“Implementasi Konsep Blue Economy untuk Mendukung Ketahanan Pangan Nasional”

Eva Anggraini
Direktur Konektifitas Global
&
Program Studi Ekonomi Kelautan Tropika
Departemen Ekonomi Sumberdaya dan Lingkungan
Fakultas Ekonomi dan Manajemen
IPB University
Persoalan Pangan Global

Sekitar 768 juta jiwa di dunia yang mengalami kelaparan pada 2021, meningkat sekitar 46 juta jiwa dari 2020.

Sumber: FAO (2021)
Impacts of Climate Change

- **Forest coverage**: Decrease about 50%
- **Water scarcity**: Area that faces water scarcity is increasing from 6% to 9%
- **Wild life Habitat**: The decrease in population of extinct animals
- **Environment & agriculture**: Drought, rain anomaly, more frequent natural/hydrometeorology disasters (flood, erosion), sea level rise etc. → effect land and marine based activities
  - **Economy**: Loss and damage
  - **Health**: *Malnutrition, stunting*, tropical diseases
  - **Social**: Increasing social and environmental conflicts
  - **Energy**: Energy crisis

Dampak Perubahan Iklim terhadap Sumberdaya Alam

Potensi Kerugian Ekonomi Dampak Perubahan Iklim pada Empat Sektor Prioritas (Rp Triliun)

<table>
<thead>
<tr>
<th>Sektor</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kelautan &amp; Pesisir</td>
<td>81,30</td>
<td>81,43</td>
<td>81,57</td>
<td>81,60</td>
<td>81,82</td>
</tr>
<tr>
<td>Air</td>
<td>3,83</td>
<td>4,74</td>
<td>5,61</td>
<td>6,45</td>
<td>7,29</td>
</tr>
<tr>
<td>Pertanian</td>
<td>11,20</td>
<td>13,40</td>
<td>15,59</td>
<td>17,77</td>
<td>19,94</td>
</tr>
<tr>
<td>Kesehatan</td>
<td>6,03</td>
<td>6,15</td>
<td>6,26</td>
<td>6,37</td>
<td>6,48</td>
</tr>
<tr>
<td>Jumlah</td>
<td>102,36</td>
<td>110,27</td>
<td>119,03</td>
<td>132,29</td>
<td>145,53</td>
</tr>
</tbody>
</table>

Sumber: Bappenas (2021)
Keterkaitan Krisis Energi dan Pangan

Source: FAO
Conflict, Climate and Food Crises

Around 134 million people across 53 countries experienced a food crisis or worse (IPC/CH Phase 3 or above) in 2021.

Conflict was the primary driver of food crises in 2021 even accounting for economic effects of COVID-19.

<table>
<thead>
<tr>
<th></th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conflict/Insecurity</td>
<td>73.9M</td>
<td>77.1M</td>
<td>99.1M</td>
<td>139.1M</td>
</tr>
<tr>
<td>21 countries</td>
<td>22 countries</td>
<td>23 countries</td>
<td>24 countries</td>
<td></td>
</tr>
<tr>
<td>Weather extremes</td>
<td>28.8M</td>
<td>33.8M</td>
<td>15.7M</td>
<td>23.5M</td>
</tr>
<tr>
<td>26 countries</td>
<td>25 countries</td>
<td>15 countries</td>
<td>8 countries</td>
<td></td>
</tr>
<tr>
<td>Economic shocks</td>
<td>10.2M</td>
<td>24.0M</td>
<td>40.5M</td>
<td>30.2M</td>
</tr>
<tr>
<td>6 countries</td>
<td>8 countries</td>
<td>17 countries</td>
<td>21 countries</td>
<td></td>
</tr>
</tbody>
</table>

Source: Global Report on Food Crisis 2021, FSIN, GRFC May 2022
What is Blue Economy?

- "Sustainable use of ocean resources for economic growth, improved livelihoods, and jobs while preserving the health of ocean ecosystem" (World Bank)

- "All economic activities related to oceans, seas and coasts. It covers a wide range of interlinked established and emerging sectors” (European Commission)

- "An emerging concept which encourages better stewardship of our ocean or 'blue' resources" (The Commonwealth of Nations)

- "Blue economy also includes economic benefits that may not be marketed, such as carbon storage, coastal protection, cultural values and biodiversity" (Conservation International)

- ”It is now a widely used term around the world with three related but distinct meanings- the overall contribution of the oceans to economies, the need to address the environmental and ecological sustainability of the oceans, and the ocean economy as a growth opportunity for both developed and developing countries" (Center for the Blue Economy).

