to involve in tourism related activities in the islands. However, conflicts were raised due to the gazettement of these islands to the fishermen who depend on fishing activities as their major income source. This study was aimed at investigating the perceptionof local community on economic impact and tourism development towardsgazettementof PulauTinggi and PulauSibu as Marine Park Area (MPA). The data was derived from a census data of 60 families based on a face-to-face interview. This study used the descriptive analysis to analyze the overall data. The results of the analysis showed that the majority of the local community are males with middle age and had low education level. The result also revealed that the local community in the islands agreed the gazettement of MPA has negative impacts on their economic activities. The result further revealed on the tourism development that the increasing number of tourism has damaged the marine biodiversity.

Keywords: economic impacts, tourism development, Marine Park Area, PulauSibu, PulauTinggi

INTRODUCTION

Marine Park Areas (MPAs) have been developed as an important role to conserve and manage fishery management for the sustainable exploitation of the marine resources (Bess, 2006).Fishing activities are not allowed within the marine waters areas (Roberts and Hawkin, 2000). The idea behind the development of MPA is to provide a sanctuary for the coral reefs and protect other activities that may damage the marine ecosystem. However, the role of MPA is beyond these ideas as they can provide economically valuable activities such as tourism activities while enabling recovery of marine resources (Caldecott, 2009;Gaylord *et al.*, 2005).

In Malaysia, the Department of Fisheries (DOF) was given responsibility to protect the marine environment but has been transferred to the Marine Park Department Malaysia under the Ministry of Natural Resources and Environment since 2004. Fishing is prohibited in the MPA within two nautical miles from the shore. However, other activities such as tourism and education are allowed in the MPA because it does not threaten the marine life. There are about 42 islands that have been gazetted in to the MPA of Malaysia, while 13 marine parks are located in Johor state in the south of Peninsular Malaysia. PulauTinggi and PulauSibu were declared as the MPA since 1994 (DOF, 2011). The main economic activitiesof the local community in these islandsas their income are fishing. However, the rapid development of tourism industry has shifted some of the local people to work on tourism related activities such as chalet management and boat services.

Fatimah (2012) revealed that there was a higher acceptability among the local community towards Sibu Island Marine Park compared to the Redang Island and Tioman Island. According to Thomassin*et al*. (2010), the establishment of MPA is acceptable for those who were highly educated and non-island origin compared to the less educated and island-origin community. However, the establishment of MPAs has cause conflicts particularly to the local community. Hoehn and Thapa (2009) found that economic activities of the local community inhabitant in the island are highly depending on marine resources.

Local community may be subjected to face certain economic risks such as having low income and being marginalized from the island development (Charles and Wilson, 2009). A study conducted by Manaf*et al.* (2011) showed that MPA has created negative impact on the local community's socio-economic activities and there was a declining trend on the number of visitors visiting the island. Thus, the objective of this study is to investigate the perception of local community on economic impact and tourism development towards the gazettement of PulauTinggi and PulauSibuas an MPA.

Methodology

In this study, data collection using face-to-face interviews were conducted in PulauTinggi and PulauSibu, Mersing, Johor. The interviews were carried out to obtain detailed information about respondent's perception and allow more detailed questions to be asked to reduce misunderstanding. Census data from Mersing district office and village chieftain of 60 families in the islands were selected for the study. Three trained enumerators were involved to collect the data during the interview sessions.The questionnaire for the study consisted of structured and semi-structured questions and was divided into three sections. The first section was related to the socio-demographic background of the respondents. The second section consisted of questions about the perception of local community towards economic impacts and the third section covered questions related to the perception of local community towards development of tourism in the island. Most of the questions developed in the questionnaire were based on a 5-point Likert scale. The data collected were analyzed using descriptive analysis. It was used to identify the socio-demographic characteristic of the respondents and their perception on economic impacts and tourism development on the gazettement of MPA.

Results and Discussions

This section highlights the results of descriptive analysis of respondent's socio-demographic profiles such as age, educational level, income level, and marital status in PulauTinggi and PulauSibu. Total respondents who took part in this study were 60 families (n=60). The study was represented by 88.33% males and 11.67% females. A majority of the respondents were in the age ranged between 41 and 50 years old which accounted for 31.67%. The majority of the respondents had completed their primary school (55%) and weremarried (80%). Based on Table 1, majority (31.67%) of the respondents earned RM500 to RM1,000 per month. It showed that fishery communities were typically low income communities. In terms of household size, 46.67% of the respondents live in a house with four to six peoples. In addition, 71.67% of the respondents were working as a fulltime fishermen as their major occupation.

Table 1: Socio-Demographic Profile of Respondents

Variables		Frequency (n)	Percentage (%)
Gender	Male	53	88.3
	Female	7	11.7
Age (year)	≤ 30	13	21.7
	31-40	12	20.0
	41-50	19	31.7
	51-60	10	16.7
	> 60	6	10.0
Education Level	No formal education	6	10.0
	Primary school	33	55.0
	Secondary school	14	23.3
	Higher education	7	11.7
Marital Status	Married	48	80.0
	Single	12	20.0
Income level	≤ 500	5	8.3
	501-1,000	19	31.7
	1,001-1,500	15	25.0
	1,501-2,000	18	30.0
	> 2,000	3	5.0
Household Size	1-3	13	21.7
	4-6	28	46.7
	7-9	19	31.7
Fulltime Fishermen	Yes	43	71.7
	No	17	28.3

n=60

The results of mean score and standard deviation by each statement of local community perception towards economic impacts are presented in Table 2. The statement on migrated because of declining fisheries resources was the highest mean score among the statements with mean score of 3.8. Based on the Level of Capacity and Development Guideline of PulauTinggi (2006) and PulauSibu (2007) by the Department of Town and Country Planning, the declining population in the small islands around Mersing is concentrated in the mainland which is significant economic opportunities, higher earnings and other benefits. The lowest mean score on local community's perception towards economic impact was 2.02, which indicated by the statement on gazettement of MPA has increased the income of local community. It showed that the development of MPA has reduced local community income. According to Ngugi (2000), the impact of marine conservation on local community in small island are mostly as a result of the lack alternative in economic opportunities. Overall mean score was 2.93, which is below than 3indicating that the local community disagreed that their economy havenot been affected by the establishment of MPA.

Respondents were required to state their perception rating regarding the tourism development. Table 3 shows the mean score and standard deviation of local community perception towards tourism development in the islands. The scores for the 10 statements were ranged between 2.70 to 4.22. The results showed that the local community had highest perceptions for the statement of "*stiffer fines should be imposed to the tourists and locals who violate the rules of MPA*" with mean score of 4.22. The lowest mean score on local community perception towards tourism development in MPA was 2.28 which indicated by the statement of "*impact of the increasing number of tourists have affected marine resources*". According to Islam *et al.* (2014),small island is mostly exposed to environment impacts due to tourism activities. Overall mean score of the 10 statements of local community perception was 3.33, indicating the local community agreed that tourism development has provided positive as well as negative implications to their islands.

Table 2: Local Community Perception towards Economic Impacts

Statement	1	2	3	4	5	Mean*	SD
1. Local community has migrated because their income have been affected by the declining of fisheries resources	5.0	11.7	18.3	28.3	36.7	3.80	1.21
2. Younger generation are more interested to involve in tourism sector than fisheries sector after the gazettement of Marine Park Area (MPA)	15.0	6.7	20.0	28.3	30.0	3.52	1.38
3. Economic benefits from tourism activities are more important than environmental protection	6.7	11.7	40.0	18.3	23.3	3.40	1.17
4. Young people should be encouraged to participate in the fisheries sector	11.7	18.3	16.7	26.7	26.7	3.40	1.39
5. The establishment of Marine Park Area (MPA) helps to improve the transportation system in the island	10.0	11.7	33.3	23.3	21.7	3.35	1.23
6. Local community will shifted to other jobs if their income is reducing	20.0	26.7	6.7	36.7	10.0	2.90	1.36
7. The gazettement of Marine Park has caused local people to start their own business	16.7	25.0	28.3	18.3	11.7	2.83	1.25
8. Small Medium Enterprise should be developed to enhance the local economic	20.0	25.0	15.0	26.7	13.3	2.65	1.29
9. Local community can easily carry out economic activities at the sea or on the land due to the gazettement of Marine Park Area (MPA)	36.7	31.7	18.3	13.3	0.0	2.22	1.32
10. Marine Park provides job opportunities to local people	38.3	23.3	25.0	13.3	0.0	2.13	1.08
11. Impact of the gazettement of Marine Park Area (MPA) has increased the income of local community	36.7	31.7	25.0	6.7	0.0	2.02	0.95
Overall Mean						**2.930.40**	
						2.930.40	

*Note: n=60, 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree

Table 3: Local Community Perception towards Tourism Development

Statement	1	2	3	4	5	Mean*	SD
1. Stiffer fines should be imposed to the tourists and locals who violate the rules of Marine Park Area (MPA)	10.0	15.0	10.0	41.7	23.3	4.22	0.69
2. The Marine Park Department should emphasize rules of the Marine Park Area (MPA) to the tourists	1.7	0.0	10.0	70.0	18.3	4.03	0.66
3. Revenue from tourism is better than revenues from fishing activities	15.0	10.0	13.3	35.0	26.7	3.72	1.28
4. Impact of the tourism development has caused damage to coral reefs	8.3	15.0	25.0	31.7	20.0	3.40	1.21
5. Tourism development is the major cause of the incline in fisheries resources	6.7	21.7	23.3	31.7	16.7	3.30	1.18
6. The gazettement of Marine Park Area (MPA) has contributed to the increment in tourism activities	6.7	28.3	21.7	25.0	18.3	3.20	1.23
7. The development of tourism infrastructure in Marine Park Area (MPA) has attracted many tourists	11.7	16.7	25.0	33.3	13.3	3.20	1.22
8. Distinction of coral reef will cause the number of tourists visited to Marine Park Area (MPA) decreasing	13.3	23.3	15.0	40.0	8.3	3.07	1.23
9. The development of tourism will cause serious pollution to the sea	18.3	26.7	16.7	25.0	13.3	2.88	1.34
10. Impact of the increasing number of tourists have affected marine resources	16.7	31.7	23.3	21.7	6.7	2.70	1.18
Overall Mean						**3.330.45**	

*Note: n=60, 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree

Conclusions

The study revealed that the local community perceived the gazettement of Marine Park Area (MPA) has negative economic impacts. Majority of the respondents disagreed that MPA provides job opportunities and increase their income level. There were economic hardships due to declining incomes from low catches of fish as well as job opportunities.The increasing number of threat comes from human activities through tourism such as snorkeling seems to be unsustainable to the island. So, Marine Park Department should imposed stiffer fines and restrictions on the tourism activities that directly damage the marine ecosystems.The public-private sectors should collaborate to facilitate fishing activities particularly for local community. They need to come out with new policies such as provide an area to allow fishermen to fish as they have been used the marine resources for generation for their livelihoods. The Marine Park Department should revise the rationality on gazettement of inhabited small islands as an MPA because it should be given serious consideration.

References

Bess, R., &Rallapudi, R. (2007). Spatial conflicts in New Zealand fisheries: The rights of fishers and protection of the marine environment. *Marine Policy*,*31*(6), 719-729.

Roberts, C.M. and Hawkins, J.P. (2000).Fully Protected Marine Reserve: A Guide.Endangered Seas Campaign.World Wildlife Fund, Washington DC and University of York, York.

Marine Parks of Malaysia Annual Report, Department of Fisheries, Malaysia (2011). Kuala Lumpur. Available at http://www.dmpm.nre.gov.my/files/ANNUAL%20REPORT%20JTLM%202012.pdf.Accessed on 10th October 2014.

Fatimah, K., &NurulHuda, S. (2012). Sibu Island Local Community's Perception towards the Establishment of Marine Park Areas. *Journal of Tropical Marine Ecosystem*, *2*(1).

Hoehn, S., &Thapa, B. (2009).Attitudes and perceptions of indigenous fishermen towards marine resource management in Kuna Yala, Panama.*International Journal of Sustainable Development & World Ecology*, *16*(6), 427-437.

Charles, A., & Wilson, L. (2009).Human dimensions of marine protected areas. *CES Journal of Marine Science: Journal du Conseil*, *66*(1), 6-15.

Manaf, A. A., Shamsuddin, M., & Omar, M. (2011).Marine Park Gazzettement Impacts on PulauTinggi Community in Mersing, Johor. *Journal of Tropical Marine Ecosystem*, *1*(1).

Gaylord, B., Gaines, S. D., Siegel, D. A., & Carr, M. H. (2005). Marine reserves exploit population structure and life history in potentially improving fisheries yields. *Ecological Applications*, *15*(6), 2180-2191.http://dx.doi.org/10.1890/04-1810

Caldecott, J. (2009). *Designing conservation projects*.Cambridge University Press.312 pp.

Ngugi, I. (2000). Economic impacts of marine protected areas: A case study of the Mombasa Marine Park.

Islam, G. M. N., Yew, T. S., Noh, K. M., & Noh, A. F. M. (2014). Community's Perspectives towards Marine Protected Area in Perhentian Marine Park, Malaysia. *Open Journal of Marine Science*, *2014*. http://creativecommons.org/licenses/by/4.0/

Thomassin, A., White, C. S., Stead, S. S., & David, G. (2010). Social acceptability of a marine protected area: The case of Reunion Island. *Ocean & Coastal Management*, *53*(4), 169-179. http://doi:10.1016/j.ocecoaman.2010.01.008

VISITORS' MOTIVATION TO VISIT, AND CULTURAL AND HERITAGE ATTRIBUTES TOWARDS THE OVERALL VISITORS' SATISFACTION OF HOMESTAY PROGRAMME IN SELANGOR

Faizah Shahudin[1], Amin Mahir Abdullah[2]*, Alias Radam[3], Ismail Latif[2]

[1]Graduate Student, [2]Associate Professor, [2]Lecturer , Department of Agribusiness and Information Systems, Faculty of Agriculture, University Putra Malaysia, 43400 UPM Serdang, Selangor D.E., Malaysia.

[3]Associate Professor, Department of Management and Marketing, Faculty of Economics and Management, University Putra Malaysia, 43400 UPM Serdang, Selangor D.E., Malaysia.

