Vol. 3 No. 2. June-August 2020

Development Cooperation Review

Special Issue on

Disaster Risk Management

Guest Editor : Rajeev Issar

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Strengthening Multi-Hazard Early Warning Systems and Early Actions by Impact Based Forecasting and Warning Services

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Risk-informed Development – Integrating Disaster and Climate Risks into Development

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(Continued on outside back cover)

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Guest Editorial

COVID-19 has re-defined the risk landscape, changed traditional understandings of risks and laid bare our socio-economic vulnerabilities like no other disaster before. The global footprint and unprecedented scale of COVID-19 pandemic has adversely affected every segment of society and every sector of socio-economic life.

It has exposed underlying vulnerabilities while creating newer ones thereby exposing the inadequacies of our current risk management practices. So far, risks were categorised around their origins, pathways and impacts with a certain amount of predictability about their seasonality, behaviour, regions and communities affected and even the measures needed to address them. However, COVID-19 has imbued an altogether different dimension to our understanding of risks and belied the long-held notions of disaster risk management and recovery.

The unprecedented magnitude of COVID-19 has highlighted the need for ex-ante investments in holistic risk management as a key imperative and called for a fresh look at the national, regional and global risk context and risk management systems. Within countries, the national risk management systems have come under scrutiny. The risk management instruments hitherto employed to manage risks have proven woefully inadequate. The need to review the extant institutional, legislative and policy frameworks for DRM and overhaul the existing practices has been articulated. At global level, the international frameworks adopted by the comity of nations and the approaches pursued thereunder have struggled to meet the challenges thrown by the new reality. The unpalatable new normal makes it essential to work towards a better normal.

Today's risk context is characterised by an intersecting risk landscape with no stand-alone hazards. We have already entered an era of systemic or multi-dimensional risks marked by a mutually reinforcing interplay of underlying risk drivers and vulnerabilities which amplify the socio-economic impacts across sectors, communities and countries. This is evidenced by the fact that while COVID-19 is still rampaging with devastating consequences, many countries are simultaneously grappling with extreme disasters like the Tropical Cyclone Harold in the Pacific, Cyclone Amphan in India and Bangladesh, floods in China, typhoons in the Philippines, etc. This double-whammy of multi-layered disasters is becoming more of a norm than an exception. All projections point towards this being the trend going ahead with increasing incidence of transboundary risks.

We can only ignore this reality to our socio-development pathways' peril. Linear development trajectories with their typical sectoral focus and disregard of potential disaster and other risks (like COVID-19) are no longer viable. The already high and rapidly increasing frequency, incidence and magnitude of risks and shocks does not afford the luxury to remain oblivious to this challenge. Protecting the scarce resources invested in socio-economic development from risks has become a sine qua non for building resilience and ensuring their sustainability.

This underscores the imperative to examine afresh the existing national risk management systems (including the DRM institutions, laws, policies, etc.) and capacities and assess their ability to mitigate the risk landscape sharpened by an increasingly transboundary manifestation, the inter-linkages with other socio-economic development sectors, the coordination with regional and global counterparts and the kind of forecasting, early warning-early action required to meet the emerging challenges. Harnessing the potential offered by data analytics and digital technologies like AI to support risk-informed development, disaster relief and humanitarian assistance; augmenting existing financing mechanisms like the IBSA Fund which have helped countries manage effects of disasters like floods, COVID-19; and providing leadership to advancing resilient socio-economic infrastructure through the global CDRI initiative and ensuring cross-fertilisation of expertise and ideas are some of the critical issues examined in this Edition identifying specific set of recommendations and potential opportunities for India.

These include not only an opportunity to re-configure its own national to local risk management instruments and practices but also to support partner countries to meet these challenges by strengthening its development cooperation through South-South Cooperation. The rising regional and global profile of India as reinforced by its political will and administrative bandwidth to extend medical and non-medical assistance to countries affected by COVID-19 has shown the way ahead. Coupled with the growing economic partnerships as evidenced by the initiative to re-shape global supply chains, the need to prevent potential disruptive risks and mitigate disasters requires pre-emptive and pro-active action.

The fact that many countries face this gargantuan challenge of multi-dimensional risks, the scope and potential of development cooperation across a range of areas provides a potential opportunity to widen India's development cooperation through regional and international mechanisms. The growing regional and global inter-dependencies offer an untapped potential to be leveraged for collective global good.

Advantaged by its rich experience, expertise, technological edge and demographic dividend, India is well poised to play a leadership role in the crucial risk management sphere and inform the global perspective. In sync with the Hon'ble Prime Minister's call to be "vocal for local", this provides an immense opportunity to elevate the same and take the "local to global".

The DCR Special issue on Disaster Risk Management touches upon many of these issues and their related dimensions within the Indian as well as regional and global context. It is earnestly hoped that the ideas and issues discussed in the Issue will trigger thinking towards designing a newer risk management and sustainable development paradigm.

Rajeev Issar

Strengthening Risk Management Systems to Manage New and Emerging Transboundary Risks: Lessons from COVID-19 Pandemic

*Sivapuram Venkata Rama Krishna Prabhakar**

*Rajeev Issar***

"Most developing countries in Asia have revamped their DM systems over the past decade or so inspired by global frameworks like the Hyogo Framework for Action (2005-15) and Sendai Framework for DRR (2015-2030)."

Abstract: The coronavirus disease 2019 (COVID-19) has emerged as one of the severe and important health disasters during recent times. The impacts of the COVID-19 have spanned across the globe and rightly qualify to be a transboundary disaster. When looked through the lens of transboundary risks, COVID-19 is not the first of its kind. Health and non-health transboundary risks are on the rise during recent years due to the integration at the regional and global scales. The paper argues that, despite the growth in the number of transboundary risks, the risk management systems at the national and international levels are largely oblivious of such risks and hence suitable solutions have not been developed. The paper presents various past experiences of transboundary disasters, their impacts, and important lessons related to risk reduction. It highlights the need for recognition of transboundary risks and put in place an integrated risk reduction framework from international to the national and local levels and across multiple sectors, which entails building the capacity of institutions and revamping of information and decision support systems. The paper further argues that countries such as India and Japan have the potential to lead the formulation and implementation of such a risk reduction framework that can effectively address transboundary risks given their emerging role in the Asia region and beyond.

Key words: Transboundary risks, COVID-19, India, Japan, regional cooperation, integrated risk management framework.

Introduction

COVID-19 caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has emerged as a global pandemic of unprecedented scale. It has tested countries' preparedness to manage disasters and pandemics with regional and global dimensions.

*IGES, Japan. ** UNDP, Bangkok. Views expressed are personal.

Taking the shape of a transboundary risk, COVID-19 has belied the assumptions related to its linear impact on health and healthcare systems. It has assumed the proportions of a global disaster requiring mobilisation of resources and capacities going beyond what most risk management systems are designed to manage.

The COVID-19 is not the first transboundary disaster that the countries have faced during recent years. Other notable transboundary disasters that preceded COVID-19 include the SARS outbreak of East Asia in 2003, the global food price crisis of 2008, Bangkok floods of 2011, and the Ebola outbreak in West Africa in 2014. All these disasters affected people and countries outside the countries and regions where they occurred and share similarities with the impacts of COVID-19. HIV/AIDS, though is a global epidemic, doesn't have distinct outbreak episodes unlike other events described here and is not known to have distinct impacts, described in the following section, that can qualify it to be a transboundary risk. The lessons from these transboundary disasters indicate that the risk reduction systems at the national and international level could not manage these disasters effectively and have failed to stop them from assuming regional and global dimensions.

