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CONCEPTUAL FRAMEWORK TO INTEGRATE BLUE ECONOMY PRINCIPLES INTO FOOD SECURITY OF SMALL ISLANDS IN INDONESIA

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Abstract

Vulnerability of small islands prompts challenges of how to best solve the problem of food security in term of availability, access, utilization, and stability. The requirements to attain food security in fact often contradict with the nature of small islands which particularly present severe and complex difficulties in the pursuit of sustainable development. *Blue Economy* concept has been promoted by small islands developing states (SIDS) as a framework to solve the contradiction. Similarly, Indonesia enormously needs to examine the prospect and opportunities of the concept to ensure equal food security for millions of people scattered in thousands of islands. An initial effort to contest the possibility of integrating blue economy into food security is presented in this paper based on fishery perspective. FAO's food security scheme and experts thought are used to propose schematic integration framework between blue economy and food security.

Key Words: *small islands, food security, blue economy, integration framework*

INTRODUCTION

Small islands are mainly characterized by their smallness and insularity which directly reflects their vulnerability. There are some disadvantages arising from the smallness including narrow range of resources, excessive dependence on outside trading, high pressure and overuse of limited resources, and limited capacities of local markets to achieve economies of scale. This kind of structural vulnerability affects the islands productivity and development approach, as FAO (2005) stated that vulnerability of small islands can be viewed, among others, from environmental, social, economic, and food supply vulnerability.

The vulnerability unfortunately will challenge small islands to solve problems of food security which is a condition where all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life (World Food Summit, 2009). Food Security is a

huge health and development concern in small islands. Based on FAO (2006), IPCC (2007), and Blue Economic Consulting (2013) food security must meet four main criteria 1) *Food availability*: sufficient quantities of food of appropriate quality, supplied through domestic production or imports; 2) *Food access*: to adequate resources (entitlements) for acquiring appropriate foods for a nutritious diet; 3) *Utilization*: adequate diet, clean water, sanitation and health care to reach a state of nutritional well-being where all physiological needs are met; and 4) *Stability*: a population, household or individual must have access to adequate food at all times. They should not risk losing.

The requirements to attain food security mentioned above in fact often contradict with the nature of small islands which particularly present severe and complex difficulties in the pursuit of sustainable development. Small islands have only narrow natural resource bases, high interdependence of ecosystems, and remoteness which limit abilities to address hazards or to diversify economic activities, and at the same time have very diverse economic profiles which drive to instability in the production sectors, trade, and high dependence on food from outside control (FAO, 2005).

In United Nations Conference on Sustainable Development 2012 (Rio+20) the Pacific Small Island Developing States (SIDS) which are largely dependent on the health and sustainable use of marine resources, proposed blue economy concept as a framework to solve the above mentioned contradictory in the context of pursuing sustainable development. By the same token, as the largest archipelagic state in the world, Indonesia enormously needs to examine the prospect and opportunities of blue economy framework in ensuring equal food security condition for millions of population scattered in thousands of islands.

This paper is aimed to introduce an initial effort to contest the possibility of integrating blue economy into food security issues as one of the main problems in small islands in Indonesia based on papers written by some experts of food security and blue economy. Implementation concept for food security developed by FAO (2005) is used as the general concept to frame the integration. Considering our incredibly limited knowledge on the issues outside fishery sectors, the discussion is only restricted to fishery and most of the paragraphs are direct citations from the experts' papers.

BLUE ECONOMY

The primary challenge for small islands is enhancing their prospects for economic growth, while preserving their environment and promoting social development. While there may be some concerns as to the process by which the green or blue economy debate is proceeding, the approach offers opportunities to better manage natural resources and focus on

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sustainable development. It is also critical that the special circumstances of small islands should be taken into consideration when various principles, policies and targets such as the transition to a blue economy are being developed (UNEP, UN DESA and FAO, 2012).

Traditional economic development models treat natural resources as similar to any other goods and thus their value is directly linked to market supply and demand. Growth strategies are focused on accumulation of physical, financial and human capital, while neglecting the preservation of social and natural capital. This type of development model has resulted in the gross misallocation of capital into economic sectors which has produced skewed outcomes with high ecological costs and escalated social inequality and poverty. Therefore, the goal of achieving a balance among the three interdependent and mutually reinforcing pillars of economic development, social development and environmental protection has been difficult (Claudio, 2013).