*Corresponding author: amahir@upm.edu.my

ABSTRACT

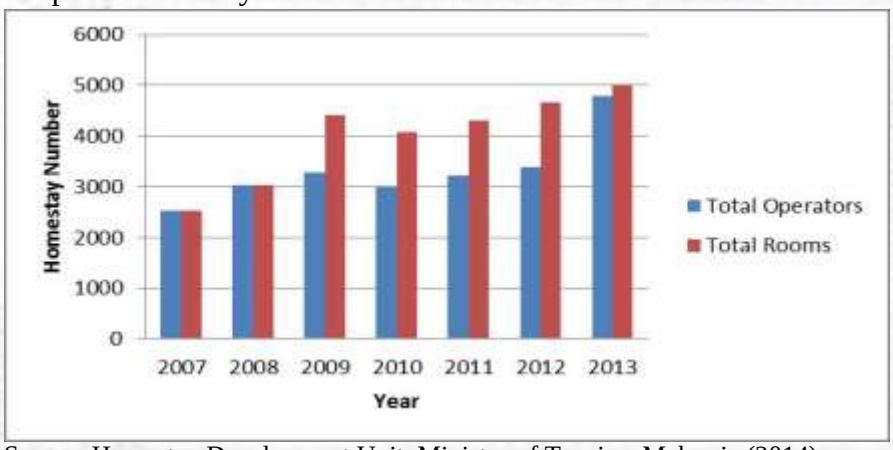
Agritourism is a niche tourism that is fast growing in many parts of the world, including Malaysia. Within the agritourism industry, homestay programme is one of the unique potential products, which offers the opportunity for tourists to stay with the local community (host) thus enabling them to experience the local lifestyle and culture. Homestay programme has the potential to develop the rural areas through the community‟s direct involvement in the various tourism activities. The hosts receive economic benefits through money exchange for the accommodation, products and activities provided at the site. In Malaysia, there are 3,431 trained and licensed homestay operators which involved around 298 villages in 166 homestays (Homestay Unit, Industry & Development, MOT, Oct 2013). Selangor has the highest number with 443 homestay operators registered in 34 participating villages. Despite the high number of registered operators, the homestay programme is seen not getting enough attraction from tourists as compared to other tourism products in the country. Furthermore, research on the level of satisfaction and tourist experience on homestay programme is somewhat limited. Therefore, this study attempted to evaluate the visitors‟ overall satisfaction based on visitors‟ „motivation to visit a homestay‟ and the „destination cultural and heritage attributes‟ of homestay programme. 34 villages were selected across the state of Selangor, Malaysia. A total of 206 respondents were surveyed using questionnaires to obtain required information such as respondent‟s socio demographic background and the characteristics determining their choice of homestay programme location. The results showed that the important factors that influenced visitors‟ choice of homestay programme were the opportunity to explore diverse culture and tradition, nature and historical attractions, accessibility of sites and the availability of various leisure and entertainment activities. The findings of this study would be useful for the homestay operators in improving their services, and promoting rural tourism destinations with an active involvement of the local community. Additionally, the findings could be used in addressing relevant issues and crafting future policy pertaining to homestay programme in Malaysia.

Keywords: Homestay programme, agritourism, tourist satisfaction, motivation to visit, destination culture and heritage attributes, local community

INTRODUCTION

Homestay programme is commonly known as a subset of agritourism sector. It provides an opportunity for tourists to understand more about agriculture of certain places. Homestay visitors seek adventurous opportunity that could immerse their experience in understanding the local or culture of the place (Thompson, 1998). Homestay programme is a community direct involvement which has the potential to develop the rural area through their involvement in various tourism activities (Hussin, R, Kunjuraman.V, 2014). In Malaysia, homestay programme is considered as one of the important community-based tourism activities that offers mixed experience of nature and the local culture village lifestyle to visitors (Jabil et. al, 2011). Therefore, homestay programme can be considered as a community based project that requires close connection or unity among its members in providing a true living experience and hospitality, while at the same time generating wealth for the rural community (Ibrahim et.al, 2004). Graph 1 below shows the significance rose in homestay establishment in Malaysia.

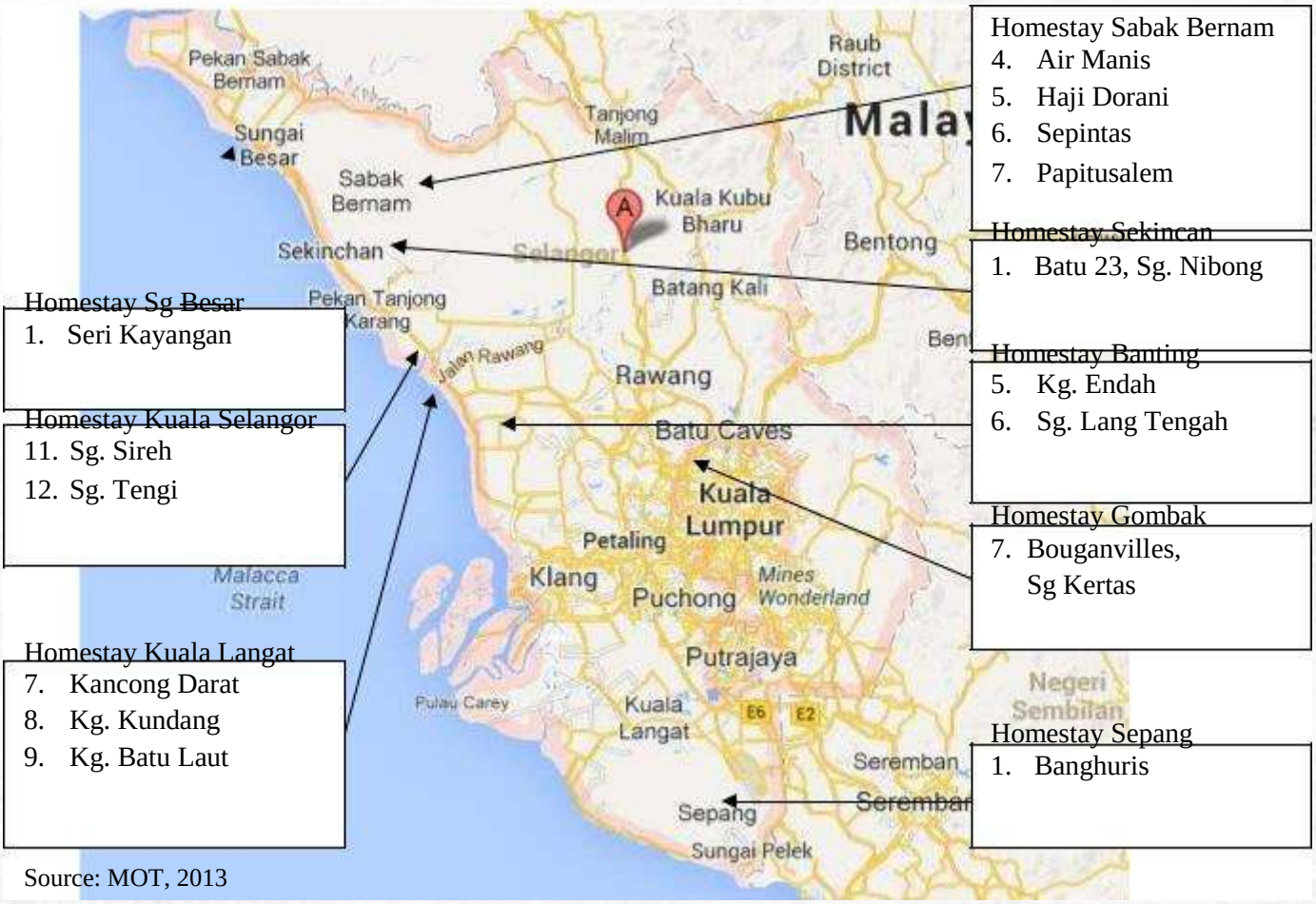
Graph 1: Homestay statistics from 2007 - 2013



Source: Homestay Development Unit, Ministry of Tourism Malaysia (2014)

A Malaysian homestay programme is very unique as it is viewed as a means to promote authentic cultural heritage experiences and *"kampung"* lifestyle. It generates additional household income by utilising existing natural resources and at the same time providing various economic benefits to the local community. The total income of Selangor homestays increased from RM 2,181,747 in 2012 to RM 3,822,168 in 2013. Selangor has the highest number of homestays establishment and the second highest for visitor arrival among all states (MOT, 2013). Figure 1 illustrates the location of study area consists the total of 15 homestays in 34 villages across the state of Selangor. Realizing the potential of this programme; therefore, operators need to focus on the strategies to increase the number of visitors by understanding the overall visitors‟ satisfaction. Thus, this study attempted to evaluate the overall visitors satisfaction based on visitors‟ "motivation to visit a homestay" and the "destination cultural and heritage attributes" of homestay programme in Selangor.

Figure 1: Location of study areas in Selangor, Malaysia



Source: MOT, 2013

Homestay Issues in Malaysia

Many studies highlighted the success factors of Malaysian homestay focusing on certain popular or active homestay locations only (Kalsom, 2002; Nor Ashikin & Kalsom, 2010; Fauziah,, 2012; Bhuiyan, M. A. H., Siwar, C., Ismail, S. M., & Ismail, S. M., (2013), despite the large number of registered homestays in the MOT list. Hence, there was lack of analysis on overall satisfaction in Selangor homestay programme thus far. Some researchers also perceived that homestay programme can contribute in improving the operators‟ life standard and increasing social enhancement (Bhuiyan, et al, 2012). In general, evaluating the effectiveness of the programme by understanding the visitors‟ satisfaction would enable the homestay operators to target a niche market segment such as special interest groups based on their locations. In 2013, there were 48,492 domestic visitors and 15,765 foreign visitors participated in the Selangor homestay programme with the total receipts of R3.8 million compared to RM2.1 million generated in 2012. However the main issue that formed the basis of this study was the

low occupancy rate facing the homestay operators as indicated in Table 1. The steady growth of the occupancy rate indicates a better prospect of the homestay programme, which can further be enhanced by increasing the level of visitor‟s overall satisfaction.

Table 1: Homestay Occupancy Rate

Homestay Occupancy Rate				
2009	2010	2011	2012	2013
20.4%	25.2%	33.1%	40.2%	41.3%

Source: Homestay Development Unit, Ministry of Tourism Malaysia (2014)

The satisfaction of homestays‟ visitors is a critical measurement to ensure that the local products, services and hospitality provided satisfactorily meet the visitors‟ expectation. Cultural and heritage factor, cultural attractions, and recreational experiences on local services have proven to be significantly related to visitors‟ satisfaction in the Wilayah Persekutuan Labuan‟s homestay programme (Yussoff, S, 2011).

Framework for Visitors' Satisfaction, Motivation to Visit a Homestay and Cultural Heritage Destination Attributes

There had been a high level of commitment shown by the host operators, local people and communities involved in the village. The appointed administrator directly involved the whole village‟s participation in the planning and execution of the homestay interactive activities, which were designed to satisfy their visitors‟ expectation from the overall visit. Unfortunately some operators did not benefit much from this participation (Sriprasert et.al 2011; Nor Ashikin & Kalsom, 2010) due to the low number of visitors‟ arrival to their location. In addition, this was also due to the attractiveness of cultural heritage attributes as well as the low motivation to visit the place.

Selangor in particular, a homestay programme usually operates by old folks, pensioners and small-time farmers. This programme is an inter-related joint activity among the operators and communities in the village. Thus the expected government outcome from this development is to reduce income disparities, create SME entrepreneurs and to increase the economic participation among the stakeholders (Liu, A., 2006; Ibrahim, Y., 2004). The total number of visitors and operators income of Selangor homestays increased every year from 2009 to 2013. The significant rose shows the need for a Selangor homestay programme to be analysed as a significant economic engine growth to the rural economy. Therefore, realizing the potential of this programme the operators, communities and Ministry of Tourism in particular need to focus on the strategy to increase the number of arrival through understanding the overall visitors‟ satisfaction through motivational to visit and by improving destination attributes itself. The attractiveness of homestay programme must be designed by capturing more international tourists, as popularity among Japanese, Korean and Singaporean have becoming popular choice of leisure tourism (Jamilah et.al, 2007: MOTOUR, 2011). Table 2 indicates the summary of domestic and international homestay visitors according to the villages in Selangor as at 2011, 2012 and 2013.

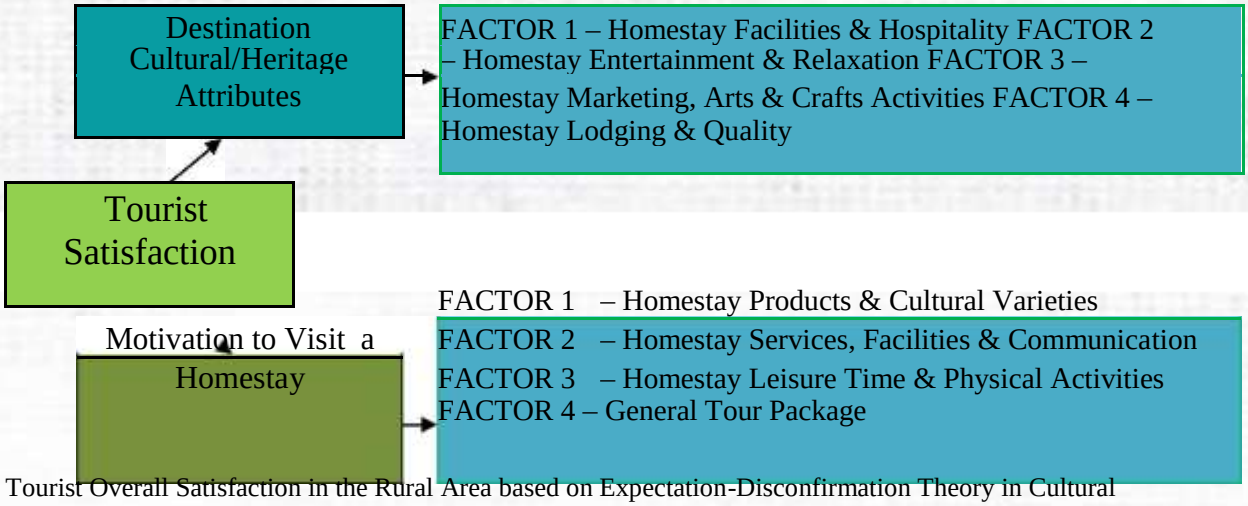
Table 2: Total Visitors Arrival for Homestay Programme in Selangor

No	Homestay	2011		2012		2013	
		Visitors Arrival (person)					
		Dom	Int	Dom	Int	Dom	Int
1	Air Manis, Sabak Bernam	3355	653	2136	529	5776	1351
2	Banghuris	2,213	4608	3,185	4139	3,634	9796
3	Bouganvilles, Sg. Kertas, Gombak	1551	375	1784	73	2166	32
4	Sg. Haji Dorani	4,801	732	4,627	464	6,030	1033
5	Kanchong Darat, Kuala Langat	1777	153	1909	1080	2342	2660
6	Kg. Kundang	1020	32	283	50	872	0
7	Kg. Batu Laut	71	0	85	0	258	0
8	Seri Kayangan	964	0	242	0	491	20
9	Sg. Lang Tengah	921	4	1100	0	1511	30
10	Papitusulem, Sabak Bernam	818	0	700	0	649	0
11	Sepintas, Sabak Bernam	172	0	70	0	90	0
12	Sg. Nibong, Sabak Bernam	1758	13	2435	8	4135	12
13	Sg. Sireh, Kuala Selangor	8,431	545	6,388	511	5,064	831
14	Kg. Endah	2413	6	5608	8	12012	0
15	Sg. Tenggi, Hulu Selangor	183	0	185	0	3462	0
	Total	**30,448**	**,121**	**30,737**	**6,862**	**48,492**	**15,765**

Source: Homestay Development Unit, Ministry of Tourism Malaysia (2014).
Note: (Dom) stands for Domestic visitors and (Int) for an International visitors

Therefore, this study attempted to evaluate the domestic and international visitors‟ overall satisfaction based on visitors‟ „motivation to visit a homestay‟ and the „destination cultural and heritage attributes‟ of homestay programme across the state of Selangor, Malaysia. The conceptual framework is as illustrated in Figure 2.