- ”Blue Economy comprises a range of economic sectors and related policies that together determine whether the use of ocean resources is sustainable, ranging from sustainable fisheries to ecosystem health to preventing pollution. Bhe blue economy challenges us to realize that the sustainable management of ocean resources will require collaboration across borders and sectors through a variety of partnerships, and on a scale that has not been previously achieved. This is a tall order, particularly for Small Island Developing States (SIDS) and Least Developed Countries (LDCs) who face significant limitations.” (United Nations)
Blue Economy supports the achievement of SDGs as a global development platform.
Transitions to Blue Economy

01 Sustainable use of natural resources, not exceeding carrying capacity and to recover the resources to increase the supply

02 Renew economic indicators to become more sustainable

03 Institutional transformation in many aspect of lifes (finance, education, social, economy) to achieve sustainability

04 Policy to enhance transition from conventional economy to bioeconomy, and support biodiversity based innovations

Source: Dasgupta (2021); E. Gawel et al. (2018)
Global Trend to Enhance Blue Economy

COP 26 dan Pertemuan G-20 put Blue Economy as a agenda

Why Blue Economy?
Ocean economy has a significant value for Indonesia, in which it contributes 20% GDP of the country. A similar ratio to other countries with large ocean territories.

This huge potential in Indonesia will be amplified by the rising trends of Blue Economy to be one of the most powerful economy in the world!

Global future trends of blue economy sector

1. Rising global population and consumption generating the need for new sources of food, energy and minerals.
2. A variety of ocean economy emerges following the soaring trends of tourism, coastal development, shipping, and port infrastructure & services as a setting for economic activities.
3. Investment opportunities are arising from the application of new technologies to harness the ocean's potential as a resource base.
4. The emerging investment opportunities in ocean health and ecosystems in mitigation to climate-change challenges.
Sustainable Blue Economy Principles

support decision makers in choosing sustainable investment and development opportunities while minimizing risk, increasing benefit-sharing, and optimizing long-term returns.
Indonesian Blue Economy Initiatives

- Strengthening fisheries management through EAFM (WPP)
- Integrated marine zone planning
- Extend marine conservation area
- Implementing National Strategy on Marine Litter
- Developing integrated and sustainable marine tourism

Policy Direction of MMF Indonesia 2021 - 2024

Increasing PNBP from capture fisheries natural resources to improve people's welfare

Development of aquaculture to increase exports and development of aquaculture villages based on local wisdom

To develop the marine and fishery industry through meeting the needs of industrial raw materials, improving product quality and adding value to increase investment and export of marine and fishery products

Management of marine space, coastal areas and small islands, strengthening supervision of marine and fishery resources, and fish quarantine through coordination with relevant agencies

Strengthening human resources and marine and fisheries policies

KKP (2021)
### Components of Blue Economy related to Food Security

<table>
<thead>
<tr>
<th>Type of Activity</th>
<th>Activity Subcategories</th>
<th>Related Industries/Sectors</th>
<th>Drivers of Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harvesting and trade of marine living resources</td>
<td>Seafood harvesting</td>
<td>Fisheries (primary fish production)</td>
<td>Demand for food and nutrition, especially protein</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Secondary fisheries and related activities (e.g., processing, net and gear making, ice production and supply, boat construction and maintenance, manufacturing of fish-processing equipment, packaging, marketing and distribution)</td>
<td>Demand for food and nutrition, especially protein</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Trade of seafood products</td>
<td>Demand for food and nutrition, especially protein</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Trade of non-edible seafood products</td>
<td>Demand for cosmetic, pet, and pharmaceutical products</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Aquaculture</td>
<td>Demand for food and nutrition, especially protein</td>
</tr>
<tr>
<td></td>
<td>Use of marine living resources for pharmaceutical products and chemical applications</td>
<td>Marine biotechnology and bioprospecting</td>
<td>R&amp;D and usage for health care, cosmetic, enzyme, nutraceutical, and other industries</td>
</tr>
</tbody>
</table>

Source: [https://sustainabledevelopment.un.org/content/documents/15434Blue_EconomyJun1.pdf](https://sustainabledevelopment.un.org/content/documents/15434Blue_EconomyJun1.pdf)
BLUE ECONOMY SEBAGAI BASIS PENGELOLAAN SUMBER DAYA PERIKANAN TANGKAP

ASPEK UTAMA PERIKANAN TANGKAP

**Biologi**
- Menjaga sumber daya ikan untuk keberlanjutan produktivitasnya

**Lingkungan**
- Meminimalkan dampak penangkapan ikan terhadap lingkungan & SDI, termasuk untuk spesies non-target dan spesies yang dilindungi

