

A REVIEW OF APPLICATION OF BLUE ECONOMY AS A DEVELOPMENT CONCEPT FOR SMALL AND OUTER ISLAND IN INDONESIA, CASE STUDY: NATUNA ISLAND

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ABSTRACT

The blue economy as a concept of economic policy development where based on sustainable development) is a concept that becomes the vision of Indonesia as presented by the President at the Rio + 20 Conference. The major concern of Blue Economy application in Indonesia is that on a small and outer island in Indonesia where there's a lot of problem regarding about its connectivity and poverty needs to be overcome. And to be specified on Natuna Island because of its geographical benefits and its geopolitical effect on Indonesia towards the South China Sea This makes Indonesia requires a deeper study of the implementation of the blue economy. This paper contains literature studies on references related to the implementation of the blue economy in Indonesia (especially on small and outer island) and applications outside Indonesia, where an in-depth study of related aspects has been conducted. In addition, the literature used shows the comparative interpretation, peer comparison and implementation of the concept and application of blue economy both in Indonesia and outside Indonesia.

Keywords: Blue Economy, Small Island, Natuna, Maritime Economics, Indonesia

INTRODUCTION

1.1. Blue Economy as Indonesia Development Framework

As an Archipelagic state with more than 17.500 island makes Indonesia the biggest Archipelagic state in the world. The major concern is not all the habitable small and outer island as seen in Table 1 is well managed. As Indonesia become a part of Rio+20 convention which Indonesia declares that will develop its marine sectors adhering to Blue Economy concept. The small and outer island becomes the frontier of Indonesia sustainable development to support geopolitical strength, people welfare, economy, and ecosystem. It's a fact that small and outer island in Indonesia has difficulties in their access, poor management in fisheries aspect, and poverty. As part of Indonesian archipelagic Small island areas have the potential of natural resources and high environmental services and can be used as the basic capital for the implementation of Indonesia's development in the future. This area of unexplored resources provides

productive natural resources such as coral reefs, seagrass beds, mangrove forests, fisheries and conservation areas (BAPPENAS, 2008).

Table 1 Indonesia's Small and Outer Island (BAPPENAS, 2008)

No	Province	Number of Small and Outer Island	Number of Habitable Small Island
1	Nanggroe Aceh Darussalam	6	
2	North Sumatera	3	1
3	Riau Island	20	3
4	West Sumatera	2	
5	Bengkulu	2	1
6	Lampung	1	
7	Banten	1	
8	West Java	1	
9	Central Java	1	1
10	East Java	3	
11	Nusa Tenggara Barat	1	
12	Nusa Tenggara Timur	6	1
13	East Kalimantan	4	2
14	North Sulawesi	11	7
15	Central Sulawesi	3	1
16	North Maluku	1	
17	Maluku	17	9
18	Papua	9	5
	Total	92	31

As Indonesia also declares to be World's Maritime Axis in the future application of Blue Economy is emerging, the concern is it should not only centralize in the big island in Indonesia. The connectivity, tourism development, fisheries, and other aspect involving should be also applied to the small and outer island in Indonesia. The character of small island which its economies of tend to be based on a single or limited range of activities (e.g. fishing, tourism, particular cash crops); and also the numbers of people are relatively small, with population densities high creates relatively complicated and challenging strategies to develop, especially using blue economy concept (Bass and Dalal-Clayton, 1995).

In conceptualizing 'Blue Economy', we can say that 'Blue economy' refers to the new system of ocean-based Green Economy that interweaves creative neo-science and technologies with the ocean. More precisely, it implies a new growth engine by promoting both the sustainable use and preservation of the oceans, ensuring the Earth's continued survival (Kathijotes, 2013). The blue economy in Indonesia which emphasize on sustainable development demanding the cooperation of multiple governance parties, and policy support. As in various aspect, the vision of sustainable development differs each institution is a burden the process to create such an action to develop sustainable policy and actions. The development of small islands also faces various threats from ecological aspects such as environmental degradation, such as pollution, destruction of ecosystems and overfishing or social aspects caused by low accessibility and lack of local community acceptance. Therefore, in anticipation of these changes and threats, the management of small islands must be comprehensive and integrated.