The disaster risk reduction systems have been continuously revamped at the international and national levels inspired by the initiatives such as the Sendai Framework for Disaster Risk Reduction, and the Paris Agreement on Climate Change, both adopted in 2015. Despite these improvements, a large proportion of national-level risk management systems have been designed to respond to and mitigate only those risks that emanate and affect within the territorial remits of countries. A very little emphasis has gone into mitigating the disaster impacts from spilling over beyond the national boundaries. This left the management of transboundary risks such as pandemics to much less known, less maintained, and archaic acts, such as Epidemic Disease Act 1897 of India, which were developed in a context clearly outdated for present day needs and conditions. Since countries have not been facing epidemics and pandemics as frequently as other natural hazards, and due to the limited awareness on the transboundary risks in general (Prabhakar et al., 2018), developing national response measures for addressing such risks has not received sufficient attention. As a result, the expertise and capacities have not been well developed to manage contagious diseases, at the scale of the COVID-19 pandemic.

Keeping the above background in view, this paper first provides an overview of new and emerging transboundary risks and places the pandemics and epidemics among the important emerging transboundary risks that countries are increasingly facing. It further analyses the response to the pandemic undertaken by India and Japan, reflecting the varying priorities prompting and determining the same. In the end, the paper presents a risk mitigation framework that will help build the capacity of national and international systems to manage transboundary risks.

Impacts of Transboundary Disasters

The COVID-19 and other transboundary disasters have wide-reaching consequences affecting most parts of human lives and

national economies. In this section, a summary of the impacts of COVID-19 and other transboundary disasters is presented that also paints a picture of the effectiveness of the national risk management systems.

Impacts of health-related transboundary disasters

Prior to COVID-19, SARS, Ebola, and Zika epidemics had provided the initial experience of addressing transboundary health risks. Each of these had long-term impacts across countries and regions with high direct and indirect costs – although the scale and extent of impacts were much lesser than that of COVID-19. Each of these posed a profound equity challenge with a disproportionate impact on the poorest countries with weak health response systems as well as on socio-economically marginalised segments of society. During the Ebola outbreak, restrictions on transport, travel, and movement of labor resulted in nearly 40 percent of the land in Western Africa going uncultivated and sharp spike in prices of essential food items like rice (Thomas *et al.*, 2014; Fuente *et al.,* 2019). During the SARS outbreak in 2003, the incidence of hoarding of essential supplies such as food was witnessed in China while the spread of the epidemic inflicted wider socio-economic impact across the entire South-East Asian region (Hanna and Hung, 2004).

The most recent COVID-19 pandemic had major impact on health systems, employment and economies of countries across the world and in Asia. As of 2 April 2020, more than 50 percent of the global population was in lockdown, with severe implications for global economic activity. The economic impact is expected to be similar to that of the Global Financial Crisis of 2009 (GFC) (IMF, 2020). In the Asia region, it has affected supply chains and aggregate demand with serious economic repercussions from extended lockdowns in most countries with almost no exceptions. The most affected have been the daily wage and migrant workers, those engaged in temporary employment, and informal sector jobs.

Prolonged lockdown has affected all the businesses but the impact on the small and medium enterprises (SMEs) has been severe, with informal workers—estimated at 1.3 billion people accounting for two-thirds of the workforce in Asia and the Pacific –most affected. The ILO projected a 6.7 per cent loss in working hours globally in the second quarter of 2020, equivalent to 195 million full-time workers—125 million of which are in Asia-Pacific (ILO, 2020). Migrants, displaced people and informal workers faced a stark trade-off between safeguarding their lives and livelihoods. Nearly 100 million migrant workers in India are on the move in search of safety and basic sustenance defying a nation-wide lockdown.

The World Bank projected that at least 11 million people across East Asia and the Pacific will fall into poverty even under optimistic scenario (The World Bank, 2020). Already, an estimated 100 million migrant workers in India are on the move to their hometowns and villages in search of safety and basic sustenance (UNDP, 2020). Informal workers are among the most vulnerable as most of them are not covered by government social security nets or reached by rescue packages.

The COVID-19 pandemic has exposed at least two important vulnerabilities of the

current food systems, among many others: labor-intensive agriculture systems, and the development of specialised food production zones characterised by monocropping. Though mechanisation is on the rise, agriculture is still a labor-intensive sector in many Asian countries, barring few highly mechanized pockets. During COVID-19, many Asian countries were having winter crops such as wheat in the fields, which were ready for harvesting sometime during Feb-April coinciding with the spread of COVID-19. There is a direct linkage between large-scale monocropping and long-distance food transportation. Contiguous areas producing a single crop has increased the reliance on the transportation of food over long distances to fulfill diverse nutritional needs, among other factors.

Though statistics is yet to come by, emerging evidence indicates several negative outcomes in India and other countries: 1) The large-scale lockdown by governments has severely hampered the labor movement and crop operations in several countries in Asia and beyond (FAO, 2019; Pothan *et al.,* 2020). This impacted the timely harvest, quantity, and quality of harvested produce with implications for food shortage and food prices in the immediate future. 2) The lockdowns have impacted the perishable food that is meant for long-distance transportation (Yaffe-Bellany and Corkery, 2020; Pothan *et al.,* 2020). 3) The lockdown has led to a food deficit in many markets with an impact on nutritional choices available to people in the short term (Yaffe-Bellany and Corkery, 2020; Pothan *et al.,* 2020). 4) High risk of farmers facing economic hardship to invest in the following rainy season crop as the revenue from the preceding winter season crop was severely affected.

While the above impacts on food production and distribution can affect a large section of the society, agricultural labourers and those dependent on agriculture production and food supply chains are most vulnerable to the socio-economic and nutritional impacts. Food availability and price changes could continue to affect the food consumption of urban poor even after the COVID-19 episode until the economic impacts are stabilized and their purchasing power is restored.

Further, several compounding factors are expected to further stress the food availability in the short term. National governments have started using the available food buffer stocks to feed vulnerable sections of the society affected by lockdowns and hence very limited buffer stocks are available to stabilise the post-pandemic market prices. No clear strategic interventions by the governments on how to address this impending food shortage problem were apparent during the time of writing this paper.

The COVID-19 could have long-term impacts, setting a 'new normal', either planned or unplanned. 1) Emphasis may grow for local food production systems. Governments may rush to promote urban agriculture without robust studies on its impact on the local resources in terms of water, energy, and land especially in and around the urban centers. 2) The emphasis on farm mechanisation may further grow with increased demand for off-farm energy inputs. 3) Governments may revamp food buffer stocks, public distribution policies,

and related infrastructure with an emphasis on the expansion of cold storage facilities and real-time information on food stocks and food prices. 5) Countries may plan to reduce their dependency on imported food which can have net positive environmental benefits for some countries. 6) On the contrary, such reduced food imports may have negative consequences for countries such as Japan with a high dependency on imported food and depleted farming population.

Impacts of non-health Transboundary Disasters

The emerging understanding indicates climate change impacts are transboundary, crossing borders, and impacting shared resources (Prabhakar *et al.,* 2018). Trade and supply chains, the flow of people, shared natural resources, and linked economies connect countries (Benzie *et al.,* 2018). The Bangkok floods of 2011 exemplify transboundary climate impacts (Prabhakar and Shaw, 2019). One country's adaptation effort can also affect another country's resilience and contribute to additional climate risks (Rebecca and Roberts, 2018).

Disaster risks such as tsunamis, cyclones, floods, and droughts are increasingly casting transboundary impacts due to various factors. On one hand, the magnitude and intensity of disaster events, especially climate-related ones, have amplified due to climate change and other underlying risk drivers. On the other, there is a greater interconnection between countries due to socio-economic imperatives. To add to that, biophysical and socio-economic pathways of the transboundary flow of water resources, biodiversity and ecosystem services, human movement, and trade and supply chains further exacerbate the impact.

Just like health epidemics, disaster events such as the 2004 Indian Ocean Tsunami, droughts in the Horn of Africa and the Sahel, the hurricanes in the Caribbean have assumed trans-national nature with many affecting entire regions or sub-regions. With the widespread nature of impacts, these incidents highlighted the need for a greater interface between national and regional DM systems. Each of these disasters quickly overwhelmed the national systems and capacities requiring massive international effort and regional support to mount an effective response and recovery effort.

