



WORLD SUSTAINABLE DEVELOPMENT SUMMIT 2023

MAINSTREAMING SUSTAINABLE DEVELOPMENT
AND CLIMATE RESILIENCE FOR COLLECTIVE ACTION

February 22-24, 2023
New Delhi



WORLD BANK GROUP

Enhancing Coastal Resilience for a Sustainable Future: Managing Risks and Climate-Resilient Shoreline in India

THEMATIC TRACK SUMMARY

Venue: Casuarina

Date: 23rd February, 2023

Time: 2:00 PM – 3:30 PM (IST)

Suggested Citation

World Sustainable Development Summit (2023), Enhancing Coastal Resilience for a Sustainable Future: Managing Risks and Climate-Resilient Shoreline in India, Thematic Track Summary (Rapporteur: Madhuparna Maiti), New Delhi: The Energy and Resources Institute.

Actionable Messages

Message 1: There is a need to deliberate on a design to address climate change, and multi-hazard risk which is very critical to coastal communities. There is enough knowledge, but it's important to put in place a working platform for cross-learning action across states.

Message 2: Data management systems emerged as a major challenge for the small island emerging states, and there is a critical need to focus to improve communication capabilities and outreach across various actors.

Message 3: The three main structures on which CDRI focused were power, transportation, and telecommunication, but it also focused on infrastructure for tourism, coastal development, water and waste water management, early warning systems, and ICT. A lot more work has to be done on strengthening small island developing states so that resilience and inclusion can be incorporated into development. This is because infrastructure is for people and will only be really robust if the gender and social dimensions are addressed.

Message 4: Keeping in mind that resilience is site-specific, there is a need to deliberate on how important it is to consider locally led, indigenous adaptation methods for boosting resilience.

Narrative

The question of whether or not India's coast is prepared to resist the effects of the climate change-induced disasters arises given the very climate-sensitive nature of India's coast line. It is crucial to address local community demands while simultaneously enhancing coastal resilience. In order to improve the protection of coastal ecosystems on a large scale, coastal resilience also needs to go beyond meeting immediate local needs and focus on developing a larger body of data that makes the case for more investment and international cooperation. Moving from coastal risk to resilience requires a comprehensive approach to building resilience. Diverse stakeholders will need to collaborate to engage and support local people, improve investment and finance opportunities, and strengthen international collaboration and understanding in order to shift from coastal risk to resilience. In light of these, the focus of the session was on the necessity of integrating climate-smart, nature-friendly, and resilient initiatives across sectors to prevent unintended negative effects. Through public and private initiatives, public-private partnerships, and other cutting-edge forms of cooperation, this session also covered options to quicken the pace of action and reduce the risks associated with the transition. Also, the discussion focused on ways to strengthen the contribution of research to effective decision-making in coastal regions.

This session brought together key stakeholders, including **Mr Anup Karanth** (Senior Disaster Risk Management Specialist, The World Bank), **Dr. K.J. Ramesh, Former DG** (Indian Meteorological Department, Ministry of Earth Sciences, Government of India), **Dr. Sumit Sharma** (Programme Officer, United Nations Environment Programme), **Ms. Riya Rahiman** (Lead, Infrastructure for Resilient Island States, Coalition for Disaster Resilient Infrastructure), **Mr. Ignacio Urrutia** (Senior Disaster Risk Management Specialist, The World Bank); and the session was chaired by **Dr. M.V. Ramana Murthy**, Scientist G and Director, National Centre for Coastal Research (NCCR), Ministry of Earth Sciences.

