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by Enjang Sudarman

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Enjang SUDARMAN, M.Si, Dr
SekolahTinggiManajemen IMMI, Jakarta, Indonesia
Gatut L. BUDIONO, Prof, PhD,
Universitas Pancasila, Jakarta, Indonesia
gatutelbudiono@yahoo.com

Ni Nyoman SAWITRI, Dr
Universitas Trilogi, Jakarta, Indonesia

Abstract: *The study of the role of maritime education on growth by exploiting the potential of the sea using literature method aims to determine the role of maritime education on growth by exploiting the potential of the sea. Maritime education greatly contributes significantly to economic growth. The field of maritime economy that has been developed was the fishing, shipping industry, maritime trade, port, shipyard and the shipbuilding industry. Human resources play a role to support the maritime economy bears a university graduate technologists shipping, shipbuilding technology, marine technology, fisheries technology, business and maritime law, port engineering and shipbuilding. The economic value of marine fisheries and aquaculture with a total production of 8.4 million tons can absorb the fisheries sector workforce 2,748,908 people in 2012. While the export value of sea trade was USD190 in 2014.*

Keywords: *Education, maritime, economic growth, potential of the sea*

Ключевые слова: *образование, морской, экономический рост, потенциал моря*

JEL Classification: O1, A10, A20, E20

Introduction:

Indonesia is the largest archipelago in the world, concerned with maritime education is very primary. The geography of Indonesia consists of 17,504 islands, 104,000 km long coastline and vast marine fisheries 6.28 million km2; covering an area of 85,000 km2 of coral reefs and small islands supporting maritime economy has not been managed optimally. Maritime education provided supplies expertise, prepare skilled human resources to fill maritime employment. Maritime education should be continuous from elementary school to college. Early on maritime spirited individuals formed to become sailors or maritime employers. Colleges that already have developed maritime majors being able to provide maritime technology personnel. There are 14 universities and three polytechnics which have maritime studies program (Sukonono, 2015). The amount is grossly inadequate to establish a maritime shaft require approximately 700 thousand experts to develop the maritime sector.

Results and discussions:

The Maritime Education

Maritime education is the education system to provide a wide range of talent in the shipbuilding industry fisheries, shipping, shipbuilding machinery, engineering shipbuilding, port, crew training and a wide range of maritime services such as finance maritime, maritime security and delivery services (Dong, 2014). The government needs to unite the maritime educational institutions integrated with the name "Maritime University of Indonesia", serving the Faculty of Engineering Sailing, Marine Technology, Technical Fisheries, Faculty of

Business and Law maritime, and Faculty of Engineering Building shipping and port (Mohsin, 2014). Human resources working in the maritime sector include; worker domestic and foreign commercial vessels; workers on board fishing domestic or foreign; cruise fisherman; labor offshore Deepwater exploration; labor ecotourism; labor and port (Huda, 2014). Maritime education in Indonesia had more specific on shipbuilding techniques.

Universities in Indonesia which have engineering shipbuilding, among others: The Institute of Technology (ITS), University of Indonesia, Diponegoro University, National Development University "Veteran" Jakarta, Surabaya Shipbuilding State Polytechnic, University of Hasanuddin Makassar, the Pattimura University in Ambon and the Maritime University of King Ali Haji in Tanjung Pinang Riau archipelago. Shipbuilding engineering education (Naval Architect Engineering) is an engineering discipline that studies a working system of the ship began planning the shape of the hull, engine power requirements, structure and stability, as well as the operation of the ship. Marine shipbuilding techniques can be used as a means of transport, sea hydrocarbon exploration, fishing, marine recreation, and maintain the security of the waters. Maritime education in ITS aims to educate students with core competencies field of marine engineering. There are four areas of expertise in marine engineering majors ITS includes: the field of hydrodynamics, Construction and strength, the field of marine transportation planning, and the field of ship production techniques. The expertise gained is the field of hydrodynamics is controlled shape analysis of the hull, the propeller more efficient. Expertise construction field strength is controlled construction planning, strength and vibration of the hull. Expertise in the field of transport planning is planning various types of marine vessels and usage optimization. While the preferred transportation program in transport management and planning cruise port. Expertise in the field of production vessels is controlled in the planning, implementation of ship building, ship repair and planning agency shipyard. In implementing classes to obtain professional certification, ITS collaboration with bodies such professionalism; International Institute of Marine Engineering Science and Technology (IMarEST), The Royal Institute of Naval Architects (RINA) and Wismar University, Germany. Alumni technique shipping systems mostly worked at Shipyard/ Offshores, Marine Industry, Shipping Company, Oil & Gas, Class Society, and several other fields scattered throughout Indonesia and abroad.