Among the interesting cases of disasters with significant transboundary impacts outside the country of disaster occurrence also include the eruption of Eyjafjallajökull volcano in Iceland in 2010 and the floods in Bangkok in 2011. The 2010 eruption of Eyjafjallajökull, although small for volcanic eruptions, caused enormous disruption to air travel across western and northern Europe. In spite of its minimal effect on farming in Iceland, the eruption disrupted the weather adversely affecting the flower farmers in Kenya (Justus, 2015). The 2011 Bangkok floods were overwhelming for the people directly affected by the event. It was particularly noticeable for the extensive disruption it caused to the regional and global supply chains and the wide-ranging impacts on the private sector.

These two disaster events were perhaps among the first few examples of an increasingly evident trend of an in-country disaster causing cascading impact across many countries around the region

and/or world. The immediate effects were compounded due to the sudden dislocation they brought to the globalised economy, creating ripple effects across sectors. The Bangkok floods of 2011 have caused economic damage of 46.5 billion USD (The World Bank, 2012). Nearly 90 per cent of total losses were accrued to the private sector including the Japanese MNEs. More than 550 Japanese affiliate firms were affected by these floods, production facilities such as buildings and machinery were severely affected due to floodwaters (Hayakawa, et al., 2014).

In addition to the direct effects, many Japanese firms engaged in the supply chain outside the flooded area were also affected by these floods. As these firms provide supplies to their factories in Malaysia, Vietnam, and Indonesia and other parts of the world, the production of these factories was also affected due to the shock to the supply chains. As a result of floods, the insured losses for Japanese firms alone were estimated to be in the range of 10-15 billion USD a significant part of which was borne by the Thai insurance companies (Meehan, 2012). Such negative shocks on multinational entities (MNEs) in developing countries is a major issue if the foreign investments in vulnerable and developing parts of the world to make any significant difference to the economies of these countries (Kato & Okubo, 2017). The disasters in the vulnerable countries will not only impact the MNEs, they can also have a huge impact on the source countries of these MNEs, their societies, and institutions. For example, the 2011 floods induced Japan to extend reinsurance support to Thailand to help regain the lost confidence for businesses in Thailand (Bank of Thailand, 2012), encourage Thai government to provide loans to the affected firms by offering Government of Japan bonds as collateral (BBC, 2011; METI, 2012), and offered various forms of credit and insurance facilities to the affected Japanese firms (METI, 2012).

Besides, Japanese insurers were the largest affected among all the foreign insurance companies (with an estimated loss of 1.8 billion USD) (The Institute of Actuaries of Japan, 2013), the impact on the industrial production of the world was estimated to be 2.5 per cent (Haraguchi & Lall, 2015) and 16.2 per cent reduction in industrial production of Japan as a combined effect of floods and Thailand and Great East Japan Earthquake (METI, 2012).

The 2008 global food price crisis can also be added to the list of transboundary risks faced by countries during recent years. The 2008 global food price crisis was argued to have been caused or worsened by a diversion of crops to biofuel production, though other factors, such as increasing population, changing consumption trends, and weather abnormalities, may have also contributed. During this crisis, many countries took extreme steps, such as restricting food exports to allay fears of food insecurity, including in some cases, measures to restrict biofuel production from food or feed-based crops; however, it was not clear how effective these measures were (Katz, 2008; MacInnis et al., 2008).

The transboundary disasters discussed above have confirmed that we are facing a new paradigm in risks, i.e. risks are increasingly becoming globalised and compounding than ever before.

Contributing factors are climate change, globalisation, and regional economic and social integration, socio-economic processes, livelihood constructs, etc. In all the instances of transboundary disasters discussed above, risks known to be local and to remain local assumed regional and/or global dimensions and impacted millions of people across the world. They overwhelmed national governance, financial, and risk management capacities to manage them and ensure sustainable recovery processes in their aftermath.

Existing Risk Reduction Systems

Over the years, a number of risk reduction systems have been put in place at the global level. Some of the important frameworks are The Sendai Framework for Disaster Risk Reduction (DRR) the Paris Agreement on Climate Change. Increasingly 'shared vulnerabilities' underscore the need for adopting a shared multi-hazard approach as espoused across different strands of the 2030 Agenda. The Sendai Framework for DRR recognises the growing imperatives of transboundary risks and states that *"….transboundary cooperation remains pivotal in supporting the efforts to…..reduce disaster risk……..Developing countries…… need special attention and support to augment domestic resources and capabilities through bilateral and multilateral channels…"* (UNDRR, 2015). One of the Guiding Principles calls upon each State to take *"the primary responsibility to prevent and reduce disaster risk, through international, regional, sub-regional, transboundary and bilateral cooperation"* and to address these, it calls to *"foster more efficient planning, create common information systems and exchange good practices and programmes for cooperation and capacity development, in particular to address common and transboundary risks."*(United Nations, 2015: Page 7).

The Paris Agreement on Climate Change, while does not make a specific reference to transboundary risks, recognises the "importance of support on and international cooperation on adaptation efforts, and the importance of taking into account the needs of developing country Parties, especially those that are particularly vulnerable to the adverse effects of climate change." (UNFCCC, 2015: page 9)]

The Agenda for Humanity adopted at the World Humanitarian Summit (WHS) underscores the need *"…to increase support to countries vulnerable to disaster risks or the negative consequences of climate change…."* as part of the Core Responsibility to 'Invest in Humanity'. At the same time, the 'Commitment to Action' adopted at the WHS mandates the need to *"ensure regional and global humanitarian assistance for natural disasters complements national and local efforts."* (UNHCR, 2017: Page 2).

At the national level, countries in Asia and elsewhere are developing or revising their national and sub-national DRR strategies as envisaged under the Sendai Framework for DRR and their national adaptation plans (NAPs) under the Paris Agreement. However, the lack of a clear understanding of the nature and magnitude of transboundary risks limits their ability to address disaster and climate risks comprehensively. International cooperation on adaptation remains limited to the financing of local projects often ignoring the transboundary risks (Rebecca

and Roberts, 2018). Hence, there is a need to relook at these frameworks and strengthen their implementation approaches to address the new and emerging risks such as transboundary risks.

Most developing countries in Asia have revamped their disaster management (DM) systems over the past decade or so inspired by global frameworks like the Hyogo Framework for Action (2005-15) and Sendai Framework for DRR (2015-2030). The improvement in DM systems is significantly apparent with institutional mechanisms and policy frameworks, SOPs to manage post-disaster response, dedicated DM funds, focus on disaster risk mitigation among other measures being the key.

However, most of these DM systems are primarily oriented towards managing in-country or localised disasters and have not been designed to address transboundary risks. National disaster risk management approaches have either completely ignored or vaguely covered epidemics and pandemics leaving much to the ad hoc interpretation of DM laws – requiring special interventions to help with the COVID-19 pandemic. For example, India's official definition of disaster doesn't clearly cover diseases and its national DM plan talks about diseases as something that needs to be addressed in the aftermath of an event such as typhoons and floods.

A Comparison of Responses to COVID-19 by India and Japan

Different countries have responded differently to the COVID-19 pandemic. The responses were determined by factors such as the stage of detection of the pandemic, the government's perceived capacity to manage emergencies as reflected in terms of disaster risk management capacity, health sector preparedness capacity, and the quality of governance. The quality of intervention outcomes was in turn determined by how their societies have responded to government measures. A comparison of approaches taken by India and Japan provides a good case study of responses by the Asian countries.

Table 1 presents a contrasting picture of how India and Japan responded to the pandemic. This is an emerging picture, valid at the time of writing this paper, and these differences may further emerge over time. Nevertheless, the initial differences in their responses warrant a discussion and provides an interesting case of how countries at different developmental stages may respond to such pandemics. While India has focused on saving the lives during the initial stages of the pandemic, Japan seemed to have focused on safeguarding the economy while minimising the human impacts of the pandemic.