Figure 2: Homestay Visitors‟ Satisfaction Conceptual Framework



Tourist Overall Satisfaction in the Rural Area based on Expectation-Disconfirmation Theory in Cultural Heritage & Homestay Tourism (Adopted from: Yussoff, S. 2011, Seubsamarn, K., 2009; Uysal, M., Murrmann, Brian , J.,2002; Heung, V.C.S., Cheng, E., 2000; Liu, A., 2000; Lynch, p.A., 2000b; Pizam, A., & Millman, A., 1993; Pizam, A., Neumann, Y. & Rachel, A., 1978).

Visitors or tourists‟ satisfaction is considered to be a vital element in the tourism sector to maintain profitability, business competitiveness and to secure tourist arrival. This has also been proven to affect the choice of travelers in measuring cultural heritage attributes of tourism products and services (Kozak & Rimmington, 2000; Peleggi, 1996). The expectation-disconfirmation model evaluated the overall satisfaction through a comparison of the product expectation towards the actual performance of the product (Oliver, 1980). Another important aspect of homestay visitors‟ satisfaction is the motivation to visit. Motivational factor is defined as a need that urged an individual to travel or behave indifferently a certain way to achieve their level of satisfaction from time and money sacrificed (Crompton, 1979). Research conducted by Yussof, S. (2011) showed that cultural and heritage attributes of homestay programme in Wilayah Persekutuan Labuan, highlighting the cultural attractions, experience of recreational and local services, significantly affected the overall satisfaction. Motivation, on the other hand, was influenced by the destination images, excitement feelings induced by a place or surrounding people, who experienced the tourist destination based on different motives and expectation to travel (Baloglu, 1997).

Method and Data Collection

The state of Selangor was selected due to the highest number of popular homestay, coinciding with the highest number of homestay operators, high achievements and high number of participating villages (MOT, 2013). The sampling frame comprised of 206 respondents, who were both domestic and international visitors. A number of homestay operators were also interviewed to gather information on visitors and the homestays‟ performance. Based on the secondary finding, close-ended questionnaires were developed to generate primary source of data. The questionnaires contained four main sections; visitors‟ demographic background, visiting objectives, visitors‟ motivation, and visitors‟ satisfaction. A total of 206 questionnaires were distributed to the homestay residing visitors. The data were collected from respondents who were above 18 years of age; they were randomly interviewed if they were part of a group visit. SPSS was used to analyze the data. The quantitative data analysis focused on 1) descriptive analysis, 2) reliability test and 3) exploratory factor analysis.

Results and Discussions

Respondents Demographic and Socioeconomic Characteristics

Most of the respondents were in the range of age 26 to 45 years old (41%) and followed by range of 18 to 25 years old (25%). From an overall of 206 visitors interviewed, the gender distribution of the visitors was quite even, with 86 visitors (41.7%) of them were males and 120 (58.35%) are females. The data was gathered from two types of visitors nationality participated in Selangor homestay programme, which domestic visitors was more dominant (73.3%) than international visitors (26.7%). 61 of the respondents were students (29.6%), while others were private employees (30.1%), government employees (6.3%), self-employed (22.3%) and unemployed (11.7%) was the

smallest group that mostly represent by senior citizen visitors or pensioners. In terms of education level, most visitors had diploma (31.6%), with bachelor‟s degree (30.6%), secondary level (30.6%) while postgraduate (5.3%) and only small portion of them has primary level education (1.9%). The results show, most of the homestay visitors are relatively possessed high educational attainment. In term of the visitors‟ annual household gross income, the largest group earned approximately a total of RM24,000 to RM47,000 (48%), followed by RM12,000 to RM23,000 (28.6%), and RM 48,000 to RM 99,000 (16%) and RM 100,000 or more was the smallest group (7.8%). Since almost half of respondents were under 30 years old category, 112 (54.4%) were still unmarried, 94 (45.6%) were married. Most of the homestay information were gathered through MOT promotion and advertisement (36.9%), tour agency (23.8%), friends and relatives (24.8%), internet and website (10.2%) and others media information (4.4%).

Visitors Overall Level of Satisfaction with the Homestay Programme in Selangor

From the research findings, 50% of the respondents indicated that they were satisfied, 25% respondents were strongly satisfied, 15.5% respondents fall under the group of somehow satisfied. However there were small group of respondents are strongly dissatisfied 2.9%) and 6.3% were neither satisfied with homestays programme offers in Selangor as indicated in Table 3. A destination attributes is an important pull factors in evaluating visitors satisfaction to visits a homestay. Respondents were questioned on their overall satisfaction of the homestay programme in Selangor. Table 3 summarized the results overall level of homestay visitors satisfaction from the perspective of the destination or location on "Motivation to Visit a Homestay" and the "Cultural and Heritage Attributes" towards the homestay programme in Selangor. Respondents were asked about their overall level of satisfaction with the homestays.

Table 3: Visitors Overall Level of Satisfaction in Selangor Homestay Programme

Variable	Frequency	Percent
Strongly Dissatisfied	6	2.9
Dissatisfied	13	6.3
Somehow Satisfied	32	15.5
Satisfied	103	50.0
Strongly Satisfied	52	25.2
Total	206	100.0

Note: Overall satisfaction mean ranges from 1 (Strongly Dissatisfied) to 5 (Strongly Satisfied)
N=206

Factor Analysis

Even though the results of reliability test have been satisfactory but still further analysis need to be conducted. Factor analysis has been used to ensure that questionnaire are measuring what it intent to measure as a result after item analysis factor analysis have been carried out on all statements in order to examine the dimensionality, and to ensure

that the questionnaires are able to measure the proposed factors adequately. The study by Hair et al (1992) recommended the minimum factor loading of equal or greater than 0.30 is required to determine an item in its respective variable. However the factor loading of 0.40 is very important but if the value is greater than 0.50 represent the most significant (Hair et al., 2006; Zikmund et al., 2012).

Factor Analysis (Homestay Destination Attributes)

Based on the homestay destination attributes, factor analysis result for all the factors have been loaded and the results are favorable as stated in Table 4 below.

Table 4: The Result of Factor Analysis on Homestay Destination Attributes

Factor	Factor Loading			
	Factor 1	Factor 2	Factor 3	Factor 4
Homestay Facilities, & Hospitality				
Public amenities are sufficient	.820			
Homestay facilities provided by operator	.758			
Complete tour package provided	.736			
Beauty of the scenery	.703			
Homestay Cleanliness	.663			
Hospitality & friendliness of the local residents	.658			
Homestay Entertainment & Relaxation				
Diversity of historical attractions (Architecture, Building, etc)		.836		
Diversity of cultural attractions (Tradition and Customs, etc)		.813		
Cultural events by local community		.773		
Opportunity for rest		.714		
Possibility for shopping		.651		
Ethnic composition		.555		
Availability of local culture and lifestyle		.552		
Homestay Marketing, Arts & Craft Activities				
Other site activities/events – arts & crafts			.823	
Homestay advertising/ e-advert sufficient			.722	
Homestay information is readily available			.701	
Homestay Lodging & Quality				
Climate conditions				.804
Destination can be easily reached				.793
Personal safety and security				.640
Local Cuisine				.553
Eigenvalue	12.951	1.928	1.404	1.063
% Variance	23.231	19.671	16.405	16.106
Cumulative variance	23.231	42.902	59.307	75.413
Cronbach‟s alpha	0.926	0.920	0 .887	0.905

Notes: Extraction method: Principle component analysis
Rotation method: Varimax with Kaiser normalization (Rotation converged in 7 iterations)
KMO(Kaiser-Meyer-Olkin measure of sampling adequacy) = .869
Bartlett‟s test of sphericity: $p = .000$

The principal component methods were used to underline the dimensions of homestay destination attributes. The factors with eigenvalues greater than or equal to 1.0 and attributes with factor loadings were reported. Table 4 above illustrates the results of the factor analysis for this study. The four factors were: Homestay Facilities & Hospitality, Homestay Entertainment & Relaxation, Homestay Marketing Arts & Crafts Activities, Homestay Lodging & Quality.

The overall significance of the correlation matrix was .000, with a Bartlett test of sphericity value of 5508.067. The Kaiser-Meyer-Olkin overall measure of sampling adequacy was .869. Table 4 shows the results from the varimax-rotated factor matrix. Two variables (participation of local community and site infrastructure) were dropped due to the failure of loading on any factor at the level of .5. The factor analysis yielded four factors with 23 variables. The eigenvalues suggested that all four factors solution explained by 75.41% of the overall variance. In order to test the reliability and internal consistency of each factor used, the Cronbach‟s alpha of each was determined. The results showed that the alpha coefficients ranged from .887 to .926 for the four factors. The four factors underlying the destination cultural and heritage attributes in Selangor homestay programme were as follows;

Homestay Facilities & Hospitality (*Factor 1*) contained 6 attributes and explained 23.23% of the variance in the data with an eigenvalue of 12.95. The Cronbach‟s alpha value of .926, represents high stakes testing. Homestay Entertainment & Relaxation (*Factor 2*) accounted for 19.67% of the variance, with an eigenvalue of 1.928, and Cronbach‟s alpha of .920. Homestay Marketing, Arts & Crafts Activities (*Factor 3*) loaded with 3 attributes. This factor accounted for 16.41% of the variance, with an eigenvalue of 1.404, and Cronbach‟s alpha of .887. These attributes were other site activities/events (arts & crafts), homestay advertising or e-advertising is sufficient and homestay information is readily available.

Homestay Lodging & Quality (*Factor 4*) contained 4 attributes. The factor explained 16.11% of the variance, with an eigenvalue of 1.063, and a Cronbach‟s alpha of .905. These attributes were the climate conditions, offer of local cuisine, destination can be easily reached and personal safety and security were the important indicators of Selangor homestay tourists‟ overall satisfaction. This result provides meaningful new insights for operators to improvise their homestay programme.

Factor Analysis (Motivation to Visit a Homestay)

The exploratory factor analyses were used to underline the dimensions of the motivation to visit a homestay. The factors with eigenvalues greater than or equal to 1.0 and attributes with factor loadings were reported. Table 4 above illustrates the results of the factor analysis for this study. The four factors were: homestay products & cultural varieties, homestay services, facilities & communication, homestay leisure time & physical activities and general tour package.

Table 5: The Result of Factor Analysis on Motivation to Visit a Homestay

Factor	Factor Loading			
	Factor 1	Factor 2	Factor 3	Factor 4
Homestay Products & Cultural Varieties				
Having more village nature & livestock	.821			
Having time by myself	.810			
Having variety of foods	.765			
Having more cultural tour at the village	.677			
Having more fun & enjoyment	.659			
Having more cultural sport activities	.636			
Attending more cultural events	.630			
Explore more native lifestyle				
Homestay Services, Facilities & Communication				
Having more comfortable homestay setting		.862		
Having better communication with the host		.694		
Having more cultural performance & arts		.657		
Better facilities provided in the room		.646		
Having to meet good service-minded people		.628		
Having more interactive activities with the host		.604		
Homestay Leisure Time & Physical Activities				
Having to visit new places at the site			.799	
Having a restful and relaxing trip			.654	
Having more physical activities			.625	
Having to seek the beauty of nature				
Visit friends and relatives				
General Tour Package				
Having a variety of site activities				.813
Having to know different cultures				.715
Having a careful planned trip				.620
Eigenvalue	10.969	2.007	1.424	1.298
% Variance	24.721	19.397	14.685	12.553
Cumulative variance	24.721	44.117	58.802	71.355
Cronbach‟s alpha	0.922	0.890	0 744	0.691

Notes: Extraction method: Principle component analysis
Rotation method: Varimax with Kaiser normalization (Rotation converged in 7 iterations)
KMO(Kaiser-Meyer-Olkin measure of sampling adequacy) = .821
Bartlett‟s test of sphericity: p = .000

The overall significance of the correlation matrix was .000, with a Bartlett test of sphericity value of 4506.941. The Kaiser-Meyer-Olkin overall measure of sampling adequacy was .821. Table 5 shows the results from the varimax-rotated factor matrix. Three variables (explore more native lifestyle, having to seek the beauty of nature and visit friends & relatives) were dropped due to the failure of loading on any factor at the level of .5. The factor analysis yielded four factors with 22 variables. The eigenvalues suggested that all four factors solution explained by 71.36% of the overall variance. In order to test the reliability and internal consistency of each factor used, the Cronbach‟s alpha of each was determined. The results showed that the alpha coefficients ranged from 691 to .922 for the four factors. The four factors underlying the motivation to visit a homestay in Selangor homestay programme were as follows.

Homestay Products & Cultural Varieties (Factor 1) contained 8 attributes and explained 24.72% of the variance in the data with an eigenvalue of 10.97. However, to explore more native lifestyle attribute were dropped due to the low factor loading of .5. Homestay Services, Facilities & Communication (Factor 2) loaded with 6 attributes accounted for 19.40% of the variance, with an eigenvalue of 2.007, and Cronbach‟s alpha of .890. Homestay Leisure Time & Physical Activities (Factor 3) loaded with 5 attributes. This factor accounted for 14.69% of the variance, with an eigenvalue of 1.424, and Cronbach‟s alpha of .744. Two attributes from this factor (having to seek the beauty of nature and visit friends and relatives) were dropped due to less than .5 of factor loading. Homestay General Tour Package (Factor 4) contained 3 attributes. The factor explained 12.56% of the variance, with an eigenvalue of 1.298, and a Cronbach‟s alpha of .691. These attributes were having a variety of site activities, having to know different cultures and having a careful planned trip

Conclusion and Recommendations

There have been numerous and continuous efforts strategized to propel the tourism industry, especially the Malaysian homestay programme. In doing so, it is imperative that tourists‟ expectations are met. Three main strategies to be emphasized are services and hospitality, location attractiveness, and the sense of adventure provided by the operators. Homestay can be branded as a product, or a feasible option that offers an affordable cost for leisure, loaded with interesting activities in rural destinations to encourage especially international tourists. A study conducted by the Bureau of Innovation and Consultancy UTM (2009) and the MOT 2013 report indicated that some of the homestay operators withdrew or became inactive from the programme due to the lack of visitors arrival and low income generated after their establishment. The finding of this study has addressed the relationship between tourists‟ overall satisfaction and motivation to visit with the low visitors‟ occupancy rate or international visitors‟ interest. This programme uniquely promotes the provision of commercial hospitality and it does contribute towards the construction of agritourism product in the country. In overall, Malaysia can develop both agriculture and tourism industry through agritourist that is established based on homestay program by understanding visitors‟ satisfaction that highly contributes towards improving the tourist demand, site value, infrastructure, facilities, local activities and related products in the surrounding area.

References

Baloglu, S., (1997). The relationship between destination images and socio demographic and trip characteristics of international travellers. *Journal of Vacation Marketing,* 3(3), 221-233.

Bhuiyan, M. A. H., Siwar, C., Ismail, S. M., & Islam, R. (2012). Home stay accommodation for tourism development in east coast economic region. Am. *Journal of App. Sci.*, 9(7), 1085-1090.

