

## FISHERY OR TOURISM DEVELOPMENT? REVIEW OF BLUE ECONOMY CONCEPT FOR INDONESIA

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### ABSTRACT

The blue economy concept emerged during the Rio+ 20 Summit in Brazil, at the end of June 2012. This concept emphasizes sustainable development that makes the sea as an integral part. On the other hand, Indonesia is an archipelagic state that has a vast sea area, which is still not fully utilized. Indonesia has also carried out many activities in carrying out the blue economic concept, long before it is emerged, such as the Bunaken Declaration which was initiated during the reign of President Prof. Dr. B.J. Habibie. From recent studies, marine industries are believed that they have such a great economic impact, and also have high backward linkages with other industries. In general, developing countries focus more in developing fishery and marine tourism sectors as they have high economic impact. However, overfishing and high number of tourist populations occurring in some countries today has led to a decline in the quality and quantity of the sea. This paper aims to gain an understanding of blue economy concept and emphasize some of the results of existing studies, particularly in fishery and marine tourism sectors, to be made reference to Indonesian stakeholders in determining sustainable development plans for the marine sector.

**Keywords:** Blue Economy, Indonesia, marine industries, economic impact, fishery, marine tourism

### I. INTRODUCTION

Blue economy is a concept pioneered by Small Island Developing States (SIDS), which have many interests in their waters. The blue economy makes the sea as an integral part of sustainable development. In addition, the blue economy also supports the same principle of green economy in the Rio+ 20 Summit in Brazil at the end of June 2012, namely improving human welfare and social justice, while significantly reducing environmental risks and ecological scarcity (UNEP, 2013). Therefore, it is not only archipelagic or developing countries that can implement blue economy, but also developed countries or non-archipelagic countries. In the Rio+ 20 Summit in Brazil, President of Indonesia, Dr. H. Bambang Susilo Yudhoyono, said in his speech "For Indonesia, Blue Economy is our next frontier", which intends to invite the world to jointly implement the blue economy in its national development.

To implement the blue economic concept in Indonesia, it is necessary to have rules or various policies and also the legal basis of the Indonesian government so that there will be no overlap between the various parties that each have interests in the marine sector. In addition, there needs to be an analysis or research on the economic impact of the marine sector on various matters which later can be the references for

decision makers or government to decide future development plans in the Indonesian marine and coastal sector.

## II. MARINE ECONOMIC

Often the economic impact of the marine industry is considered trivial, with evaluations that only assess its direct impact. Marine industries have more indirect positive impacts so they stimulate new industries (Dyck & Sumalia, 2010). An example is a commercial fishery that is generally evaluated by the quantity of fish produced. However the fishery industry requires an output from another industry, the same like the recent study done by (Morrissey & O'Donoghue, 2012) that marine industry have high backward linkages, like the nets from a net-making industry, that provokes other economic activities beyond its direct economic impact. Therefore, changes in the fishery industry will affect the amount of production in the net-making industry, the impact which will then be extended to the broader economic system, such as the change of spending by the workers of a net manufacturer in response to changes in activity in their industry. This direct and indirect economic impact is the so-called "multiplier effect" (Watson & Beleiciks, 2009). A multiplier with value of 1 has no multiplier effect, while value of more than one indicates the existence of great impact to the other.

In his research entitled "A global synthesis of the economic multiplier effects of marine sectors", (Jacobsen et al., 2013) divide the marine industry into 8 sectors (aquaculture, commercial harvest, offshore energy, seafood processing, transportation, recreational harvest, shipyard and tourism) and also divides the economic indicators into 4 (revenue, income, GDP, and employment). They analyzed the value of the multiplier impact of the marine industry on a country's economy, but the value of this multiplier also applies to all countries in the world in general. (Morrissey & O'Donoghue, 2012) analyzed the total economic impact of the 10 marine industry sectors and produced certain multiplier values that could only be used or intended for the Irish state economy.

As mentioned previously, multiplier impact value of more than one is the expected result. According to (Jacobsen et al., 2013), each of the eight marine industry sectors has a multiplier impact value of more than 1 with an average total multiplier impact value of 1,82. Offshore energy sector itself has the highest value followed by seafood processing, tourism, aquaculture, and commercial harvesting.