In more than one way, the response by governments to COVID-19 reflected their priorities, whether explicitly stated or not. For example, the responses by the Government of India could be stated as decisive prioritising the lives of people as opposed to livelihoods and economy. On the other hand, the initial responses by the Government of Japan could be stated as cautious, mostly prioritising economic wellbeing. The differences in initial priorities are understandable. The Government of India recognises the weakness of its health sector preparedness to manage pandemics. It knew that any

delay in the complete lockdown can put enormous pressure on the health system with a snowball effect on people.

However, the priorities and responses changed throughout the pandemic. The Government of Japan has increasingly realised the need for stricter social distancing measures prioritising human wellbeing. Similarly, India has seen the need to bring focus on the economy and livelihoods of people as negative impacts on livelihoods started to outweigh the benefits of the lockdown as the pandemic progressed. It was apparent that in the end, an equilibrium between economic and social priorities emerged, it became clear that both can't be considered in isolation. In the case of India, the severe economic impact on the poor and migrant workers pushed the country to ease the restrictions at the cost of the spread of infections.

In terms of the mitigation strategy, the Indian government gave less emphasis on livelihoods and more emphasis on lives. It practiced a complete lockdown of the country with no state-level exceptions

Table 1. Contrasting responses of India and Japan to COVID-19: Major Vulnerabilities, Capacities and Risks

	India	Japan
First case reported	Jan 30th in Kerala state	16th Jan
Strategy (Mitigation vs suppression)	Mitigation	Mitigation
Level of stringency of actions [As on 7 May, 2020, Hale et al, 2020]	81.94	47.22
National travel restrictions	Sealed the public movement and public transportation services between states and affected districts.	No internal travel restrictions between cities or prefectures imposed.
International travel restrictions	Started from 26th Jan, with 15 days mandatory quarantine.	Started from 1st January, no mandatory quarantine.
	Evacuation of Indian citizens stuck in China, Italy, Iran, etc.	Japanese were brought from Wuhan in several chartered flights.
Economic measures	1st package: 26 billion USD to support poor people (insurance for doctors, money transfer, food supply to the poor for 3 months) 2nd package: 2 million USD for emergency and health systems PM CARES Fund	1st package: 4.5 billion USD for SMEs 2nd package: 9.6 billion USD for SMEs 3rd package: 1 trillion USD as an economic stimulus package

Table 1 continued...

Table 1 continued...

	India	Japan
Public support measures	Established Group of Ministers (GoM) on COVID-19 on 11th March. Established national and state-level helplines, help desk, WhatsApp center, etc.	Established Novel Coronavirus Response Headquarters on 30th Jan.
	Supply of cooked meals to the vulnerable people by the government and NGOs	Not relevant for Japan/ Status not known
	Accommodations to hospital doctors and support staff	Not relevant for Japan/ Status not known
Health: testing, therapy & cure	Targeted testing, limited to symptomatic patients. Comparatively less number of tests (137 per million population) than Japan, free in government hospitals.	Targeted testing, limited to symptomatic patients. A comparatively high number of tests (544 per million population) conducted, covered by health insurance.
	The first test kit approved on 24th March that takes 2.5 hours, based on reverse transcription-polymerase chain reaction (RT-PCR) and developed by Mylab.	Employed PCR test starting from Feb 18, takes 4-6 hours for results. A new test has been developed by Wako Pure Chemical Corp that takes 2 hours.
	Antibody tests: ICMR validated the US-FSA method and issued guidelines on 4th April.	NIID is testing, no approvals are issued yet for antibody tests.
	Convalescent plasma therapy was first approved on 10th April.	Not yet approved.
Regional and international initiatives	10 Million USD support to the SAARC COVID-19 Emergency Fund proposed by India. Export of Hydroxychloroquine to needy countries at least cost and large quantities. Commitment to support the G20 statement to fight COVID-19.	Japan is part of the ASEAN+3 mechanism for the health preparedness of the ASEAN region. It is not clear what specific support Japan has committed under the mechanism.

Table 1 continued...

Table 1 continued...

	India	Japan
Communication	Direct communication by the Prime Minister with the people of the country *Mann Ki Baat*, addressed the nation twice on TV.	The Prime Minister of Japan spoke on several occasions addressing the nation.
	Daily updates by the national health ministry, state chief ministers, and city administration.	Regular daily updates are provided by the Minister of Health, Labor and Welfare.
	Aarogya Setu smartphone app Food and shelters on Google Maps.	Not known
Use of disaster management laws	Activation of the National Disaster Management Act by declaring the COVID-19 as 'Notified Disaster' to use disaster management funds at national and state levels.	Declaration of emergency, but not under the Disaster Countermeasures Basic Act, to provide governments special powers to regulate society and provide funding.
Use of health-related laws	Activation of The Epidemic Diseases Act to provide government special powers to regulate society.	Declaration of COVID-19 as 'infectious disease under the Infectious Diseases Control Law to facilitate treatment.

Note: Most of numeral observations are valid until April 2020.

Source: Based on Ministry of Health, Labor and Welfare, 2020; Ministry of Health and Family Welfare, 2020)

from the midnight of 24 March 2020 (total cases 617) for the initial 21 days. [Pilot nation-wide lockdown on 22 March 2020 implemented as '*Janata* curfew' (self-imposed curfew)]. The schools were 'required' to close on 3 March 2020. On the contrary, Japan gave more emphasis on livelihoods and the economy. The emergency measures were effective only from 7th April (total cases 4257) for 1 month. No lockdown, in a strict sense, was announced. Schools were only 'recommended' to close on 2 March 2020. Both the countries have considered COVID-19 as a special disaster and declared it as such, which is a common feature to note, to obtain special powers and resources that are otherwise not accessible to governments to manage the pandemic.

Several differences in approaches between the two countries are listed in Table 1. It is apparent that these differences reflected the respective differences in strengths and weaknesses in these countries in terms of institutions and socio-economic factors.

In terms of strengths, India has a young population, strong domestic economy, strong national government, direct cash transfer programme for the poor, warm weather conditions, early

and strict social distancing measures, isolation and contact tracing measures, less dependence on exports, and low crude oil prices (no reduction in retail prices helped the government with revenue that can be spent on social measures). Initial success achieved through 'Bhilwara model', which was identified as the best model to curtail the spread (involves six stages of isolation, mapping of hotspots, door-to-door screening, contact tracing using teams and disinfecting, establishing isolation wards, and help-line for rural areas) gave the country a model to emulate.

On the contrary, Japan has high levels of general hygiene, strong communication between local government and people, better rural infrastructure, strong disaster management capacity in general, and 'limited impact' ('*Eikyō wa gentei-tekida*') on food as Japan didn't import large quantities from countries that have curtailed food exports due to COVID-19. A high rate of mask usage is common in Japan, especially during the pollen season, and has contributed to effective mitigation of the spread of the virus. The formation of cluster response teams and the cluster approach for isolation and contact tracing appears to have provided a good model for the country to emulate. More importantly, the presence of strong social etiquette, the standard of living, and cultural level of people termed as "*mindo*" was claimed to have contributed to the significantly low number of infections and death rates in the country.

These countries also have several vulnerabilities in terms of COVID-19. For example, India has a high population density, poor sanitation and hygiene conditions, large uneducated population and prevalence of superstitious beliefs, insufficient penetration of health facilities in rural India, insufficient health infrastructure and skills to manage pandemics, large migrant population, and a large number of poor people dependent on daily wages. In the case of Japan, important vulnerabilities include the constitutional inability of the government to issue strict social distancing measures, dependency on exports, a large proportion of the old population, old rural population, high population density in major economic centers, insufficient health facilities compared to population density, very low remote working possibilities, and cold weather conditions.