Blue Economy approach seeks sustainable solutions that are practical, affordable, and informative including:

1. Challenging the dominant mind set rooted in the principles of scarcity and poverty.
2. Building a new kind of leadership, stimulating creativity and innovation.
3. Affirming the creative potential of each individual and their unique contribution towards the development of themselves and their communities.
4. Exploring the deep science that informs the workings of nature through fun filled stories; and thus paves the way towards the creation of a new breed of scientists, business leaders, and citizens working with nature.

The Blue Economy is a collection of innovations contributing towards the creation of a global consciousness rooted in the search for practical solutions based on sustainable natural systems. From an environmental perspective, the elimination of waste represents the ultimate solution to pollution problems that threaten ecosystems at both local and global levels. For industry, Blue Economy means greater competitiveness and represents a continuation of its inevitable drive towards efficiency. For governments, the full use of raw materials creates new industries and generates jobs even as it raises productivity. Moreover, it provides the means to feed clothe and house their populations without destroying the ability of future generations to do the same. The Blue Economy is scaling several dozen projects worldwide. It is inspired and aided by a number of leading scientists, spread across a hundred or so countries, making their vision, knowledge and services available, together with pioneering research inspired by our desire to do more with what we have (Pauli, 2012).

In blue economy the economy and environment are mutually supportive partners not competitors; natural capital has value; and environmental sustainability is necessary for the future. This approach minimizes the trade-off between economic development and the environment and green opportunities are seen as drivers of economic growth. According to the UN "a blue economy is one whose growth in income and employment is driven by public and private investments that reduce carbon emissions and pollution; enhance energy and resource efficiency; and prevent the loss of biodiversity and ecosystem services" (Claudio, 2013).

Blue Economy Consulting (2012) emphasized that innovative Blue Economy business models are capable of bringing competitive products and services to the market. By harnessing and optimizing untapped local potential we respond to basic needs, build social capital, stimulate and develop local communities, and generate multiple sustainable cash-flows - all in harmony with nature. Moreover, Blue Economy businesses in general look at business from a systemic point of view. We see companies as part of a bigger system, use waste and by-products efficiently and turn costs and challenges into new possibilities and multiple cash flows. Blue Economy businesses are therefore more profitable, competitive, flexible, diverse and resilient than traditional businesses.

The core objective of Blue Economy is to go beyond sustainability. We have to focus on how we can do much better with what has already been available. Since we desire to have more impact, we embarked on a process to identify the innovations that would change the business, permitting that the best for the world and the healthiest for us would be the cheapest. Again inspired by *natural systems*, we would only use what is locally available, and submit ourselves to the deep principles imposed by the laws of physics which determine the framework where the networks of life thrive. Some basic key principles of Blue Economy are as the following (Pauli, 2012):

- *Nature is our biggest source of inspiration.* All Blue Economy concepts are supported by the laws of nature and physics
- *Create more benefits and diverse revenue streams.* Diversity leads to wealth and abundance. Standardization is based on scarcity
- *Be efficient.* Maximize the use of locally available materials and energy. Use only what you need. Substitute something with nothing
- *Waste does not exist.* Any by-product can be the source for a new product
- *Be more competitive:* Beat Goliath by changing the game unexpectedly
- *Innovation can happen everywhere at any time,* especially in challenging situations

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- *Systems thinking*: Think out of the box and everything is connected
 - *Think locally*: satisfying local needs with local resources creates a multiplier effect.

Blue economic policy leads to eco-efficient growth through more sustainable use and management of the natural capital. The main features of a blue economy include: (1) preserving and investing in natural capital; (2) improving the efficiency of using natural resources and ecosystem services; (3) strengthening environmental management and promoting environmentally sustainable goods and services; and (4) developing pathways that result in both economic growth and environmental protection. Strategies towards a blue economy are not defined by a specific sector but address systems as a whole. Development strategies and policies are typically approached from a national perspective (Claudio, 2013).