This paper reviews the literature which contains the research or report with the possibility of actions to implement to develop small and outer island in Indonesia, also review the possible research to improve and to conduct further research as a platform for decision maker and government in Indonesia. As a multi-domain aspect, blue economic policy opens up many opportunities to analyze inter-influential aspects in it. The concept of a blue economy which relies on sustainable development means that development in one aspect should not negatively impact on other aspects. This is certainly a challenge where prior to policy-making needs to be conducted a study of how the interrelationship between every aspect involved such as social, environment, tourism, and economics.

1.2. Overview of Natuna Island Potency

As mentioned above besides the tremendous amount of outer island in Indonesia, there is one island to be specified on this research to assess is Natuna Island. Natuna island is chosen not only because of its position located in the outer most of Indonesia's territory jurisdiction but also because of its implications in Indonesia's geopolitical strength towards the South China Sea. Its a fact that the Indonesia's geopolitical strength in the South China Sea could achieve from the economic strength in Natuna Island. Natuna as an outer island in Indonesia with a huge natural resource such as:

- Marine fisheries resources reaching more than 1 million tons per year with a total utilization of only 36%, of which only about 4.3% are utilized by Natuna District itself.
- Agriculture & plantations such as yams, coconuts, rubber, palm, and cloves.
- Attractions: nautical (beaches, diving islands), mountains, waterfalls, caves, and cultivation.
- The D-Alpha gas field located 225 km to the north of Natuna Island (in ZEEI) with a total reserve of 222 trillion cubic feet (TCT) and 46 TCT hydrocarbon gas is one of Asia's largest sources (Prasetya, 2016).

BLUE ECONOMY AS DEVELOPMENT CONCEPT

Small Island Development States (SIDS) has developed the Blue Economy concept based on the Rio + 20 conference which the main issue is to improve human welfare and social justice, while significantly reducing environmental risks and ecological scarcity. Based on this concept the background of why the Blue Economy became concern is due to the awareness of the geographical conditions of the world where 72% of Earth's territory is the oceans and oceans have a percentage of 95% of the existing Biosphere, this is what underlies the so-called Earth as Blue Planet (Blue Planet).

The blue economic concept outlined has several principles that promote the principle of equality. These principles are:

- Optimizing the benefits resulting from the development of marine environments (eg, fisheries, and mineral resource exploitation)
- Promoting national equality, including gender equality, developing inclusive generation, and decent employment for all citizens.

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- Having special attention reflected in the development of more national jurisdictional seas, including the revamping of the marine governing international policy (UNEP, 2012).

In addition, this paper also emphasizes vital issues in relation to the implementation of the blue economy, where the issues are:

- Sustainable use of existing biodiversity.
- Food security
- Fisheries that do not promote sustainable principles
- Climate change and carbon management
- Coastal and marine tourism
- Marine pollution and debris
- Cooperation between government and international (SIDS, 2012).

From the things described above, this paper can be used as a reference for countries that have the vision to develop the blue economy to know what aspects can be extracted and can be processed, of course by promoting the principle of sustainable development. As the oceans are very large and particularly sensitive ecosystems, which need to be preserved, a balance between the use and the protection of the seas has to be found (Ehlers, 2016).

The maritime sector emerges with Blue Economy appear to be a significant aspect of world's economy, according to the European Commission, the EU's blue economy represents 5.4 million jobs and a gross value added of just under € 500 billion per year (Ehlers, 2016). This article also mentions the common maritime activity as a "Traditional Maritime Activity" which emphasizes the basic activity of maritime include transportation as a heart of maritime activity, port service and shipbuilding as well as fisheries. Even traditional maritime activity is a major revenue for the whole maritime sector, Blue Economy also produce new economic areas to explore such as:

- Aquaculture
- Coastal and maritime tourism (blue tourism)
- Marine biotechnology (blue biotechnology)
- Ocean energy (blue energy)
- Seabed mining.

