

**VIEW OF THE REPUBLIC OF INDONESIA  
ON THE EFFECT OF CLIMATE CHANGE ON OCEANS**

***Executive Summary***

The ocean plays a significant role in shaping our climate. In this regard, as the biggest archipelagic country in the world, Indonesia has a pivotal role in shaping global climate through its waters. Indonesia's geographical trait as a tropical country also adds to this importance, as Indonesia's tropical seas contain much of the planet's marine biological diversity.

In order to address climate change effectively, the world must provide sufficient support to archipelagic and small island States, especially developing ones, in their ocean-based mitigation and adaptation efforts. These include sustainable use of marine resources and sustainable development of coastal areas.

Indonesia is committed to manage its seas and oceans in a sustainable way. This is an integral part of Indonesia's commitment to support Agenda 2030 for Sustainable Development as well as the global climate change regime, including the Paris Agreement. In this regard, Indonesia calls for, among others, enhanced international cooperation and partnership to mobilize means of implementations in support of archipelagic and small island developing States in their mitigation and adaptation efforts, and strengthened international research collaboration on the nexus between tropical waters and climate change.

This submission also explains Indonesia's views regarding the 5 issues requested by the Secretariat, namely, collection of relevant scientific data, awareness raising, fostering climateresilient sustainable development of oceans and seas, development of ocean-based mitigation measures and adaptation policies and strategies, as well as capacity-building, partnership and financing mechanism. For each issue, this report elaborates on Indonesia's policy regarding the issue, actions undertaken by Indonesia, as well as proposal on possible areas where international cooperation can be strengthened with regard to each respective issue.

The ocean plays a significant role in shaping our climate. It covers about 71% of the world's surface and has a two-way relationship with climate. It influences the weather and contributes to regulate the world temperature, while climate change can bring profound impacts to the ocean, such as rising sea level and ocean acidity.

As the biggest archipelagic country in the world, more than 60% of Indonesia's territory is covered by water, namely intra-national seas and oceans. This also means that Indonesia has a significant role in shaping global climate through its waters. As stated by Nature Geoscience: "The Indonesian seas represent the only pathway that connects different ocean basins in the tropics, and therefore play a pivotal role in the coupled ocean and climate system". Indonesia's geographical trait as a tropical country also adds to this significance, as Indonesia's tropical seas contain much of the planet's marine biological diversity.

In order to address climate change effectively, the world must provide sufficient support to archipelagic and small island States, especially developing ones, in their ocean-based mitigation and adaptation efforts. These include sustainable use of marine resources and sustainable development of coastal areas.

Indonesia is committed to manage its seas and oceans in a sustainable way. This is an integral part of Indonesia's commitment to support Agenda 2030 for Sustainable Development as well as the global climate change regime, including the Paris Agreement. In this regard, Indonesia calls for, among others:

- Enhanced international cooperation and partnership in supporting archipelagic developing countries in their mitigation and adaptation actions, data collection and analysis, as well as sustainable marine and coastal development effort.
- Strengthened international research collaboration on the nexus between tropical waters and climate change.

The following sections will further elaborate Indonesia's views regarding collection of relevant scientific data, awareness raising, fostering climate-resilient sustainable development of oceans and seas, development of ocean-based mitigation measures and adaptation policies and strategies, as well as capacity-building, partnership and financing mechanism.

### **Collection of Relevant Scientific Data**

1. On collection of relevant scientific data, Indonesia is of the view that such effort should:
  - a. Aim at addressing climate change as a complex and long-term gradual physical symptom with multi-dimensional implications. Therefore, it should be based on thorough, relevant and valid scientific data, measured in multi-temporal design.
  - b. Be focused on the characteristics of coastal and marine areas and their climate change impact level, especially due to topography, bathymetry, coastal geomorphology, hydrooceanography, coastline, and land use change on coastal areas.
  - c. Use and optimize the best available data while promoting new data collection for priority strategies, actions, and sites.
  - d. Make use of community/traditional wisdom and knowledge related with climate change, and support the application of climate change model at local sites with more detailed scale.
  
