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The Relationship Blue Economy, Fishery Development Sustainable and Production Fishery

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Abstract

The purpose of this paper is to examine blue economy that affects fishery production through sustainable fisheries development. The approach used this study was mix method, namely, quantitative and the sample were obtained from 150 respondents comprising Fishermen's Cooperative at Banten Province in Indonesia. This structural equation modelling used to analyze the data via Smart PLS 3.0. Findings from this paper revealed that the blue economy contribute to increase sustainable fisheries development and fishery production. whereas, sustainable fisheries development factors, namely, institutional, socio-economy and community sustainable give contribute of fishery production, only ecological sustainable as exception. The practical implication appropriate blue economy and sustainable fisheries development can enhance fishery production at fishermen's cooperative. This study extends the literature on blue economy context in emerging country. The originality of this paper examines qualitative and quantitative analysis (no previous study on this relation) and the study conducted on the Fishermen's Cooperative in Indonesia.

Keywords: blue economy, sustainable fisheries development, fishery production, covid-19.

INTRODUCTION

Indonesia is the largest archipelagic country in the world in which there are very abundant potential natural resources. The sketch of the archipelagic state is very beneficial because Indonesia is no longer seen as a country divided by islands separated by the sea, but a sovereign state consisting of islands united by the sea. So that the territorial area of Indonesia becomes wider, not only bound by the territorial sea, but also the waters of the Exclusive Economic Zone (EEZ) (Sutardjo, 2014).

Indonesia's economic conditions are able to influence the global economic cycle. This is in accordance with The Wealth Report's prediction that by 2050 Indonesia is included in the top 10 countries with influence in the world economy (sourced from the GDP ranking value in Purchasing Power Parity). One of the key aspects of economic success is determined by how much knowledge/new innovative products are generated. A knowledge-based economy and innovation are the keys in facing competition in the trend of world economic transformation. The dynamics of economic behavior begins with an industry-based economy, then moves in a knowledge-economy economy by prioritizing production mechanization, and in the end goes beyond an economy that prioritizes or is based on creativity and innovation (science & technology). those who adapt to use innovation in products to services. Innovation in science & technology will become economically valuable by including growth strategy factors as well as competitive strategy, value proposition, market segmentation, revenue model and value chain structure (Saefuddin, 2015).

Many players are actively advocating for new or enhanced international attention to oceans and ocean governance institutions; many argue for additional investment in ocean conservation and development, while some perceive new opportunities for accumulation. In this sense, the birth and spread of the term "blue economy" can be seen as an example of "grabbing green," in which ocean spaces and resources are discursively included into the broader green economy agenda and certain, neoliberal, principles are rising inside international oceans governance (Silver et al., 2015).

In the United Nations Conference on Sustainable Development (UNCSD), which was held in the City of Rio de Janeiro, Brazil from 20 to 22 June 2012, it focused on 2 main themes of further development and refinement of the Institutional Concept in Sustainable Development and its Growth. called the "Green Economy Concept". The "Blue Economic" approach has a broad relationship in the utilization of marine products for the prosperity of the community. Because the marine sector has a big role for the future of humanity, the Blue Economy recommends a better sustainable development approach. The sea explores most of the importance in the global population as food and means of transportation accounting for about 80% of global trade, and the marine and coastal environment are also the main resources for the benefit of the world tourism industry (Prasutiyon, 2018).

Oceans, which make up more than 95 percent of the biosphere, are where life began. The ocean, regardless of what we do to improve its health, continues to support all life by producing oxygen, absorbing carbon dioxide, recycling nutrients, and regulating global climate and temperature. It provides food and livelihood to a significant section of the world's population and transports 80 percent of global trade. The marine and coastal fronts provide a valuable resource to the tourism industry; they supply all of the elements for tourism development of the well-known notion of "sun, sand, and sea," and they contribute to the wide and developing domain of nature-based tourism. The seafloor currently supplies 32% of the world's hydrocarbon supply, and exploration is expanding. Technological improvements are paving the way for new frontiers in marine resource exploitation, from bio-prospecting to seabed mineral mining. The sea also has a large potential for producing renewable 'blue energy' from wind, wave, and tidal sources, and also thermal or biomass source materials (Bari, 2017).

The origins of the blue growth notion may be traced back to sustainable development; however, as international communication and research into the blue economy concept rise, more significant connotations are emerging. When examining blue economy examples, interdisciplinary and multidisciplinary research is crucial, with one of the primary issues being how to integrate across the different fields. The "Blue Economy" is a policy instrument or means of driving economic growth and job creation. Construction, transportation, mineral resource development, ship building, communication cable laying, pharmaceutical enterprises, equipment deployment, sustainable energy from waves, currents, seaside leisure tourism, and fisheries and aquaculture are among the marine industrial activities aimed at revitalizing the economy. In addition to traditional marine development operations, the marine-oriented information and research industries are becoming increasingly important in promoting blue economy sustainable growth (Wenhai et al., 2019).

Blue Economy is an emerging market (developing country) initiative initiated by SIDS (Suddent Infant Death Syndrome), as well as volunteers in all coastal countries, as well as nations that depend on waters outside of national law. SIDS has always depended on the sea to achieve people's welfare, thus The conceptualize of the Blue Economy of the ocean is a "development environment" in which the concept that combines conservation, oil extraction, bioprospection, sustainable energy production and marine transportation should focus on the possible impacts that arise, because in In the framework of the blue economy concept, the ocean or ocean is considered an economic resource so that it is

always maintained and managed for the future (Prasutiyon, 2018).