The sectors mentioned above are the new emerging industry that can support the Blue Economy as well as become an alternative to conducting sustainable development of maritime sectors.

As the demands of maritime activity increase, the concern to keep the marine environment stay on good terms, environmental aspect become a major concern to consider. Various maritime activity such as maritime shipping, fisheries and aquaculture, blue biotechnology, mining, blue energy, blue tourism, and desalination become several things to consider regarding their impact on the marine ecosystem. Several things mentioned before have the tendencies to improve the environment but does not rule out the possibility of side effect into the ecosystem. It makes the aspect regarding maritime activity needs specific attention regarding its effect on the marine environment.

The regulatory frameworks to develop sustainable maritime activity as the implementation of the blue economy need to be implemented. The main source of regulations regarding the seas already provided by UNCLOS. This constitution of the

sea aims at establishing a legal order which, quoting the Preamble, “will promote the peaceful uses of the seas and oceans, the equitable and efficient utilization of their resources, the conservation of their living resources, and the study, protection, and preservation of the marine environment” (Ehlers, 2016).

The purpose of the regulatory framework is to conduct ocean governance as a platform for decision maker and protection. The establishment of regulations alone is not sufficient. What is still needed is ensuring compliance with these regulations. That requires their effective implementation and enforcement (Ehlers, 2016). The ocean governance should see its policy as a long-term vision to ensure the upcoming generation also can enjoy the wealth of the seas, as its also the objective of Blue Economy which is sustainable development.

ENVIRONMENTAL CHALLENGE TOWARDS SUSTAINABLE DEVELOPMENT

To pursue the sustainable development there is appear to be an interlinked problem of environment and development, especially on small island states. Also considering the implementation of agenda 21 at United Nations Conference on Environment and Development (UNCED). As a follow-up to UNCED, the UN Global Conference on the Sustainable Development of Small Island Developing States was held in Barbados in May 1994. The conference reaffirmed the principles and commitments to sustainable development made at UNCED and set out a programme of action for small islands to implement Agenda 21. It also stressed the need to develop national and regional strategies, plans, policies and processes (Bass and Dalal-Clayton, 1995).

The outline of the main issues that small island encounter to conduct a sustainable development. The major characteristic of small island states are:

- A narrow economic base;
- Economic dependence on larger countries for markets and investment and, most significantly, for sea and air transport
- Geographic isolation within and between countries which can significantly limit economies of scale;
- Geographic isolation (which, however, can effectively be reduced by proximity to an established sea or air route);
- An inability to exploit land transport fully;
- Small populations, and hence a limited pool of skills;
- Yet often high population densities, and hence high demands on resources (Hong Kong, Singapore, South Tarawa (Kiribati), Majuro (Marshall Islands), Malta and Barbados have some of the highest population densities in the world);
- Highly circumscribed space; paucity of natural resources; and, even though productivity is often high, production systems are often highly vulnerable;
- The intimate linkage of all island ecosystems: impacts in one part will affect other parts;
- A high ratio of coastline to land area, leaving islands vulnerable to marine and climate influences, such as cyclones, hurricanes, storm waves, salt-related corrosion and marine Pollution; the vulnerability of island ecosystems to other external ecological influences, notably exotic Species introduction; and in spite of the above, the presence of traditional and/or community-based "subsistence affluence" systems of production, which may be sustainable in the face of many island constraints.

Further, the key factors for developing a framework for island sustainable development require:

- understand its economic and ecological characteristics: the resource capabilities and their values;
- understand the rationale and operation of traditional and subsistence resource management systems, and the preconditions for their successful use and future development;
- understand the external economic and ecological influences: their type, degree, frequency/hazard, and likely costs/benefits;
- assess the island's interactions with external influences: their impacts on island capabilities and values; and identify ways of maximising positive interactions and minimising hazardous ones;
- understand the economic and policy signals (external and internal) encouraging current resource uses;
- set strong strategic "bargaining" positions with external decision-makers, to counter the boom-bust syndrome;
- Institute public participation in decision-making and resource management, based on traditional systems where appropriate;
- set ultimate limits to the appropriation of natural habitat, based on the total economic value of natural habitat, the costs of its removal, and the costs of its conservation 4;
- restore, stabilize and develop the resource base outside protected natural habitat - to include strategies aimed at multiple and adaptable purposes, using minimal external inputs, closing ecological cycles,
- combating wastage and taking advantage of renewable sources of energy;
- establish hazard management capabilities, e.g. for oil spills, hurricanes, and other potentially catastrophic external influences;
- equip institutions and staff to undertake multiple functions, and to have a good grasp of the interactions of economic, ecological and social subsystems, but also to have access to the best specialists when needed;
- enable training institutions to produce highly-qualified generalists;
- establish policy, legislative, participatory and economic incentives and other means to achieve the above; and
- determine which aspects of the above are best tackled regionally (notably in cooperation with other islands) rather than nationally.

The aim of Blue Economy models is to shift society from scarcity to abundance – based on what we have and to start tackling issues that cause environmental and related problems through novel ways. Some major factors that cause ecological alterations to coastal and surface waters and contribute to nutrient inputs include municipal wastewater and stormwater discharges; combined sewer overflows; other urban runoff; agricultural runoff; aquaculture; and various others (Kathijotes, 2013) as seen in Figure 1.

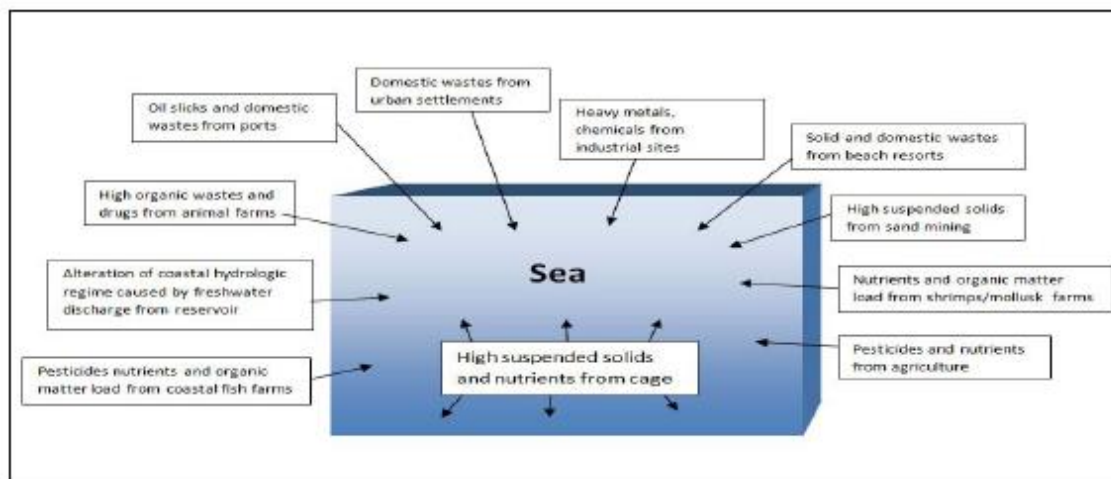


Figure 1 Pollutants of the Sea (Kathijotes, 2013)

Management decisions and investments that focus on the well-being of the oceans are essential if we are to continue to profit from this rich natural resource. Many natural resources found in marine environments are being degraded by unsustainable use, ultimately putting their ecosystems, food security and climate regulations at severe risk. The application of a 'blue' economy concept would be a big step on the right path. 'Innovation', is the key word on which to work on. The world's marine ecosystems provide essential food and livelihoods to millions of people. According to UNEP, a switch to a blue economy would unlock the potential of the marine-based economy while reducing ocean degradation and alleviating poverty (Kathijotes, 2013).

NATIONAL STRATEGY FOR SUSTAINABLE DEVELOPMENT

Indonesia government represented by Dewan Kelautan Indonesia already provide the report about marine economy policy using Blue Economy concept. This report explains the follow-up of the importance of implementation of the Rio + 20 conference in the development of the blue economy in Indonesia. This report emphasizes the ratification of UU no. 17 the. 1985 on the Law of the Indonesian sea does not yet have a policy that specifically regulates the sea (Sutarjo et al, 2012). This report outlines how the current state of marine policy in Indonesia, the marine economy, the application of marine economics to the blue economic model, and policy development.