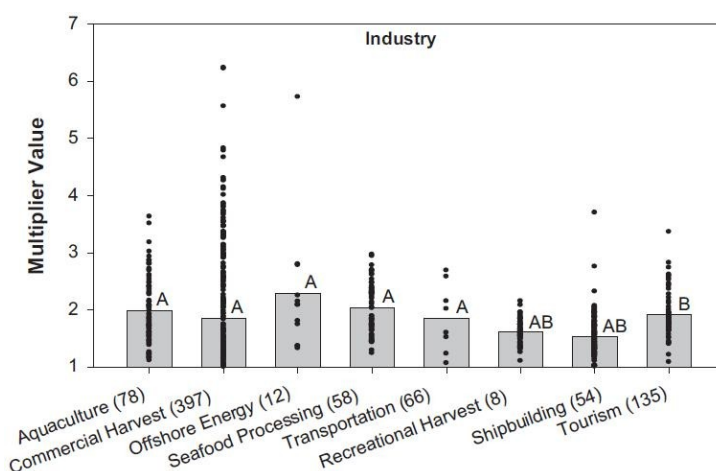


Figure 1. Distribution of Multiplier Value by Industry Type (Jacobsen et al., 2013)

With all marine industry sectors combined, revenue is the highest economic indicator seen from its multiplier impact value. The relation of multiplier impact value to the status of a country is not very significant. Between developed and developing countries have nearly the same multiplier value of the marine industry (Jacobsen et al., 2013)

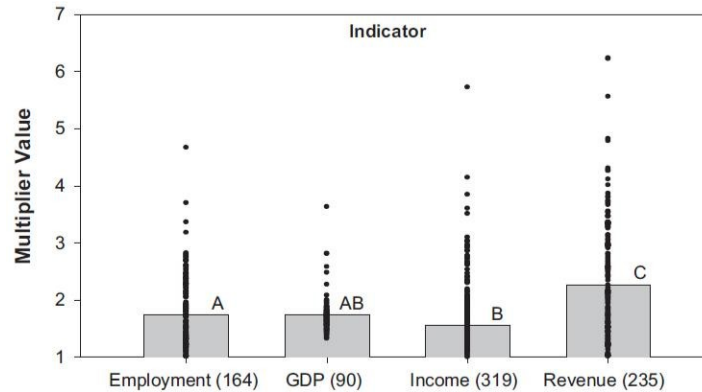


Figure 2. Distribution of Multiplier Value by Type of Indicator Eknomi (Jacobsen et al., 2013)

## Dynamic Model of the Tourism Sector

From previous research, tourism sector is included in the marine industry. Indonesia itself is well known for its natural beauty that can attract many tourists both for local and international tourist. Therefore research result of the impact of tourism on the social, economic, and environmental aspects of a country can be used as a reference in determining the sustainable development of tourism in the marine industry in Indonesia. (Patterson et al., 2004) modeled the tourism sector in the Dominican Commonwealth that is integrated with environmental, social and economic systems.

### 2.1. Social Domain

Model of the social domain includes the population and social capital that is subdivided into 2, namely social networks and social norms. Generally in developing countries, low GDP rates are associated with high birth and mortality rates. But the Dominican state has a birth rate similar to that of the United States but a lower mortality rate than the United States. Therefore, in the modeling, the population of the Dominican state is considered constant due to the relation between the GDP and the less obvious population (Patterson et al., 2004).

Dominica has a good social network due to its small population and the influence of the West African matrilineal tradition. Meanwhile, with the presence of tourist populations, declining traditions and society norms can occur due to competition with the norms of foreign communities (tourists) (McElroy & de Albuquerque, 1998). Additionally emigration and resource competition can have an impact on pressure in the social domain (Costanza & Voinov, 2001).

### 2.2. Environmental (Ecology) Domain

For the environment domain, it consists of land use and residential sector (habitat). With Dominica's area of 790 km<sup>2</sup>, the land use sector is divided into 6, forest, protected forest, urban, subsistence farm, non-banana commercial farm, and banana production area. In addition, banana is one of the export commodities of the Dominican

state. For residential sector, it is strongly related to carrying capacity which is influenced by total occupancy and quality of occupancy.