Since the idea of blue economy is based across several fields of study (such as geo-economics, politics, economics, social and cultural studies), it seen that development ideas cross ecology and planetary boundaries, with tipping points providing a new sense of urgency for reassessing the environment and economy and revaluing the marine/biological-economic relationship globally. Linking BE to the UN's SDGs is particularly difficult, especially when there are possible competitions or conflicts between individual or industrial goals such as reducing fossil fuel-based carbon emissions and providing electricity. The SDGs and their associated 17 goals, 169 targets, and 232 indicators are the product of a multi-stakeholder agreement between governments to minimize unsustainability and promote global sustainable development (Lee et al., 2020). In the past decade, the use of the term 'Blue Economy' has increased tremendously. However, there are still numerous unsolved problems regarding the conceptual and practical uses of the growing and increasingly prominent concept of a Blue Economy. Given the rising prevalence of the phrase in forums such as the OECD, United Nations Sustainable Development Forum, and Food and Agricultural, it is crucial to disentangle some of the competing claims and seemingly incongruous interpretations of the notion. It is uncertain whether debates over the future use of the world's seas, including progress towards the UN Sustainable Development Goals (SDGs), are taking place in a shared language or with an appropriate grasp of the consequences of the differing ways the phrase is deployed and enacted (Voyer et al., 2018).

Regarding such an ocean-sized industry, one of the things that interested in learning is what the new Blue Economy might and really ought to consist of. The capacity of our coastlines and oceans to fulfill the requirements of sustainable development is enormous. And, if it is possible to keep them in a healthy and productive state, or to restore them to such a state, the ocean will play an even more vital role in the future of humanity. The coasts and the ocean are, in many respects, the final on-ramp that we need to combine into our road to sustainable development (Spalding, 2016). Ecosystem adaptability, financial sustainability, community participation, institutional integration, and technological capacity are the five components of the Blue Economy. As fundamental components, ecosystem resilience, economic sustainability, and community participation are directly derived from the Blue Economy's foundations in sustainable development literature. Maintaining ecosystem resilience is essential when the carrying capacity of ocean ecosystems is strained by stressors that range from local to global dimensions and can result in cumulative and transboundary effects. Economic sustainability includes local subsistence as well as commercial operations that produce employment and government revenue. Community engagement, which is particularly important given the lack of reach of central governance systems, the high number of rural populations depending on marine ecosystems, and the prevalence of traditional marine tenure, completes the basic triad (Keen et al., 2018).

The purpose of the Blue Economy principle is to generate increased economic growth in the marine and fisheries sector, while at the same time guaranteeing the preservation of natural resources (Pauli, 2010). The Blue Economy concept will always be based on the people's economic development comprehensively to achieve national development in an ordered manner. The concept of sustainable development, such as the Blue Economy concept, has now become the mainstream in economic development policies in various countries, including Indonesia. The Blue Economy principle, in principle, emphasizes innovation and creativity to process raw materials into raw materials for other derivative products called zero-waste or leaving no waste (Zulham, 2012). There are ongoing efforts to safeguard waters where governance inefficiencies and IUU risks to fisheries exist. These include enhancing the openness and accountability of ocean-based activities through control technology such as monitoring, surveillance, and stricter licensing and

reporting rules. Although terrible human rights and labor abuses certainly exist in global fisheries and require more attention, it is hazardous to conflate "illegal" with "unregulated" and "unreported." In low-income nations, where about 90 percent of the world's fishers are engaged in small-scale and informal fisheries, fisheries are generally unregulated and unreported, but not necessarily illegal, and constitute a key source of revenue, food, and nutrition. In fact, the vast majority of fishermen are small-scale family businesses. Instead of addressing and preventing the underlying causes of unlawful activity and labor abuses, the most vulnerable may bear the brunt of imposing access controls and registration costs, thereby being pushed out of the market (Childs & Hicks, 2019).

Based on the above background, this research purpose is a social view of the well-being of fishers, as detailed more below, allowing us to investigate further the relationships between blue economy, ecological, institutional, socio-economy, community sustainability, and production fishery. These relationships are critical to the role of the blue economy for policy and management measures aimed at halting ecosystem degradation. They provide the key to understanding whether we can generate a sustainable level of consent among the people and communities who will be governed by that policy and whose well-being depends on those ecosystems.

Literature Review

Blue Economy Concept

In its evolution from 'triple bottom line objectives of environmental sustainability, economic development, and social equality or inclusivity, the Blue Economy as a concept is currently congruent with recent broader trends in environmental management (Keen et al., 2018; Voyer et al., 2018). In contrast to this sufficient support, the Blue Economic needs established frameworks, rules, and toolkits via which objectives can be established, action-planned action plans, and assessment and monitoring programs can be designed. Some have attributed this to the absence of a widely agreed-upon definition to support these governance systems. Others oppose the necessity of a universal definition and advocate for governments to build their own Blue Economy objectives based on the particular needs of their constituents. In the absence of a definition, several actors have advanced Blue Economy "activities." (Voyer et al., 2018).