This report identifies what policies have been outlined in the laws governing the maritime field. Among the several laws is Law no. 1 of 1973 on the Indonesian Continent, Law no. 5 of 1983 on Indonesia's Exclusive Economic Zone, Law no. 5 of 1984 on the industry, and others. This report also explains historically the Indonesian as a marine-oriented state of affairs has been done through declarations made, where the Djuanda Declaration establishes the Indonesian marine territory, the Bunaken Declaration which instructs the Indonesian development oriented toward the ocean, and the establishment of the Sea Exploration Department which is on its way become the Ministry of Fisheries and Marine Affairs.

In this report also described how the marine economy as the mainstream of national development. Where the vision and mission of development in Indonesia are contained in the Law no. 17 of 2007 concerning the national long-term development plan of 2005-2015 whose implementation in the maritime field is based on 5 (five) main

pillars namely: maritime culture, marine governance, marine economy, defense, marine safety, and marine environment.

On this paper also describe the major actions to take by Indonesia's governance inter-agencies which: Economic Development of Sea Transportation, Economic Development of the Maritime Industry, Economic Development of Fisheries, Economic Development of Marine Tourism, Economic Development of Marine Energy and Mineral Resources, Economic Development of Marine Building, Economic Development of Marine Services, Cross-sector Economic Development of Marine sector.

BAPPENAS as Indonesia government's developing agencies also conducts the report as a national framework to develop small island in Indonesia. These reports describe the strategies and plan to develop small island in Indonesia. The concern is that the development of small islands is a process that will bring about a change in its ecosystem. These changes will have an effect on the environment. The higher the intensity of management and development that is carried out means that the higher the utilization of resources, the higher the environmental changes that will occur on the small islands (BAPPENAS, 2008).

This report also explains the common issue for a small island. With the number of islands and the potential of its vast natural resources and scattered locations making it difficult to achieve it, the Government needs to give greater attention to the national issues relating to the management of small islands. The example of the corresponding issue of the small island are:

- Unconfirmed data bank (database) small islands containing the name, area, potential, characteristics, business opportunities, problems and others;
- Most of the small islands are lagging, uninhabited or sparsely populated but have good natural resource potential;
- Limited facilities and infrastructure of sea transportation that can connect with mainland and between small islands;
- Some small islands have become disputes between provinces and districts/municipalities;
- Unclear authority on the management of small islands in border areas between the Government and Provincial / Regency / City Government;
- Some of the outermost small islands that have strategic functions as they relate to boundaries between States are threatened to disappear due to uncontrolled sand mining;
- The occurrence of pollution around the waters of small islands due to increased disposal of solid and liquid waste;
- Small islands have the potential to be places of activity that can threaten national stability and security;
- Limited monitoring, monitoring, and surveillance (MCS) systems in small islands are still limited (BAPPENAS, 2008).

As a result, this report conducts the strategic actions to take as a part to develop a sustainable small island economy. The actions grouped by various aspect point of view such as general strategy, and specific strategy. For general strategies the major actions to take are:

- To realize the integration of political, economic, social, cultural, defense and institutional aspects;

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- Implementing institutional arrangements and strengthening of Government, Local Government, community and private / business world;
 - To prepare database (spatial) and spatial planning (sea, coastal and small islands);
 - Conducting development and structuring facilities and infrastructure with respect to environmental carrying capacity
 - Develop a community-based small island management plan and local resources with due regard to customary law / local wisdom
 - Implement regional coaching and quality improvement of human resources for the sake of national defense in an integrated and continuous
 - Increase public participation and access to information, capital, marketing and technology
 - Realizing opportunities and a conducive business climate for investment
 - Undertake the inventory, study, management, and development of conservation areas
 - Provide adequate legal instruments and enforce the law with due regard to customary law and customary rights.