**Ekonomi**
- Menghasilkan keuntungan ekonomi yang optimal bagi pelaku usaha dan masyarakat
- Menghasilkan penerimaan yang optimal dan berkelanjutan bagi negara

**Sosial**
- Memaksimalkan peluang kerja/mata pencaharian bagi nelayan dan masyarakat
- Menjaga harmoni antar stakeholders
- Mendukung pertahanan dan keamanan negara

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**Prinsip Ekonomi Biru**

**Efisiensi SDA, bukan ekspolitasi SDA**

**Nilai ekonomi dan sosial seimbang, bukan semata fokus pada profit**

**Ramah lingkungan dan berkelanjutan, tidak merusak ekologi**

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**Model Bisnis:**

- Penangkapan ikan yang ramah lingkungan
- Pengembangan Pelabuhan perikanan berwasan lingkungan (eco fishing port)
- Pengolahan limbah ikan
- dll

KKP (2021)
PEMBAGIAN ZONA KEBIJAKAN PENANGKAPAN TERUKUR DI WPPNRI

: Zona Fishing Industry
: Zona Nelayan Lokal
: Zona Spawning & Nursery Ground
: Garis Pantai
: 12 mil (wilayah tradisional)

Nelayan lokal dengan ukuran kapal <30 GT tetap dapat menangkap di WPPNRI

KKP (2021)
TATA CARA PENERAPAN KEBIJAKAN PENANGKAPAN TERUKUR ZONA FISHING INDUSTRY

**KUOTA**
JTB di masing-masing zona dibagi kepada pelabuhan-pelabuhan pendaratan di zona tersebut

**SISTEM PERUJIAN**
- Seleksi pelaksanaan konsesi dilakukan dengan beauty contest
- Menandatangani kontrak konsesi penangkapan terukur

**JALUR PENANGKAPAN IKAN**
12 mil garis pantai, di 4 zona penangkapan (Zona 01, 02, 03 dan 04)

**PENDARATAN**
Pendaratan ikan hanya di Pelabuhan pangkalan dimana kuota penangkapan ikan diberikan.

**UKURAN KAPAL**
> 30 GT

**PEMASARAN IKAN**
Pengangkutan ikan untuk pasar domestik dan ekspor dari pelabuhan perikanan yang ditetapkan di WPP

**AWAK KAPAL**
Seluruh awak kapal adalah nelayan lokal (kecuali fishing master dan nakhoda kapal untuk kapal buatan Luar Negeri)

**SISTEM PEMUNGUTAN PNB**
Kontrak dan Pasca Produksi

KKP (2021)
Marine Spatial Planning

- Increasing inter-island input-output connectivity to reduce the dominance of Java and cities in the national economy
- Spatial planning needs to link the production system and the settlement system
- Need a strong national logistics system based on sustainable spatial planning

Integration of land and marine spatial planning

- Requires total integration, includes
  - Inter-sectoral
  - Inter-governmental
  - Spatial
  - Science-management
  - International

Fisheries and Aquaculture Estates as a Hub in Blue Economy Networks
Marine Conservation by the State

Rejim Konservasi Laut

UU 5/1990 Rejim Kehutanan
- Biodiversity conservation
  - Taman Nasional Laut
  - KLHK

UU 31/2004 & 45/2009 Rejim Perikanan
- Fisheries management
  - Taman Nasional Perairan Laut
  - KKP

UU 27/2007 & 1/2014 Pengelolaan Pesisir
- Coastal and small island management
  - Taman Pesisir /Pulau Kecil
  - KKP
Small Islands as a Niche of the Blue Economy

- Catch Fisheriy
- Aquaculture/Mariculture
- Marine tourism

Need Conservation to increase asset value

- Other sectors in the marine sector, such as transportation, marine industry, etc.

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Integrated management, such as the concept of MINAWISATA BAHARI can:
- reduce marine pollution (including marine plastic)
- Reducing the impact of climate change
- Increase community engagement and management
- Encouraging partnership development
- Increase green investment
Mainstreaming the Blue Economy requires:

- integration of land and sea spatial planning
- integration of policies and programs between ministries/agencies
- Technological innovation
Agro-Maritim 4.0: a thought from IPB