Ecosystems are all about connecting, creating networks, allowing everyone to contribute to the best of their abilities, while operating within clearly defined boundaries where nutrients and energy are endlessly cascaded as defined by the laws of physics. Within each of these systems, which can be as diverse as a desert, an alpine mountain range, wetlands, or a tropical rainforest, the same management principles apply. Traditional business thinking asserts that an increase in productivity is only possible by shedding jobs. Nature knows better. At a time of crisis, with millions out of work, and hundreds of millions of young people suffering from a sense of uselessness, our opportunity to shape a Blue Economy is very encouraging. Emulating natural systems can unleash local entrepreneurship much like evolution embraced innovations through diversity (Pauli, 2012).

INTEGRATION FRAMEWORK

The notion behind the integration is the fact that implementation framework for blue economy concept in small islands is still unavailable especially for Indonesia. Blue Economy Consultant (2012) mentioned that several recommendations have been presented for enabling the transition to a blue economy. Primarily among those conditions is the revision of key areas of policy-making to enable the right conditions that support a blue economy transition. One of the main point is the revision of legislative and regulatory framework and enhancing institutional capacities using an integrated planning approach which needs articulation of clear transitional policy instruments and the establishment of sound regulatory frameworks; coordination of policies across countries (regional groups); and identification of capacity-building requirements, including sourcing of funds to assist with and ease the economic transition.

The FAO's framework proposed that in order to achieve sustainable food security in small islands, there should be at least three aspects developed which are economic resilience, social resilience, and ecological resilience, as follows:

- a. **Economic Resilience:** Small islands that rely on domestic food production, show little evidence of chronic food shortage because they can depend on the adaptive strength of their agricultural sectors. However the islands that rely on trade experience food shortages when shipping links are disrupted. More small islands indicate food supply dependence and vulnerability. The excessive dependence on imports affects food availability. Economic governance in food security requires public-private partnerships to enhance the efficiency and competitiveness of fishery enterprises.
- b. **Social resilience:** Household food security in small islands is based on two distinct systems; access to food via subsistence production is determined by access to natural resources (i.e. artisanal fishing grounds); and purchasing power and heavily dependent on imported food. In both cases, poverty is prevalent. Improving access requires different strategies especially in remote rural areas far from markets. Social governance requires reconciling competition through linkage among economic sectors, namely fishery and tourism, and the revitalization of healthy food systems.
- c. **Environmental resilience:** The most serious food security concern in small islands is long term sustainability. Conversion to commercial monocultures may increase incomes, but it also increases their vulnerability to natural disasters. Over-exploitation of water through intensive fishing not only degrades natural resources, it undermines traditional food systems that are essential for food security. The ability to ensure that food production is not threatened in the face of adverse impacts of climate change and sea level rise remains a major priority. Sustainable conservation and use of natural resources, improved nutrition and enhanced self-reliance require sharing responsibilities in natural resource use.

FAO's framework toward sustainable food security considered that within the context of increased vulnerability and competition for resources, small islands fishery sector can no longer develop in isolation. Fishery policies affect developments in the economic, social and environmental sectors. National sustainable development plans and strategies should include food security strategies and related measures to address vulnerability and build resilience. A coherent policy framework for sustainable development should be put in place that: recognizes the role of fisheries in contributing to the overall economic growth; and ensures integration of and consistency among national, regional and international commitments. An integrated planning and management among sectors is

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necessary for building islands resilience; linked institutions can pool resources and enhance efficiency.

Blue economy concept has prospective to be integrated into the framework especially as tools to attain the 3 resilience based on sustainable development principles. Blue economy is about shifting economic paradigm by applying 1) system thinking that is learning from nature and using the logic of ecosystems, and 2) changing the way of doing business that is redefining core business as defined by core competence, endless innovation where innovation creates opportunities, and visionary and creativity. Based on the blue economy paradigm, the following are the aspects to be inserted into FAO's food security framework:

- 1) Nature efficiency
- 2) Zero waste: leave nothing to waste – waste for one is a food for another - waste from one process is resource of energy for the other
- 3) Social inclusiveness: self-sufficiency for all – social equity-more job, more opportunities for the poor
- 4) Cyclic systems of production: endless generation to regeneration, balancing production and consumption
- 5) Open-ended innovation and adaptation: the principles of the law of physics and continuous natural adaptation