The opening remarks and framing presentation were delivered by **Mr. Anup Karanth, Senior Disaster Risk Management Specialist, The World Bank**, where he highlighted the various kinds of work done by state governments in the areas of disaster management for management of risks and building a climate-resilient shoreline in terms of last mile connectivity, early warning systems, evacuation roads in many coastal states stretching from West Bengal to Gujarat. "The intervention that we make, whether it is from an infrastructural point of view or looking at things like livelihoods and other things, is stressed by the numerous threats that are present along the shore," said Mr. Karanth. He made the observation that a lot of risks do not originate from our coastlines, but rather originate from distant sources, necessitating the need for interventions to be viewed from a multi-hazard perspective, stressing on the requirement for further development in housing stock, and state governments must actively try to address this issue. He made the reference of the Tsunami 2004 and an active Tsunami in the Makran zone of Iran as examples. Deliberating on how to include them as part of the design process is essential. There is enough data available, but the challenge is how to integrate that data into a common platform and make those data sets accessible. The ADP, the UN, and the World Bank computed the overall damage and loss estimates from the Odisha flood over a period of 15 to 20 days. The damage and loss estimates were close to 3.7 billion dollars, and there's a lot of money that needs to be pumped in to have a very sound recovery—a recovery on how to build back the existing energy systems. CDRI has been working extensively in terms of building resilience across the power sector. Much work needs to be done to make the best science available for the decision-making process as he briefed about some of the ongoing initiatives towards multi-hazard risk management in coastal areas. The Indian Metallurgical Department has significantly changed how early warning is produced. A number of agencies are working on this in terms of processing data in real time to predict where the landfall is going to happen. He added that genuine work has been done in terms of the

modelling of the cyclone trajectory, etc., and that we are adept at using data from the Indian National Center for Ocean Information Services, which provides the modelling findings for the storm. In his description of the Early Warning Dissemination System (EWDS), Mr. Arup noted that numerous methods of reaching out to individuals have been created. Showing some photos from the aftermath of the cyclone that hit Odisha, he underlined how critical it is to rebuild resilient homes and community infrastructure. It is important to build institutions, and a need exists to bring the data together and make it dynamic to make it available in real time, which is really challenging. He talked about the Web-DCRA and DSS Application Landing Screen and emphasized the need to build the sea level rise module tool into this so that one common tool can be there in several institutions. Long-term engagement is crucial to building the capacity of communities. “Another engagement is looking at how we look at hazard reduction, coastal protection, land use regulations, impact prediction, and residual risk. There will also be some residual risk because we can’t reduce risk to zero, so it’s important to understand residual risk,” he averred. He stressed the need for better systems around it, so the new programs that are being designed for the coastline are looking at issues of not just life-saving but also loss reduction.

The discussion continued towards understanding the current scenario in the coastal region as **Dr. M.V. Ramana Murthy** described the fragility of our infrastructure, as it is not capable of taking up the extreme climatic stress events, especially when a precipitation of 40 cm happens in three days’ time. Resuming from there, he highlighted the significance of efficiently utilizing the data to disseminate it and use it further. “If we want to develop urban cities in terms of improvements in the drainage system that need to be addressed in the long term, we need to have an urban flood warning system like the Integrated Flood Warning System, also called iFLOWS, that was set up for both Mumbai and Chennai,” cited Dr. Murthy. Another important phenomenon that needs to be looked at is coastal causal erosion, as many of the fishing communities are subjected to the threat of coastal erosion. As of date, West Bengal is highly affected by coastal erosion. About 60% of the coastline is subjected to erosion, followed by Pondicherry at 57% and Kerala at 45%. He further stressed the importance of preparedness for coastal disasters in terms of rehabilitation, as he gave an example of a policy of rehabilitation and then mitigation measures by the National Disaster Management Authority (NDMA). A method has to be devised for nature-based solutions because the fishing community’s reliance on the coasts makes it incredibly difficult to rehabilitate individuals from coastal districts to other states. The National Centre for Coastal Research (NCCR) is working on safeguarding the shoreline from erosion through shoreline mapping and monitoring wherever erosion is high.

Dr. K.J. Ramesh, Former DG, Indian Meteorological Department, Ministry of Earth Sciences, Government of India, said, “We are at 1.2°C, which means this has made 7% more moisture, which will result in heavy rainfall events. Thus, we need dynamic models readily available for major rivers in the coastal zone.” Some of the states have begun and are addressing a portion of the risk assessment effort. Yet, there is still a lot to be done. The shoreline must be protected from erosion, coastal highways must be designed, and the canal system must be modified to boost the capacity of water recharge, among other things. The amount of moisture in the atmosphere increases by 7% at 1.5°C. Due to significant anticipation and unusual rainfall occurrences in the coastal zone, an easily accessible dynamic model is needed.

