

Coastal challenges: Mainstreaming climate action in the G20 development agenda

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This policy brief explores and provides a holistic view of the existing practices, issues, and opportunities for a sustainable coastal management initiative among the G20 member countries. Specifically, it highlights coastal disaster risk reduction and resilience strategies, along with the financial implications of public investment on the need of a proper assessment of the social return of adaptation projects, and on the avoided fiscal deadweight loss. The brief also discusses the importance of funding for development projects to reach mitigation targets and the need for an evaluation framework to improve the efficiency of these adaptation efforts. The policy brief suggests establishing an initiative within the G20 to address disaster risk reduction (G20DRR) by providing a decision support system as well as a centralized dissemination platform for quality-controlled, transparent national climate impact assessments by fostering global collaboration between institutions, researchers, and experts.

Challenge

Climate change is emerging as a global threat, with long-lasting impacts that differ across regions and sectors. Several countries are experiencing extreme weather conditions with catastrophic impacts on humans and infrastructure, and extreme weather events are projected to intensify in most regions. As climate drives biochemical activities along coastlines, increases in average temperature and sea level have a significant impact on the physical, biological, and chemical behaviors of coastlines. Coastal areas and small island nations are particularly vulnerable, as coastal risks (e.g., storm surges) are increasing with the rising sea levels and intensifying extreme weather events (e.g., tropical cyclones leading to coastal inundation, destruction, and displacement of coastal populations). Therefore, a comprehensive plan of action is needed to anticipate future climate-related risks and develop evidence-based sustainable and tailored mitigation and adaptation plans. Currently, no proper mechanisms exist that verify whether the outcomes of adaptation and mitigation measures are being accurately reported, are aligned with resiliency principles, and are evaluated for sustainability. Therefore, a measuring, reporting, and verification mechanism is required for adaptation projects, along with a centralized communication platform for knowledge management and communication.

Disaster risk mitigation must be at the forefront of any development agenda, as it directly impacts the lives of people. It should include strategies that integrate both the management of risk and the ability to respond effectively so that vulnerabilities can be addressed. Adaptation strategies can be implemented effectively and resilience improved to reach a disaster proof society.

Proposal

This policy brief highlights the following key areas of intervention and provides recommendations for Group of Twenty (G20) countries.

Proposal I

Challenges, practices, and requirements for coastal disaster risk reduction

Coastal areas provide important economic, social, cultural and ecological services. Most of these services are affected by coastal hazards every year. Therefore, the coastal infrastructure, such as shipping industries, ports, transport network, water supply and health infrastructures and services are under immense stress. Recently, investments in climate- and disaster-resilient infrastructure and services have proven to be a good business strategy for sustainable economic growth. However, investments must be protected so that the benefits from having such infrastructure are realized.

Over the past decades, coastal disasters have become more frequent and severe. Although modeling and predicting hazards have improved, many developing nations still do not have access to these technologies, as their disaster management is limited to post-event recovery and relief. Hence, there is a need for a concerted effort to leverage expertise and financial and technological support for the development of a comprehensive decision support system for coastal disaster management. To accomplish this, the existing disaster risk reduction (DRR) cooperation between nations should be more supportive in terms of technology transfer, financial support, and capacity building. There is also a strong need for well-coordinated and sound efforts to leverage all expertise, financial and technological support for the development of comprehensive climate adaptation, and mitigation action plans for sustainable coastal management.

The Sendai Framework for Disaster Risk Reduction was the first major agreement in the UN's development agenda that provided member states with concrete actions to protect development gains from the risk of disaster (UNDRR). Further, the Third UN World Conference on Disaster Risk Reduction (WCDDR) advocates for "The substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries." However, global collaboration under the UNDRR has limitations in addressing local and regional challenges. The G20 nations should work towards finding new ways to enhance the coherence between the Sendai Framework, the Sustainable Development Goals (SDGs), and the Paris Agreement and also explore innovative actions to address disaster risks. We thus propose an initiative within the G20 to tackle regional and local disaster issues (G20-DRR) to ensure continuous multilateral efforts in improving disaster resilience.

