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T20 POLICY BRIEF

Task Force 01

FIGHTING INEQUALITIES, POVERTY, AND HUNGER

Advancing Climate-Resilient Oceans for Global Food Security

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Abstract

The escalating risk to land and ocean ecosystems due to global climate change is posing a significant threat to global food security. The health of marine environments, covering 70% of the Earth's surface, is crucial for the well-being of millions of people. However, unsustainable resource management and pollution are impeding the optimal utilization of these marine resources, particularly in the face of climate change. Developing coastal communities are especially vulnerable to climate-induced food insecurity, intensifying threats to marine ecosystems and their vital contributions. To address this issue, we propose a comprehensive policy focusing on four key areas. Firstly, the establishment of locally-owned protected marine areas to fortify marine ecosystems, leveraging traditional practices and knowledge, with active community involvement to accelerate recovery, preserve biodiversity, and ensure sustainable resource utilization. Secondly, G20-driven international collaboration to address the global impact of climate change on food security, advocating for assistance schemes, including infrastructure, financial aid, and capacity building to address resource disparities. The G20 platform serves as a key conduit for global mobilization, fostering collective efforts to advance food security through sustainable maritime practices and alleviate climate-related vulnerabilities in coastal communities. Thirdly, prioritizing sustainable fisheries practices is imperative, advocating for methods that prioritize ecosystem health, reduce overfishing, and minimize environmental degradation. Lastly, promoting women's participation in strategic positions also plays a vital role in ensuring inclusive policy related to climate food security. By adopting this holistic approach, we can collectively work towards ensuring the long-term health and sustainability of marine ecosystems, which are essential for global food security.

Keywords: Climate resilience, food security, gender empowerment, ocean governance

Diagnosis of the issue

As per Okeke-Ogbuafor et al. (2024), more than 2.3 billion people globally face chronic food insecurity, with around 811 million suffering from malnutrition in 2020. Data from 93 countries in 2021 indicated that 957 million individuals worldwide struggled with hunger. Considering that oceans encompass 70% of the Earth's surface, the well-being of marine ecosystems plays a crucial role in the welfare of millions. Maximizing marine resources could be pivotal in attaining food security and alleviating global hunger. In 2018, according to FAO (2021), global fish production and aquaculture output reached 179 million tonnes, with approximately 59.5 million people employed in the primary sector of capture fisheries and aquaculture. These facts underscore the aquaculture industry's substantial contribution to global fish production and livelihoods. In Southeast Asia, where nine out of ten countries are located along the coast, approximately 625 million people rely heavily on marine resources for sustenance and livelihoods (Asian Development Bank 2021). However, using maritime resources to ensure food security faces several challenges, including the impacts of climate change, unsustainable fishing practices, habitat destruction, and pollution discharge.

Carbon dioxide (CO₂) concentration in the atmosphere has significantly increased since the industrial revolution, reaching 37.5 ± 2 GtCO₂ in 2023 due to human activities such as burning fossil fuels and deforestation. Of this, around 47% is absorbed by the atmosphere, and another 26% is absorbed by the ocean (Friedlingstein et al., 2023). Excessive amounts of greenhouse gases (GHG) trapped in the atmosphere lead to an increase in the Earth's temperature, and the ocean plays a crucial role in absorbing more than 90% of anthropogenic heat in the Earth's systems to moderate global atmospheric warming (Li, England, and Groeskamp 2023). However, under current circumstances,

ocean warming is reaching unprecedented levels due to an increase in GHG emissions. This changing global climate poses significant challenges not only to the land ecosystem but also to the ocean ecosystem. The impacts of climate change on marine ecosystems are broad and include ocean warming, sea level rise, and ocean acidification, which threaten the viability of ecosystems across the world, including the productivity of fisheries management and food security. Climate change-related maritime-based food security is a significant concern for populations, particularly in small island developing states and developing nations, where maritime resource-based food sources account for 90% of their protein consumption (Salinger and Hobday, 2013). In a scenario of ocean warming exceeding 1.5°C, it is projected that the global fish catch potential, encompassing aquaculture, will decrease by 3 million tonnes for each additional degree of warming (Cheung, Reygondeau, and Frölicher 2016).

Climate change is expected to escalate food insecurity, particularly impacting women and girls. By 2030, 7.5 million women and girls are projected to face food insecurity due to climate change, and this number is anticipated to increase to 33 million by 2050 (Audrey Pirzadeh et al., 2023). This exacerbates existing gender disparities, such as the underrepresentation of women in strategic and leadership positions in the maritime sector, where 85% of women occupy non-strategic roles (low-level work roles). In the academic realm, women hold less than 40% of positions in fields related to oceanography and marine science globally (Legg et al., 2023), limiting diverse perspectives and impeding policy and research development essential for addressing marine and environmental challenges. The intersection of climate change and gender inequities emphasizes the necessity for targeted interventions to empower women across all sectors.