According to **Dr. Sumit Sharma, Programme Officer, United Nations Environment Programme (UNEP)**, there are four primary priorities that should be recognized: understanding and mapping the disaster risks; bolstering NGOs and the government at all levels (regional, state, and federal); figuring out how to direct investments; and, last, using communications to put all of our systems into

action. Plastics are now a serious problem not just in India but throughout the world. Nowadays, there are 9–10 billion tons of plastic in use, only 10% of which is recycled, and the majority of that is broken down into micro-plastic that is making its way into our food chain from numerous sources. A resolution pledging to eradicate plastic pollution while taking into account the entire life cycle was signed by member states of 170 or more nations in February at the United Nations Environment Assembly. This indicates that the issue must be addressed from the outset, rather than at the outset. Highlighting his engagements with Goa on a number of projects, he said that tourism puts a lot of pressure on the resources, and that there are a lot of environmental concerns in such coastal regions, which generate their own environmental pressures.

Ms. Riya Rahiman, Lead, Infrastructure for Resilient Island States (IRIS), Coalition for Disaster Resilient Infrastructure (CDRI), highlighted the impact that extreme events have on infrastructure. “We’ve made considerable improvements in saving lives, but the economic damage and physical infrastructure have been overlooked,” said Ms. Rahiman.

About cyclone Fani, the economic damage was close to 9 billion USD where the power sector accounted for 1.2 billion USD with respect to economic damage; then there was a serious cyclone in Fiji in 2017, where the economic damage was 1.3 billion USD, that is one-third of the GDP. Similarly, the most recent volcanic eruption and the tsunami that happened in Tonga in the Pacific region, where the economic damage was close to 90.4 million USD of which the infrastructure damage was calculated to be 20.9 million USD, which is 18.5% of the GDP, translates how the infrastructure damage happens, especially in the small island developing states. However, little has been done to address such concerns of economic and infrastructure damage. An early warning system is one of the major contributing factors to coastal disasters. Despite efforts in communication, there was a gap in the connection to the infrastructure. The necessity for a strong power utility infrastructure is immense so that power could be adjusted when extreme occurrences happen. Ms. Rahiman went ahead to talk on the initiative ‘Infrastructure for Resilient Island States (IRIS),’ which was developed through extensive consultations to understand the main challenges and the opportunities for mainstreaming resilience and infrastructure developments. It was launched at COP26 in Glasgow by the honourable prime minister of India along with the prime ministers of Australia, Jamaica, Mauritius, and Fiji. Early warning systems and early learning systems that were integrated as an infrastructure were the major concepts that evolved. Data management systems emerged as a significant difficulty for the small island emerging states, and there was a critical need to improve communication capabilities. Ms. Riya highlighted that there were a lot of efforts being made with respect to communicating alerts or information to the people, but the link to the infrastructural components was missing. Risk-informed planning, database management systems, access to financing, as well as mainstreaming gender and disability inclusion, were the four themes that emerged from broad regional consultations to determine the core areas that call for comprehensive action. Power, transport, and telecommunication were the three key structures on which CDRI focused, but it also placed a strong emphasis on tourism infrastructure, coastal infrastructure, water and waste water management, early warning systems, and ICT. Because infrastructure is for people and will only be truly resilient if the gender and social aspects are incorporated, the focus of IRIS is unquestionably on empowering small island developing states so they can incorporate resilience into development. Speaking on the CDRI initiatives, there are several factors that are being looked at including distance from the coast, vulnerability and damage with respect to cyclones, the transmission and distribution infrastructure, and mapping to develop an infrastructure inventory, she added.