The main challenge of the development of policy in Indonesia regarding the small and outer island is As the biggest archipelagic nations Indonesia has inconsistency in policy making and development of marine governance. As a result, the vulnerability of Indonesia marine resource is kept decreasing over time. The continuing decline of marine resource abundance and the degradation of marine ecosystems result to a large extent from policies that are still structured around unsustainable approaches to marine resource use.

So far it seems that the national policy framework has focused on addressing the symptoms (by outlining measures for dealing with sensitivity and adaptive capacity) without adequate consideration of one of the underlying causes of vulnerability (exposure). A more holistic and balanced approach needs to be taken if the Indonesian policy framework is to be appropriate and effective in addressing the vulnerability of its coastal communities to marine resource degradation (Ferrol-Schulte et al, 2015).

NATUNA AS ROLE MODEL FOR BLUE ECONOMY AT SMALL AND OUTER ISLAND IN INDONESIA

Natuna with its characteristic and potency need special treatment to conduct sustainable development especially using Blue Economy concept. In fact, every small and outer island in Indonesia needs their own treatment to develop due to social, geographical, and economic diversity. The explanation mentioned above might just generally overviewed the aspect towards blue sustainable development. Further, Natuna as one small and outer island in Indonesia with strategic resources and geopolitical effect through the South China Sea need the specific strategy to conduct sustainable development.

By seeing the global multiplier effect of marine sector and comparing with natural island GDP we can decide what sector needs to be developed more so that the correct strategies can be taken. In general, with evaluations that only assess the direct economic impact. Whereas the marine industry has more indirect economic impacts that actually stimulate other industries (R., Dyck A. J. & Sumalia U., 2010). These indirect effects are called multiplier effects. the research was conducted to see the influence of the

factor of multiplication especially in the maritime industry globally, where the aspects reviewed are 8 (eight), namely: 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). By viewing Figure 2 we know that the highest global maritime multiplier effect comes from commercial harvest.

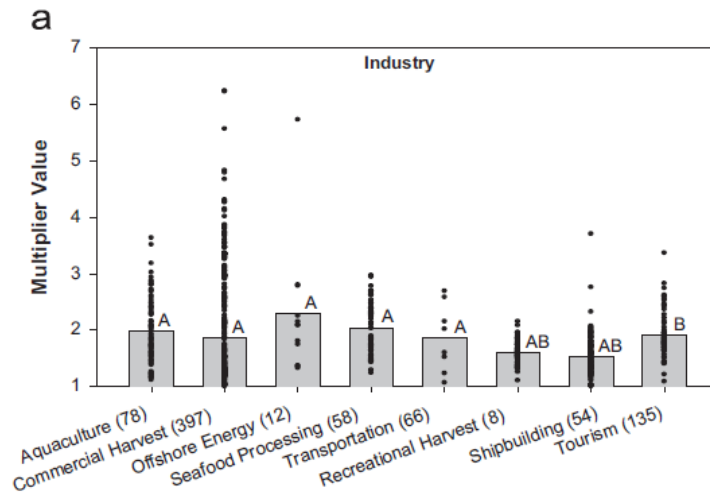


Figure 2 Global Multiplier Effect (R., Dyck A. J. & Sumalia U., 2010).

Now by seeing the Natuna GDP provided by National Statistic Agency in Table 2, we can see that Natuna already follows the global trends on their economics activity. Even though the biggest contribution is from mining, we can see the harvest, forestry an Fisheries are the second largest contributors into Natuna GDP. This indicates Natuna Island has the capital to how to conduct the sustainable development of those sectors.