The G20-DRR initiative should include a framework for the implementation and monitoring of DRR targets through monitoring, reporting, and verification. It should fix accountabilities, provide a better understanding of natural hazard risks, and assess strategies to prevent excessive economic imbalances and foster collaboration for the development of a comprehensive decision support system for DRR.

Proposal II

Challenges and opportunities in financing the climate resilience infrastructure

Sea level rise (SLR) threatens coastal areas around the globe. However, vulnerability and resilience differ not only across local areas, but also across countries. For shocks, it is reasonable to assume that the resilience of advanced countries is higher than that of developing countries. Hence, adaptation should differ across regions and nations. Scientists have convincingly shown that the most cost-effective way to protect human lives and economic and social activities from SLR is by mitigating climate change, that is, reducing harmful GHG emissions. However, this is a global public good and agreeing on the provision of a sufficient, let alone socially optimal, amount is difficult. It follows that individual countries have to take adaptation measures to protect themselves against risks. Adaptation is a private good, typically country- and context-specific, and has to be implemented locally mostly through appropriate and specific infrastructures.

Financing adaptation infrastructures to the necessary extent would be a significant challenge, as it would primarily affect public budgets. Countries that are in fiscal distress or are cash-strapped will be especially affected, as there will be economic, financial, and political limitations to governments' abilities to finance adaptation infrastructures.

Additionally, as more climate-resilient infrastructures for adaptation are put in place, their social return will tend to decline for at least three reasons: (1) more resources are devoted to maintain the infrastructure, (2) financing will be more expensive as the deadweight loss of taxation increases more than proportionally, and (3) inevitably, the marginal productivity of infrastructures subsequently decreases.

Developing countries, especially those vulnerable to climate change impacts and largely located in the Southern hemisphere, will be especially challenged. From this standpoint, two considerations are in order. First, in certain countries, public–private partnerships (PPPs) have emerged in recent decades as a new organizational form to provide public infrastructure. Although the public provision continues to be the dominant procurement option, investment in PPPs in transport over the past 25 years has been considerable, totaling EUR 203 billion in Europe and USD 535 billion in developing countries. However, in some countries, investment via PPPs in other infrastructure types, such as hospitals and schools, has also been significant. PPPs are thus funded by a combination of user fees and government transfers.

Second, the developing countries especially affected by SLR but with insufficient funds to finance adaptation measures will have to depend on earmarked foreign aid. In this respect, the AF was established under the Kyoto Protocol of the UN Framework Convention on Climate Change and, since 2010, USD 720 million has been committed to climate adaptation and resilience activities, including supporting 100 concrete adaptation projects. In addition to the AF, the GCF is a UNFCCC fund established during COP-16 in Cancun as an operating entity of the Financial Mechanism that assists developing countries in terms of adaptation and mitigation practices to counter climate change. The Fund has set itself a goal of USD 100 billion a year by 2020; so far, a total of USD 10.3 billion has been pledged (3 billion by the US and almost 5 billion by the EU).