These vulnerabilities and capacities reflected in terms of the nature of impacts during the course of the COVID-19. In the case of India, the impacts were mainly social that was underpinned by the economic impacts. Food security implication for millions of poor people, loss of livelihood for millions of people, loss of crops and perishable food, the large flux of movement of poor people known during recent decades, disruption of the social fabric, fears of economic recession highlights some of the important impacts of COVID-19. In the case of Japan, the impacts were marginal and mainly economic in nature, i.e. fears of economic recession, impact on the tourism industry, impact on trade.

Both the countries have strived to play a regional role to the extent their circumstances allowed them. India has taken a lead role to support countries in the region as evident even during the COVID-19 crisis where it sent its medical teams, medicines and other health infrastructure support to countries like

Maldives, Nepal, Bangladesh and others in the region. India has pledged a support of 10 Million USD to the SAARC COVID-19 Emergency Fund. It has helped countries with the export of Hydroxychloroquine at least cost and large quantities. It has shown commitment to support the G20 statement to fight COVID-19. Similarly, Japan has increasingly played an important role in the Asia region. As a part of the ASEAN+3 mechanism for the health preparedness of the ASEAN region, it has provided necessary technical support to the group.

Measures for Strengthening Risk Reduction Systems

COVID-19 and other transboundary risks discussed in this paper highlight the need for integrated risk assessment frameworks. Developing such an integrated risk assessment paradigm should have the following components (see Figure 1): Recognise the shared risks/risk interlinkages of risks

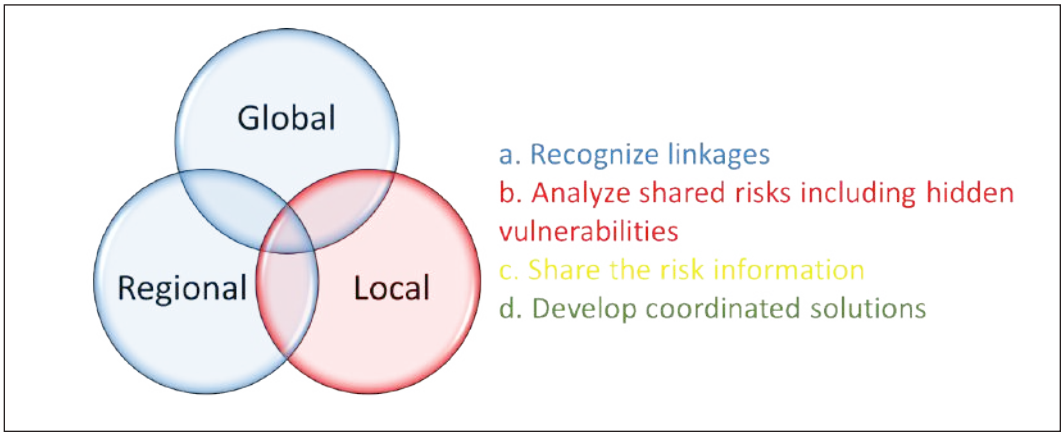
- Analyse shared risks
- Share the risk information
- Develop coordinated solutions

Though it has been evident for some time, the interlinked nature of risks from the local to global level has not influenced our way of conducting risk assessments. This could be due to several issues that are mainly related to limited understanding and data on external risks. However, countries are aware of transboundary risks that they are exposed as countries experienced a range of such risks during the recent past as discussed in this paper. There is a need to transform the recognition into action such that the risk assessments conducted at the local or national level are informed of the regional and global risks. Recognising the interconnected nature of risks requires a change in the willingness of policymakers to think beyond boundaries and to provide a mandate to institutions to invest in increasing their understanding of such risks.

Analyse the shared risks that considers hidden vulnerabilities

First, analysing shared risks requires information sharing among countries and regions and sectors within countries.

Figure 1. Risks are interlinked at local, regional and global levels. Recognize the shared risks



Source: Author's own complilation

Secondly, the analysis of shared risks should move from factoring 'obvious' vulnerabilities and expand to include 'hidden vulnerabilities'. Integrated risk assessments are required that factor in the risks across sectors and geographical boundaries which is the major gap in the existing risk assessments that are largely sectoral in nature and seldom consider the risks emanating from outside the 'boundaries'.

Share the risk information

Sharing risk information across boundaries has not been done transparently and smoothly. Such sharing of risk information is even more limited with corporations and private entities. The national disaster risk reduction mechanisms and national adaptation planning are designed to address risks that emanate from within their boundaries. The risks emanating from outside the national boundaries are largely not recognised and solutions have not been developed because of the difficulty in understanding these risks and assessing their trajectory, manifestation, and impact. The information that forms the basis for understanding such risks either doesn't exist or is not being shared across the board. For example, the 2008 food price crisis has demanded to develop a food price early warning mechanism at the global level. Despite the efforts by several international development agencies, a reliable price early warning system couldn't be developed so far largely because either the required information doesn't exist, or countries are hesitant to share risk information. It is even harder to expect corporations to share information on the risks they are subjected to.

Our inability to understand and model complex risks continues to be a major limitation to fight new and emerging risks. Our limitation in unearthing hidden vulnerabilities before they 'surface' deserves urgent attention. Vulnerabilities form the basis for pressures to translate into adverse impacts. However, our vulnerability assessments are still emerging, and current methods do not factor in the interconnected nature of vulnerabilities and mutually reinforcing nature of seemingly disconnected risks. As a result, vulnerability assessments and hence the risks assessed are largely incomplete and fragmented. From this point of view, we are certainly under-estimating risks and as a result, under-preparing for them at global, regional, and national levels.

Information technologies have been employed to a great extent during the COVID-19 to a scale never seen before and it made a significant difference in the way the information has been shared. This experience has shown the importance of information technologies in managing pandemics. However, national governments and other agencies had to fight false information while providing the right information and addressing 'fake information' is one major limitation with the current information systems. There is a need to invest in artificial intelligence and related technologies to curtail fake information. Similarly, mainstream newspapers, television, and the national DRM-related public awareness materials can help in addressing these issues.

Developing globally coordinated solutions

Just like the way the risks are increasingly interconnected and globalised, the solutions are also connected from the global to regional, national and local

scale. This calls for an increased need for seamlessly coordinated risk management policies and instruments from global to a local level based on a universal risk information sharing framework.

At the national level, the risk management systems need to be much more coordinated. Some progress has already been taking place at the national level. For example, the disaster risk management systems and the climate change adaptation systems are being well-coordinated in some countries while many other countries are still developing their own approaches. However, coordination of risk mitigation in other areas is far from being satisfactory. For example, the coordination between health and DRM systems deserves great attention, our experience from COVID-19 suggests. Health systems need to be coordinated with national DM systems so that the capacity of health systems is improved in sync with the rest of the DM systems. 'Extreme event' is the keyword here where both systems converge. Such coordination also means that health emergencies deserve greater attention in the future than what they have been given so far. Looking at the frequency of pandemics during recent years, the national health systems have to be improved on the same scale as that of the DM systems – and of course, inter-connected at all levels. This requires laws and institutional systems for epidemic management at par with the national DM systems. It also means that there is a need to mandate conducting emergency drills and simulation games for epidemics and pandemics: There are no known emergency drills and simulation games for managing pandemics being conducted by governments on a regular basis. It is time for national DRM systems to include pandemics in their emergency drills and simulation games.

The overall governance in general and the risk governance in particular assumes importance for managing transboundary risks such as COVID-19. Governments at the national and sub-national levels do not have the capacity to manage extreme events. Similarly, in-country systems need to have some coordination platform for interface with sub-regional, regional, or global systems to benefit from their frameworks, information, capacities, and resources (technical and financial).

Different stakeholders in the country including local governments would have to realize that a greater role for the national governments is necessary to help local and regional governments to improve their capacity to manage pandemics. This is important in countries where health is considered as a state subject and national governments do not have much leverage in health matters. Many countries are able to successfully manage COVID-19 when the national and local governments are able to work together putting aside political differences.