A comprehensive global framework, including the sustainable development goals (SDGs), has been established to address climate change-induced food insecurity

worldwide. The SDGs aim to eradicate hunger, ensure food security, enhance nutrition, promote sustainable agriculture, take prompt action to combat climate change and its impacts, and sustainably utilize marine resources while empowering women across all sectors for sustainable development by 2030. Urgent transformative actions from G20 member countries are necessary to achieve the 2030 agendas that are in line with G20's key priorities. Strategic interventions are crucial to avert further adverse effects of climate change on the world's populations, many of whom heavily depend on ocean-based resources. Failing to mitigate and adapt to climate change will result in drastic declines in fishery productivity, with detrimental implications for socio-economic and environmental aspects. This policy brief underscores the challenges of climate change pertaining to maritime-based food security and the potential of adopting climate mitigation and adaptation policies for the global community.

Recommendations

This policy brief aims to enhance the resilience of oceans against climate change in order to ensure global food security. The approach involves integrating protection, mitigation, and adaptation strategies. The brief suggests several policy recommendations, including the establishment of locally-owned marine protected areas (MPAs), international collaboration among the G20 countries, prioritizing sustainable fisheries practices at both small and industrial scales, and promoting of women’s leadership, both by G20 country members and the global society.

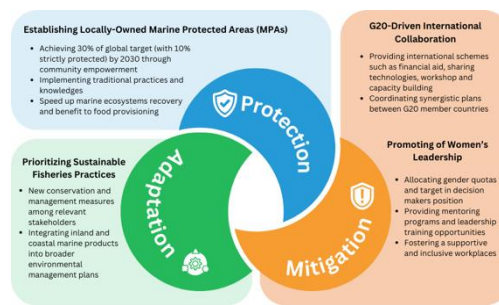


FIGURE 1. Policy framework for sustainable marine-based food security

Recommendation 1: Establishing locally-owned marine protected areas (MPAs) to fortify marine ecosystems.

Marine Protected Areas (MPAs) are effective tools that can help mitigate the negative impacts of human and industrial interventions on marine ecosystems. Under adequate management and certain ecological conditions, MPAs could potentially protect and recover marine ecosystems, including marine-based food sources, and achieve nature-positive goals by 2030 (Humphreys and Clark, 2020).

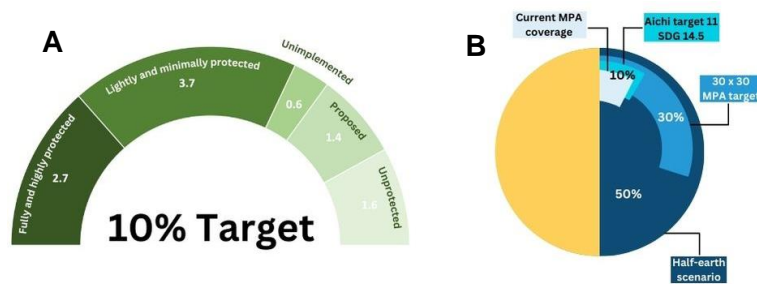


FIGURE 2 Global marine protected area coverage and potential international targets. (A) Share of global ocean covered by MPAs of different designation categories in April 2021. (B) Share of global MPA coverage in relation to potential future MPA coverage targets. Modified from Kriegl et al. (2021).

The global target for establishing MPAs is 30% by 2030, usually called the 30 x 30 MPA target (30% of the area covered with 10% strictly protected). Unfortunately, as of 2021, only around 7% of the ocean area has been designated or proposed as protected areas, and only 2.7% is actually implemented as strictly protected (Sala et al. 2021). However, highly and fully protected MPAs have proven to be effective in increasing the biomass of commercially targeted fishes and invertebrates over time, and given the right biological conditions, they may also enhance productivity in fished areas outside of the MPA through adult and larval spillover (Lynham et al. 2020). In Southeast Asia, one of the world's highest biodiversity hotspots, 69% of MPAs are categorized as areas with ineffective management (Lam et al. 2019). Therefore, establishing locally-owned MPAs, which fortify these vital ecosystems but also ensure sustainable fisheries, foster long-term food security, and empower local communities to become stewards of their maritime heritage, represents a compelling strategy. Encouraging the opening of locally-owned MPAs can be an alternative management approach for marine protection from climate change impacts. This includes involving community participation in implementing traditional knowledge and practices to maintain their owned MPAs. Community

involvement in implementing sustainable management of MPAs through traditional knowledge implementations is critical to support the rehabilitation of marine ecosystems, particularly with sensitive and vulnerable species. Implementing this policy requires collaborative efforts and engaging local societies, governmental agencies, and international stakeholders. Through global governance, the G20 platform must establish a maritime spatial planning system that provides potential zones for locally-owned MPA developments, including socio-economic considerations. G20 efforts should also ensure that community stakeholders have access to financial and technological aid to provide sustainable management of locally-owned MPAs.