### **2.3. Economy Domain**

The range of potential economic activities to be modeled is very broad, even for a Dominican-sized country. Economic domain modeling is divided into 5 sectors, namely tourism, export of agricultural products, manufactured exports, government, and internal domestic economy (Patterson et al., 2004). The tourism sector itself is divided into 3 things, namely hotel room capacity, airport capacity, and tourism revenue.

### **2.4. Intersection of Economy and Ecology Domain**

The most significant economic impact on ecology is the change in land use patterns. Since bananas are the most profitable export commodity for Dominica, non-banana commercial farms can turn into banana production area, following a change in banana prices on the market. Subsistence farmland can also turn into commercial land of banana if conditions support. Even for the expansion of urban areas, subsistence farms are often utilized. Therefore, subsistence farms also act as buffers between urban areas and export farms. In addition, other economic impact on ecology is the reduced number of corals in the coastal areas and surrounding areas along with the rising tourist population.

Furthermore, to clearly illustrate the ecology domain affecting the economic domain is how the state of the Dominican country environment can attract tourists. T. Patterson, et al. defines a variable called "natural beauty" which is a function of forest quality and coral reefs.

### **2.5. Intersection of Ecology and Social Domain**

In this modeling, the ecological domain affects the social domain through two paths, namely, first is the "pride of place" which is vital to the identity of an island or country and the second is ecological support in the preservation of indigenous cultures such as hunting culture in the forest.

The mainstream in which social capital affects ecology in this modeling is "wage-sharing", a term used to describe the form of income redistribution that reflects the informal economy and the family assistance provided by the matriarchal lineage.

### **2.6. Intersection of Economy and Social Domain**

Diverse native communities can be as important as the expectations of tourists to return like tourist destinations with natural beauty, especially for the Dominican country.

Then in this modeling the economic domain perceives the social domain in two ways. First the economic domain affects social capital through changes in the pressure of unemployment and changes in cultural pressures that are proportional to the tourist population. Secondly, the economic domain encourages emigration, which can suppress the Dominican social network.

### **2.7. Intersection of the Three Domain**

It is clear that maintaining the quality of life for Dominican citizens and the quality of the experience of travelers depends on maintaining the health of each domain. When taken as a whole, the ongoing success in one domain also depends on maintaining the functionality and quality of systems across the island.

It seems that the Dominican government accumulates state debts in the form of government expenditure during the first five years after independence. This suggests that the tax collection system was less effective at the time, but has increased.

While GDP almost doubled during this period in real terms, the size of the internal economy remained constant, as did real wages. One way to understand this difference is through the use of the concept of a tourism / tourism multiplier economy. In 1990, Dominica was thought to have a higher tourism multiplier than most tourist destinations in the Caribbean region (Weaver, 1991). Output models tend to support this, resulting in a multiplier 2,1 for 1990. In 2000 the multiplier effect has decreased, down to 1,45. The main reason seems to be a significant increase in foreign ownership of tourist facilities.

### **Tourism Sector Impact to Fishery Sector**

Nowaday, nature based tourism is one of the popular way people consider to do, and marine tourism is one of most considered the best. Many developing country benefit from the marine tourism as they have more sea and coastal area. As the economic benefits often come first, the environmental or social consequences of increased and unplanned tourism is neglected. Whereas conservation is usually not a top priority for developing countries, it is still important to make the existent initiatives viable and worth maintaining.

Marine Protected Area is an effort can be done in order to marine conservation for such country. MPA of Fernando de Noronha in Brazil is one of the instance that is affected by tourism activities. MPAs that allow visitation may exacerbate the pressure on natural resources to attend the demands created by tourists. Tourism may be the main factor creating conservation conflicts on this MPA via demands on fisheries (Lopes et al., 2017). Globally, tourism has been shown to negatively impact ecological features of protected areas (e.g.: by trampling, spreading weeds, etc.)

In Indonesia, Gili Matra Islands are well-known as the marine tourism destination by both local and international tourist. This islands are located in North Lombok Regency, West Nusa Tenggara Province, Indonesia. Studies by (Kurniawan et al., 2016) shows that Gili Ayer Island has the highest vulnerability with a SIVI of 2.75 (Moderate), followed by Gili Meno Island with a SIVI of 2.50 (Low), while Gili Trawangan Island has a SIVI of 2.25 (Low). Tourism is the sole stress to Gili Matra Island's ecosystem due to its direct damaging impact and reducing its environmental quality.