Bhuiyan, M. A. H., Siwar, C., Ismail, S. M., & Ismail, S. M., (2013). Socio-economic Impacts of Home Stay Accommodations in Malaysia: A Study on Home Stay Operators in Terengganu State. Journal of Asian Social Science. 9(3).

Crompton, J. L., (1979). Motivations for pleasure vacations. *Annals of Tourism Research,* 6(4), 408-424.

Fauziah, C. L. & Mohd, R, H., (2012). Homestay tourism and pro-poor tourism strategy in banguris Selangor, Malaysia, Elixir Geoscience 45, pp. 7602-7610.

Heung, V.C.S. & Cheng, E. (2000). Assessing tourists‟ satisfaction with shopping in the Hong Kong special administrative region of China. *Journal of Travel Research*, 38, 396-404.

Hussin, R., & Kunjuraman, V., (2013). Satisfaction of Domestic Tourists with the homestay Programme in Mesilou Village, Kundasang, Sabah. Paper presented at 3rd *Regional Conference on Tourism Research* 2013(RCTR2013).

Ibrahim, Y., (2008). Tourism Development and Community Changes in Redang Island. Kuala Lumpur: *Dewan Bahasa dan Pustaka*.

Ibrahim, Y., (2004). Homestay program in Malaysia: Development and prospect. *ASEAN Journal of Hospitality & Tourism*, 3(1), 65-75.

Jabil M., Siti Asma‟ M. R., Munir S., Sharmini A. (2011). Pembangunan program homestay di Wilayah Utara Semenanjung Malaysia, Profil, produk dan prospek. Retrieved 5Jun 2012 from GEOGRAFIA *Onlin TM Malaysia Journal of Society and Space*, issue 2.

Kalsom, K. (2009). Community Based Toursim in Developing Countries. Proceeding of *International Seminar on Community Based Tourism*.

Kalsom, K. (2002). Exploring factors influencing individual participation in community-based tourism: The case of Kampung relau homestay program, Malaysia. *Asia Pacific Journal of Tourism Research* 7 (2), 19-27

Kozak, M. & Rimmington, M. (2000). Tourist Satisfaction with Mallorca, Spain, as an Off-Season Holiday Destination. *Journal of Travel Research*, 38(3), 260-269.

Liu, A. (2006). Tourism in rural areas: Kedah, Malaysia. Tourism Management, 27(5), 878-889.

Lynch, P.A. (2000b). Setting and its Significance in the Homestay Sector: Explorations. Ministry of Culture, Art and Tourism Malaysia. (2013). Stastistik Homestay

Nor Ashikin, M. N., & Kayat, K. (2010). The challenges of community based Homestay programme in Malaysia (Dec 2010) *Proceedings of Regional Conference on Tourism Research: The state of the art and its sustainability*, Penang, Malaysia,

Oliver. R. L. (1980). A Cognitive Model of the Antecedents of Satisfaction Decisions, *Journal of Marketing Research*, 17, 46-49.

Proceedings of *CHME 9th Annual Hospitality Research Conference, Huddersfield*, 319-333.

Peleggi , M. (1996). National heritage and global tourism in Thailand. *Annals of Tourism Research*, 23(2), 340-364.

Pizam, A. & Millman, A. (1993). Predicting satisfaction among first-time visitors to a destination by using the expectancy-disconfirmation theory. *International Journals of Hospitality Management*, 12(2), 197-209.

Pizam, A., Neumann, Y. & Reichel, A. (1978). Dimensions of tourist satisfaction with a destination. *Annals of Tourism Research*, 5, 314-322.

Seubsamarn K (2009). Tourist motivation to use homestays in Thailand and their satisfaction based on the destination‟s cultural and heritage based attribute, *Unpublished Thesis*, Thailand

Sriprasert, P., Chanin, O., & Suttara, R. (2011). Exploring the relationship between managerial functions and the success of Homestay Community Based Tourism in Thailand: A case study of Phomlok, Nakhon SiThammarat, Thailand, *2nd International Conference of Business & Economics Research proceeding*

Thompson, M. (1998). Cultural Tourism. *Washington Heritage Bulletin*, 20(4).

Uysal, M. & Williams, J. (2004). The Role of Expressive and Instrumental Factors in Measuring Visitor Satisfaction. *London: CABI*.

Yussoff, S., (2011). The relationship between tourists' motivation and cultural and heritage attribute towards customer satisfaction. *Master's thesis*, Universiti Malaysia Sabah.

CRAFTING KNOWLEDGEABLE RANCHERS TO CONSOLIDATE THE SUSTAINABILITY OF EDIBLE-NEST SWIFTLET RANCHING INDUSTRY

Selvakkumar K.N.Vaiappuri[1], Nitty Hirawaty Kamarulzaman[2]*, Mad Nasir Shamsudin[3], IsmailAbd. Latif[4] and Mohd Noor Hisham b Mohd Haron[5]

[1234]Department of Agribusiness and Information Systems, Faculty of Agriculture, Universiti Putra Malaysia
[5]Department of Veterinary Services Malaysia
*Corresponding author: nitty@upm.edu.my

ABSTRACT

The number of bird houses in Malaysia has shown an increasing trend. Sustainable edible-nest swiftlet ranching practices indeed is required for the development of the industry for a long term and increase the industry success rate. The expansion of edible-nest swiftlet ranching industry has cause many environmental issues particularly concerning the long-term sustainability of edible-nest swiftlet ranching in Malaysia.Thus, the objective of this study was established to investigate sustainable edible-nest switlet ranching activities among ranchers towards sustainable swiftlet ranching.

Keywords: Edible-bird nest, sustainability, rancher, swiftlet

INTRODUCTION

Edible-nest swiftlet ranching industry is a very lucrative investment for those that are successful. Malaysia government expects to produce 870 metric tonnes edible-bird nest (EBN) per year by 2020, while current production is about 20 metric tonnes. There are a dire need to increase the individual bird house production on average 13.8 kg per year. The number of bird houses in Malaysia has shown an increasing trend. Sustainable edible-nest swiftlet ranching practices are indeed required for the development of the industry for a long term and increase the industry‟s success rate. The expansion of edible-nest swiftlet ranching industry has cause environmental issues particularly concerning long-term sustainability edible-nest swiftlet ranching in Malaysia. Malaysia is very fortunate that the country is covered with large tracks of greens, which provide suitable environment for the edible-nest swiftlet ranching activities.

Realizing the advantages that the industry could offer to the country‟s economy, the Malaysian government has encouraged more investors and industry players to get involved in the edible-nest swiftlet industry. In fact, the government has included the edible-nest swiftlet industry in the Economic Transformation Program (ETP) and expected the industry to increase the revenue from US$0.5 billion to US$3.6 billion by 2020. An accelerated expansion of edible-nest swiftlet ranching activities in the last few years has raised several issues concerning long-term sustainability of edible-nest swiftlet ranching in Malaysia. The industry is currently facing several sustainable issues such as environmental disturbances cause by „bird calling sounds‟, maintenance of heritage status, life quality of surrounding community, high rate of failure, hygienic issues, air pollution, jeopardise the heritage tourism industry, wrong harvest method, waste management and nitrite and nitrate contamination edible bird‟s nests (Kamarudin and Aziz, 2011; Koon, 2011). Therefore, the objective of this study was to investigate sustainable edible-nest switlet ranching activities among ranchers towards sustainable swiftlet ranching.

LITERATURE REVIEW

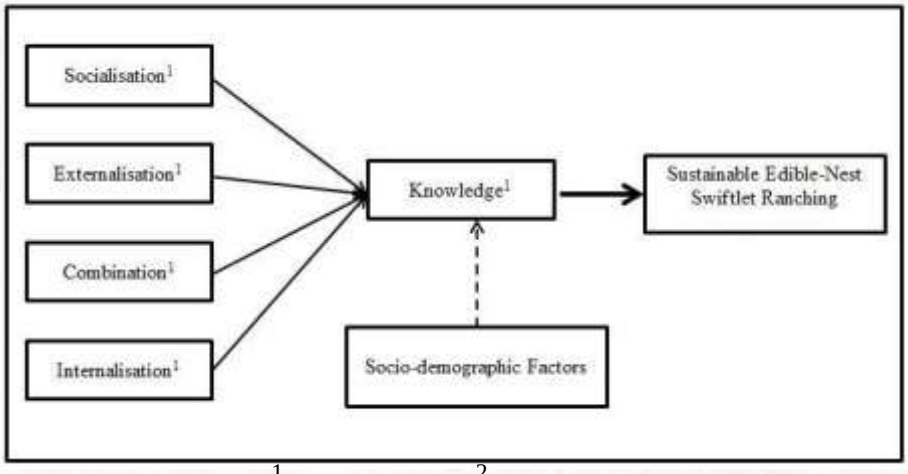
Studies showed that most of the issues have rooted from bird houses whiten the "edible-nest swiftlet ranchers" who play a main role in the ranching. The issues revealed that the industry has problems in practising sustainable practices. To implement the sustainable practices in the edible-nest swiftlet industry, the ranchers must have adequate knowledge on sustainable ranching. It is found that gaining knowledge is a continual and lifelong process(Nonaka, 1994). A knowledge creation in an organisation will undergo same process between explicit knowledge and tacit knowledge (Nonaka, Umemoto, & Senoo, 1996).Two terminologies that take place here are explicit knowledge and tacit knowledge.Usually tacit knowledge explains knowledge that cannot be verbalised, intuitive and unarticulated, while the things that articulated, while the knowledge that can be specified in writing, drawings and computer programming is known as explicit knowledge (Haslinda & Sarinah, 2009).

METHODOLOGY

Conceptual Framework

Sustainability of any industry highly depends on knowledge of its mainplayers (Kurien, 1998). According to Faber (2006), sustainability of knowledge denotes the processes to acquire new knowledge and integrate this knowledge into human behaviour. Sustainability of knowledge is about how individuals learn, how knowledge is transferred, and how it is developed (Jorna, 2006). Since the ranchers is represented as an active processor, who explores, discovers, reflects, and constructs knowledge is not so much to transmit information, but rather to encourage knowledge development and development of cognitive processes for judging, organizing, and acquiring new information (Pope, 2002). The conversion process (SECI Model) will enlarge both tacit and explicit knowledge in terms of quality and quantity matter. The conversion can classify into four categories, namely socialisation, externalisation, combination and internalisation (Figure 1).

Figure 1: Conceptual Framework of Knowledge Creation onSustainable Edible-Nest Swiftlet Ranching



Source: Adapted from [1]Nonaka (1994); [2]Vaiappuri(2012)

*Note: Direct relationship

Direct relationship

Data Collection

A list of ranchers‟ name and contact details were obtained from the Department of Veterinary Services (DVS) 2013 Directory. A total of 107 ranchers was randomly selected and involved in this study. Structured questionnaires through face-to-face interviews were carried out to collect data from the respondents. The research instrument being a structured questionnaire was developed based on reviews of the empirical literatures and information obtained from experts and industry players.The reliability of the questionnaire was measured using Cronbach‟s alpha score.

The Cronbach‟s alpha score for the pre-test questionnaire was 0.947. The collected data was analysed using descriptive statistics, knowledge level analysis and exploratory factor analysis (EFA) to identify the factors affecting knowledge. The knowledge level analysis was calculated based on a calculated score for questions related to edible-nest swiftlet ranching knowledge. There were 20 items, which measured by using 7-point Likert Scale statements (1 = strongly disagree to 7 = strongly agree).

RESULTS AND DISCUSSION

Descriptive statistics was performed to find out the information about the distribution of ranchers‟ socio-demographic. The result showed that 72% of the ranchers involved mainly in ranching, while others involved in processing and trading. Majority of the respondents was male (62.6%) and Chinese (55.1%).About 66.4% of the respondentswere married and only 32.3% obtained a secondary level of education. It is found that 65.6% of the respondents had adequate knowledge level.An EFA allows the computer to identify linear factors which explain the theoretical maximum amount of common variance in a correlation matrix (Bryant & Yarnold, 2004), which will determine the underlying factor model that best fits the data.

Table 1: KMO and Bartlett's Test Result

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		**0.890**
Bartlett‟s Test of Sphericity	Approx. Chi-Square	1061.31
	Df	190
	Sig.	0.000

Table 1 shows that the KMO test for knowledge creation indicates that the sampling adequacy at
0.890, which is acceptable for conducting the factor analysis. The Bartlett‟s test of sphericity indicates that the overall correlations matrix significant ($p < 0.000$) with Approx. Chi-Square value 1061.31. Four factors were identified namely; socialization, externalization, combination and internalization, with Eigen values over Kaiser Criterion of 1 and in combination explained
66.72% of the variance. The Cronbach‟s alpha of the measure each factor was more than 0.6 which is in the range of acceptable (Nunnally, 1978).

CONCLUSIONS

Most of the ranchers had adequate knowledge on sustainable ranching, but there is a space to improve for those in range of inadequate knowledge level. Four factors were identified that will influence knowledge creation. In the future, advance research such as Confirmatory Factor Analysis (CFA) can be used to confirm all the component to check the its effectiveness on knowledge of sustainable edible-nest swiftlet ranching industry.

Acknowledgements

The authors wish to extend their gratitude for the fund provided bythe Ministry of Education (MOE) under the Exploratory Research Grant Scheme (ERGS). Invaluable assistance and support from the Department of Veterinary Services (DVS) is also gratefully appreciated.

REFERENCES

Bryant, F. B. & Yarnold, P. R. (2004).Principal-components analysis and exploratory and confirmatory factor analysis. In L.G. Grimm & P.R. Yarnold (Eds.) *Reading and Understanding Multivariate Statistics (*pp. 99-136). DC: American Psychological Association.

Faber, N. R. (2006). *Knowledge in Sustainable Behavior: Using Knowledge – Based Decision Support Systems for the Improvement of Sustainability.* Ridderkerk: University of Groningen.

Haslinda, A., & Sarinah, A. (2009). A Review of Knowledge Management Models. *Journal of International Social Research, 2*(9).

Jorna, R. (2006). *Sustainable Innovation. The organizational, human and knowledge dimension.*
Sheffield: Greenleaf Publishing Ltd.

Kamarudin, M. I. and Aziz, A. J. (2011). Managing *God-given wealth: the need for inclusivity for sustainable EBN industry*. Department of Veterinary Services Malaysia, Ministry of Agriculture and Agro-based Industry.

Koon, L. C. (2011). *Opportunity and Sustainability of Swiftlet Farming in Malaysia*. International Conference and Training on Swiftlet Ranching. Kuala Terengganu: Universiti Sultan ZainalAbidin (UniSZA).

Kurien, J. (1998). Traditional ecological knowledge and ecosystem sustainability: new meaning to Asian coastal proverbs. *Ecological Applications*,*8*(sp1), S2-S5.

Nonaka, I. (1994). A Dynamic Theory of Organisational Knowledge Creation. *Organisation Science*, 5, p. 14–37.

Nonaka, I., Umemoto, K., & Senoo, D. (1996). From information processing to knowledge creation: a paradigm shift in business management. *Technology in society*, *18*(2), 203-218.

Nunally, J. C., & Bernstein, I. H. (1978). Psychometric theory.

Pope, S. (2002). *"The ethics of Aquinas".* Georgetown University Press, Washington, D.C

Vaiappuri, S.K.N., Nitty, H. K., Ismail, A. L. and Kamaruddin, M. I. (2012). Ranchers" knowledge towards sustainable swiftlet ranching. *Malaysian Journal of Animal Sciences*, 15:27-35.