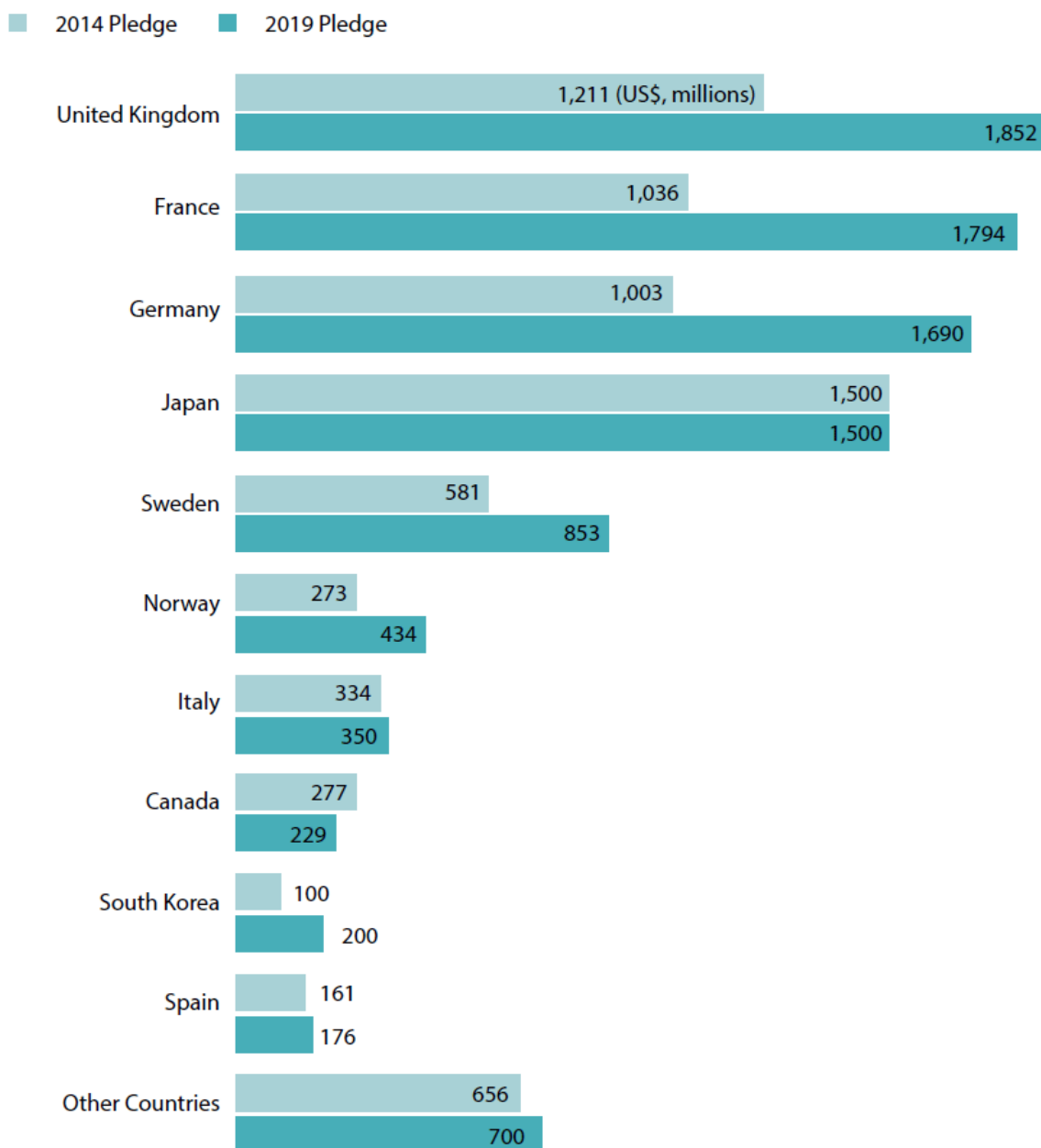


Figure 1: Funds pledged by 27 countries to the GCF

Source: NATURE BRIEFING, November 4, 2019

Disputes remain as to whether the funding target would be based on public sources or whether “leveraged” private finance will be counted towards the total. The lack of pledged funds and the potential reliance on the private sector is controversial and has been criticized by developing countries. While many developed countries advocate the appeal to capital markets—particularly pension funds and other institutional investors—by using a broad range of financial instruments, several developing countries and non-governmental organizations have suggested that private sector funding should focus on pro-poor climate finance for addressing the difficulties faced by micro-, small-, and medium-sized enterprises in developing countries.

Proposal III

Collaboration for the development of new adaptation and mitigation programs

The Arab region is highly vulnerable to climate change impacts. Its unique geography, with some of the world’s largest and harshest desert lands, exposes the region to an intensification of already frequent droughts and the further reduced rainfall leads to increased degradation and desertification. Water is a scarce and fragile resource in the Arab region. Arab countries cover 10 percent of the world’s land area, but receive only around 2 percent of its average annual precipitation. The same holds true for South and south Asian countries, which experience the worst coastal disasters almost every year. The frequency of these events has increased significantly over the past decades. Living with disasters has become the norm in this part of the world. Other examples would be the African Atlantic coastline and the central Arabian Gulf (Doha, Dubai, Manama), which are particularly susceptible to heat stress and have the most extreme weather conditions across this region.