Inclusive integration of land and sea area management involving complex social, economic and ecological systems that requires a transdisciplinary, integrated and participatory approach.
<table>
<thead>
<tr>
<th>Direction of Agro-Maritime Transformation 4.0</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Competitive Agro-Maritime Industry and Trade</strong></td>
</tr>
<tr>
<td>- Increasing Productivity of Agro-Maritime Products</td>
</tr>
<tr>
<td>- Safe and Halal Agro-Maritime Product Traceability</td>
</tr>
<tr>
<td>- Agro-Maritime Industry Competitiveness</td>
</tr>
<tr>
<td>- Upstream-Downstream Integration of Agro-Maritime Logistics System</td>
</tr>
<tr>
<td>- Elements of Production, Industry and Trade in one coordination umbrella</td>
</tr>
<tr>
<td>- Building the Provision and Management of Agro-Maritime Big Data</td>
</tr>
<tr>
<td><strong>2. Strengthening the Connectivity Infrastructure and Agro-Maritime Value Chain</strong></td>
</tr>
<tr>
<td>- Integrated Agro-Maritime Intermodal Transportation System</td>
</tr>
<tr>
<td>- Strengthening the Effectiveness of Intermodal Port Services</td>
</tr>
<tr>
<td>- Distribution and Warehousing System of Strategic Agro-Maritime Products</td>
</tr>
<tr>
<td>- Policy and Technology</td>
</tr>
<tr>
<td><strong>3. Strengthening Human Resources and Science and Technology</strong></td>
</tr>
<tr>
<td>- Strengthening Agro-Maritime Education and Community Development Systems</td>
</tr>
<tr>
<td>- Strengthening of Agro-Maritime Science and Technology</td>
</tr>
</tbody>
</table>
IPB Agromaritim 4.0: Pengembangan Pertanian, Kelautan dan Perikanan Cerdas yang Berkesinambungan Iklim
Strategi Implementasi Agro-Maritim 4.0

Implementasi Agro-Maritim 4.0 IPB di berbagai wilayah di Indonesia

2017-2021
Penguatan penelitian dan inovasi yang berbasis Instrumentasi dan Internet of Things

2022-2023
Alat / instrumen diarahkan ke Lokus-Lokus Penelitian IPB atau di lokasi Mitra IPB

2024-2025
- Penguatan infrastruktur Big-Data
- Integrasi data
- Pengambilan keputusan secara otomatis

Keberlanjutan

Sumber: Buku Roadmap Penelitian Agro-Maritim 4.0 IPB Edisi 2 (2022)
### Smart Fisheries and Coastal Management

<table>
<thead>
<tr>
<th>Technology</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TREKfish</td>
<td>Aplikasi untuk menelusuri jejak penangkapan ikan</td>
</tr>
<tr>
<td>Automatic Coastal Weather Station</td>
<td>Teknologi untuk sistem peringatan dini/prediksi cuaca</td>
</tr>
<tr>
<td>Nusantara ARFI</td>
<td>Al untuk Identifikasi Species Indikator Kesehatan Terumbu Karang</td>
</tr>
<tr>
<td>Underwater Televisual System</td>
<td>Aplikasi untuk pemantauan &amp; evaluasi ekosistem vegetasi bawah laut &amp; terumbu karang</td>
</tr>
<tr>
<td>Smart Rumpon Portable</td>
<td>Alat bantu pendeteksi posisi ikan melalui smartphone</td>
</tr>
<tr>
<td>Smart Aquaculture in Eel Production</td>
<td>Kolam cerdas untuk produksi Algae</td>
</tr>
<tr>
<td>Sea Farming</td>
<td>Teknologi cerdas untuk produksi belut</td>
</tr>
<tr>
<td>Sea Surface Drone</td>
<td>Robot tanpa awak untuk pemantauan dan evaluasi ekosistem dekat pantai</td>
</tr>
<tr>
<td>Smart Coastal Management</td>
<td>Program pemberdayaan &amp; pelatihan budidaya laut menggunakan teknologi 4.0</td>
</tr>
</tbody>
</table>

**Tim Peneliti:**

- Prof. Yandra Arkeman, Irman Hermadi, PhD, Dr. Dhani Satria, Ganjar Saefurrahman, MSc, Willyam, SKom
- Dr. Indra Jaya, Muhammad Iqbal MSi, Mahesa Glugah, MSi, Agung S.Kel.
BUDIDAYA UDANG INTENSIVE DENGAN
SYSTEM BIOFLOC-RAS INDOORS di Lahan Terbatas

- **Produktivitas = 4 - 7 kg/M3**
- **Potensi Produksi Per Ha = >100 Ton/Ha (Dengan Panen Parsial)**
- **Manfaat:**
  - Meningkatkan Biosecurity untuk Menurunkan Risiko Penyakit Sehingga Tingkat Keberhasilan Lebih Tinggi
  - Meningkatkan Produktivitas Lahan dan Air
- **Potensi Pengembangan:**
  - Pemanfaatan Lahan Tambak Terbengkalai
  - Urban Farming
TERIMA KASIH

Contact: evaanggraini@apps.ipb.ac.id

Direktorat Koneksi Global - IPB University
http://dpis.ipb.ac.id/