THE SUSTAINABILITY OF THE ROBUSTA COFFEE FARMING AGRIBUSINESS AT THE SOUTHERN AREA OF LUMAJANG REGENCY EAST JAVA PROVINCE

Soetriono
A Lecturer at Agribusiness Department Faculty of Agriculture
University of Jember

INTRODUCTION

East Java is one of the centers of the coffee commodity (*Coffea spp. L.*), which is referred to as the high-rated plantation commodity since the cultivation process involves a big number of manpower while at the same time it provides the source of income to the people at the surrounding rural areas. Either viewed from backward or forward point of view, this business plays an enormous economical role. When viewed backward, this business is the employment field to many farmers, peasants, and other users of agricultural inputs. On the other hand, when viewed forward, it provides opportunity for business and employment on the trading sectors, as well as transportation and beverage sectors. Coffee is an the commodity of upstream industry which is only available to consume after being processed. The coffee growers even need to process the fresh coffee fruit into the dry beans before selling the crop. To most of the farmers, coffee also gains high economical value since decades ago as the source of living. Even with minimum maintenance and cultivation effort, it has successfully supported many families with decent life. Thus, when it is managed efficiently, the value may boost (Soetriono at. al., 2013).

The expansion of the main farming commodity area in East Java during the period of 2008-2012 has shown an average of 1,78%. Nearly all of the main commodities in East Java experience areal expansion, including coffee. However, the anomaly of the climate is responsible for the lateness of the coffee flowering which causes the decrease of production. Data shows that during the period of 2008-2010, the yield increased to 56.202 tons as compared to 2011 which reached only 37.397 tons, or 18.805 tons decrease of production. In 2012, the production bounced back to 54.239 tons (Office of Farming and Plantation East Java, 2012). The result of the study conducted by Soetriono and Soejono, 2013, reveals that another factor to cause the decrease is the competition to other commodity such as sugar cane. In East Java, coffee is mostly grown by the farmers at the southern area. It ranks high in the list of the strategic commodities since it is capable of fulfilling the domestic demand as well as the commodity for meeting the export demand which generates income. Soetriono, 2013, stated that the Robusta coffee is highly competitive. He also stated that the Robusta coffee which is grown in the southern area of the Eastern region of East Java is ready for international trade, although the rank begins to lose when competing with the Vietnamese one. By those facts presented above, this study attempts to discuss the available efforts to preserve the culture and cultivation of the commodity (sustainability) in order to provide impacts towards the revenue and environmental aspects. Therefore, the specific goals to achieve are: specification of the farming business, profit value, sustainability level, as well as the modeling on the farming business development.

METHODOLOGY of THE RESEARCH

The determination of the research area was conducted purposively (Nazir, 1999). The area chosen is located at the southern area of Lumajang Regency East Java Province. The selection is based on the consideration that Lumajang is a farming center which is adjacent to the exporting market. This research employs the purposive sampling method to gather the data regarding the farming business. Nazir, 1999, stated that purposive sampling method is the method in which the sample is conducted purposively. This is due to the fact that the sample of the research is not in accordance with the commonly-used regulation in the Rapfish, where "rule of thumb" expresses that sample is ready for three repetitive actions for the ordinate attributes (Stalans, 1995 in Pitcher, 1999).

The first data analysis by using the profit analysis (Soekartawi, 1999) is conducted through the following formulation

$Y = TR - TC$

$TR = P.Q$

$TC = TFC + TVC$

where,

Y = Income gained by farmers (Rp)
P = Unit price of the output (Rp)
Q = Quantity of the output (kg)
TR = Total Revenue (Rp)
TC = Total Cost (Rp)
TFC = Total Fixed Cost (Rp)
TVC = Total Variable Cost (Rp)

The second analysis is the analysis on the sustainability of the Robusta coffee farming business (Pitcher, 1999) which is performed using the farming business approach. The problem-solving method is conducted using the observation, survey, and analysis techniques on social, economical, technical, and environmental aspects (ecology). Later, analysis on the sustainability method by using the Multi Dimensional Scaling (MDS) (Thamrin., et al, 2008) by using the Rapfish rapid Appraisal Technique is termed as RAP-Coffee.

To find out the strategy of the sustainability of the agribusiness, *Force Field Analysis* (FFA) is employed based on the pushing and hindering factors (Sianipar and Entang, 2003).

Table 1. Level of Urgency among factors

Num.	Factors	Comparation Level of Urgency of Factor				Urgency Value (UV)
		D1	D2	D3	D4	
1.	D1	X				
2.	D2		x			
3.	D3			x		
4.	D4				x	
Total Urgency Value (TVU)……=						

The determination of the values for the supporting aspect and the interrelated factors is done using the likert scale. By considering the pushing and hindering

factors which are identified directly from expert, a quantitative assessment is available in the scales of 1-5 as follows:

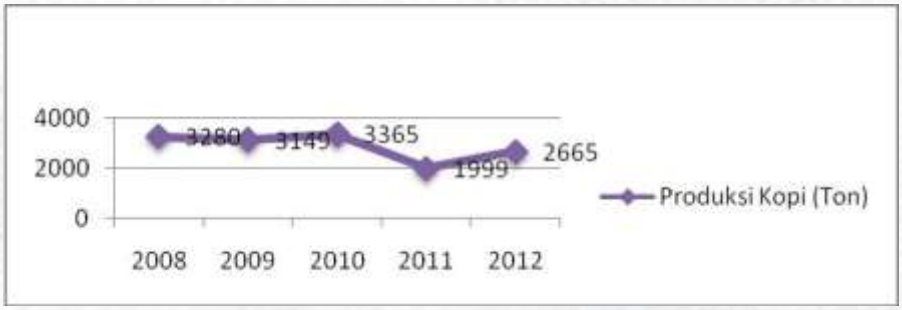
5 = very high (value of support/value of interrelation)
4 = high (value of support/value of interrelation)
3 = moderate (value of support/value of interrelation)
2 = poor (value of support/value of interrelation)
1 = very poor (value of support/value of interrelation)

RESULTS and DISCUSSION

1. The existence of Robusta coffee at the area under research

Robusta coffee is one of the high-rated commodities in East Java, particularly in the Southern Region. This is due to the proper geographical conditions, climate, temperature, and precipitation that support the coffee planting. The farming business of the Robusta coffee is conducted from downstream area to the upstream one. The upstream sector refers to the soil preparation, cultivation/breeding process, up to the harvesting process. Meanwhile, the downstream sector refers to post-harvesting treatment, marketing, as well as the respective process to provide added value to the coffee, into the half-ready product or even ready-to-consume product. Data of the research reveals that production diminished in 2011 and bounced back in 2012. The decrease in 2011 is due to the climate factor in macro assumption.

Below is the coffee yield in Lumajang Regency during 2008-2012



Picture 1. the coffee yield in Lumajang Regency

Picture 1 shows the coffee yield in Lumajang Regency during the period of 2008-2012. The yield experienced fluctuation. In 2008, Lumajang Regency generated 3.280 tons, and decreased 131 tons in 2009 to only 3149 tons in 2009. In 2010, the yield increased to 3.365 tons, meaning that there was 216 tons increase compared to 2009's production. In 2011, the decrease was quite significant. A record of 1.336 decrease resulted in only 1.999 tons coffee yielded. in 2012, the number bounced back to 2.665 tons, meaning that there was 666 tons increase.

The change on the climate during 2010 to 2011 was so drastic that it affected the cultivation of coffee. The change made the flowers fell off the trunk that the production decreased. the climate change has caused the increase on temperature as well as seasonal pattern. the increased temperature has caused the area of the coffee plantation to shift to higher areas. The unpredicted rainy season

has hindered the growing of the coffee. The climate change, too, has aroused the plant pest and diseases.

2. The revenue of the Robusta coffee farming business

The attempts of improving the people's welfare in an area may be done by accelerating the rate of the economy growth as well as strengthening the structures of the economy of the respective area. Regarding the South Crossing Line in East Java to lower the gap of the economy growth between the northern and southern area, one of the available alternatives which is correlated to character, culture, and the condition of the soil, coffee growing seems to be interesting. the results of the revenue analysis is presented in table 1.

Table 1. The agribusiness profit of the Robusta coffee in Lumajang in 2014

Num.	Analysis Technique	Calculation Result	
1.	Conversion of the area (Ha)	1 Ha	
2.	Average production (Kg)	2.276	
3.	Average selling price (Rp)	Rp. 23.000,00	
4.	Revenue (Rp)		Rp. 52.369.230,77
5.	Fixed Cost (Rp)	Rp. 1.917.230,77	
6.	Variable Cost (Rp)	Rp. 21.601.538,46	
7.	Total Cost (Rp)		Rp. 23.518.769,23
8.	Revenue (Rp)		Rp. 28.850.461,54
9.	R/C Ratio	2,77	

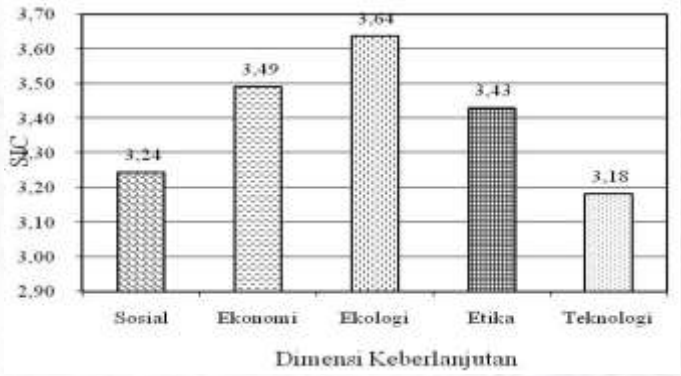
Source: Primary data, managed in 2014

Table 1 shows the revenue gained from the Robusta coffee farming business at the area under research Rp. 52.369.230,77 with the total expenditures of Rp. 23.518.769,23 and revenue Rp. 28.850.461,54. The results of the analysis reveals that the Robusta coffee farming business is financially profitable. In addition, the efficiency on the cost is 2,77 (based on the R/C ratio) meaning that the Robusta coffee farming agribusiness is efficient and profitable. The R/C value of 2,77 translates as a Rp. 1,77,00 profit of every Rp.1,00 used as the cost. This finding is in line with Soetriono's study in 2013.

3. The sustainability of the Robusta coffee farming agribusiness at the area under research

The sustainability of the robusta farming agribusiness in Lumajang is examined using the *RAP-Coffee* data analysis by using the *Multi Criteria Analysis* (MCA). The MCA analysis approach is used as the evaluation structure on the indicator of the sustainability of the Robusta coffee farming agribusiness by using the participatory methodology by involving the stakeholders who play important roles in the development of the business. This method is divided into two stages, namely (a) ranking determination of each importance rate and relative weights, (b) scoring of each attribute being assessed by the importance rate of each attribute (indicator) respondent (expert) by using the Saaty scale (1-9).

Based on the dimension analysis, the dimension of ecology ranks the highest in the SIC with the score of 3,64. Economy dimension ranks second (SIC score 3,28). Ethic dimension ranks third with the SIC score of 3,43 followed by the Technology Dimension with the SIC score of 3,11. The *RAP-Coffee* analysis by using MCA reveals that the importance of the sustainability of the Robusta coffee farming agribusiness is determined by the ecological dimension. Meanwhile, the sustainability of the Robusta coffee farming agribusiness depends on the economy factor. This is due to the fact that if the economy dimension is not paid attention or is non-profitable, there will not be any sustainable Robusta coffee farming agribusiness, which many people are aware of. The visualization of the SIC score of each sustainability dimension is seen on picture 2.

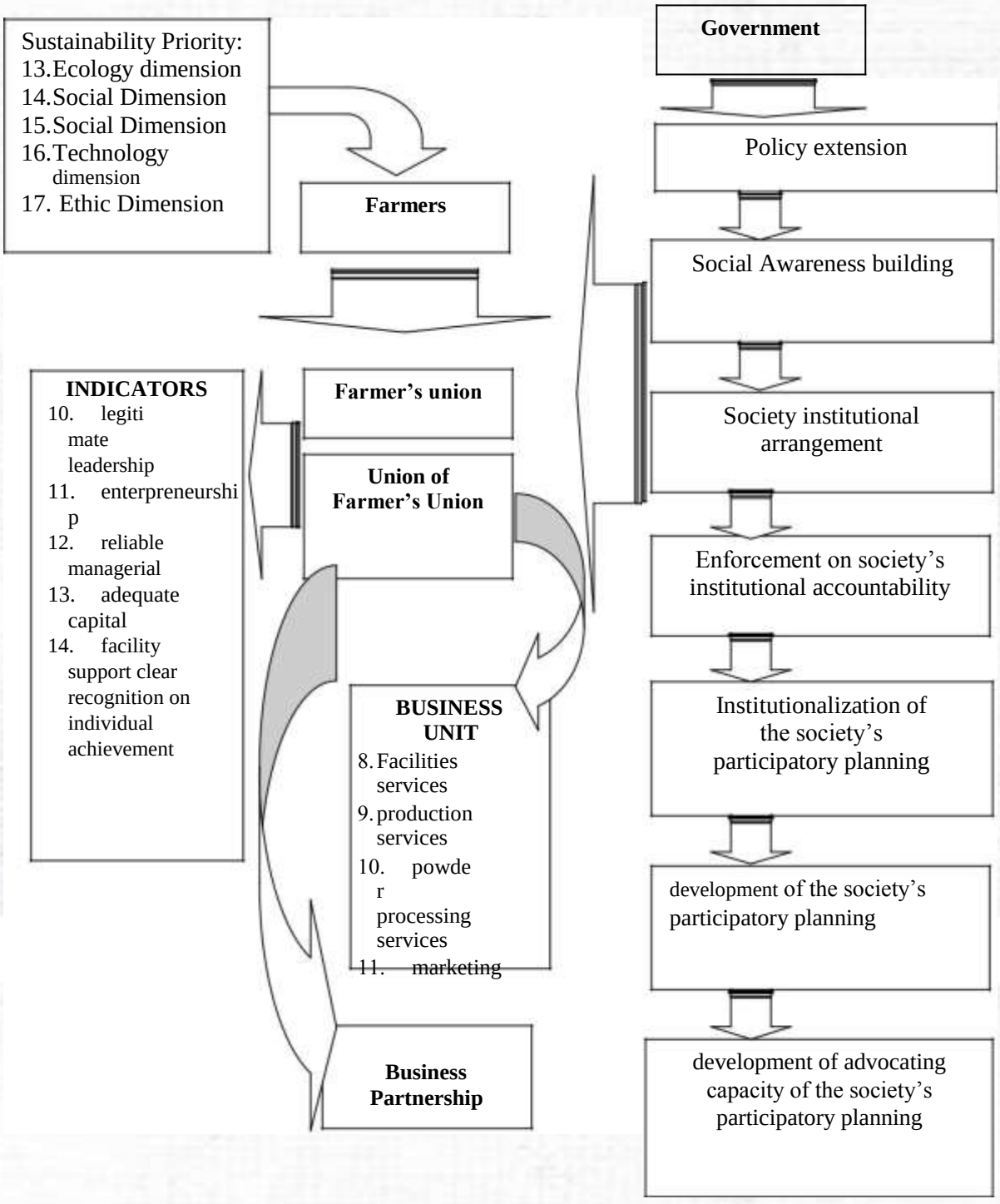


Picture 2. Sustainability Indicator Criteria (SIC) of the Robusta coffee farming agribusiness.