2. In this regard, Indonesia has taken the following steps:
  - a. Conduct a flagship program called "One Data" for Marine and Fisheries sector, to support national policy formulation by improving data quality and integration as well as open access to data for the public. This program can be used by communities as a basis for conducting marine and fisheries mitigation and adaptation efforts.
  - b. Conduct 3 types of research to address climate change :
    - Internal independent research programs, to collect ocean data that can be used to detect climate change phenomenon in Indonesian waters.
    - International collaborations in the form of sea-going cruises, to deploy oceanographic sensors for measuring long-term oceanic parameters that can be used to interpret climate change signals.
    - Based on the above data, conduct model projections of the future of Indonesian coastal and seas under climate change.
  - c. Conduct 3 thematic research to specifically address climate change mitigation:
    - Assess the process and capability of coastal and ocean waters as carbon sink.
    - Study the role of "blue carbon" ecosystems (mangrove and seagrass) as carbon sink
    - Assess fisheries carbon footprint (carbon produced from fishing effort) for TunaCakalang-Tongkol commodities.
  - d. Apply "Water Environment Fishery Port Information and Monitoring System" (SIPLP3) to monitor environmental conditions at Ports, including level of sea surface temperature that have impacts on fisheries production and aquaculture.

3. To strengthen international cooperation on this issue, Indonesia would like to make the following suggestion:
  - a. Establish a United Nations specific body on ocean for coordination and strengthening data collection on climate change model application, technology application and knowledge management.
  - b. Strengthen regional organizations and partnership to reduce survey cost exchange, especially for marine hot spot and coastal biodiversity, such as the Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security (CTI-CFF).
  - c. Assist developing countries, especially archipelagic States, to enhance their data collection and research capacity, including through resource mobilization and transfer of technology.
  - d. Strengthen international research collaboration to study tropical seas, which contains much of the planet's marine biological diversity and plays a critical role in regulating Earth's climate.

### **Awareness-Raising**

4. On awareness raising, Indonesia is of the view that:
  - a. Effort to raise awareness on climate change should not be treated exclusively and stand-alone from sustainable ocean and coastal development. This is because effective implementation of marine and coastal-based climate actions will depend not only on effective conservation of coastal and marine areas but also on improvement of coastal communities' livelihood through marine and fisheries sector development.
  - b. Awareness campaign has to be specific and well targeted. Materials may need to be customized based on specific types of audience (government, parliamentarians, community, private companies, etc), to reflect different interests, understanding, capacity, and level of risk.
  - c. To create a sense of urgency, public awareness strategy must link to practical and/or real daily problems that have affected communities.
  - d. Awareness raising efforts need to engage community and religious leaders and make use of relevant cultural practices.
5. In this regard, Indonesia has taken the following steps:
  - a. Provide relevant information for policy-making process on the linkages between marine and coastal areas with climate change, by conducting research such things as:
    - ecosystem service and function to support fisheries sector,
    - spatial planning,
    - coastal dynamics (land-use and land-cover analysis), and - the origin of carbon.
  - b. Conduct Indonesia Coastal Education (ICE/”*Sekolah Pantai Indonesia*”) for students in junior school (7th-8th grade) and high school (10th-11th grade), to raise awareness for improving coastal ecosystems quality and resiliency.
  - c. Produce materials for awareness based on religious and cultural perspectives.
6. To strengthen international cooperation on this issue, Indonesia would like to make the following suggestion:
  - a. Sharing of best practices such as materials and methods of campaign.
  - b. Publication of success stories on mitigation and adaptation from around the world.

- c. Developing applications that may interest the public, such as climate change adaptation games.

### **Fostering Climate-Resilient Sustainable Development of Oceans and Seas**

- 7. On fostering climate-resilient sustainable development of oceans and seas, Indonesia is of the view that such effort must:
  - a. Be embedded within existing and ongoing development plans for effective implementation.
  - b. Incorporate considerations regarding climate change impacts to existing marine spatial planning and coastal management plan and practices.
  - c. Reduce new developments at high risks areas.
  - d. Balance short-term economic interest with mid-term or long-term conservation objectives.
  - e. Apply risk assessment (from natural hazards and/or climate change impacts) for all new developments in coastal areas and small islands.
  - f. Improve skill in adaptation-driven planning, project design, and monitoring and evaluation.
  