The World Bank's concept encompasses multiple dimensions of marine sustainability, including sustainable fisheries, ecosystem health, and pollution prevention. Notably, the concept necessitates cross-border and cross-sector engagement through diverse partnerships and stakeholders. Nonetheless, various stakeholders will favour particular emphases or interpretations of the concept to achieve their objectives. It suggests that specific possible conflicts or problems may result from the preferences or interests of various parties (Lee et al., 2020). The Blue Economic comprises chances for development and growth and threatened regions in need of preservation. The underlying contradictions between these two arguments necessitate solutions that acknowledge and solve the ocean economy's risks while embracing its opportunities. In the context of the blue economy, the Sustainable Development Goals (SDGs) of the United Nations imply that economic development is both inclusive and environmentally sustainable. They emphasize the need to balance the economic, social, and environmental dimensions of sustainable development of oceans (Griggs et al., 2013).

The United Nations recently designated 2021 to 2030 as the "Decade of Ocean Science for Sustainable Development" to encourage efforts to break the cycle of ocean health deterioration and unite ocean stakeholders throughout the world behind a unified framework. This framework strives to ensure that ocean science can fully assist nations in establishing better circumstances for the ocean's sustainable growth. As a central component of the Blue Economy, the World Bank places particular attention on 'balancing the triple bottom lines of environmental sustainability concerning oceans (World Bank, 2017). The need for actively

participating among these stakeholders is emphasized in several SDG-related areas for a comprehensive response to marine environmental concerns and sustainable development of the maritime space. Special issues of HELCOM on eutrophication in the Baltic Sea (HELCOM, 2009, 2010) are an excellent example of an engaged, scientific group working toward a consensus across field stakeholders. In a paper on eutrophication in the Baltic Sea, Lundberg (2013) urged a holistic and sustainable approach to action through cooperation with all stakeholder groups and governance levels, with the carrying capacity of the Baltic Sea ecosystem as the top priority. Similarly, for maritime spatial planning (MSP) in Romania, Văidianu & Ristea (2018) advocate a call for significant actors and institutions involved in MSP application to participate in affected stakeholders and communities throughout all levels from small to large.

In addition, the relationship between humans and the ocean is shifting, and the traditional ocean economy is adjusting to meet new demands, ecological needs, and the dynamics of global climate change. Objective 14: Conserve and sustain Use the Oceans, Seas, and Marine Resources for Sustainable Development," one of the recently adopted UN Sustainable Development Goals (SDG) for the global ocean, defines seven targets and three ways of implementation for the sustainable use of the ocean (see table 2). Notable in this regard is objective 14.7, which states, "Increase by 2030 the economic advantages to small island developing states (SIDS) and least developed countries (LDCs) through the sustainable use of marine resources, notably through sustainable management of fisheries, aquaculture, and tourism." (Spalding, 2016).

The Relationship Blue Economy and Fishery Development Sustainable

The majority of blue economy management research takes a sustainable development stance. A conceptual framework developed by Keen et al. (2018) for the blue economy can be utilized to evaluate sustainable maritime management. Sarker et al. (2018) has established a management framework for blue growth, highlighting that promoting blue growth and achieving sustainable development goals involves collaborative efforts (SDGs). Howard (2018) discussed the role of stakeholders in sustainable development at length. Due to the confluence of the blue economy and marine ecology, ecological accounting and blue growth are intimately related (Lillebø et al., 2017)

Wild-caught and aquaculture fishing is a significant factor, but the blue growth idea encompasses all activities in the ocean and coastal zones (as well as freshwater). This includes shipping, oil and gas development, offshore wind farms, the rapidly expanding seabed mining industry, tourism, cruise ships, coastal development, and cultural and traditional usage (Howard, 2018).

Microplastics are a significant component of marine pollution and a substantial source of global ocean litter (Raubenheimer & McIlgorm, 2018). Human activities are the primary source of microplastics (Cole et al., 2011). Microplastics have expanded throughout the world's foremost maritime areas, having varying degrees of impact on human development and the biological environment, with some of the effects being disastrous (Jambeck et al., 2015). Microplastics have been discovered in biological cells, blood circulation systems, and even brains (Yu et al., 2018). Furthermore, a considerable amount of plastic accumulates in estuaries and coasts, affecting the natural marine environment in coastal areas and, as a result, the tourism sector, inhabitants' lifestyles, and port terminals. As a result, marine microplastics will harm the blue economy's long-term viability (Wenhai et al., 2019).

The government is in charge of coordinating cooperative microplastics governance. Its functions as the dominant government in the entire governance system include leadership, organization, coordination, and oversight. China, for example, has actively carried out marine debris control activities and established marine debris monitoring and evaluation in more than 50 representative sites along the

coast since 2007. The monitoring region primarily comprises areas of high public concern and sea areas with a high potential for marine debris that may impair the environmental quality of the sea area. The monitoring contents include beach waste, floating garbage, undersea garbage types, numbers, weights, and origins. China also manages marine debris scientifically and meticulously according to relevant laws and regulations, technical standards, and international treaties and prevents solid waste, such as plastic garbage, from damaging the coastal ecological landscape.