Relatively, the technology dimension ranks the lowest in the average score of SIC. Hence, the Robusta coffee farming agribusiness needs to focus on the improvement on the technology dimension combined with the technology aspect. The policies of the Robusta coffee farming agribusiness is expected to improve the design of the development pattern of the business by employing the sustainable cultivation and post-harvesting efforts since this dimension is one of the requirements in improving the economical value as well as the ecological value of the Robusta coffee. This would mean that the dimensions of economy and ecology are most-seriously-addressed for achieving the "sustainable state".

4. Modeling and development strategis in improving the sustainability of the Robusta coffee farming agribusiness

The focus of the strategy in the FFA analysis states that the key pushing factor in improving the sustainability of the Robusta coffee farming agribusiness is the development of the farmers' institutional networking system through the enforcement on the functional and institutional relationship with governmental institution as well as input-output services institutions as seen in picture 3.



Picture 3. Modeling of the sustainability of the Robusta coffee farming agribusiness at the area under research

Picture 3 explains that: the farmer's institutionalization (farmer's union) serves several functions, namely (1) the learning media for the members to gain knowledge, skill, and attitude as well as the media where independence grow.

Thus, production will increase, revenue will increase, and their life should be more prosperous; (2) the media for cooperation where farmer as individuals, or among farmers, or among farmers' union may cooperate in a better atmosphere in order to generate a more efficient farming business while at the same time become more resistant to threat, hindrance, or other disturbances; (3) the production unit, meaning that the farming business should be seen as the unity to be developed to achieve the desirable scale of economy, either in quality or quality, as well as continuity.

The observation at the research area generates the following finding: the institution of the farmer's union has several characteristics, among others are (1) knowing each other well; (2) tend to have uniform goals and interests in running the farming business; (3) have the similar tradition or residential background as well as social, language, education, and ecological aspects and; (4) there are clear job divisions as well as responsibilities among the members based on the mutual agreement.

The institutionalization is facilitated and empowered by government or local authorities in order that the union may grow and develop into strong and independent organization. Therefore, in the attempts of developing the sustainability of the Robusta coffee farming agribusiness, the government roles are: (1) extending every policy line; (2) growing institution's awareness towards the policy; (3) providing feedback and input actively; (4) reinforcing the institution's accountability; (5) developing the institution system by considering the local wisdom; (6) developing the network of the institution; (7) developing human resources.

The government's role in the institution of the Union of the farmer's union are: (1) holding legitimate leadership; (2) stimulating and generating entrepreneurship; (3) possessing reliable managerial ability; (4) possessing adequate capital; (5) being supported by adequate facilities and (6) clear recognition regarding individual achievement. Those abilities serve as the motor in running the organization.

Regarding the agricultural facilities, there is a need of the fertilizer institutionalization starting from allocation up to distribution as well as the supply and distribution of the pesticides. Regarding the coffee production, there is the need of manpower institutionalization, irrigation, as well as land tenure in terms of the relationship between land owner and peasant. Regarding the powder processing, there is a need of institutionalization on powder processing, starting from the post-harvesting processing up to the packaging. Regarding the marketing services, there is a need of the supply on the market information. The institutionalization on the farming management is a process of delivering a certain product to the consumer, where efficiency is an important indicator. Regarding the capital services, there is a need of credit institution.

However, to improve the performance of the business, networking creation is an important aspect. Building a network is a process of building communication, sharing ideas, information and resources on the basis of mutual understanding and trust. This form of mutual understanding may be formed into an MoU that helps reaches mutual success.

CONCLUSION AND RECOMENDATION

Conclusion

8. The existence of the Robusta coffee farming business at the area under research is highly potential to be developed since it has yield potential of 2.665 tons in 2012 with the profit rate of 28.850.461,54/Ha

9. in order to find out the sustainability level of the Robusta coffee farming business with the average value of interest rate and the sustainability indicator criteria (SIC), it is found that the ecological dimension is the main priority of the interest, followed by economical, ethical, social, and technological dimension in consecutive order.
10. the strategy for developing the sustainability of the Robusta coffee farming business at the area under research is performed through the development of the farmer's institutional network of the coffee growers performed by enforcing the functional and institutional relations with the government institutions as well as input/output services institutions.

2. Recomendation

6. the strategic option to promote the sustainability of the Robusta coffee farming agribusiness is performed through developing business partnership. The partnership will be effective when performed in participatory way by involving the entire business owners during the process of planning, actuating, monitoring, as well as evaluating stages.
7. government attempts to promote the value reinforcement which becomes the foundation of the harmonic relationship between human and nature. This means that the aspect of the sustainable environmental function should also be the main consideration in designing the business.
8. government needs to pay serious attention on the approach attempts on the use of social capital like local knowledge, local institution as the entering stage to every business development phases of the robusta coffee farming agribusiness.

Bibliography

Badan Pusat Statistik. 2013. *Kabupaten Lumajang Dalam Angka 2013.* Lumajang: Badan Pusat Statistik

Dinas Perkebunan Provinsi Jawa Timur. 2012

Nazir, M. 1999. *Metodologi Penelitian*. Jakarta: Ghalia Indonesia.

Pitcher, J. Tony. 1999. Rapfish, *A Rapid Appraisal Technique For Fisheries, And Its Application To The Code Of Conduct For Responsible Fisheries*. Rome: FAO Fisheries Circular.

Sianipar J.P.G dan Entang. H.M 2003. T*eknik-Teknik Analisis Manajemen*. Jakarta: Lembaga Administrasi Negara.

Soekartawi. 1999. *Analisis Usaha Tani*. Jakarta : UI-Press.

Soetriono, dkk, 2007, Daya *Saing Agribisnis Kopi Robusta "Sebuah Perpektif Ekonomi*, Surya Pena Gemilang, Malang

Soetriono, dkk. 2013, *Pemodelan dan Pengembangan Agribisnis Minuman Berbasis Kopi Robusta dalam Mendorong Perekonomian Kawasan Jalur Lintas Selatan (JLS) Jawa Timur,* Lembaga Penelitian Universitas Jember, Jember

Soetriono dan Soejono, 2013, *Akselerasi Inovasi Teknologi Pasca Panen Berbasis Komoditas Kopi Dan Kakao*. Lembaga Penelitian Universitas Jember

Soetriono, dkk, 2014, *Kajian dan Strategi Keberlanjutan Agribisnis Kopi Robusta Di Kawasan Selatan Jawa Timur*. Lembaga Penelitian Universitas Jember, Jember

Thamrin,. *et al.* 2007. *Analisis Keberlanjutan Wilayah Perbatasan Kalimanatan Barat- Malaysia untuk Pengembangan Kawasan Agropolitan*. Jurnal Agro ekonomi Vol.25 No.2, Oktober 2007.

INTENTION TOWARDS IMPLEMENTING URBAN AGRICULTURE AMONG CITY DWELLERS

I. NurDalinna, S. Juwaidah, M. Zainalabidin, R. Golnaz

Department of Agribusiness and Information Systems, Faculty of Agriculture, Universiti Putra Malaysia, Serdang, Selangor, Malaysia.
e-mail: dalinna77@gmail.com

INTRODUCTION

Urbanization has become a source of pressure and has resulted in high competition, environmental degradation caused by pollution, deficiency in the agriculture area and ever increasing demandfor food. In Malaysia, the national rate of urbanization is estimated to increase at 2.4% annually where 72% of our population concentrated in twenty cities (DOS, 2013). Food basically being produce in rural area is not enough to support the total population especially those in city where has no direct source of food supply. To ensure the sufficient food supply to country, Malaysia has confronted an annual percentage growth in the cost of food and beverages from RM 12.69 million to RM 23.37 million between 2003 and 2007 (Asgari& Yuan, 2007). Due to high import demand and low self-sufficiency level in many food items, urban agriculture has drawn as a tool for sustainable development that has potential to provide food on the edges of urban areas. The enthusiasm towards urban agriculture in the country has brought with it the reason to identify city dweller attitude towards practising urban agriculture. The factorsthat could influence city dweller's perception and intention to adopt urban agriculture would beimportantinformation for the government and related organization before embarking on campaigning and implementation of the program.

JUSTIFICATION

The Green Earth Campaign was launched in 2006 with the objective to encourage people to farm or engaging in farming activities to produce their own food for daily consumption. By 2010, the interest towards this program decreased as the purchasing power of the population increased due to strong economic growth (MOA, 2013). However, the increasing number of population, volatile economic condition and high cost of living in urban area expected to put pressure on food security. Therefore Malaysia government has planned to promote urban agriculture among urban community to involve in agriculture in turn will reduce dependence on imported food and facilitate food supply. The attitude of city dwellers towards urban agriculture is an important impetus to implement the urban agriculture policy. Furthermore, the degree of Malaysians are mindful of the benefits of urban agriculture are still doubtful. This project was developed to understand and identify factors which affecting city dweller's attitude to practising urban agriculture in lieu of food security issues.

LITERATURE REVIEW

Many studies have been done previously to identify factor influence consumer intention in many fields. The study from Caroline (2009) show that attitude, subjective norm, perceived ability, age and education influence the intention to adopt organic agriculture. Other than that, the attitudes, social pressure and perceived behavior control over pesticide are able to

explain the factors influence farmer in Jharkhand, India to apply pesticide management in their vegetable systems (Bond et al., 2009). The study conducted by Robinson and Smith (2002) show that factors such as demographic, belief, attitude, subjective norm and perceived behavior control associated with consumer intention to purchase sustainably produced foods. Next, a study was conducted by Jianying et al. (2010) reveals that education level, income, the governmental policy, cognitive component and affective component of attitude and convenience are the significant factors that influence farmer's purchase intention of agricultural machinery. Among other, in order to understand factors influencing organic vegetable consumption in Belgium, Pieniak et al. (2010) find that there are three classical dimensions of attitude formation influencing consumer behavior. They are cognitive (knowledge about organic vegetables), affective (general attitudes towards organic vegetables) and conative dimension (consumption on organic vegetable).

METHODOLOGY

This study focuses on city dweller who live in Klang Valley area because they have similar characteristics such as social life, lifestyle and housing pattern. The sample size taken is 1500 which present a crude yardstick to achieve the aim of this study. Sampling was conducted at the supermarket such as Cold Storage, AEON (Jusco), Jaya Grocer, AEON Big and Tesco in Klang Valley area. Systematic sampling method was use to select the respondent where every fifth customer who entered the supermarket was chosen to be the respondent. The supermarket was selected from the list of supermarket in Klang Valley. Face to face interviews with respondents was conducted in the survey. A constructed questionnaire consisting of closed ended with multiple choice questions was selected for the study and comprised two sections. The first section was designed to capture the sosio-demographic profile. In the second section, 52 declarative statements related to acceptance on urban agriculture are given to measuring the attitudes of respondent. The respondents were asked to indicate their opinion for each statement.

RESULTS AND DISCUSSION

a) Factor Analysis

Factor analysis is widely used in the determination factors that could influence city dweller's intention to practice urban agriculture. In this study, the value of KMO Measure of Sampling Analysis was fallen in great category (KMO=0.951) while Bartlett's test of sphericity significant result is p=0.000. The communality value of this study showed that communalities range is from 0.521 to 0.887. The factor loading from dominant component factor analysis obtain after a varimax rotation of city dwellers responses to the 57 question relating to their view on intention to adopt urban agriculture. The dominant component analysis in the data extraction performed six factors influencing city dweller's intention to adopt urban agriculture with eigenvalue between 1.456 to 16.367 while total variance explained was 67.01 percent (Table 1). The six factors, namely Perceived Value, Facilitating Condition, Perceived Behavior Control, Social Influence, Perceived Risk and Attitude.

As shown in Table 2, the result indicates R-squared value = 0.782, it shows that 78.2% of the variation of the Intention can be accounted by variation of independent variables. On the other hand, the F-statistics = 709.157 and p-value = 0.000 indicate the model is good fit for the data. Based on the model, at 5% level of significance, all of these variables (attitude, subjective norm, perceived behavioral control)are having positive impact on city dweller's intention towards implementing urban agriculture.

Table 1: Factors that influence city dweller's intention to adopt urban agriculture

Factor	Eigenvalue	% of variance	Total of % variance
1. Perceived Value	16.367	12.697	12.697
2. Facilitating Condition	4.237	12.554	25.251
3. Perceived Behavior Control	2.660	11.337	36.588
4. Social Influence	2.175	10.693	47.281
5. Perceived Risk	1.950	10.237	57.519
6. Attitude	1.456	9.542	67.061

(Source: Survey, 2014)

b) Multiple Regression

Multiple regression is a technique that used to explore the relationship between one dependent variable and a number of independent variables (Pallant, 2005). In this study, the dependent variable is city dweller's intention while independent variables are the factors influencing their intention.

Table 2: Regression Analysis Results

Model	Unstandardized Coefficients		t	Sig.
	B	Std. Error		
(Constant)	.309	.685	.452	.652
Attitude	.121	.021	5.646	.000
Subjective Norm	.211	.022	9.471	.000
Perceived Behavioral Control	.429	.017	25.688	.000

Dependent Variable: Intention

**Significant at 0.05 level

R-square = 0.782

F-statistic = 709.157, p-value = 0.0000

(Source: Survey, 2014)

CONCLUSION

As conclusion all factors tested are significant with city dweller's intention to adopt urban agriculture. All factors should be considered before any program conducted in order to gain full support from city dweller to practising urban agriculture in the future.

REFERENCES

Asgari, B., & Yuan, W. C. (2007).Depicting the technology and economic development of modern Malaysia.*Asian Journal of Technology Innovation*, *15*, 167–193.

Bond, J. L., Krisemer, S. K., Emborg, J. E., and Chadha, M. L. (2009).Understanding farmer's pesticide use in Jharkhand, India.*Extension Farming Systems Journal*, Volume 5.

Caroline, H. *Adopting Organic Agriculture: An Investigation Using the Theory of Planned Behavior*. Paper presented at the International Association of Agricultural Economics Conference, Gold Coast, Australia. August, 2006.

Jianying, F., Zetian, F., Xiaoping, Z., and Weisong, M. (2010).Farmer's purchase intention of agricultural machinery, an application of the theory of planned behavior in China.*Journal of Food, Agriculture and Environment*, Volume 8 (3&4), 751-753

Pieniak, Z., Aertsens, J., and Verbeke, W. (2010).Subjective and objective knowledge as determinants of organic vegetables consumption. Journal of Food Quality and Preference, 21(6), 581-588.

Robinson, R., and Smith, C. (2002). Psychosocial and demographic variables associated with consumer intention to purchase sustainably produced foods as defined by the Midwest Food Alliance. *Journal of Nutrition Education and Behavior*, 34(6), 316-25.