- 8. In this regard, Indonesia has taken the following steps:
  - a. Incorporate marine and coastal adaptation activities within the National Midterm Development Plan (RPJM-N).
  - b. Establish regulation on coastal setback policy to reduce development within high-risk areas.
  - c. Adopt coastal hazards forecast and modeling in the development of marine spatial planning.
  - d. Develop Marine Protected Areas (MPA) networks to strengthen marine habitat protection, replication, and connectivity for maintaining healthy marine ecosystem.
  - e. Establish coral bleaching and algal bloom monitoring and response network (INACOBAS).
  - f. Apply site permit for all settled activities in marine and small islands where disaster mitigation plan is required.
  
- 9. To strengthen international cooperation on this issue, Indonesia would like to make the following suggestion:
  - a. Promote an independent certification for climate-resilient development plan/practice.
  - b. Provide many different examples of development practices (as template and guidelines) that clearly contain adaptation elements and differ from usual practice.
  - c. Enhanced international cooperation to support developing countries' means of implementation. In this regard, development partners may consider conducting training to improve the quality of human resources in the area of Climate Change on Oceans, and to provide financial support for developing countries and lead in the mobilization of funds from various sources.
  - d. Design a multilateral fund that is more related to climate change priorities of developing countries (including Indonesia) which will enable funders to reach their goals more effectively

## Development of Ocean-Based Mitigation Measures and Adaptation Policies and Strategies

10. On development of ocean-based mitigation measures and adaptation policies and strategies, Indonesia is of the view that:
  - a. Such effort should follow an ecosystem-based strategy through integrated coastal and ocean management, as well as preserving and enhancing natural resilience of coastal system to climate change.
  - b. Pillars for such strategies are:
    - Protecting key coastal and near-shore marine ecosystems that are vulnerable to climate change impacts such as mangrove, seagrass and coral reefs.
    - Rehabilitating those key ecosystems degraded as a result of coastal development or other anthropogenic factors.
  - c. Policy-making process on mitigation and adaptation strategies should be based on solid ocean research and observation, with focus on:
    - Sustaining ecosystem services
    - Reducing risks, and - Improving capacity.
  - d. Direct locus of priorities at: i) the most critical areas, ii) high value assets, iii) critical infrastructure, iv) the most vulnerable communities, and v) healthy and or degraded habitats.
  - e. There is a need to explore and develop potential sources of energy from ocean.

### Additional thoughts on mitigation

On mitigation, there has been discussion on the potential role of ocean in mitigating green house gasses (GHG) emissions. While the potential to sequester GHGs in ocean depth is less in the tropical one (due to the dynamics of the ocean in tropical area, which is more unstable compared to the sub-polar ones), there are also potentials by using tropical marine and coastal biota, including sea grass, seaweeds and mangroves (blue carbon).

Most of these potentials are not yet part of mitigation options under the UNFCCC due to scientific and technical issues related to accounting methodologies. Further in-depth understanding on this very basic issues are keys before such options can be accepted and included as options for mitigation.

That notwithstanding, for islands states as well as archipelagic ones like Indonesia, ocean and marine sector still can contribute significantly in mitigation actions, namely through the development of marine and ocean based energy generation, such as tidal, waves and even further OTEC. For such countries, harnessing energy from ocean and sea will definitely support them in achieving their national sustainable goals and agenda through a more climate friendly way.

### Additional thoughts on adaptation

Archipelagic countries like Indonesia have felt real impacts of climate change. Coastal communities as well as those that rely their livelihoods on seas and oceans are among the hardest hit. In addition to rising sea level, reduction of fish and other marine commodities has become a real challenge for coastal communities livelihood. Another impact is bleaching of coral reefs due to ocean acidification.

There is therefore an urgent need for sufficient adaptation actions and efforts to address these issues. Development of alternative income and livelihood needs to be considered, as well as introduction of more advanced technologies for fish and marine industries (such as

storage, packaging, and further aspects of production chain). Addressing issues related to loss and damages will have to include this sector and communities as well.