According to Charles (2001), there are four dimensions continuity in development fisheries and marine. For start, there continuity ecological. With consider continuity ecological this, development fishery/marine should Keep going ensure continuity biomass source power fishery/marine with ensure no exceed power support biomass. Development capacity and quality ecosystem Becomes attention important. Second, development fishery should sustainable by social and economic. Development fishery/marine should produce well-being period long. Third, development fishery should ensure sustainability society (community sustainability). Management resource fishery/marine should guard continuity wisdom locally obtained through management and development based on society. Lastly, problem continuity institutional. Development and management should character systemic, take advantage of system fishery. As has been discussed before, sustainability development fishery/marine depicted using a sustainability model called triangle sustainability (Charles, 2001).

Based on the information above, then the hypothesis proposed in the research is as following:

H1a: blue economy has an effect towards ecological sustainability

H1b: blue economy has an effect to institutional sustainable

H1c: blue economy has an effect towards sustainable socio-economy

H1d: blue economy has an effect towards community sustainability

The Relationship Blue Economy, Fishery Development Sustainable and Production Fishery

The Blue Economic is a notion of growth in the economy through the sustainable usage of ocean resources with technological inputs to improve symptoms and address the rising need for jobs without compromising the ocean ecosystem's health. Blue Economy can stimulate economic expansion and employment. It ensures food security, regulates and protects the ocean environment, generates new employment opportunities, and diversifies energy, pharmaceuticals, chemicals, nutrition, and materials for human well-being (Ninawe, 2017). However, the Blue Economy is a new concept. The ocean and its resources provide significant economic benefits to humanity. The ocean's economic activities focus on the massive expansion of marine industries such as oceans and coastal tourism, offshore oil and gas, shipbuilding, and maritime material transportation, which are paired with resource overexploitation (Sarker et al., 2018).

The ability to assess and solve the distribution of the ocean economy's social and economic advantages and harms is also lacking. Potential advantages include the regeneration of coastal economies, the development of alternative livelihoods, and increased food security and well-being. New economic prospects may also allow coastal states to reclaim sovereignty and access to marine resources. The premise of a 'trickle-down' blue economy, on the other hand, is problematic. Unregulated economic growth can result in economic inequality, limited local benefits owing to elite capture, adverse social and cultural consequences, exposure of marginalized groups to pollutants, and displacement of local inhabitants. A growing body of evidence from the worldwide fishing industry shows how unrestrained development can result in human rights violations such as enslavement and deterioration of local access to fisheries and food security. According to international social movements, 'ocean grabbing' occurs when ocean spaces and

resources are confined and exploited for growth. Similar difficulties have been noted in other maritime industries (aquaculture and oil), with global gatherings focusing on the need for social fairness and "blue justice." Specific concerns about small-scale fisheries (SSFs), Indigenous peoples, women, and youth, for example, were prominently discussed at the 2018 Sustainable Blue Economy Conference in Kenya. Nevertheless, the language of equity, diversity, and risk-sharing overtook policymaking and best practices implementation (Bennett et al., 2019).

Several projects aiming to attain fisheries sustainability have been implemented to recognize the importance of fisheries to global food security lives and economies. Most recently, the 2030 Agenda for Sustainable Development's Sustainable Development Goal 14 has established the goal of eliminating overfishing and replenishing depleted fish supplies. The world's fisheries have yet to meet this target, and the percentage of overfished stocks has remained relatively steady at roughly 30% worldwide since 2009 (Ye & Gutierrez, 2017).

Accounting for the complexity of freshwater ecosystems, the scale and dynamics of commercial and subsistence fisheries, and competing multi-sectoral freshwater users is a fundamental problem for incorporating inland fish into comprehensive sustainable development plans (Lynch et al., 2020). The finding of Oyakhilomen & Zibah (2013) in Nigeria, to achieve self-sufficiency in fish production, production of surplus for foreign exchange earnings through fish exportation, provision of employment opportunities along the fish value chain, contribution to poverty alleviation, particularly in rural Nigeria, and ultimately provide a platform for sustainable development of economic development of Nigeria. Must establish an adequate institutional framework to promote fish farming enterprise. It's possible due to the favourable agro-climatic conditions, massive water bodies in Nigeria that have yet to be utilized for fisheries output, and the existing local and international fish markets.

The polluting effluents from aquaculture systems substantially influence the ecosystem (Diana, 2009). Several studies have revealed that nutrient pollution could result from untreated wastewater containing fish excrement and residual feed near coastal ponds and cages (Naylor et al., 2000; Neiland et al., 2001). Therefore, untreated wastewater could result in coastal eutrophication, detrimental to water quality (Nakano et al., 2016). In addition, the use of antibiotics in shrimp farming has impacted the quality of coastal water (Lebel et al., 2016; Naylor et al., 2000).

Antibiotics are extensively used in shrimp farming to prevent and treat disease outbreaks, as their frequency has increased to the point where they severely impact shrimp yields (Cheevaporn & Menasveta, 2003; Lebel et al., 2016). Most Thai shrimp farmers utilized antibiotics on their farms. Seventy-four per cent of the 76 farmers interviewed utilized antibiotics in their shrimp ponds. The usage of antibiotics also impedes international trade (Sampantamit et al., 2020).