In a recently released report titled, *Bangladesh Coastal Resilience*, **Mr. Ignacio Urrutia, Senior Disaster Risk Management Expert, The World Bank,** concentrated on a few issues that emerged from their

work in Bangladesh. The report's major objective was to assess the outcomes of prior interventions. Seven recommendations are made at the end of the report, of which three were discussed during the session. Coastal resilience is a need that arises from a situation in a specific coastal area, not an objective in and of itself. Therefore, understanding how the first is driven by the needs of development in a particular area will further give us the sermon to make decisions and have conversations about what is the acceptable level of risk in this area. Using the Bangladesh Delta Plan 2100 as an example, Mr. Urrutia said that the problem now is to figure out how to put the adaptive planning into practice, which leads to the second point: We strive for more adaptable ways to coastal resilience, including both government and community-based initiatives that are site-specific and time-consuming. When a coastal resilience intervention is connected to urban services, urban revitalization projects, or recreational areas that truly let the community use the place, there is economic activity that helps the communities, and community value also exerts political pressure. So, one of the biggest obstacles may be connecting the protection investments with the various uses and ecosystem benefits, he added.

Making Words Count @WSDS 2023

<p>“</p>	<p>Protecting the shoreline from erosion, designing coastal highways as well as re-designing canal system to increase the capacity of water recharge are important concerns. With 1.5°C, there is an increase of 7% moisture content in the atmosphere. We are anticipating heavy and unprecedented rainfall events. There is an early monitoring system available, but people in open areas, such as in agriculture fields, need to be protected and a planning at the governmental level is required.</p> <p style="text-align: right;">Dr K.J. Ramesh <i>Former DG, Indian Meteorological Department, Ministry of Earth Sciences, Government of India</i></p>
<p>“</p>	<p>There are four major priorities that need to be understood: (i) map the disaster risks; (ii) strengthen the NGOs and government at all levels – regional, state and central; (iii) channelize the investments, and (iv) communications to implement all the systems in place. Plastics have become a major issue, not just in India, but globally. By now, there has been 9-10 billion tons of plastic, out of which only 10% is recycled and a lot of it is broken down into micro-plastic which is entering our food chain through various sources.</p> <p style="text-align: right;">Dr Sumit Sharma <i>Programme Officer, United Nations Environment Programme (UNEP)</i></p>
<p>“</p>	<p>We have made considerable improvements in saving lives during coastal disasters, but less has been done to address economic and infrastructural damage. One of the key factors for coastal disaster is an early warning system. Though efforts have been done in communication, the link to the infrastructural components is missing. The power utility system must be considered to tackle extreme events.</p> <p style="text-align: right;">Ms Riya Rahiman <i>Lead, Infrastructure for Resilient Island States (IRIS), Coalition for Disaster Resilient Infrastructure (CDRI)</i></p>
<p>“</p>	<p>Recovery is about how you build back better after a disaster. There are challenges but also ways in terms of how to increase resilience. We have worked immensely in the Restoration of Environment Services and Livelihood Support. It is important to build institutions and strengthen the building capacity of engineers, which in itself is a never-ending process.</p> <p style="text-align: right;">Mr Anup Karanth <i>Senior Disaster Risk Management Specialist, The World Bank</i></p>
<p>“</p>	<p>Coastal resilience is not an objective in itself, but it is a need that arises from a particular situation in coastal areas. It becomes important to understand how coastal resilience is driven by the developmental needs of the particular area so that decisions are made about what is the acceptable level of risk in that area.</p> <p style="text-align: right;">Mr Ignacio Urrutia <i>Senior Disaster Risk Management Specialist, The World Bank</i></p>
<p>“</p>	<p>Availability of data is important for any disaster so that we are able to disseminate the data and use it effectively. Our infrastructure is not capable of handling extreme events, especially when we have a precipitation of 40 cm happening in 3 days' time. If we want to develop an urban city, improvement in the drainage system is crucial.</p> <p style="text-align: right;">Dr M.V. Ramana Murthy <i>Scientist & Director, National Centre for Coastal Research (NCCR), Ministry of Earth Sciences</i></p>