Adapting coastal zones to climate change is a unique endeavor for two primary reasons: (1) we are developing adaptations for a complex ecosystem with a limited knowledge base and (2) there are limitations to adaptation. Paradoxically, we rely heavily on coastal ecosystem services, yet we know relatively little about our oceans and coasts. Unlike other natural areas, coastal zones are dynamic ecosystems that exist at the interface of the coast, watershed, and land, making them complex systems subject to rapid transformations. Additionally, there are limitations to adaptation in coastal areas. For instance, at the current SLR rate, the IPCC AR5 projects a complete loss of land, particularly in poorer countries. Given some limitations, adaptation measures such as coastal retreat and infrastructural abandonment, which were once considered “failures to adapt,” are now considered viable adaptation options. This is just one example of the ever-changing adaptation landscape of coastal areas. Based on these premises, we propose the need to develop and enhance our current understanding of coastal adaptation practices.

Suggestions for implementation

We suggest addressing the above proposals both theoretically and practically. Theoretically, we see added value in approaching adaptation projects as soon as the adaptation design and then throughout implementation and evaluation. Practically, we suggest revisiting large-scale coastal adaptation projects and documenting both successful and unsuccessful practices and outcomes.

There are nevertheless limitations to the practical implementation of proposals, such as access to resources and time constraints. Developing a repository of coastal climate change adaptation projects, conducting field visits, and requesting feedback from coastal adaptation project managers is costly and time-consuming. However, the goal is to transition the coastal adaptation analysis from an outcome-oriented approach to a learning-oriented one.

Current approaches to addressing climate change vulnerabilities at the community level are insufficient due to regional and local peculiarities. An effective and coordinated approach is thus needed among G20 countries to support long-term sustainability. The following areas could be taken up by G20 member states in addressing challenges in adaptation and mitigation programs in vulnerable communities:

- Support autonomous adaptation through a policy that recognizes the multiplestressor nature of vulnerable livelihoods.
- Increase attention to the cultural, ethical, and rights considerations of adaptation by increasing the participation of women, youth, poor, and vulnerable people, including those in conflict between adaptation policy and implementation.
- Raise awareness and build human/institutional capacity for mitigation, adaptation, impact reduction, and early warning.

- Combine “soft measures” and flexible and iterative learning approaches with technological and infrastructural approaches and blend scientific, local, and indigenous knowledge when developing adaptation strategies.
- Focus on building resilience and implementing no-regret adaptation measures accounting in synergy with development strategies accounting for future climate and socioeconomic uncertainties. Build adaptive management and social and institutional learning into adaptation processes at all levels.
- Address energy vulnerabilities to increase social well-being, sustainable energy, and water services. Raise environmental sustainability to a development priority by harnessing the pool of natural resources through adequate choices of infrastructure, technology, governance, and sustainable management practices.

Proposal IV

Monitoring and verification process for coastal adaptation

Monitoring and verification in climate change adaptation projects will enhance our knowledge of adaptation efforts and improve the efficient use of funds in this area. Additionally, an international repository for climate impact assessments can be used to develop high-quality standards for reporting climate risk and impact assessments. The adaptation project monitoring and verification process includes:

1. International repository for coastal adaptation projects:By documenting climate change adaptation projects in different coastal regions of the world, we can systematically identify patterns of success and failure in adaptation applications. Moreover, an international repository will allow us to compare adaptation projects across and within regions. This will permit practitioners and policy makers to identify the global and culturally contextual barriers to successful climate change adaptation.

2. A systematic analysis of coastal climate adaptation projects:We propose the documentation of climate adaptation best practices, which will inform future evaluation options. The goal is to employ a more nuanced approach to the adaptation lifecycle. As such, rather than focusing solely on project outcomes, there is a need to analyze best practices during the project design, implementation, and evaluation stages of climate change adaptation projects.