Even though natural resources are disproportionately crucial to developing countries' economies, priority is frequently given to immediate economic development demands over resource protection, as evidenced by the accompanying governance index (GI) rankings. It appears unmistakable that countries with lower GI ratings, primarily from the developing world, have higher average increases in effort. Although reducing effort is not always desired, and fishing patterns are frequently influenced by factors such as food demand, employment, and social requirements, countries with higher GI ratings are more likely to restrict fishing to ensure long-term sustainability (Ye & Gutierrez, 2017). Based on the information above, then the hypothesis proposed in the research is as following:

H2a: ecological sustainability has an effect to fishery production

H2b: institutional sustainability has an effect to fishery production

H2c: socio-economy sustainable effect to fishery production

H2d: community sustainable influence to fishery production

H3: blue economy has an effect to fishery production

H4a: Relationship between blue economy and fishery production through ecological sustainability

H4b: Relationship between blue economy and fishery production through institutional sustainability

H4c: Relationship between blue economy and fishery production through sustainable socio-economy

H4d: Relationship between blue economy and fishery production through sustainable community

Methodology

Data Collection and Analytical Technique

This research used a mix method between qualitative and quantitative method. This survey study was conducted at Fisherman Cooperative in Indonesia. The sample included 26 Fisherman Cooperative with six respondents were recruited form each for filling out the research questionnaire. The total number of the participants was 156, which included core member names: The head of village, director, treasurer, secretary, operational executive and supervisor. The questionnaire was distributed through a mail survey and the filling out time of questionnaire was three months, from January to March 2022. While, the respondents who filled out the questionnaire were 150 people. Thus, the data processed in this study were 150 samples. To maintain anonymity, respondents were not required to write their names. To comply with the university's ethical standards, a cover mail was attached to the questionnaire, explaining the objectives of the research, emphasizing that participation in the survey was purely voluntary and stating that the data would be analyzed on an aggregate basis for the scientific purposes.

This study applied with partial least squares-structural equation model (PLS-SEM). SEM is a multivariate technique, widely employed to study structural relationship. It allows several variables to analyzed in an integrated model at once (Hair et al., 2014; 2016). PLS-SEM provides useful insight into the conceptualization of constructs and theories that can be tested with empirical data. It also can reveal causal modeling complexities. According to Akter, et al. (2017), PLS-SEM explains the estimation of a model using a small sample with many latent variables. It was preferred over other techniques in consequence of the small sample and non-parametric nature of data. PLS-SEM can estimate from a relatively low sample size. Similarly, this approach is effective for analyzing data that are not normally distributed (Hair et al., 2016).

Conceptual Framework

Based on the constructs conceptualized in the model have been contextualized based on contexts in Indonesian Fishery Production. The adoption of constructs in this model has been modified based on context of the study area. The detailed descriptions of constructs are provided as above. All the hypotheses are summarized in the conceptual framework in Figure 1.

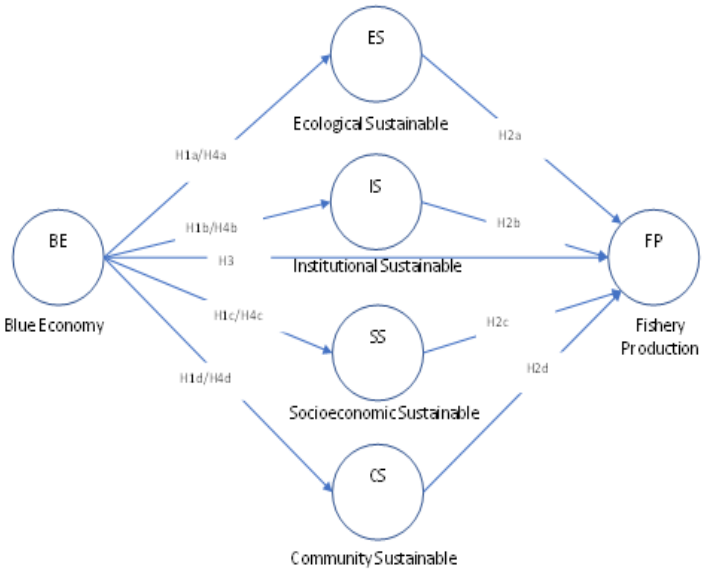

Figure 2. *Conceptual framework*

Measurement of Variables

All measures were adopted and modified from prior studies. All constructs were designed using a self-assessment report with a modified Likert-type with a measurement scale of 5. The questionnaire was developed using simple and easily understood language for the research objective to be achieved. To measure BE uses a scale of six items adapted from Bhattacharya & Dash (2021).Then, to measure ES, I adopted the four-items scale by Lefroy & Hobbs (1992). Fours indicators are used to measure IS based on (Spangenberg, 2002), six indicators to measure SS by (Efroymson et al., 2017). Meanwhile, CS is measured four indicators by (Thanthirige et al., 2016). Finally, I adopted the seven items-scale to measure FP based Bhattacharya & Dash (2021).

Data Analysis and Findings

Validity and Reliability

The result of the validity and reliability checks are exhibited in Table 1 below. To test the internal consistency, the values for composite reliability (CR) and Cronbach's α was checked. The results in Table 1 indicate that the constructs have internal consistency: the values for CR and Cronbach's α are greater than 0.70. As well, indicator reliability was checked by analyzing factor-loading values. According to Hair et al. (2016), factor loading should be greater than 0.70 to ensure indicator reliability. In this case, the values for all indicators are greater than 0.70. This shows that all indicators meet their loading goals in their respective constructs.