FEASIBILITY ANALYSIS OF SMALLHOLDERS COFFEE PLANTATION IN JEMBER

Joni M. M. Aji[1], Julian A. Ridjal[1], Apriyanto D. Laksono[2], Ebban B. Kuntadi[1], and Siswoyo H. Santosa[3]

[15] Lecturer at Agribusiness Study Program, Dept. Of Social Economics, Faculty of Agriculture, Jember University
[16] Alumnus of Agribusiness Study Program, Dept. Of Social Economics, Faculty of Agriculture, Jember University
[17] Lecturer at Development Economics Study Program, Faculty of Economics, Jember University

Extended Abstract

Introduction

Coffee is one of leading commodities in the Indonesian plantation sub-sector. The role of the coffee commodity for the Indonesian economy is quite important, both as a source of income for coffee farmers, a source of income, a producer of industrial raw materials, as well as a provider of employment through processing, marketing, and trade (export and import). Coffee plantation products have great market opportunities, both domestically and abroad. In 1990s, the share of Indonesia's coffee exports in the international coffee market occupied the third highest after Brazil and Colombia. Most of Indonesia's coffee exports are the type of robusta coffee by 94% of the total and the rest is arabica coffee. However, since 2000s the position of Indonesia has been displaced by Vietnam (Chandra, 2013).

According Yahmadi (2007), the types of commercial coffee which is now cultivated in Indonesia, robusta and arabica coffee two commodities are not native to Indonesia. Coffee Liberika which is noted as a native Indonesian coffee is no longer cultivated. The most common coffee cultivated by the Indonesian growers is robusta coffee. Robusta is commonly chosen by growers because it is more adaptable to various types of land, especially in lowland. Robusta coffee is also more resistant to pests, and domestic demand for robusta coffee is relative large as it is more preferable for Indonesian consumers.

Smallholder coffee plantations dominate coffee production in Indonesia. In 2010 smallholdings has an area of 1.162 million ha with a production of 657,909 tonnes, while the state plantations have a plantation area of 22 681 ha with a total production of 14,065 tonnes, while private plantations have an area of 24 873 ha with a total production of 14,947 tonnes. This data shows that smallholder coffee plantations have a significant roles and contribution to Indonesian coffee production.

Geographically, Indonesia's coffee production is spread evenly throughout the part of the archipelago. This indicates that Indonesia has the potential for coffee plantations. One of the provinces that have high production is East Java. In 2009 East Java coffee production reached 54,012 tonnes and in 2010 reached 56,200 tonnes. However, in 2011 the production of coffee in East Java decreased to 37,396 tonnes, but in 2012 in East Java coffee production rebounded to 38,479 tonnes.

Jember is a district that has the second highest coffee production in East Java, after Malang. In 2012, coffee production in Jember reached 2,218 tonnes or accounts for 5.7 percent of total East Java coffee production. Jember coffee production spreads over 20 sub-districts. Silo is the sub-district with the highest coffee production with a total production in 2012 at 1,166 tonnes which accounts for more than half of the total production of Jember district. Another district that contributes to the production of coffee in Jember district is Panti with coffee production of 154.68 tonnes.

This research seeks to analyze the feasibility of smallholders' coffee plantation in Jember District based on the data collected from Silo and Panti Sub Districts. Feasibility was measured technically and financially. Technical feasibility was measured based on some technical aspects including location suitability, production area (scale), technology utilization, production layout and on-farm activities, while financial feasibility was measured based on the costs incurred and income earned using project feasibility evaluation indicators such as Net Present Value (NPV), Internal Rate of Return (IRR), Benefit/Cost Analysis (Net B/C and Gross B/C) and Payback Periods (PP).

Methodology

Determination of the study area was conducted intentionally using purposive method. The District of Jember was chosen as the research area because Jember is a potential coffee production area in East Java where all types of plantations, all types of plantations, i.e. state owned, local government owned and private estates, as well as, smallholders' plantations are available in this district. So, it is no wonder that the Indonesian Coffee and Cocoa Research Institute (ICCRI) is located in Jember. The primary data in this research was collected the Silo Sub-District and Panti Sub-District known as two basis area of cofee production in Jember. So the total number of respondent interwviewed in this study was 45 farmers. These respondents include 32 farmers from '"Sidomulyo I" Farmer Group in Sidomulyo Village,

Silo Sub District and 13 farmers from "LMDH Taman Putri" Farmer Group in Kemiri Village, Panti Sub-District, Jember.

As previously noted, the first problem related to the feasibility of the technical aspects was analysed using descriptively. Descriptive analysis is an analysis by describing in detail the activities of the people of coffee farmers on farm fields, location, area of production (scale), technology and layout. On-farm activities undertaken by coffee

farmers from preparation to harvesting activities were described and analysed and reviewed based on theory derived literature or references on coffee plantation theory and practices. This analysis was also supported and verified by a focus group discussion (FGD) with coffee plantation stakeholders including farmers, experts from research institutions, government institutions, extension workers, farmer associations, coffee exporters and trader associations.

Meanwhile, the second problem related to financial viability were analysed with project evaluation indicators including Average Rate of Return (ARR), Payback Period (PP), Net Present Value (NPV), Internal Rate of Return (IRR) and Probability Index (PI). These analyses were measured based on an interest rate of 10.50% which is taken of the interest rate of Bank Rakyat Indonesia. Bang Rakyat Indonesia was chosen as this bank is available in all almost sub-districts in Jember and they offer credits to small farmers.

Results and Discussion

1. Technical Feasibility of Smallholders' Coffee Plantations

The technical feasibility aspects of coffee plantations consist of several criteria including criteria for determining the location, production area (land size or scale), technology utilization and production layout (process) and on-farm practices feasibility. These criteria are the criteria expected to support and facilitate the activities of smallholders' coffee plantation in Jember.

The result of descriptive analysis shows that based several criteria, i.e. availability of input, means of telecommunication, water and electricity, market access, climate and land suitability and development possibility, the location of plantation was feasible for coffee plantation development.

Based on the observation and evidence collected during field study farm inputs such as seeds and fertilizers are relatively easy to obtain. Inputs, such as seed and fertilizers, can be obtained not only from markets but also from research and government institutions. Closeness and thus relatively easy access to ICCRI has opened farmers 'opportunity to get wider access to inputs and new technology. With regard to labour availability, while labour is generally available, but at peak harvesting season, there could be a shortage of labour hence farmers sometimes need to seek help or labour from other villages nearby.

While the condition of road and access to transportation is not easy, generally both coffee production area still have a relatively good access to transportation, means of communication, water and electricity power. This condition is generally enough to support coffee plantation development in those area specifically and thus in Jember generally. Possibility of coffee plantation development is also supported by physical environment including suitability of land and local climate to coffee plantation.

The technical aspects related to the production area can be said to be 'unfit' or less feasible as average farmers' land ownerships are relatively small (less than 2 ha), mostly below economies of scales. Consequently, farm management, financial conditions as well as farmer bargaining power are relatively weak. This condition suggests that to be competitive, farmers need for empowerment, assistance and support from other parties, especially to strengthen their institutional and financial conditions.

The farmers still do not have a strong capability to finance their own farm. It is characterized by the use of minimum fertilizers application. On average, farmers only apply once in a season, far less than coffee cultivation standards. Practically, farmers still cannot do a good agriculture and management practices. Farmers also still do not take into account the family labour related to costs, this represents that farm and financial management of smallholders 'coffee plantation is still weak. Whereas, technological improvement is possible because in Jember, there are supports from various institution including Indonesian Coffee and Cocoa Research Institute (ICCRI), an institution that continuously doing research to find new technology in the form of seeds and coffee cultivation techniques and disseminate them in order to development of a coffee plantation. Based on these explanations can be concluded that the technical aspects related to production scale is considered to be not quite feasible.

The technical aspects of the technology utilization is considered to be 'suitable' for all the criteria are met. The thing needs to be noted is that technology available and utilised have helped farmers to improve their productivity. These are expected not only able to help farmers in farming but also able to enhance the level of efficiency.

The use of technology known to be associated with technology availability, supply of technology from research and development institutes, and dissemination of technology from extension workers, so that the technology can be readily adopted and utilised by farmers. If it is related to substances, tools and machinery, the availability of the products as well as their spare parts in the market is also important. So far, farmers generally perceived that most of technology they need for coffee cultivation are abundantly available in the market. New technology is also available from both private and public institutions.

Production layout is evaluated based consistency of production technology applied to obtain the ultimate goal and to mitigate problems in coffee farming activities. The technical aspects of smallholders' coffee production layout is considered to be 'unfeasible' yet because there is still a bottleneck in the production workflow especially those associated with fertilizer applications (mucking). The constraint associated with the production flow is largely hampered on the groove fertilization which should be done twice in a season, but due to limited finance, is only done once in a season. Farmers have applied optimal spacing (between plants) as it is recommended (2,5 to 3 m). This layout potentially can minimize the costs especially those associated with

labour costs, still for financial reason and uncertain coffee price, most farmers in the villages only apply fertilizers once not twice. This unstandardized practice has generally influenced the efficacy of coffee plantation practices which eventually also influence coffee productivity and total production in this region.

The technical aspects of on-farm activities is still considered to be 'unfit' or less feasible. Most of the activities in the process of fertilization is not done associated with a balanced fertilizer but farmers usually fertilize the coffee plant depends on the condition of capital and the availability of fertilizer in the area. While fertilization which should be done twice in a season only conducted once , farmers may reduce fertilizer needs and thus costs by replacing expensive inorganic fertilizers with cheaper organic fertilizers.

2. **Financial Feasibility of Smallholders' Coffee Plantation**

Analysis of average rate of return (ARR) attention in investing activities compared with profits after tax income. Tax revenue share system here is hinted at by the farmers by giving most of the crops on the forestry side. This analysis is used to determine whether the transfer or purchase of equipment or investments made feasible or not feasible.

Based on the ARR analysis, the average value of investments made in smallholder's coffee plantation was Rp 3,559,846.43 with an average income of over 14 years of Rp 6,669,620.23. The calculations show ARR value of 187.35%. The ARR value is very much greater than the discount rate applicable at the time of this study show that in terms of investment smallholder's coffee cultivation is considered to be strongly feasible.

Another financial feasibility criteria is the net present value (NPV). NPV analysis of smallholders' coffee plantation in Jember is the present value (present value) which reflects the difference between the benefit (benefit) at cost (cost) at a specified discount rate applicable at the time of the study.

The calculation shows NPV of Rp. 12,177,566.27 which is far greater than zero. NPV at a discount rate of 10.50% is greater than zero shows that smallholders' coffee plantation in Jember is profitable. This indicates that smallholders' coffee farming is feasible to proceed. This value also means that at 10.50% interest rate per year, coffee plantation can create profit for farmers at Rp 12,177,566.27.

Analysis of cost efficiency is expressed the comparison of total profit and costs in net present value. There are two dimensions of calculation for cost efficiency, namely Net B/C and Gross B/C. A project said to be feasible if the value of both criteria are more than 1. Conversely, if the value of at least one criterion is less than one then it is considered that the project is not feasible.

Net B/C obtained from comparing the NPV that has a positive value with the value of NPV that has a negative value in the interest rate during a specified period. In the case of smallholders' coffee plantation in Jember, the value of net B/C calculated from year 0 to year 14 is greater than 1, which is 1.24. This value indicates that smallholders' coffee plantation in Jember is feasible to continue. The meaning of the value of the net B/ C of 1.24 is that smallholders' coffee plantation in Jember provides sufficient benefits to farmers that is 1.24 times of the cost spent by farmers. Meanwhile, value of gross B/C can be obtained by comparing the present value of the benefit to the present value cost at the applicable interest rate. The value gross B / C is equal to 1.17 which is greater than one. This implies that smallholders' coffee plantation in Jember is feasible to continue as it provides a gross benefit of 1.17 times compared to the cost spent during the production of coffee for 14 years in average. Based on the facts above, it can be concluded that the interest rate of 10.50%, the smallholders'coffee plantation in Jember is efficient or viable in terms of cost efficiency.

Furthermore, internal rate of return (IRR) is one of the criteria in the feasibility analysis that is usually used to measure the level of interest rates per annum where the present value of proceeds equal to the present value outlays. In these circumstances the NPV is equal to zero. The IRR analysis is related to investment decisions on smallholders' coffee plantation in Jember. The bank interest rate used in this study, as noted above, is equal to 10.50%.

The value of IRR for smallholders' coffee plantation in Jember district is 13.54% per year, which is obtained from the interpolation of discount factor of 13.50% with a NPV of Rp. 200,889.13 and the discount factor of 13.60% with a NPV of Rp. 146,293.08. This value, i.e., 13.54% is greater than the bank interest rate that is equal to 10.50%. This that at the current interest rate, the smallholders' coffee plantation in Jember is viable to continue.

Payback period analysis aims to determine how long it will take to be able to return the investment costs incurred. The payback period reflects the economic value of a business. Technically, productive period for a coffee plant is from 3 to 15 years. After fifteen years, coffee plants need to be rejuvinated.
From the analysis, The payback period for smallholders' coffee plantation in Jember using net benefit value is around 7 years this is because at 8th year of net benefit cumulative is already greater than zero or positive values. When carefully calculated period payback period is 7 years 5 months 2 days.

If compared with the productive age of the coffee plant, the payback period of smallholders coffee plantation in Jember is still quite feasible as it is still far shorter than the productive age of coffee plants. This proves that smallholders' coffee plantation in Jember is feasible to proceed.

Conclusions and Recommendations

24. The technical aspects related to the determination of the location, extent of production, the use of technology and the layout of production and on-farm activities of smallholders' coffee plantation in Jember in practice are already meet the minimum standards and thus feasible to proceed.

25. Financially, smallholders'' coffee plantation in Jember is also classified to be viable. This is indicated by the fulfilment of feasibility criteria i.e., ARR, NPV, IRR, net B/C, gross B/C and PP. ARR value of smallholders' coffee plantation in Jember is equal to 187.35% far exceeding the applicable discount rate. The NPV of smallholders' coffee plantation in Jember is Rp. 12,177,566.27 which is greater than zero. The IRR of smallholders' coffee plantation in Jember is 13.54% which is still greater than the interest rate prevailing at the time of the study of 10.50%. The payback period of the smallholders' coffee plantation in Jember is for 7 years 5 months 2 days, this time is still shorter than productive period of the coffee plant, which is approximately 15 years.

26. Barriers observed in the technical aspects, the layout of the production and on-farm activities are often associated with the high cost of fertilizers. The government is therefore expected to provide fertilizer subsidy especially for smallholder plantation, as so far fertilizer subsidy is only available for foodcrops, so that coffee farmers can afford to buy more fertilzers and able to cultivate coffee in accordance with good agricultural practices.

References

FAO 1991. Financial Analysis in Agricultural Project Preparation. FAO/Investment Centre Technical Paper No.8.

Gittinger, J. Price, ed. 1984. Compounding and Discounting Tables for Project Evaluation. (2nd ed.) Johns Hopkins UniversityPress for the World Bank.

Gittinger, J. Price 1982. Economic Analysis of Agricultural Projects.(2nd ed.) Johns Hopkins University Press for the World Bank.

Sarwono, B. 2005. Cara Budidaya yang Tepat, Efisien, Dan Ekonomis. Jakarta: penebar swadaya.

Suwarto, Yuke Octavianty. 2010. Budi Daya 12 Tanaman Perkebunan Unggul Jakarta: Penebar Swadaya.