Building the capacity of different stakeholders forms an integral part of the strategy to develop and implement globally coordinated solutions. The COVID-19 pandemic has caught most NGOs unawares, more than the governments. Usually, NGOs play an important role in managing natural disasters. With the right capacity and predetermined roles, they can come handy in managing future pandemics. The ability of the national and local governments to directly engage with the local communities

to follow measures such as self-isolation, self-declaration, and self-quarantine needs to be strengthened and the trust of people in the government to manage pandemics needs to be reinforced through enhancing the quality of risk governance.

Conclusions

There is an evidentiary increase in extensive risks while intensive risks have not been effectively mitigated. Factors like climate change, unplanned urbanisation, socio-economic issues like inequality, marginalisation, discrimination, poverty, etc. coupled with increasing exposure and deepening vulnerabilities are magnifying risks across hitherto 'safe' regions and sectors. The greater interaction of risks is leading to an expanding multi-dimensional risk landscape while weakening governance contexts and inadequate capacities are aggravating the destructive potential of disasters. Addressing one risk at the cost of the others is resulting in skewed risk management practices with diminishing returns as it is leading to elevating the unaddressed risks. Commonalities in the socio-economic processes and developmental constructs are contributing to expanding the geographical occurrence of disaster/climate risks and are magnifying their impacts.

COVID-19 is just one of the several transboundary risks that countries have faced during recent times. These experiences have proved that transboundary risks can undermine the capacities of countries to manage risks with short- and long-term consequences. In the short-term, the serious socio-economic effects were apparent on the poor in urban and rural areas. In the long-term, these risks have questioned the risk management practices of governments and institutions and called for reforms in risk management.

However, not all is lost. The strengthened DM systems have come to help with the COVID-19, either in terms of using DM funds or using provisions under the laws laid out for DM albeit on an ad hoc basis. There is also evidence to suggest that the national response has been much faster due to improvements in DRM laws, SOPs, and communication systems. Yet, it is true that there is no recent pandemic of a similar scale to compare how best the systems responded. Likewise, COVID-19 has stress-tested the capacity of national risk management systems calling for changes in the way we assess and manage risks.

One of the key lessons emerging from the transboundary epidemics and disaster events was that they underscored the need for strengthening national, regional, and global preparedness and response capacities – with the active engagement of local authorities and affected communities – and the need to ensure greater inter-linkages across countries, sectors, and stakeholders. This brings us to the need to consider and analyse the underlying processes, risk drivers, and factors that are increasingly causing high-magnitude multi-country disasters or aggressively contributing to making even the seemingly 'localized' or in-country disasters assume regional or global dimension.

Management of transboundary risks requires robust information systems that feed into strategic and integrated risk assessments to identify effective preparedness, response, and mitigation actions. Since the transboundary risks

can unearth hidden vulnerabilities, there is a need to identify ways and means of factoring such vulnerabilities into risk assessments. Sharing of risk information is an important part of managing transboundary risks and countries have a long road ahead in establishing a seamless risk information-sharing paradigm.

Public participation makes a difference and the role of civil society organisations is paramount in fighting against pandemics and other transboundary risks. The criteria to restart economies and 'normal lives' should be governed by the principle of building back better and natural wellbeing, realise that human wellbeing is a consequence of natural wellbeing. Prioritising any other strategy could mean we have not learned a lesson from the pandemic.

The transboundary nature of disasters is underlining the need for fostering a more seamless interface between national, regional, and global risk management systems and practices. Just like the close in-country vertical integration of DM systems across administrative levels, there is a need to put in place proper protocols and mechanisms for information sharing, early warning, response and recovery coordination including wider risk management practices at the regional and international levels connecting all countries.

In the light of this experience, India's role in South-Asia, South-East Asia and the wider Indian Ocean Rim countries becomes crucial. Given India's investments over the years in risk monitoring, early warning, search, rescue etc., India has taken a lead role to support countries in the region and beyond as discussed in the paper. This can justifiably be scaled up by India through further strengthening existing mechanisms or promoting newer ones to help cross-fertilise technical expertise, capacities, and systems for risk monitoring, comprehensive multi-hazard risk management, early warning, early action, etc. with agencies and institutions in the countries in the Asia region.

Given India's emergence and recognition as a regional and global power and increasingly leading role in international affairs, as evidenced by the recent election of India to the UN Security Council with unprecedented and overwhelming support, it will be in keeping with India's growing global stature that it assumes the leadership mantle to help countries and communities address an increasingly manifesting threat of transboundary disasters of multiple origins, be it natural hazards or pandemics or food security issues. After all, the ancient wisdom and philosophy that inspired India for millennia call for considering the world as one family (*Vasudev Kutumbakam*).

The COVID-19 experience has also shown the social and economic resilience of Japan in the wake of the pandemic. The presence of a high standard of living, cultural values, high level of disaster preparedness, hygiene standards, and willingness to engage for the benefit of the society helped the country to become a model for other countries to emulate. The country has made a significant impact on development assistance in the areas of infrastructure, disaster risk reduction, and environmental protection. These experiences and contributions by India and Japan are expected to contribute to strengthening the risk management

systems in Asia and beyond so that capacity of countries is enhanced to manage and mitigate future pandemics and impacts of other transboundary disasters.

Acknowledgements: Authors are grateful for the support received from IGES senior administration in drafting this paper. Authors also gratefully acknowledge the support received from APN Research Grant CRRP2019-SP904-Sivapuram Venkata Rama, IGES SRF grant, and the support by the Environment Research and Technology Development Fund (2-1801) of the Environmental Restoration and Conservation Agency of Japan.

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INDIA-UN DEVELOPMENT PARTNERSHIP FUND SUPPORTS PROJECTS TO TACKLE COVID-19 PANDEMIC

The India-UN Development Partnership Fund is supporting several projects in areas like national healthcare capacities, reducing risk of transmission, mitigating socio-economic impact and catalysing transformative recovery to face the challenges posed by COVID-19. The Fund created in 2017, is supported and led by the Indian government, managed by UNOSSC and implemented in collaboration with the United Nations system.

According to the knowledge sharing platform, South-South Galaxy, the projects in Antigua and Barbuda helped in strengthening national health capacities and reducing the negative impacts of COVID-19 on socio-economic and human development. A USD 1 million budget has been approved for the implementation of the project by UNDP, which aims to create a food security strategy, through the identification of vulnerable households and development of mechanisms for cash transfers. This project will provide support for economic reactivation and transition of small businesses in the informal economy to a model which is more sustainable.

A project in Palau aims towards strengthening national health capacities to face COVID-19 crisis and under it medical supplies, equipment and testing capacities have been provided at a budget of USD 153,000. Under a project in Grenada, a new incinerator for proper management of biomedical waste will be purchased and installed at a budget of USD 100,000. The project in Guyana focuses upon improving clinical management of COVID-19 patients and reducing virus transmission risk among healthcare workers. The project has a budget of USD 1 million and will provide intensive care medical equipment and also adequate Personal Protection Equipment.

In Saint Lucia, a project will be implemented by UNDP and World Food Programme at a budget of USD 1 million. UNDP will provide ventilators and PPEs while WFP will support the cash transfer programme led by government to address the socio-economic challenge of COVID-19 on the most vulnerable sections and expand the Public Assistance Programme to cover vulnerable people. A USD 1 million project in Nauru to be implemented by UNDP and WHO will focus on procurement of medical equipment and PPEs.

Source: PTI. (2020, July 30). India-UN Development Partnership Fund supports projects to respond to COVID-19. The Economic Times. Retrieved from https://economictimes.indiatimes.com/news/economy/finance/india-un-development-partnership-fund-supports-projects-to-respond-to-COVID-19/articleshow/77257035.cms

Strengthening Multi-Hazard Early Warning Systems and Early Actions by Impact Based Forecasting and Warning Services

*Lalit Kumar Dashora**

"There is a need to shift from the current focus of hazard forecasting in country to impact-based forecasting and warning at regional level."