Table 1: *Confirmatory factor analysis with reliability and validity statistic*

Constructs	**Items**	**Loading**	**AVE**	**CR**	**A**
Blue economy	BE1	0.809	0.639	0.914	0.887
	BE2	0.832			
	BE3	0.795			
	BE4	0.804			
	BE5	0.779			
	BE6	0.775			
Community Sustainable	CS1	0.828	0.717	0.927	0.901
	CS2	0.833			
	CS3	0.870			
	CS4	0.812			
	CS5	0.890			
Ecological Sustainable	ES1	0.701	0.809	0.943	0.915
	ES2	0.965			
	ES3	0.939			
	ES4	0.964			
Fishery Production	FP1	0.786	0.620	0.920	0.898
	FP2	0.815			
	FP3	0.787			
	FP4	0.802			
	FP5	0.786			
	FP6	0.786			
	FP7	0.749			
Institutional Sustainable	IS1	0.909	0.772	0.912	0.870
	IS2	0.862			
	IS3	0.749			
	IS4	0.871			
Socio-economy Sustainable	SS1	0.827	0.677	0.926	0.903

SS2	0.788
SS3	0.809
SS4	0.834
SS5	0.931
SS6	0.736

Note(s): *BE = blue economy, CS = community sustainable, ES = ecological sustainable, FP = fishery production, IS = institutional sustainable, SS = socio-economy

Furthermore, the convergent validity was confirmed of the constructs by checking the values for average variance extracted (AVE). The AVE values for all constructs were greater that recommended threshold level of 0.50, indicating that all constructs were convergently valid. The Forner-Larcker criteria were applied to ensure discriminant validity, as shown in Table 2. According to those criteria, the square root values of the AVE were greater than the inter-construct correlations. In this study was confirming discriminant validity, because the square root values of the AVE were greater than the inter-construct correlations.

Table 2: *Fornell-Larcker criteria*

Construct*	**BE**	**CS**	**ES**	**FP**	**IS**	**SS**
Blue Economy	0.799					
Community Sustainable	0.937	0.847				
Economic Sustainable	0.826	0.748	0.899			
Fishery Production	0.992	0.921	0.842	0.788		
Institutional Sustainable	0.883	0.809	0.945	0.900	0.850	
Socio-economy Sustainable	0.956	0.918	0.842	0.960	0.896	0.823

Note(s): *BE = blue economy, CS = community sustainable, ES = ecological sustainable, FP = fishery production, IS = institutional sustainable, SS = socio-economy

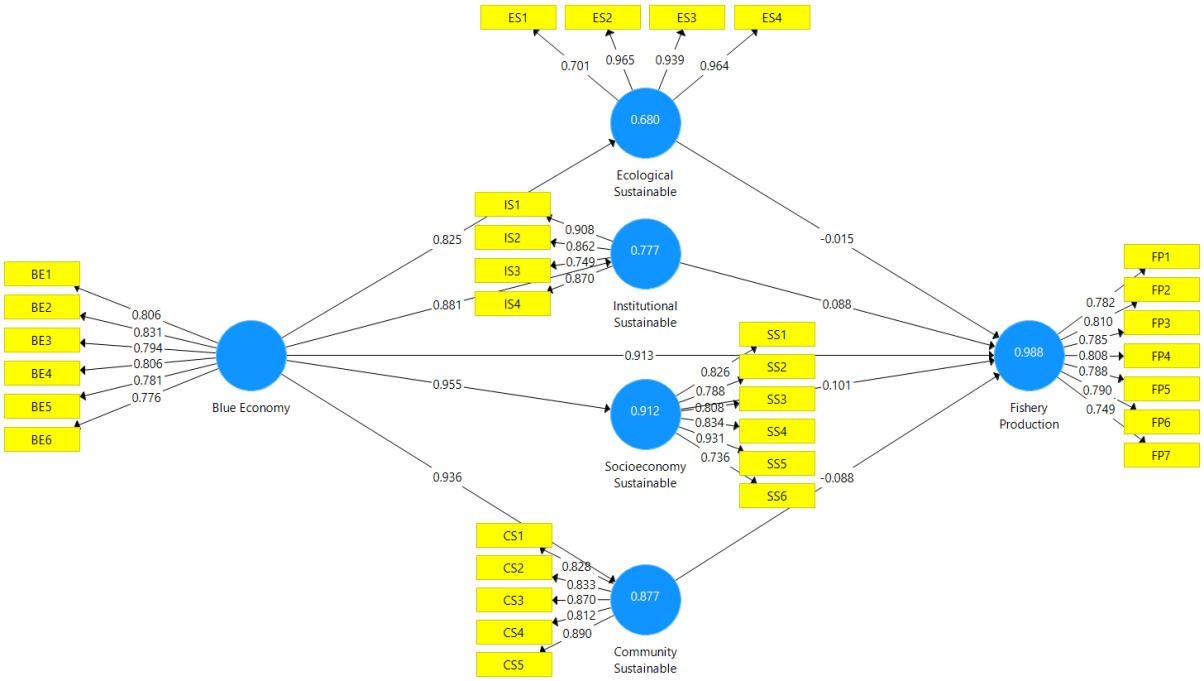

Figure 3. *Estimated model*

The results of the hypotheses testing are showed in Table 3. They exhibited that blue economy (β=0.936, T=95.474) had a significant and positive influence on community sustainable. Then blue economy on ecological sustainable (β=0.825, T=28.621), had a

significant and positive influence. Likewise, blue economy (β=0.881, T=53.426) had a significant and positive influence on institutional sustainable. However, blue economy had a significant and positive influence on socio-economy sustainable (β=0.955, T=147.106) and fishery production (β=0.913, T=18.817). Interestingly, ecological sustainable has negative influence on fishery production (β=-0.015, T=0.409) but not significant. Finally, community sustainable (β=0.088, T=2.553), institutional sustainable (β=0.088, T=2.438) and socio-economy sustainable (β=0.101, T=2.290) had a positive and significant influence on fishery production. Furthermore, the result of mediating testing is showed in Table 4. The mediating relationship between the constructs in this study were all accepted, except that the relationship between blue economy and fishery production no mediated by ecological sustainable (P value < 0.005).