The Utilization of Potential Sea

Indonesian marine was untapped potential optimally. The Indonesian government to educate the human resources to manage the potential for the maritime economy such as fish processing, oil and gas exploration offshore, shipping industry, maritime trade, coral reefs, port services, coastal forestry, shipping and marine tourism. One potential use of the sea is port development. Indonesia has a harbor as many as 1,306, but only 141 ports that can serve ships of foreign countries. According to the International Maritime Organization (IMO) port that meets the requirements of the International Ship and Port Facility Security (ISPI), amounting to 5 ports includes a port of TanjungPriok in Jakarta, Tanjung Perak port in Surabaya, TanjungEmas in Semarang, and Belawan Port in Medan and the Panjang port in Lampung. Conditions are less qualified port 141 international ports, therefore, 60 per cent of exports of goods Indonesia must pass through the port of Singapore. As a solution, the Indonesian government attempted to build 25 new ports to serve large vessels to transport goods exports and imports. Indonesia Sea with the aim of building Toll facilitate sea transportation, lower shipping costs, lowering the cost of transport of people from island to island. The toll sea, is helpful smoothen the distribution of staple goods to the national logistics throughout Indonesia.

The investment needed for the construction of a new port reached US $ 7 billion including the completion of the port, as the port of Benoa in Bali island entered the International Electronic Navigation Map so that cruise ships and large vessels to feel comfortable and safe to lean on the port (Amin, 2015). Other maritime economic potential that the Government of Indonesia including the conservation area and underwater beauty. Indonesia has 108 conservation area of 15.78 million hectares and the beautiful underwater so much visited by foreign divers. Underwater beauty includes: Bunaken in North Sulawesi, Raja Ampat in West Papua, and Wakatobi in Southeast Sulawesi. The research results Triangelnature Concervation (TNC) Indonesia has conducted marine conservation as much as eight million hectares in 2005, used as a marine conservation area nature reserves, wildlife sanctuaries, national parks, natural park. The economic benefits Bunaken marine conservation has been visited 38 thousand tourists in 2004 and is able to provide as many as 1,063 jobs sector travel.

Maritime Economy

The economic value of marine fisheries has been able to provide employment for 180 million people worldwide and provides animal protein consumed globally (Bonini et al, 2011). Fish and fishery products were one of the agricultural commodities most heavily traded in the form of exports with a value of more than $ 85 billion in 2008. But marine fishing is currently experiencing overfishing and declining fish stocks and damage to marine ecosystems has become a threat to the economic survival, the economic value of the cruise industry was the delivery of goods by sea transport at a low cost. Maritime economy that can be developed in the cruise industry is (Stopford, 2003); port, sea transport system, freight forwarding, shipping, shipbuilding and trade. There were Indonesian marine potentials namely: 1) fish and other biota, coral reefs, mangrove forests, small islands, the natural beauty 2) oil, gas, minerals and mineral 3) of marine energy like; waves, tides, wind, biomass, ocean thermal. 4) The shipping industry, transport, communications, and maritime trade. Marine resources utilized for economic and social development, the fisheries sector is the source of people's livelihood of coastal areas, poverty reduction, employment creation, foreign exchange State earnings, recreation and tourism (Adisanjaya, 2015). Marine fisheries were one source of the maritime economy can provide animal protein and food security. The economic benefits of sea fish were a source of income for the people and the state, enterprises, create jobs and increase household income, particularly for those who are involved in fishing (Sumaila, 2011).