Figure 3. shows, this phenomenon is called as bleaching. Bleaching occurs when the algae (or their pigment) are lost and the white calcium carbonate skeleton of the coral becomes visible. Bleaching is a general stress response when corals are exposed to extremes of temperature, UV radiation, salinity and pollutants (Nyström et al., 2010). Hoegh-Guldberg predicted that global warming will increase the frequency of mass bleaching of the coral reefs of the world, and that it will occur annually in Southeast Asia and the Caribbean by the year 2020, in the Great Barrier Reef between the year 2030 and 2040, and in the central Pacific by the year 2040.

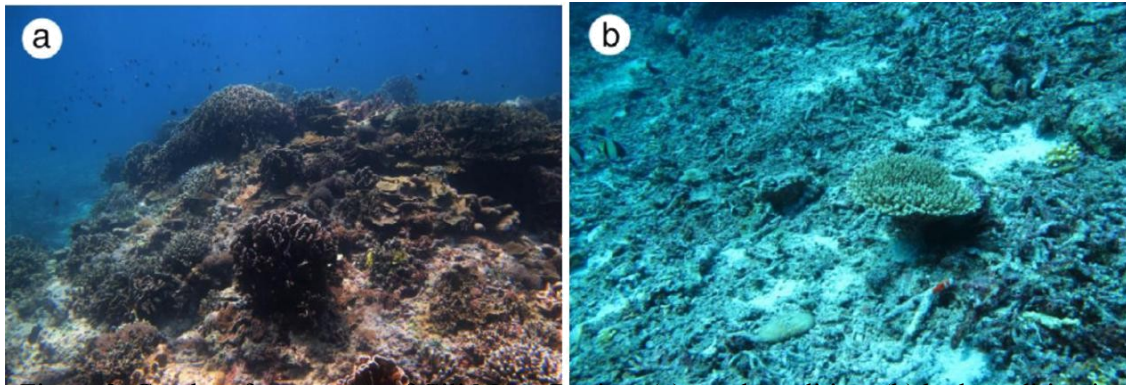


Figure 3. Coral reef ecosystem of Gili Matta Region: (a) good condition, (b) bad condition in one of the diving spots due to the impact of tourism. (Kurniawan et al., 2016)

### III. BLUE ECONOMY

The blue economy is a concept pioneered by SIDS (Small Island Developing States), which have many interests in their waters. The blue economy makes the sea as an integral part of sustainable development. In addition, the blue economy also supports the same principle of green economy in the Rio + 20 Summit in Brazil at the end of June 2012, namely improving human welfare and social justice, while significantly reducing environmental risks and scarcity ecological (UNEP, 2013).

The principles that exist in the Blue Economy concept, namely:

1. Natural resources efficiency
2. Zero waste
3. Social inclusiveness
4. Cyclic systems of production
5. Open-ended innovation and adaptation

#### 3.1. Blue Planet

The oceans cover 72% of the earth's surface and represent more than 95% of the biosphere. Life comes from the oceans and will continue to support all life today by generating oxygen, absorbing carbon dioxide, recycling nutrients and regulating global climate and temperatures.

Data from the FAO indicates that 87% of the world's fish stocks have been fully or over-exploited (FAO, 2010). Increased pollution and unsustainable coastal development contribute to the reduction of biodiversity and ecological functions. Increased atmospheric CO<sub>2</sub> levels undermine the fundamental aspects of many marine ecosystems through acidification of seawater; changing the chemical structure of seawater at a faster rate in the last 300 million years (IGBP, 2013).

The importance of the oceans for sustainable development has been realized from the beginning of the UNCED process, in Agenda 21, the Johannesburg Plan of Action and reaffirmed in the documents of the Rio + 20 Conference; but the ongoing trends in the exploitation and degradation of marine and coastal ecosystems show that there is insufficient effort and much remains to be done.

#### 3.2. Blue Economy Framework for Sustainable Development

The blue economy supports the same principle of green economy in the Rio+ 20 Summit, improving human welfare and social justice, while significantly reducing



environmental risks and ecological scarcity (UNEP, 2013), but based on in the context of the developing world and established to reflect the circumstances and needs of countries whose future resource base is marine. Underpinned by this approach is the principle of justice that ensures that developing countries:

- optimize benefits received from the development of their marine environment, eg agreements in fisheries, bioprospection, oil and mineral extraction.
- promote national equality, including gender equality, and decent work for all.
- Having well-reflected concerns and interests in marine development beyond national jurisdiction.