Table 3: *Result of the structure model*

Hypotheses	Path	β	*T*-Value	Interpretation	Result
H1a	BE -> CS	0.936	95.474	Significant	Accepted
H1b	BE -> ES	0.825	28.621	Significant	Accepted
H1c	BE -> IS	0.881	53.426	Significant	Accepted
H1d	BE -> SS	0.955	147.106	Significant	Accepted
H2a	ES -> FP	0.015	0.409	Not Significant	Rejected
H2b	CS -> FP	0.088	2.553	Significant	Accepted
H2c	IS -> FP	0.260	2.438	Significant	Accepted
H2d	SS -> FP	0.088	2.290	Significant	Accepted
H3	BE -> FP	0.913	18.817	Significant	Accepted

Note(s): *BE = blue economy, CS = community sustainable, ES = ecological sustainable, FP = fishery production, IS = institutional sustainable, SS = socio-economy

Table 4: *Result of mediating*

Hypotheses	**Influence**	**β**	***P*-Values**	**Interpretation**	**Result**
H4a	BE -> CS -> FP	0.082	0.011	Significant	Accepted
H4b	BE -> ES -> FP	0.012	0.685	Not significant	Rejected
H4c	BE -> IS -> FP	0.077	0.016	Significant	Accepted
H4d	BE -> SS -> FP	0.097	0.023	Significant	Accepted

Note(s): *BE = blue economy, CS = community sustainable, ES = ecological sustainable, FP = fishery production, IS = institutional sustainable, SS = socio-economy

Discussion

Quantitative analysis

This section discusses the hypotheses testing result. First, the acceptance of H1a, H1b, H1c and H1d indicates that blue economy sustainable fisheries development at Fisherman Cooperative through ecological, institutional, socio-economy and community sustainable to set Gross Fix Capital Formation (GFCF), Electricity Consumption (EC), Carbon Dioxide Emission (DE), Information and Communication Technology (ICT) and Trade Openness (TO) (Bhattacharya & Dash, 2021). In addition, the blue economy can increase fishery production in fishermen's cooperatives in Indonesia. this is evidenced by the finding that the blue economy has a positive effect on fishery production (H3). The factors of fishery production, namely, Fish Price, Export, Gross Fix Capital Formation in agriculture, forestry and fishing (GFCFA), Electricity Consumption (EC), Carbon Dioxide Emission (DE), Information and Communication Technology (ICT) can increase due to the role of sustainable fisheries development, as evidenced by the influence of 3 dimensions of sustainable fisheries development (institutional, socio-economy and community) that affect fishery production (H2b, H2c and H2d), although ecological sustainability does not have a significant effect on fisheries development

sustainable (H2a). Furthermore, the direct relationship between the blue economy and fishery production has a positive and significant effect as shown in H3. Meanwhile, the indirect relationship through sustainable fisheries development mostly shows that the relationship between blue economy and fishery production is mediated by 3 dimensions of sustainable development, namely institutional, socio-economic and community sustainable (H4b, H4c and H4d), but only ecological sustainability does not mediate the relationship both (H4a).

Qualitative analysis

To help Indonesia make the transition to a blue economy in the era of Covid-19 pandemic, there are several main ways, including the following:

1. Expanded Marine and Aquatic Resources Administration (Fisheries, Mangroves, Coral Reefs)

Indonesia has grown executive fisheries management as a construct for significant independent direction with respect to collection rates for fishing areas. Naturally, this framework is great, execution continues to require spending plans, HR, and executives intend to prevent a decline in fish stocks, including ensuring clear collection limits in view of science and sufficient information.

Indonesia has also regulated the spatial arrangement of the sea by recognizing the sea domain that makes sense for monetary exercise, the actual sea area that must be secured. The combination of marine spatial arrangements with the current business permit framework is expected to ensure that developments conform to the draft guidelines. The “Scorecard” framework can be used to measure consistency and plan execution progress, with different pointers acting on the status of seaside and marine assets, such as mangrove area and coral reef properties. During long distances, Indonesia may consider cadastral preparations for marine and coastal areas (spatial title registry) to stay away from sea and coast front clashes.

Indonesia can apply executive fisheries standards “in mind freedom”, which supports best practice in fisheries areas of the planet. In this situation, the public authority grants privileges to individuals residing in the Waterfront Territory or grants the organization a certain number of accumulated freedoms to the extent possible. An arrangement like this makes anglers one of the individuals closely involved in fishing executives, supports great administration, and raise efficiency.