3. Verification tools for coastal adaptation projects:Verification tools differ from current evaluation measures in climate change adaptation projects. Unlike evaluations primarily concerned with how funds are distributed and spent across a project, verification measures will periodically document the gradual progress of an adaptation project. This also signals the need to incorporate a post-adaptation stage for all coastal adaptation projects.

4. Cost-benefit analysis of a range of verification approaches:To date, verification processes are not required for climate change adaptation projects. Our goal is to identify the most cost-effective verification approaches to be employed across projects, either regionally or internationally.

Proposal V

Science communication platform for knowledge management and dissemination

We propose the implementation of a science communication platform for quality controlled, transparent national climate impact assessments. The platform will provide user-friendly access to the latest peer-reviewed climate impact research and data based on cross-sectoral consistent, multi-model climate impact simulations for historical periods, as well as for different standard future emission and socioeconomic scenarios. The simulations will capture the main physical climate risks in coastal areas, including the risks of coastal floods, river floods, and tropical cyclones, accounting for slow-onset long-term climate change impacts such as SLR. A harmonized modeling protocol permits the assessment of the risk of compound events, such as simultaneous river and coastal flooding, which is especially important for low-lying flood-prone developing countries like Bangladesh. The interactions between different risk categories can also be considered. For instance, higher water levels due to SLR increase the risk of tropical cyclone-induced storm surges.

Thus, the platform will provide user-friendly access to: (1) information about future climate risks, (2) a transparent evaluation of model performances based on historical observations, and (3) the attribution of observed climate change impacts. To this end, the platform invites scientists to translate their recently published scientific papers into easily accessible national impact assessment reports, accompanied by open access to simulation data. Equally important, the platform enables the continuous dialog between practitioners, such as the G20 Climate Sustainability Working Group or the Network for Greening the Financial Sector, and climate impact researchers to develop transparent metrics and standards for reporting physical climate-related risks. Therefore, the platform will meet the growing demand of

national and international institutions (e.g., central banks, the International Monetary Fund, and the GCF), as well as of the private sector (e.g., reinsurance industry, Task Force on Climate-Related Financial Disclosures) for standardized and transparent risk assessments.

A transparent paper-based evaluation of models will allow users such as the national adaptation planners involved in the NDC process to choose the model that performs best in the region and for the event category of interest. The platform is thus designed to inform the objective metrics to assess climate change-related risks in the context of sustainable financing. It also provides critical decision support for policy makers by translating the newest region-specific climate impact research into stakeholder-oriented climate risk reports for a historical period and for various future climate scenarios, including NDC-based scenarios. This supports climate risk disclosure and sustainable financing, as addressed by the G20 (e.g., TCFD) and ESG related processes.

Key Recommendations

- Establish a collaboration forum (G20-DRR) to tackle regional and local coastal disasters and develop a comprehensive decision support system (DSS) for a disaster risk reduction (DRR) mechanism for enhancing resilience to coastal risks.
- Develop a blueprint defining a comprehensive appraisal process for projects, to develop financing capacity and enhance cooperation among G20 countries to assist developing countries.
- Translate the commitments of the G20 countries into actual contributions to official adaptation funds (United Nation's Adaptation Fund (AF) and the Green Climate Fund (GCF)) by targeting their moral obligations towards non-G20 countries. In view of the capacity of the G20 to mobilize financial resources, study the feasibility of setting up a G20 adaptation fund to hedge against the risk of SLR by supporting the most vulnerable countries with limited financial resources.
- Develop an open, quality-controlled science communication platform for global climate impact data, providing easy access for international and local stakeholders to state-of-the-art national-level climate risk assessments under different standardized greenhouse gas emission (GHG) and socioeconomic development scenarios.
- Set-up a task-force within the G20 Climate Sustainability Working Group to develop and agree on transparent metrics and standards for reporting physical climaterelated risks, thus meeting the growing demand for their standardized and transparent reporting.
- Utilize these results, practices, and tools to inform and support the G20 Climate Sustainability Working Group, Network for Greening the Financial Sector, Task Force on Climate-Related Financial Disclosures, and national adaptation planners involved in the NDC process.

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Disclaimer

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