### **3.3. Opportunities in Blue Economy System**

#### **a. Shipping and Port Facilities**

80% of global trade by volume, and more than 70% by value, transported by sea and handled by ports around the world. Coastal States and SIDS need to position themselves in terms of facilities and capacity to meet trade growth and optimize benefits. IMO has brought new measures to improve efficiency, reduce greenhouse gas emissions and pollution.

#### **b. Fishery**

Globally 350 million jobs related to marine fisheries, with 90% of fishermen living in developing countries. The value of fish traded by developing countries is estimated at US \$ 25 billion making it the largest single trade. The data says that global fish catches since 1900 have increased, but starting in 2000 its value began to decline (GOC, 2008). In addition to human activity in fishing, the decrease in the number of fish catches is also caused by climate change that causes the rise of ocean stratification and reduces nutrient mixing in the sea.

#### **c. Tourism**

Tourism is a major global industry and also contributes 9% of global jobs that generate US \$ 1.3 trillion or 6% of world export revenue (UNWTO, 2013). Much of the world's tourism focuses on marine and coastal environments, and is predicted to continue to rise in value. The ecotourism sector is growing by 20%, which is 6 times larger than the overall growth of the industrial sector.

#### **d. Aquaculture**

Aquaculture is the fastest growing global food sector that currently provides 47% of the world's fish consumption (FAO, 2010).

#### **e. Energy**

In 2009, 32% of world crude oil production was produced in offshore areas and the value is projected to continue to be 34% by 2025. The sea also has enormous renewable energy potentials, such as wind energy, waves, tidal, biomass, etc.

#### **f. Biotechnology**

Products from marine biotechnology are currently predicted to be worth about US \$ 2.8 billion and are projected to grow to about US \$ 4.6 billion by 2017. Marine

bacteria are a potential source of many available for pharmaceuticals. In 2011 there were 36 derivative drugs, including 15 of them for cancer treatment.

### 3.4. Indonesian Marine Economic Policy

Pasal 25 UUD 1945 underlies the development of the marine field, because there is stated explicitly that Indonesia as an archipelagic country. Similarly to pasal 33 implicitly mandating that natural resources (including marine resources) should be fully utilized for the welfare of the people.

Bunaken Declaration which was issued on 26 September 1998 during the reign of President Prof. Dr. B.J. Habibie, explicitly states two main points of awareness of the Indonesian nation's geographic region and the great will of the Indonesian nation to build marine. Meanwhile, Indonesia has a vision of national development in 2005-2025, "Indonesia is independent, advanced, fair and prosperous."

Then, the pillars of the national development strategy used to achieve the vision and mission as mandated in Undang-undang No. 17, 2007 is sustainable development with the spirit of pro-poor, pro-growth, pro-job and pro-environment.

The success of Indonesia in the world maritime stage is evidenced by the successful holding of meetings between heads of state from Coral Triangle Initiative. This initiative stems from the idea of the President of the Republic of Indonesia, Dr. H. Susilo Bambang Yudhoyono invited the head of the Coral Triangle Initiative (CTI) to inaugurate the idea of CTI in safeguarding and reef resources in this triangular region which include: Malaysia, Philippines, Indonesia, Papua New Guinea, Solomon Islands and Timor Leste.

In the CTI Regional Plan of Action (RPOA) agreement, there are five main objectives of the CTI idea:

- 1) Establish a seascape-managed priority area that is effectively managed
- 2) Application of fishery resources management principles and other marine marine resources based on ecosystem
- 3) Effectively managed "Marine Protected Area" Determination
- 4) Implement climate change adaptation measures
- 5) Increasing the status of threatened marine species