Indonesia could increase its aggressive mangrove reclamation target - 600,000 hectares by 2025 with more conservation exercises. The reclamation exercise must be complemented by measures to reduce and eventually stop the loss of the common Timberland Mangrove. The development of an essential forest conversion ban that also incorporates mangroves would be very helpful; Indonesia could begin planning for the implementation of results-based installments for the carbon removed in the biomass and soils of the extraordinary mangroves, and ensure these advantages arrive in the coastal network to provide a motivator to practical mangrove executives.

2. Assembly motivates power and speculation

Extending the basic management and essential foundations in landfill type, water management, and waste removal is expected to monitor the ecological effects of the beach front area, work on the basic administration and personal satisfaction of the beach network, and keep the travel industry objections from harm. The effort required will be enormous, but engagement at a global level indicates that the potential gains from upgrading the framework, for example, are very high (council level significant for sustainable marine finance aspects, 2020).

After all, the framework is only ready to deal with problems. In the long term, Indonesia's blue economy will require a reduced circular economy from the start. This work combines approaches that increase the cost of plastics, motivation for progress and reuse, and changes in behavior to reduce plastic use. Unofficial legislation in terms of extending producer liability can be supplemented by a store

discount framework, norms for reused materials, least reused content, and a focus on materials reused in open acquisitions.

3. Better framework for various kinds of information and observations

Indonesia's complex ocean ranges require precise and idealized data frameworks for fisheries, biological systems, and the effects of human exercise. It is important to grow as far as an overview to collect and collect stock data for a specific species, in addition to increasing the speed of delivery of the observation and electronic disclosure framework. Finalization of a stable strategy with regard to environmental audits and information sharing is also required. Better information will help areas of the travel industry. Observation of natural effects can be reached to well-known tourist sites to identify problems and provide data in relief length as soon as possible.

4. Change it to "bluer" after the Covid-19 pandemic

Implication Theory and Managerial

The difference of the research model with the prior studies shows this mix analysis between qualitative and quantitative analysis, thus adding to the research literature for further investigation. Because the results of this study become a research gap so that it becomes the concern of scholars. In addition, research in the fishery sector, especially in Indonesia, is still very lacking. For this reason, it is hoped that this research will become an additional basis for further research. The next implication in this study is that Fisherman Cooperative management is expected to prioritize blue economy and sustainable fisheries development to improve fishery production.

Limitation and Future Research

The study has some limitations that may be addressed by future studies. The first limitation is the restricted generalizability of the findings. Although they may be applicable to Fisherman Cooperative in Palangka Raya, Indonesia, readers should be exercise prudence when extending these findings to Fisherman Cooperative in other province entire Indonesia or even other country in emerging and developed countries. Research is encouraged to test the hypotheses in other contexts with large sample. Second, there may be other mediating factors in relationship blue economy and fishery production, therefore, future studies may consider other mediating (e.g., government policy) to enrich understanding of why or how blue economy and sustainable fisheries development influences fishery production.

Conclusion

1. To date, Indonesian fishing activities can be considered as ongoing, as they have not yet fully adopted responsible fisheries standards (Code of Ethics for responsible fisheries / CCRF).

2. The main problems in fisheries management actions are that management remains “open access” despite the licensing framework, that pressure is high in coastal waters due to the influence of small fishing fleets which account for 89 percent of the total national fishing vessels, and illegal fishing processes are increasing in these waters. off the coast of Indonesia.

3. The main problems in planting fishery practices are the provision of fish feed, which still relies heavily on imported products, the supply of superior seeds which are still insufficient to meet national requirements, and the lack of spatial planning to support the implementation of sustainable aquaculture.

4. The economic aspects of sustainable capture fisheries management include: (1) increasing the competitiveness of industrial products from fishing, (2) developing an efficient and quality marketing system and marketing system for fishery products on the State Internet, and (3) increasing efficiency small capture fisheries and meet economies of scale (economy of scale). The social components of the strategy include: (4) Improving the quality and welfare of fishermen

and catching fishery workers. Meanwhile, the ecological part of the strategy can be solved in the following ways: (5) Elimination of IUU Fishing and (6) Increasing the effectiveness of capture fisheries management based on the carrying capacity of aquatic ecosystems. And for the social component of the measures implemented, they include the following: (7) Strengthening the institutional capacity of fish resource inspectors and the effectiveness of their law enforcement; and (8) collection of reliable and integrated data and information on capture fisheries.

5. Formulation strategies that must be implemented to manage economically sustainable aquaculture are as follows: (1) provide sufficient seeds and feed in sufficient quantities and at reasonable prices, (2) improve the quality assurance system and food security for products aquaculture, (3) Develop a marketing system and distribution network for efficient fishery products, and (4) improve the efficiency of aquaculture business and fulfill business scale. In terms of social issues, the approaches are as follows: (1) Strengthening the social security system for cultivators and (2) increasing the empowerment of cultivators. Meanwhile, the ecological aspects of the strategy can be implemented in the following ways: (1) minimizing the risk of environmental damage by implementing aquaculture systems that are compatible with the carrying capacity of existing waters; and (2) developing an effective, efficient, and transparent fish resource management system. (3) Reducing the risk of introduction of invasive alien species (IAS), and (4) increasing the effectiveness of small-scale fisheries management methods based on the carrying capacity of the ecosystem. In addition, the social dimensions of the plan include: (1) Strengthening the institutional capacity of producers to improve their negotiating position (bargaining power) with business players (2) spatial assurance for aquaculture business; and (3) a reliable and integrated fishery data and information collection system.

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