Economic Resilience of small islands can be approached by principles of Cyclic Production Systems by developing 1) value added chain; and 2) balancing production and consumption. *Social Resilience* can be approached by principles of Social Inclusiveness including 1) more job opportunities; and 2) equal access right for the poor, whereas *Ecological Resilience* can be approached by principles of Nature Efficiency encompassing 1) sustainable Fisheries; 2) open-ended innovation and adaptation, and 3) multiple revenue and leave nothing to waste. Combination of Blue Economy principles and the Food Security component requires strategies in order to reach economic, social and ecological resilience.

Food availability in small islands can be enhanced by implementing value added chain to ensure food supply to the most vulnerable, improving rural food production especially by small-scale fishers, and revitalization of marine culture. In addition balancing production and consumption will further enforce the availability of food by enhancing income and other entitlements to food, as well as resource rehabilitation and conservation.

Food access and utilization in small islands can be enhanced by providing more job opportunities for the people in islands, reviving rural financial systems, and strengthening labor market. Moreover, ensure equal access right for the poor by re-establishing rural institutions,

enhancing access to assets, land, and social rehabilitation program will strengthen food access and utilization.

Table 1 Summary of Relationship between Food Security and Blue Economy Components

No	Food Security Component	Blue Economy Component	Strategy	Goal
1	Food Availability	Cyclic Production	<ul style="list-style-type: none"> • Value added chain • Balancing production and consumption 	Economic Resilience
2	Food Access and Utilization	Social Inclusiveness	<ul style="list-style-type: none"> • More job opportunities • Equal access right for the poor 	Social Resilience
3	Food Stability	Nature Efficiency	<ul style="list-style-type: none"> • Sustainable Fisheries • Open-ended innovation and adaptation • Multiple revenue and leave nothing to waste 	Ecological Resilience

Food stability in small islands can be enhanced by applying sustainable fisheries which directly dealing with the structural causes of food insecurity, reviving access to credit system and savings mechanisms, and developing risk analysis and management for fisheries; Open-ended innovation and adaptation through monitoring food security and vulnerability, and reintegrating refugees and displaced people related to global warming and natural disasters will contribute to food stability; and multiple revenue and leave nothing to waste.

In small islands, the fisheries sector often represents the "engine of growth", supporting broader social and economic purposes such as health and education systems, and national capacity building. The restricted opportunities that many small islands face for industry development require that they pursue economic development strategies closely tied to the use of their fisheries resources. Because they have essentially self-contained ecosystems, fisheries problems in islands usually manifest themselves more obviously, more quickly and with greater effect than in continental, food security and the effective conservation and management of fisheries resources are critically linked.

For food security reasons, the rational utilization of all fisheries resources, particularly inshore fisheries resources, must be the central concern. Program or assistance for small islands should aim to ensure that food security is promoted first and foremost, that existing levels of fishing effort do not result in unsustainable resource use and that measures are

taken for their rehabilitation in areas where stocks have been subjected to excessive fishing (FAO, 2005).

Based on the relationships, the schematic integration between Blue Economy and food security can be illustrated as the following:

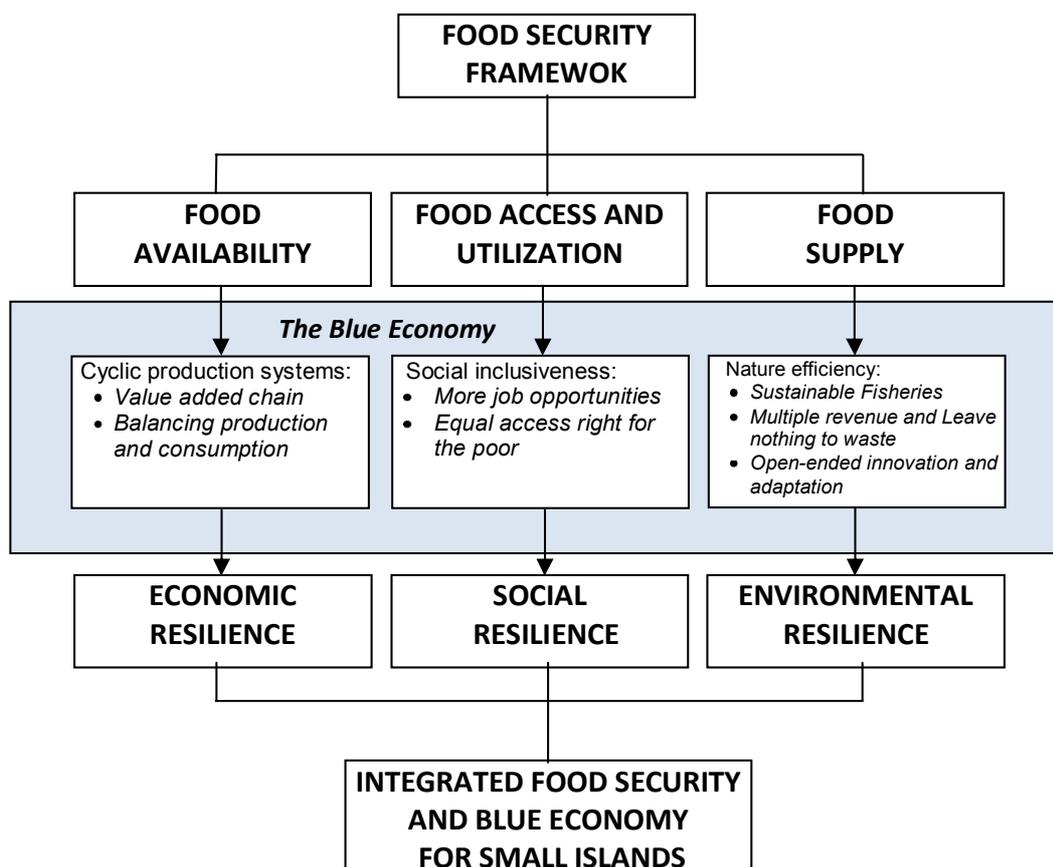


Figure 1. The Proposed Framework for integrating blue economy approach into small island

Food security from fishery perspective in Indonesia

The power of blue economy lies in the fact that it has resolved an old conflict. On one hand, there was huge pressure resulting from ever-growing consumer demands, and manufacturers seeking to satisfy them cost-effectively, hoping to make high profits in the process. Blue economy is not a compromise, neither in the sense of economic growth nor in the area of nature conservation. It provides a solution in which these economic, social, and ecological interests, earlier considered to be antagonistic, are transformed into a relationship complementing and closely dependent on each other. The model suggested by blue economy demonstrates that by using the power and processes of nature wisely and acting in harmony with it, much higher efficiency can be achieved than by

using economic models that exploit nature. This is what is meant by sustainability in the fullest sense of the word (Pauli, 2012).

Moreover, blue economy goes far beyond theoretical considerations since it offers hundreds of specific innovations for use in all market segments. This enables not only big corporations but also small and medium-sized businesses to achieve a level where they produce no waste or emissions, and operate in an environment-friendly yet very cost-effective way. Last but not least, blue economy always bears in mind the importance of sustainable development of regions throughout.

CONCLUSIONS

- Three aspects should be developed to achieve food security in small islands, they are economic resilience, social resilience, and ecological resilience
- Blue economy is about shifting economic paradigm which has prospective to be integrated into food security framework especially as tools to approach resilience based on sustainable development principles.
- Economic Resilience of small islands can be approached by principles of Cyclic Production; Social Resilience by principles of Social Inclusiveness and Ecological Resilience by principles of Nature Efficiency
- Food availability can be attained by implementing value added chain and balancing production and consumption; Food access and utilization by providing more job opportunities and ensure equal access right for the poor; and Food stability by applying sustainable fisheries, open-ended innovation and adaptation, and multiple revenue and leave nothing to waste
- Blue Economy concept has resolved an old conflict in development. Blue Economy is not a compromise, neither in the sense of economic growth, nor in the area of nature conservation. It provides a solution in which these economic, social, and ecological interests, earlier considered to be antagonistic, are transformed into a relationship complementing and closely dependent on each other.

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