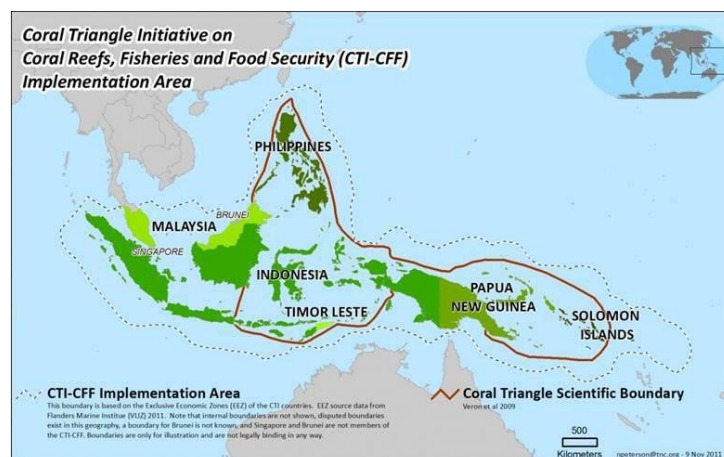


Figure 2. Coral Triangle Initiative for Coral Reef, Fisheries and Food Security (Kusumastanto et al., 2012).



#### IV. DISCUSSION

(Jacobsen et al., 2013) and (Dyck & Sumalia, 2010) have results that can be used for all countries in the world, unlike previous studies (Morrissey & O'Donoghue, 2012) that focus only on one particular country or region. It appears that the marine industry sector has a high multiplier impact value, which means that this sector is impacting the economic system widely in a region / country.

However, there is still a need for research on the relationship of marine sector multiplier impacts to marine environmental conditions, because the blue economic concept not only relies on marine as a source of economy, but also preserves the environment for sustainable development.

(Patterson et al., 2004) focuses more on the dynamic modeling of one of the maritime sectors ie tourism. In it, because there are some data that are hard to find, then more assumptions are used. Also, although his research focuses only on the Dominican Commonwealth, at least Indonesia can also make the results of this research as a reference, because geographically Indonesia is also a country that should promote the maritime sector as a sustainable development, especially the tourism sector. (Nyström et al., 2010) and (Trave et al., 2017) support the the fourth paper (Patterson et al., 2004) particularly in real interaction between social and ecology domain in tourism sector. It would be better if the study was supplemented by rigid outcomes such as the multiplier impact value on the tourism sector that is specific to the Dominican state.

(Blue Economy Concept, 2013) further explains the concept of blue economy. The Indonesian government should understand the development of various sectors of the global marine industry through this paper. In it, it is displayed a lot of data on the development of the world marine industry as well as data related to its impact on the sea in the world. Sustainable development issue on tourism is further explained in the eight and the ninth paper.

(Kusumastanto et al., 2012)'s study is actually in the form of a report made by the Indonesian Ministry of Marine Affairs and Fisheries in 2012. There are many legal and policy foundations in Indonesia and have been clarified and explained in this report. In addition, the modeling carried out in this report for some sectors such as fisheries is quite good although it is not equipped with scientific measurement or analysis.

Table 1. Comparison of Marine Sector Contribution of Several Countries (Kusumastanto et al., 2012)

| No | Country     | Beach Length (Km) | Sea Area (Km <sup>2</sup> ) | Marine Contribution to GDP                 |       |
|----|-------------|-------------------|-----------------------------|--|-------|
|    |             |                   |                             | Value                                      | %     |
| 1  | Thailand    | 2.800             | 420                         | US\$ 212 billion                           | -     |
| 2  | South Korea | 2.713             | 85.838                      | US\$ 14,7 trillion (1992)                  | 37    |
| 3  | Vietnam     | 3.260             | >1 million                  | VND 659,12 billion (2005)                  | 57,63 |
| 4  | U.S.        | 19.800            | -                           | US\$ 138,25 billion (Ocean economy, 2004)  | 1,2   |
|    |             |                   |                             | US\$ 11,4 trillion (Coastal economy, 2007) | 83    |
| 5  | China       | 32.000            | 3 million                   | RMB 2.966,2 million (2008)                 | 15,8  |
| 6  | Indonesia   | 99.093            | 7,9 million                 | -  | 22,42 |
| 7  | Canada      | 202.080           | -                           | US\$ 11,1 billion (2005)                   | 7,7   |

By comparison, Japan's marine economy is able to contribute up to 48.4 percent of its national GDP (equivalent to 17,552 billion US dollars), while Thailand, its marine field is able to contribute \$ 212 billion US dollars annually, with a coastline of only 2,800 km. Norway's GDP contribution is even sustained by nearly 60 percent of the marine resource-based economy. Indonesia, whose marine area is almost 70% of the total area, until now the contribution of the marine sector to its national GDP is still below 30% (Kusumastanto et al., 2012). Admittedly, Indonesia is still left behind in its marine development.