Abstract: Early warning and early actions are key components of the Sendai Framework for Disaster Risk Reduction (SFDRR). According to SFDRR, national governments as well as their mandated national and sub-national level agencies are responsible to keep people and businesses informed and updated about impending hazards as well as expected impacts. A decision maker and citizen that is updated with actionable forecast, warning and completely recognizes what level of impact the impending hazard will have is in better situation to take the precautionary measures that save lives and protect livelihoods of individuals and communities. Impact based forecasting and warning (IBFW) is a procedure in which hazards, vulnerabilities and risks are assessed and included with forecast and warning messages to envisage impacts of impending hazard on vulnerable people, properties and infrastructure. In other words, impact-based forecasting and warning is a translation of complexities of hazards integrated as understandable information with likely impacts. IBFW can assist decision makers and citizens to respond well in advance to an impending hazard through early warning and early action to reduce losses and damages. World Meteorological Organisation (WMO) also identified and prioritized, impact-based forecasting to increase significance and practicality of forecasts and warnings issued by National Meteorological and Hydrological Services (NMHS). In this present paper an attempt was made to highlight usefulness of impact-based forecasting and warning for sustainable development in multi hazard prone countries in South Asia.

Key Words: Forecast, Early Warning, Impact Based Forecasting, Multi Hazard, Meteorology, Hydrology

Introduction

India is one of the countries in South Asia that is highly vulnerable to climate change, although risk exposure and vulnerability are not homogeneous given the

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immense social, economic and physical heterogeneity in the country (Chittibabu, 2004; Sharma, 2008; Revi, 2008; Chari, 2010; Attri and Tyagi, 2010). In India, every year the impacts of extreme hydro-meteorological hazard events give rise to many casualties, significant loss to business and damage to properties and infrastructure, with manifold impacts on the overall economy, which last for several years (Goswami, 2006; Revi, 2008; Chari, 2010; Attri and Tyagi, 2010; Singh and Singh, 2011; Guhathakurta, *et al*. 2013). All this happens despite accurate weather forecasts and precise warning with sufficient lead time by mandated national meteorological and hydrological services and disaster management agencies (Bhatt et al., 2013; Joseph, *et al*., 2014; Chevuturi and Dimri, 2015; Shekhar *et al*., 2015; Houze, *et al*., 2017). The reason behind this ostensible disconnect is the gap between forecasts and warnings of impending hydro-meteorological hazards and the understanding of their potential impacts on people, properties and infrastructure.

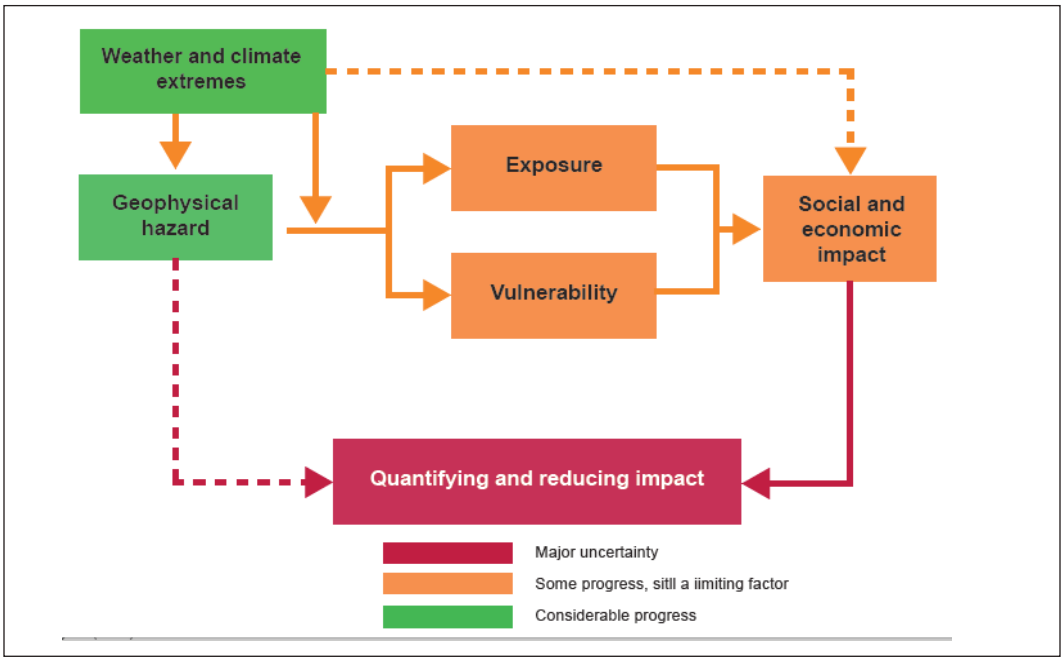
In simple terms, while there is a realisation of what the hazard might be, there is a requirement to develop an understanding of what the hazard might do. This disconnect can be filled by adopting an all-inclusive approach of observing, modelling, predicting and disseminating information on severe hydro-meteorological events, with the resultant cascading impacts of hazards on people, properties and infrastructure. This situation requires a multi-sectoral and multi-stakeholder approach to access and utilize the best possible technology, science and information and the optimum use of such services, to manage multi-hazard events, and to provide the best possible evidence base on which decision-makers can make decisions to protect people, properties and infrastructure in the near future (Bhat et al. 2013). Early warning and early action are key components of the Sendai Framework for Disaster Risk Reduction (UNDRR, 2015). As per the Sendai Framework for Disaster Risk Reduction, all countries should provide their citizens and economic sectors with actionable information that, wherever possible, identifies the timing and anticipated impacts of specific hazards. A well-informed citizen who fully understands what a hazard will do is more likely to take the necessary actions that protect their life and livelihood (UNDRR, 2015). Owing to climate change, there is an urgent need for effective and timely impact-based forecasting and warning services to cater to comprehensive social needs, to mitigate and reduce economic losses and to support the country in adapting to the potential impacts of climate change and increasingly extreme events (Sai, 2018; Silvestro, 2019). This objective of this paper to present the concept of impact-based forecast and warning services and its usefulness in South Asia regions to reduce the loss of human lives and mitigate the social and economic impact of hydro-meteorological disasters.

Impact-Based Forecast and Warning Services

Impact-based forecasting is a systemic approach in which hazard, vulnerability and risk are integrated with forecast/ warning to predict the impact of impending disasters on vulnerable people, properties and infrastructure in disaster-prone areas (WMO, 2015; Sai, 2018; Silvestro, 2019). Impact-based forecasting can

assist decision-makers and vulnerable populations to respond proactively to an impending disaster through early warning and early action to minimise loss and damages. The World Meteorological Organisation identified impact-based forecasting services as a high priority to increase the relevance and utility of national meteorological and hydrological forecasts and warning services. Impact-based forecasting, at its simplest, is the translation of hazard complexities into clear information about the likely impacts. Impact-based forecasts emphasise what a hazard will do rather than what a hazard will be. Supplementing the forecast of "85-95 kmph winds" with the likely impact on different types of homes, for example, would raise awareness of the actual threat to life and property. More quantitative impact-based forecasts explicitly take into consideration location-specific vulnerability – elevation and risk of inundation; age and type of buildings to withstand wind, mudslides, flood water; the resilience of critical infrastructure, such as electrical power, water and sanitation; and the resilience of hospitals, schools and other public services, as well as the capacity of the government to respond. The timing and location of livelihood activities, such as farming and fishing, which expose people directly to hazards, such as cyclones, storm surges, floods and lightning, need to be quantified so that impact-based forecasts are tailored to those at risk. According to WMO (2012), in many countries, there is demand from users for more than forecasts of expected weather conditions from their national meteorological and hydrological services. WMO (2015) has developed guidelines for

Figure 1: Relationship Between the Key Elements of an Impact Forecast System



Source: WMO (2015).

national hydro-meteorological services on multi-hazard impact-based forecasting and warning services. Figure (1) represents relationship between the key elements of an impact forecast system.