Marine fisheries have provided a livelihood for millions of people in coastal regions and make a significant contribution to the world economy of about US $ 235 billion per year. Indonesian marine fisheries consist of fisheries and aquaculture with a total production reached 8.4 million tons in 2011. Indonesia occupies the third position in the production level of the world's fisheries and aquaculture after Peru reached 8.2 million tons and China reached 15.7 million tons in 2011. in terms of employment, the fisheries sector Indonesia holds 2,748,908 registered workforces in 2012. the economic potential of Indonesia's fishery based on maximum sustainable yield (MSY) has been estimated at 6.4 million tons per year. While the potential was allowed of 80% of the MSY was 5.12 million tons per year. Indonesia as a maritime state uses five main policies in the field of maritime economy, among others: 1) building a culture of maritime utilization of the potential of the sea for the benefit of the people 2) maintain and manage marine resources for food sovereignty, fisheries development, 3) the development of infrastructure and connectivity maritime through development toll sea (deep seaport), the shipping industry, tourism and maritime 4) diplomacy maritime cooperation between countries on the conflict disputes the sea, illegal fishing, a violation of sovereignty, piracy and marine

pollution 5) negotiations sea borders with nine neighboring countries such as Malaysia, Singapore, Philippines, India, Thailand, Vietnam, Australia, East Timor, and Papua New Guinea 6) established a maritime defense force regional and international cooperation to realize the dignity and sovereignty of Indonesia.

Purnomo (2015) stated marine resources of Indonesia has been able to give economic profit of USD 800 billion per year. Nevertheless, it still needs a law enforcement against illegal vessels fishing illegally. For example, the vessel Hai Fa (China) entering the waters illegally and steal the fish as much as 900 tons. According to the FAO report (2014) of illegal fishing occurred in Indonesia waters, the waters of Sulawesi and South China to date has exploited 91.1% of the fish stock.

The Sea Trade

According to Abdurrahman (2014) Indonesia has the potential of maritime services industry and world trade, because 40% of the traffic of goods and services through the waters of Indonesia world trade and 80% of oil imports of Japan, South Korea, Taiwan across the Strait of Malacca. The position of the Straits sits astride the connecting lines sea or Sea lanes of communication (SLOC) and Sea Line of Oil Trade (SLOT) track global oil, maritime trade between Europe and Asia Pacific economic structure dominated exports and imports, the survey results Nippon Maritime Center based in Singapore found as many as 93 757-capacity vessels of 100 GRT (Gross Register Tonnage) through the Strait of Malacca in 2004. The tanker carrying oil estimated at 11 million barrels per day toward the South China Sea. Judging strategic position, the Malaka straits used for international navigation interests of world trade. In accordance with the rules of the United Nations Convention on the Law of the Sea (UNCLOS) regulating the use and maintain security in the Strait of Malacca is the responsibility of the three countries, namely Indonesia, Malaysia and Singapore.

Bilateral agreements between Singapore and Indonesia have agreed to establish a Defense Cooperation Agreement in April 2007 to secure the borders of the Straits of Malacca and the South China Sea. Stopford (2003) stated that sea trade is carried out by countries in the world for reasons of economic policy, politics and public policy. The aim of the sea trade in economic terms were: 1) to promote economic growth 2) the distribution of goods and trade between islands in a State, 3) commodities exchange through export and import competitive advantage. Adam Smith's argument cites the theory of absolute advantage, the State would be better if it specializes in trading of surplus production. Specialization allows it to be more productive because of the economic resources as factors of production can be used more efficiently. In this case, Indonesia has marine superior resources compared with other States in the world. Therefore, the Indonesian government issued a policy to make "National Maritime Poros" exploit marine resources for the welfare of the Indonesian people.

Sea trade activities in Indonesia tend to be more profitable as import export activities in delivery of raw materials and products could increase per capita income. Comparative advantage theory of David Ricardo stated that the trade would be profitable if one country is more efficient in producing an item from the trading partners. Therefore, Indonesia undertake export trade of the main product, prospective products and other non-oil products have advantages. Isaac (2014) stated that comparatively advantage, Indonesia's main export products include; Crude palm oil (CPO) and its derivatives, textiles and textile products (TPT), electronics, rubber and rubber products, wood products, pulp and furniture, chemical products, metal products and machinery, processed food, and automotive with export value has been reached USD190 billion.