11. In this regard, Indonesia has taken the following steps:
  - a. Incorporate marine and coastal adaptation activities into Indonesian Midterm Development Plan (RPJM-N).
  - b. Implement Climate Resilience Coastal Village program (CRV), which is an integrated coastal management concept in a small scale with 5 main focus: people, welfare, resources, infrastructure/environment, as well as disaster awareness and climate change adaptation.
  - c. Implement mangrove rehabilitation program as part of climate mitigation actions.
  - d. Promote international cooperation on blue carbon, for instance within the framework of Coral Triangle Initiative (CTI).
  - e. Application of low energy aquaculture practices, e.g. shrimp ponds paddle wheel.
  - f. Improve technology for fishing ground prediction to reduce gasoline consumption.
  - g. Establish regulation on coastal setback policy to reduce development within high-risk areas.
  - h. Adopt coastal hazards forecast and modeling in the development of marine spatial planning.
  - i. Develop research-based "blue carbon" policies by measuring and preserving natural sinks of coastal and ocean waters and "blue carbon" ecosystems (mangrove and seagrass)
  - j. Reduce carbon emissions from fishing vessels by using the results of ongoing research on fisheries carbon footprint (carbon produced from fishing effort)
  - k. Enhance marine and coastal resilience by reducing overfishing and combating illegal and destructive fishing.
  - l. Develop MPA networks to strengthen marine habitat protection, replication, and connectivity.
  - m. Establish coral bleaching and algal bloom monitoring and response network (INACOBAS).
  - n. Develop small islands economy, access, and infrastructure.
  - o. Rehabilitation of degraded coastal areas (mangrove and coral transplantation).
  - p. Combat IUUF and destructive fishing including banning of coral mining and mangrove cutting/conversion.
  - q. Protection of coastal areas from erosion.
  - r. Land certification program for coastal community.
  - s. Fishermen insurance program (*Asuransi Nelayan*).
  - t. Enactment of fishermen, aquacultures and salt farmers protection law (*Undang-undang No. 7 / 2016 tentang Perlindungan dan Pemberdayaan Nelayan, Pembudidaya Ikan dan Petambak Garam*).
  - u. Provide coastal community with skill on tourism related activities (homestay, diving package, handicraft, culinary) as alternative income generation on the event of climate change impacts
12. To strengthen international cooperation on this issue, Indonesia would like to make the following suggestion:

- a. Promote in-depth research on the potentials for marine ecosystem to serve as carbon sink.
- b. Promote technology for ocean based energy sources.
- c. Promote technology sharing schemes.
- d. Conduct more activities and research on linking science and policy for climate change policy-making.
- e. Mainstreaming ocean to all related climate change mechanism and developing a national carbon budget that takes into account the contribution of marine and fisheries sector.
- f. Promote and disseminate examples of Blue Carbon adaptation projects for communities and economies from different countries.
- g. Propose Indonesia as Blue Carbon Research and Learning Center
- h. Conduct more activities and research on linking science and policy for policy-making in climate change

**Capacity-Building, Partnerships and Financing Mechanisms for the Implementation of Actions**

13. On capacity-building, partnership and financing mechanism, Indonesia is of the view that such effort should aim to:
  - a. Improve skills for adaptation-driven planning, project design, and monitoring and evaluation.
  - b. Create common objective between government, communities, and private in relation to adaptation need.
  - c. Improve understanding on elements of adaptation, to be mainstreamed within on going activities under government projects, private business, and community activities.
  - d. Provide incentives for more risk insurance cover for coastal and small islands community, infrastructure, and assets
  
14. In this regard, Indonesia has taken the following steps:
  - a. Hosted the World Ocean Conference 2009 and the World Coral Reefs Conference 2014.
  - b. Continuously contribute to the Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security (CTI-CFF) initiative.
  - c. Sponsored a draft resolution on “Sustainable Coral Reefs Management”, which was adopted at the second session of the United Nations Environment Assembly (UNEA-2) in 29 May 2016.
  - d. Provide capacity-building programs on marine and fishery through South-South Cooperation
  - e. Finance national projects and activities on climate change adaptation and mitigation to fulfill Indonesia’s Nationally Determined Contribution (NDC).
  
15. To strengthen international cooperation on this issue, Indonesia would like to make the following suggestion:

- a. Enhance capacity building on climate change negotiation, climate finance, and climate adaptation, including climate risk management, for developing countries, particularly archipelagic States.
- b. Establish Center of Excellence for Climate Change Adaptation and Mitigation on regional basis.
- c. Incorporate climate change adaptation within existing regional training centers under UN, multilateral, and international bodies.
- d. Select and support concrete adaptation-proven project financing as a pilot.

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