## V. CONCLUSION

Long before the concept of blue economy, Indonesia has actually tried to do many things in order to strengthen development in the marine sector. Even in the report, made by the Indonesian Ministry of Maritime Affairs and Fisheries in 2012 (Kurniawan et al., 2016), various activities such as international and regional conferences have been described during each president's term.

Researches by the papers presented in previous chapter above also strongly strengthen Indonesia as an archipelagic country to participate in developing marine sector and maintain marine conservation beyond national jurisdiction. The marine industry sector is very clear that it will have a major impact on a country's economic system, as evidenced by research by (Jacobsen et al., 2013). However, the reality to date, for example, there are still many fishermen whose lives are even still in the poverty line. Even the sustainability of the sea and forests in Indonesia is increasingly troubling, exacerbated by the ongoing greenhouse gas effect.

Table 2. Proposed Concepts for Indonesia fishery development following the Blue Economy Concept

| No | Nowaday condition of Indonesia fishery                                | Blue Economy Concept  |
|----|---|---|
| 1  | Low Manpower Absorption, especially fisherman                         | High Manpower Absorption  |
| 2  | Issues in food security   | Maintained food security  |
| 3  | Low fish productivity   | High fish productivity  |
| 4  | Low value of fish product due to less effort for diversification      | High value of fish product with the diversified fishery product                     |
| 5  | Damaging the sea environment due to the use of conventional tools     | Conserving the sea environment by using friendly tools                              |
| 6  | Fish stock depletion due to overfishing                               | Maintained fish stock with seasonal catching period for certain fish with low stock |
| 7  | Inefficient fishing route   | Efficient routing by using fish finder technology with the help of GPS              |
| 8  | Less maintainable of fish quality with the use of ice cubes from land | Maintainable of fish quality with the use of efficient reefer technology            |
| 9  | High waste product  | Less waste product  |

With the aim of this study is to gain an understanding of blue economy concept and emphasize some of the results of existing studies, table 2 and table 3 depict the proposed concepts for Indonesia fishery and marine tourism development which are

resumed from reviewed references. Those can be used for Indonesia government, business owners, tourists, and other parties included in fishery and marine tourism sector.

Table 3. Proposed Concepts for Indonesia marine tourism development following the Blue Economy Concept

| No | Nowaday condition of Indonesia marine tourism                    | Blue Economy Concept   |
|----|--|--|
| 1  | Less supporting facilities (eg. ports and hotels)                | Integrated Supporting facilities   |
| 2  | Damaging the marine environment (eg. bleaching of corals)        | Conserve the marine environment  |
| 3  | Producing high waste products                                    | Producing less waste products or even zero waste   |
| 4  | Overcapacity in certain destination                              | Controlled tourist population  |
| 5  | Less promoted for several destinations                           | Well promoted to both the country and abroad   |
| 6  | Less impact to the local communities                             | High impact to the loacal communities  |
| 7  | Gaining benefits of tourist destinations without conserving them | Efforts to conserve the marine environment (eg. Marine eco-tourism, Marine Protected Area (MPA)) |

All levels of Indonesian society must understand this blue economic concept, not only understood and implemented by one layer only. Sustainable development in the marine field needs to be based on mutual will and environmental awareness today. Indonesia government should do some efforts that would ensure the achievement of both economic and conservation objectives, collaboration among stakeholders should focus on:

- Increase research effort on marine the biology, ecology and behaviour of the species/habitat involved.
- Integration of the knowledge obtained through research in the planning phase of marine tourism practices as well as in the update/improvement process of existing policies (adaptive management framework).
- Focus on reducing the observed negative impacts of marine tourism practices through prevention as well as improving existing frameworks: a) Increase education and ecological awareness of operators and visitors regarding the local species/habitat, b) Involve local communities in preserving their natural assets through non-consumptive activities and adequate management of marine tourism, and c) ensure the enforcement of policies by marine tourism operators and local authorities.
- Evaluate the possibility to implement conceptual elements, existing policies and frameworks from reported ‘successful’ cases, by adapting them to the specific circumstances of each case.

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