Table 2 Natuna GDP (BPS, 2017)

Category	2010	2011	2012	2013	2014	2015	2016
Harvest, Forestry, and Fisheries	10.06	9.95	9.70	9.71	9.67	9.84	10.26
Mining	77.66	76.77	77.12	76.75	76.16	75.35	74.03
Processing Industry	0.70	0.71	0.68	0.68	0.70	0.72	0.75
Electrical and gas supply	0.08	0.09	0.09	0.09	0.08	0.08	0.08
Water supply and Recycle	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Construction	5.26	6.10	6.10	6.34	6.66	6.88	7.18
Small and large retail, and automotive repair	2.09	2.24	2.19	2.19	2.32	2.69	3.04
Transportation and warehousing	0.43	0.45	0.47	0.51	0.56	0.64	0.71
Accomodation and food supply	0.35	0.36	0.36	0.37	0.39	0.43	0.45

Continued from Table 2

Information and Communication	0.54	0.52	0.50	0.48	0.49	0.50	0.53
Monetary and Insurance	0.11	0.11	0.10	0.11	0.11	0.12	0.13
Real Estate	0.53	0.53	0.52	0.51	0.52	0.55	0.58
Services company	0	0	0	0	0	0	0
Governance and administration	1.71	1.71	1.70	1.81	1.86	1.71	1.74
Education	0.14	0.14	0.14	0.15	0.16	0.16	0.17
Health and Social Services	0.26	0.26	0.25	0.25	0.26	0.28	0.29
Other	0.07	0.06	0.06	0.06	0.06	0.06	0.06
GDP	100	100	100	100	100	100	100

For example, the effort to conduct sustainable development on fisheries sector on Natuna is the application of KIMBis in the coastal area of Natuna Island. With the principles of the blue economy is the reuse of waste from marine and fisheries business towards zero waste. Three other principles that support zero waste is the technology used must be innovative and adaptive, a business must have a social inclusion, and business should be able to push the vast multiplier effect in the economy. With these principles, KIMBis Cakradonya, which already applied on Banda Aceh, in 2013 had implemented blue economy by using the technology of Integrated Multitrophic Aquaculture (IMTA). This technology prioritizes soft-shelled crab as the commodity target which is integrated with milkfish and seaweed as a non-targeted commodity. This paper aimed to illustrate the results of blue economy implementation principle by using IMTA technology. Results showed that the implementation of IMTA's marine conditions is excellent for cultivation soft-shelled crabs, seaweed, and milkfish in an integrated manner (Zulham et al, 2013). The multitrophic principle of aquaculture is zero waste, meaning that feed input will only be given to targeted commodities with high economic value, while the remaining feed and all remaining nutrients will be utilized by subsequent quantitative commodities far more than targeted commodities (milkfish, tilapia, seagrass, and oysters). Target and non-targeted commodities are expected to provide a multiplier effect in the economy; cultivate new activities that encourage the opening of new jobs in the community.

The application of further technology to improve the marine sector on Natuna still not maximize its potential. For example, the recent improvement of the fisheries sector in Natuna is the development of Integrated Fisheries Center or Sentra Kelautan dan Perikanan Terpadu (SKPT). This action might become the initial step for further development of sustainable fisheries in Natuna Island. The next step is to apply the possible further cutting-edge technology application to maximize Natuna potential resource. With limited area of shore in the future, Natuna Island need a strategy to maximize its potential.

CONCLUSION

As in Indonesia the small and outer island development are still left behind, the governance multi-institution agencies shall unite their vision. On the corresponding literature, most of Indonesia governance institution already has the same perspective about developing the sustainable marine development. The problem is that in the small and outer island in Indonesia where connectivity as a major concern needs special attention to be overcome. The implementation of cutting-edge marine technology as development tools is still below the expectations, this creates challenges and opportunity in the future so that further improvement can be conducted in the future.

Indonesia, which has poured its vision as a country committed to implementing the blue economy, where regulation is still weak regulatory strengthening can be done as a first step to make the implementation process of blue economy more rigid, besides looking from the synergy of institutions acting as the foundation of economic executor blue, the synergy between institutions needs to be improved so that in designing the blue economic vision the national objectives can be achieved.

As an improvisational step of the analysis initiatives as outlined in the previously described papers will greatly assist Indonesia in its plans and decision-making. As a multidimensional object, the sea needs proper handling in its management so that all parties and the sea itself becomes sustainably preserved as listed in the objective of the initiation of a blue economy of sustainable development

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