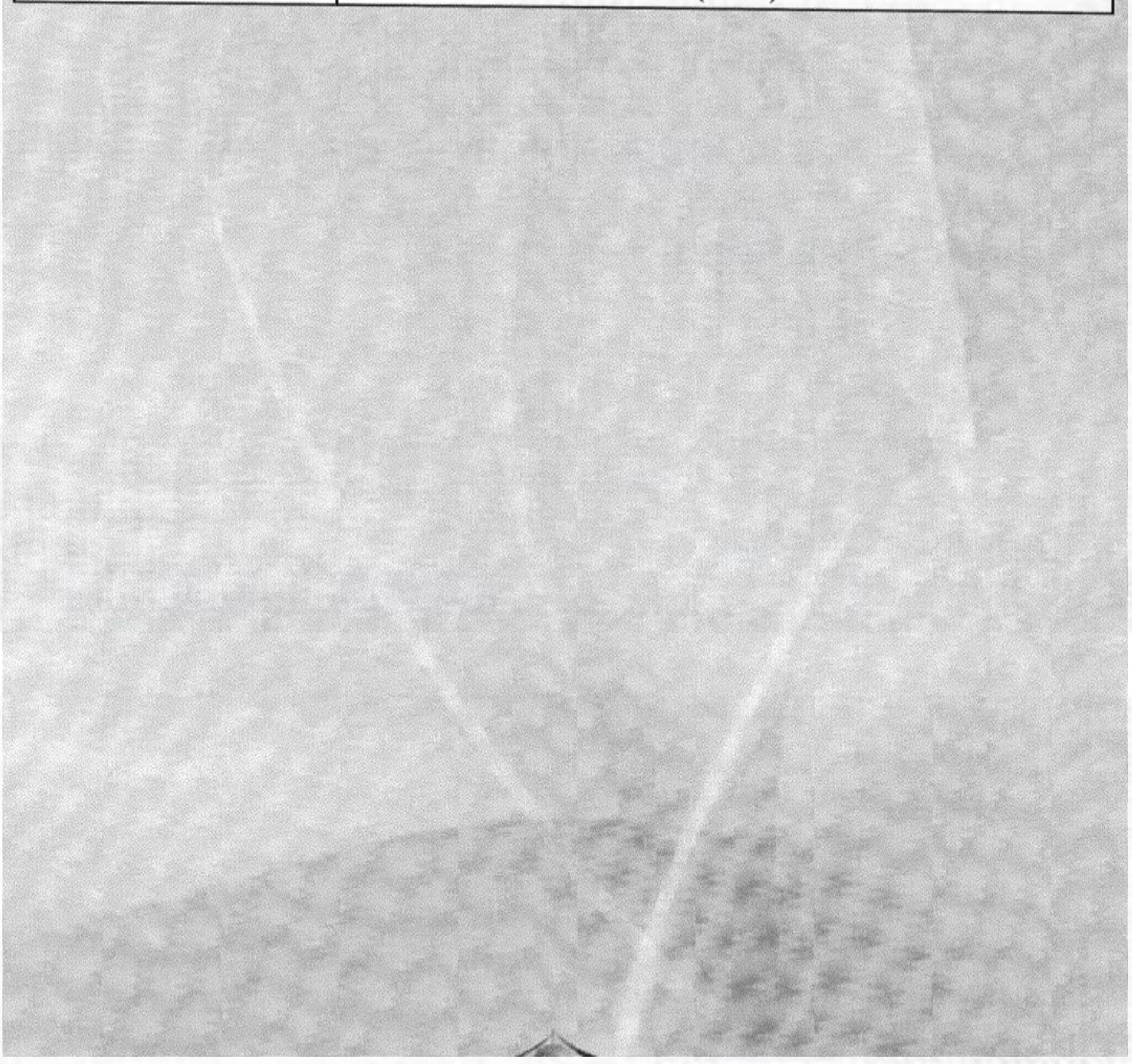
Yahmadi, Mudrig 2007. Rangkaian Perkembangan dan Permasalahan Budidaya dan Pengolahan Kopi di Indonesia. Surabaya: Bina Ilmu Offset.

Name	Organization	e-mail address
Nuhfil Hanani (Prof.)	Universitas Brawijaya	nuhfil.fp@ub.ac.id
Nur Amalina Hamzah (Ms.)	Universiti Putra Malaysia	amalhamzah89@gmail.com
Nur Dalinna Ibrahim (Ms.)	Universiti Putra Malaysia	dalinna77@gmail.com
Nur Nazurah Mohd Azaman (Ms.)	Universiti Putra Malaysia	zura_azaman@yahoo.com
Nurliyana Ahmad Mazlan (Ms.)	Universiti Putra Malaysia	myz1189@gmail.com
Olusola Olugbenga Ibitoye (Mr.)	Universiti Putra Malaysia	odusoley2k@yahoo.com
Phuah Kit Teng (Ms.)	Universiti Putra Malaysia	girlyphuah@yahoo.com
Rafidah Yahya (Ms.)	Universiti Putra Malaysia	rafidah.yahya90@gmail.com
Rahmanta (Dr.)	Universitas Sumatera Utara	rahmantaginting@yahoo.com
Riantri Barus (Ms.)	Universitas Sumatera Utara	riantribarus@yahoo.com
Rika Terano (Dr.)	Universiti Putra Malaysia	rika_t@upm.edu.my
Rini Dwiastuti (Dr.)	Universitas Brawijaya	dwiastuti_fpub@yahoo.com
Ritha Fatimah Dalimunthe (Prof.)	Universitas Sumatera Utara	rithadalimunthe@gmail.com
Rochadi Tawaf (Dr.)	Universitas Padjajaran	rochadi_tawaf@yahoo.com
Rosihan Asmara (Mr.)	Universitas Brawijaya	rosihan@ub.ac.id
Salina Main (Mrs.)	Universiti Putra Malaysia	mainsalina@yahoo.com
Selvakkumar K.N.Vaippuri (Mr.)	Universiti Putra Malaysia	mainsalina@yahoo.com
Setia Hadi (Dr.)	Bogor Agriculture University	mainsalina@yahoo.com
Setri Hiyanti Siregar (Mrs.)	Universitas Sumatera Utara	setriyantji@yahoo.com
Sigit Soeparjono (Dr.)	Universitas Jember	s.soeparjono@gmail.com
Siti Fatimah Mohamad (Mrs.)	Universiti Putra Malaysia	puterisitifatimah@gmail.com
Siti Hawa Jamil (Ms.)	Universiti Putra Malaysia	merahjambu1218@gmail.com
Soetriono (Prof.)	Universitas Jember	irtusss@gmail.com
Suhartini (Dr.)	Universitas Brawijaya	hartiniub@yahoo.com
Sujarwo (Mr.)	Universitas Brawijaya	sujarwo.ub@gmail.com
Syafrial (Dr.)	Universitas Brawijaya	syafrial_ub@gmail.com
Tasya Chairuna Pane (Ms.)	Universitas Sumatera Utara	tsy_ch@yahoo.co.id
Tavi Supriana (Dr.)	Universitas Sumatera Utara	tavihutasuhut@yahoo.com
Tri Wahyu Nugroho (Mr.)	Universiti Brawijaya	tw.nugroho@hotmail.com
Umar Nil Mukhtar (Mr.)	Universiti Putra Malaysia	umarmukhtar79@gmail.com
Viduriati binti Sumin (Ms.)	Universiti Putra Malaysia	viduriati@gmail.com
Wan Abbas Zakaria (Prof.)	Universitas Lampung	wan_abbas@yahoo.com
Wong Kelly Kai Seng (Dr.)	Universiti Putra Malaysia	kellywong@upm.edu.my
YM Che Ku Amir Rizal Che Ku Mohd (Mr.)	Universiti Putra Malaysia	rizal.economist@gmail.com
Yodifiatfinda (Dr.)	Universitas Trilogi	yodfi@universitas-trilogi.ac.id
Yoni Atma (Mr.)	Universitas Trilogi	yoniatma@universitas-trilogi ac.i
Zainal Abidin Mohamed (Prof. Dr.)	Universiti Putra Malaysia	zainal.mohamed@gmail.com
Zakiah Hanum Abd Ghafar (Ms.)	Universiti Putra Malaysia	zakiahhanum1990@yahoo.com
Zuliana Zainal Abidin (Ms.)	Universiti Putra Malaysia	anazainalabidin@gmail.com

Organizing Committee

Patron	**Prof. Dato' Dr. Mohd Fauzi Ramlan (Vice Chancellor, UPM)**
Advisors	1. Prof. Datuk Dr. Mad Nasir Shamsudin *(Deputy Vice Chancellor, Academic and International, UPM)* 2. Prof. Dr. Abdul Shukor Juraimi *(Dean, Faculty of Agriculture, UPM)*
Chairman	Prof. Dr. Zainal Abidin Mohamed (UPM)
Co-Chairman	1. Dato' Ahmad Ishak *(Director General, FAMA)* 2. Assoc. Prof. Dr. Shaufique Fahmi Ahmad Sidique *(Director, PETA)*
Secretariat	**1. Dr. Juwaidah Sharifuddin (UPM) - Chairperson** 2. Prof. Dr. Nuhfil Hanani (UB) 3. Prof. Dr. Hiroki Inaizumi (TUA) 4. Dr. Evita Soliha Hani (UNEJ) 5. Dr. Diana Chalil (USU) 6. Dr. Hasni Arief (UNPAD) 7. Tn. Hj. Sahbani Saimin (UPM) 8. Tn. Hj.Rohizad Ridzwan (FAMA) 9. Mrs. Noorizajune Abu Bakar (UPM) 10. Ms. Nurliyana Ahmad Mazlan (UPM) 11. Ms. Rafidah Yahya (UPM) 12. Ms. Siti Fatimah Mohamad (UPM)
Scientific & Technical	**1. Dr. Golnaz Rezai (UPM) - Chairperson** 2. Dr. Ismail Abd. Latif (UPM) 3. Assoc. Prof. Dr. Amin Mahir Abdullah (PETA) 4. Dr. Bisant Kaur (FAMA) 5. Dr. Atikah Nurhayati (UNPAD) 6. Dr. Tuti Karyani (UNPAD) 7. Dr. Syafrial (UB) 8. Ms. Phuah Kit Teng (UPM) 9. Ms. Elina Gom (UPM) 10. Ms. Siti Hawa Jamil (UPM) 11. Ms. Zakiah Hanum Abd Ghafar (UPM)
Finance	**1. Prof. Dr. Mohd. Mansor Ismail (PETA) - Chairperson** 2. Dr. Nolila Mohd Nawi (UPM) 3. Mr. Saiful Anuar A. Rahman (UPM) 4. Ms. Zuliana Zainal Abidin (UPM)
Social & Venue	**1. Assoc. Prof. Dr. Norsida Man (UPM) - Chairperson** 2. Dr. Rika Terano (UPM) 3. Mrs. Nurainakmal Kamal Bahrin (UPM) 4. Mrs. Norafidah Abas (UPM) 5. Ms. Melissa Elina Yusoff (UPM)

Tour & Logistics	**1. Mr. Muhamad Fadzil Repin@Rebin (UPM) - Chairperson** 2. Dr. Kelly Wong Kai Seng (UPM) 3. Mr. Azizan Saad (UPM) 4. Mr. Amir Taufiq Sabuddin (UPM) 5. Mr. Homaydi Sakdullah (UPM) 6. Ms. Suhaila Mohamad Suati (UPM)
Publicity & Multimedia	**1. Dr. Nitty Hirawaty Kamarulzaman (UPM) - Chairperson** 2. Mrs. Rogayah Md. Yassin (UPM) 3. Mr. Mohd. Ghazali Satar (UPM) 4. Mr. Hamdan Md. Ali (UPM) 5. Mr. Ahmad Sarkawi (UPM) 6. Ms. Nur Nazurah Mohd. Azaman (UPM) 7. Ms. Nur Amalina Hamzah (UPM)



The Organizing Committee for the

Conference on Agri-Entrepreneurship Development: Issues and Trends (CAgE2015)

Wishes to thank the followings for their support, contribution, commitment and participation

YBhg. Prof. Dato' Dr. Mohd Fauzi Hj. Ramlan
Vice Chancellor, UPM

YBhg. Prof. Datuk Dr. Mad Nasir Shamsudin
Deputy Vice Chancellor (Academics and International), UPM

YBhg. Prof. Dr. Abdul Shukor Juraimi
Dean, Faculty of Agriculture, UPM

Collaborators:
Federal Agricultural and Marketing Authority (FAMA)z
Persatuan Ekonomi Pertanian (PETA)
Universitas Jember
Universitas Sumatera Utara
Universitas Padjadjaran
Universitas Brawijaya
Tokyo University of Agriculture

Chairperson of the Sessions
Oral Presenters
Participants

Our appreciation also goes to
Elite Scientific Instruments Sdn Bhd
for its advertisement

A word of thanks is also due to
all those who assisted one way or another in organizing this symposium,
and those whose names may have been inadvertently omitted from the above list.

ESI

ELITE SCIENTIFIC INSTRUMENTS SDN BHD

A-LG-03, Block A, Serdang Perdana Selatan, Section 1, 43300 Seri Kembangan, Selangor Darul Ehsan, Malaysia
Tel: (603) 89456100 Fax: (603) 89457100 Tel: (6019) 2416031
Email: hassim@esi.com.my
Website www.esi.com.my

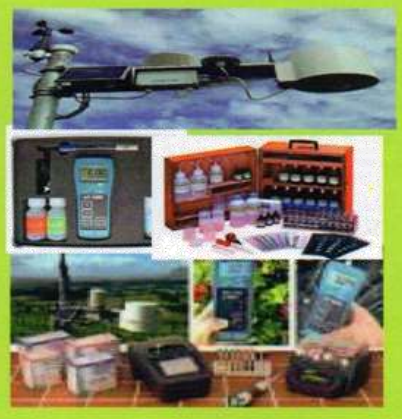
We specialize in:

- Agricultural Research Instruments
- Environmental Research Instruments
- Laboratory and Scientific Instruments
- Turnkey for Tropical and Transgenic Greenhouse
- Irrigation and Fertigation Technology
- Greenhouse Monitoring System

Our major commissioned projects:-

Transgenic Greenhouse and Research Greenhouse

Greenhouse, Rain Shelter, Irrigation and Fertigation System



Weather & Environmental Monitoring, Nutrient Management, Soil & Water Quality

Tissue Culture, Plant Growth Chamber, Laminar Flow

Photosynthesis System , Licor LI-8100 Automated Soil CO2 Flux System, Leaf Area Meter, Environmental and Biotechnology Research System

SOLE DISTRIBUTOR FOR:

LI-COR DAEYANG Pessl Instruments FHK Forestry Suppliers Groduce STEP Systems GmbH PHILIPS LED Horti Partner

For more information, please contact:
Elite Scientific Instruments Sdn. Bhd.

Tel: (603)8945 6100 Fax: (603)8945 7100
website: www.esi.com.my

Any enquiry, please contact:
Mr Hassim bin Mohamad Isa (Managing Director) Tel: 019-241 6031; 012-646 6031
Email at hassim@esi.com.my sales@esi.com.my