The SeaTransportation

Prihartono (2015) stated to improve competitiveness in sea transport, the Indonesian government should undertake the construction of sea toll. Connectivity of the sea will be more effective with their ships serve regular and scheduled from west to east Indonesia. Some supporting facilities sea toll Indonesia to become the world's maritime axis are: reliability ports, shipping industry, as well as inland access land transport infrastructure such as roads, railways connected with the port, the adequacy of the charge back and forth, routine and scheduled cruise. Indonesia sea transportation is based on measurements of the connectivity index is still not evenly distributed in each province. Connectivity index includes factors registered vessel, registered shipping company, container capacity, and the number of ship visits. Similarly, conditions Navigational aids (SBNP) installed in the sea is not adequate. Such facilities include: lighthouse, beacon buoys, signs mark the day, the child buoys. Facility means of supporting the voyage will be met only about 3,541 units (66.96%), required the addition of about 1,750 units. Shipping Channel facilities required for smooth traffic of ships, among other Navigational aids, vessel traffic services, and radio stations have not been yet fulfilled.

The Port Development

(Wilson et al, 2006) encourage the development of ports and sea transport dock. The exercise should be done based on the results of studies on the impact of economic, social and cultural. Social impact analysis, and environmental concerns positive and negative impacts. The social function of the port is as public facilities, recreational areas in which economic activity occurs. Port functions in the areas of governance include the safety of shipping, customs and excise, immigration, quarantine, security and order. Port functions in business is the servicing of vessels, goods, passengers, and rental of warehouses. According to UU No 17 Year 2008 on the voyage, the port is a place that consists of land and water used boats docked, up and down the passenger and cargo handling. Terms of port development include: 1) the existence of an easy relationship between the transportation of water and land, such as highways, railways 2) has a depth and width of a good groove 3) a place to drop anchor while waiting dock or refuel and refit boat 4) facility of loading and unloading of goods and passengers, and other supporting facilities. Port facilities dock container terminal has a size of 205 x 25 square meters, capable of berthing ships of 1,500 DWT s.d size of 4,000 DWT.

The Industrial Shipyard

Stopford (2003) stated Industry shipyard has a long-term business cycle, once a building can be used 24 to 30 years, the shipbuilding industry requires huge capital and high-tech design and produce merchant ships, warships or dredges. About 30 countries around the world implement ship industry, ship industry whilst only can be done by state industry such as Japan, Europe, America, South Korea, China and Taiwan. Industry shipyard employs much labor as an illustration to manufacture vessels with a capacity of 6,000 DWT requires a workforce of 1000 people.

Shipbuilding industry in Indonesia by PT. PAL a state-owned enterprises (SOEs) in Surabaya, East Java, Indonesia, and PT Industri Ships in Makassar. Indonesian ship production has entered the international market and the quality has been recognized worldwide. The type of ship that has been in production PT.PAL including: naval patrol boats, merchant ships as in cargo vessels, container ship, and tanker. Prihartono (2015) the construction of a shipyard in

Indonesia continues to be improved, especially the construction of new high-tech shipbuilding with a total capacity of 700,000 Dead weight Tonnage (DWT). Business of shipbuilding industry not only creates new vessels but also make ship components for approximately 70% of the vessel components are still imported. According Sindo News.Com (2016) government passenger boat Rede development of 20 units with a contract value of Rp 278.85 billion for airport passengers and inter-island connectivity.

Conclusion:

Maritime Education plays an important role to foster the economic utilization of the potential of the sea. Maritime economy developed through fisheries, shipping industry, maritime trade, port, shipyard and the shipbuilding industry. Human resources support the economy in the maritime background of university graduates maritime technology expertise covers the fields of shipping, shipbuilding technology, marine technology, fisheries technology, business and maritime law, port engineering and shipbuilding. The economic value of marine fisheries and aquaculture with a total production of 8.4 million tons of fishery sector employment as much as 2,748,908 people in 2012. While the export value of marine trade in 2014 reached USD190.

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PAGE 1

PAGE 2

PAGE 3

PAGE 4

PAGE 5

PAGE 6

PAGE 7