Recommendation 2: G20-driven international collaboration to address the global impact of climate change on food security.

Climate change is a transboundary problem that causes widespread disruption of social, economic, and environmental stability. The G20, comprising major economies, holds a unique position to drive international collaboration and advocate for several schemes, including financial aid, social protection, sharing infrastructure, and capacity building. In the face of climate uncertainty, it is crucial to have social protection programs that are based on risk information and responsive to shocks to mitigate the impact of climate change and natural disasters on poor and vulnerable communities (Winder Rossi et al. 2017). Social protection programs can also be used as a tool to boost local economic growth. Utilization of infrastructure and increasing human resources in controlling and operating maritime-based food source production processes play a role in encouraging sustainable practices. However, the ability of various countries, especially developing ones, to provide social assistance to support community activities is inadequate. The existing infrastructure is not equivalent to producing maritime-based food sources,

making it difficult to carry out non-damaging practices. To address these issues, G20 governments should aim for synergizing plans, where cooperation between fishery, aquaculture, and social protection interventions can be strengthened. Training and workshops also support sustainable community adaptation in facing the impacts of the climate crisis. In addition, through strong global governance, G20 countries can encourage global insurance and community-building programs to support vulnerable countries in facing natural disasters and/or pandemics, particularly climate-related food security.

Recommendation 3: Prioritizing sustainable fisheries practices at a small scale and industrial scale.

Scales due to climate change, there have been significant shifts in species distribution and populations, resulting in new fishing practices and parties targeting fish supply areas. It is crucial to recognize these new practices and parties and collaborate to implement data collection regarding the supply zones. All relevant parties must agree on new conservation and management measures to ensure the sustainability of fishing practices. Additionally, parties should ensure greater flexibility and adaptability in their management schemes to account for potential disruptions to traditional fishing patterns caused by shifts in fish populations. This will allow the total allowable catch to remain respected without compromising fleet sustainability and profitability. To prevent and regulate dispute resolution, it is essential to improve cooperation mechanisms in cross-border stock management. Sustainable fisheries practices can be a climate-friendly approach to food production, as they result in low carbon emissions, minimize marine pollutants, and restrict coastal habitat degradation. Therefore, fisheries, aquaculture, and other marine product users must adopt an ecosystem-based approach to adapt to climate

change. To achieve this, it is vital to integrate inland and coastal marine products into broader environmental management plans and improve integrated water and land management. Marine spatial planning, river basin scale management plans, and the development of transboundary management bodies can all help develop and implement agreed plans. By adopting these strategies, we can prioritize sustainable fisheries practices at small and industrial scales, ensuring the continued health and sustainability of our oceans.

Recommendation 4: Empowering Women in Ocean Governance and Management

The promotion of gender diversity and women's leadership in decision-making bodies and institutions pertaining to ocean governance and management is crucial for the development of inclusive and effective policies. Implementing gender quotas or targets can ensure adequate representation of women in marine policymaking processes, advisory boards, and resource management committees. By creating a supportive and inclusive environment, women can be motivated to assume leadership roles and contribute their expertise to the blue economy and marine-based food security. Providing mentorship programs and leadership training opportunities tailored to women in marine-related sectors can help enhance their confidence and skills. Recognizing and celebrating the accomplishments of women leaders in the Blue Economy can serve as inspiration for future generations.

Scenario of outcomes

Sustainable food security policies can be achieved by establishing locally-owned marine protected areas (MPAs), enhancing cooperation among G20 members, promoting sustainable fisheries practices, and empowering women in ocean governance and management. However, these policies entail trade-offs and contradictions that require careful consideration. For instance, the establishment of locally-owned MPAs may lead to conflicts between conservation efforts and local customs, necessitating a resolution. To address this, decision-makers should involve communities in the decision-making process, respect their customs, and adopt an adaptive approach that aligns conservation objectives with relevant community knowledge and traditional practices. Standard operating procedure differences in MPA management may also arise, requiring an integrated management standardization mechanism to ensure alignment with national and global conservation goals. Strengthening cooperation among G20 members can offer financial aid and technology sharing but may also result in dependency between countries, creating a contradiction. Therefore, a suitable cooperation paradigm is necessary to empower both communities and governments independently and ensure future food security without dependency. Promoting sustainable fishing practices may initially lead to economic growth at the expense of small-scale fishers and traditional livelihoods, indicating a trade-off between economic growth and social considerations. Decision-makers must carefully balance these aspects. Lastly, emphasizing gender equality and women's empowerment in ocean governance is a significant step towards inclusivity and representation. However, integrating feminist principles into policymaking may face resistance from entrenched power structures and patriarchal norms, potentially marginalizing women's voices and perpetuating existing inequalities.

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