WMO (2015) also describes the progress from general traditional weather forecasts to impact warnings. Traditionally, the majority of the forecast was focused only on hazard information, and limited attention was given to impacts; however, in the recent past the focus of national meteorological and hydrological services and disaster management organisations has shifted towards understanding vulnerabilities and impacts along with hazard.

Existing Forecast and Warning Services in India

In the recent past, national meteorological and hydrological services in India have developed the kind of skills and technology required to understand how the weather impacts society and also developed and deployed the necessary infrastructure for more effective information for decision-makers and users (Mohapatra, et al. 2012; Mohapatra, et al. 2013; Mohapatra, *et al.* 2013; Laskar, *et al.* 2016; Mehajan, 2019). However, there may be an argument that forecasting hazard risk and forecasting hydrometeorological impacts is beyond the mandate and responsibility of national meteorological and hydrological services; nevertheless, it is necessary to highlight that the risks and impacts associated with extreme weather events are dynamic and significant. National meteorological and hydrological services are probably the best equipped with trained human resources, as well as with technology, to predict their impact. In India, India Meteorological Department (IMD) and the Central Water Commission (CWC) are mandated national meteorological and hydrological services agencies of the Government of India. India Meteorological Department is also one of the six Regional Specialized Meteorological Centers (RSMC) of the World Meteorological Organization (WMO). It has the responsibility of forecasting, naming and distributing warnings for tropical cyclones in the Northern Indian Ocean region, including the Malacca Straits, the Bay of Bengal, the Arabian Sea and the Persian Gulf. India Meteorological Department conducted a detailed study on the classification of cyclone-hazard-prone districts of India (Mohapatra, *et al.*, 2012). This classification can be used for various purposes such as coastal zone management and planning; however, the vulnerability of cyclone-hazard-prone districts has not been assessed (Mohapatra, *et al.*, 2012). In many provinces of India, such information is increasingly collected and collated as a part of extensive hazard risk assessment and mapping exercises such as in Gujarat and Himachal Pradesh, often supported by development partners as well as the national and provincial governments (Mohapatra, *et al.*, 2012; Gupta, 2013; Thakur, et al. 2019). In this present paper, an attempt is made to present the need for impact-based forecast services and the steps needed to design, develop and implement them in India. In India, at the provincial level, governments are also taking initiatives to enhance their monitoring capacities by establishing monitoring centres and multi-hazard early warning systems with value-added weather services such as weather-based agriculture advisories, etc., to improve

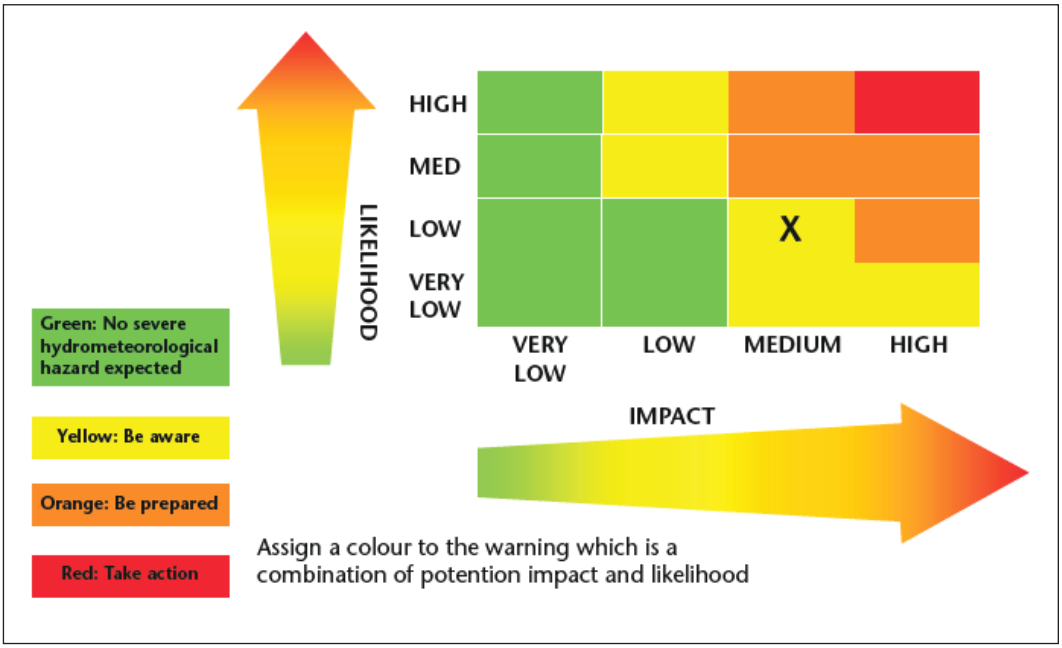
the decision-making capacity of the stakeholders at local levels (KSNDMC). In India, many private weather services agencies are emerging to fill the information gap, adding value to existing information and hence playing a large role.

Designing, Developing and Implementing Impact-based Forecast and Warning Services

The design and development of a risk matrix is the initial step of impact-based forecast and warning services. Impact matrices present the relationship between the predicted impacts of a hazard and the likelihood of occurrence of the hazard. Ensemble techniques are highly useful for a probabilistic forecast of a hazard event. The level of the impact is determined based on understanding of locational vulnerability as well as type of exposure. Impact matrices can be effectively designed and visualised based on the four-colored system approach (green, yellow, orange, red) developed for Meteoalarm System (Meteoalarm) and used by various national meteorological and hydrological services in Europe, such as the United Kingdom Met Office (UKMet). Figure (2) represents a risk matrix combining impact with likelihood of hazard.

Hazard identification and assessment involves identification, tracking and classification of the hazards in relation to their locational distribution, likelihood of occurrence, and intensity (Thakur, *et al.*, 2019). Hazard assessment can identify hazard-prone areas, describe the physical characteristics of the hazards, and characterize the hazards in terms of magnitude, frequency, duration, extent, intensity, and probability of occurrence.

Figure 2: Risk Matrix



Source: WMO (2015).

Hazard assessment produces a range of information products, including hazard-prone area, plausible event scenarios, probabilistic hazard intensity maps, and hazard zonation maps tailored to the needs and capacities of the users. Hazard assessment and mapping rely heavily on location-specific scientific quantitative information, including geologic, geomorphic, and soil maps; meteorological and hydrological data; and topographic maps, aerial photographs, and satellite imagery. Qualitative information on historic hazard events, both in written reports and oral accounts from long-term residents, can also be integrated to help characterise the potential impact of impending hazardous events. Vulnerability refers to "the conditions determined by physical, social, economic and environmental factors or processes which increase the susceptibility of an individual, a community, assets or systems to the impacts of hazards" (UNDRR). Measuring vulnerability to natural hazards is very essential in understanding true extent of risk to reduce overall impacts and to develop impact based forecast and warning (Simpson and Human, 2008; Fuchs, *el at.,* 2012). The concept of vulnerability to natural hazards is complex and cannot be comprehensively assessed by single research methodology (Fekete et al., 2010; Fuchs, *et al.*, 2012). Measuring vulnerability based on quantitative methods is essential for impact-based forecasting and warning, in particular for risk-informed decision making, which is a fundamental part of overall early warning and early action. Systematically examining elements at risk (i.e. people, properties, critical infrastructure and businesses) is an integral part of overall vulnerability assessment to identify the features that are susceptible to damage from the effects of natural hazards. Vulnerability, therefore, is a function of the natural hazards and the characteristics and quantity of people, properties and infrastructure exposed (or "at risk") to their effects (Balica, et al. 2012). Vulnerability assessments can be conducted for an individual building, for specific sectors, or for selected geographic areas, e.g., areas with the greatest development potential or already-developed areas in hazardous zones (Kumar, *et al.*, 2010; Kumar and Kunte, 2012). Understanding hazard- and sector-specific impacts at a location is another important step of impact-based forecasting and warning. Impact matrices can be developed and presented in form of table, chart, risk matrix, risk curve, and risk maps for each hazard and for each sector. This requires knowledge of the hazard and likely impact on a specific sector at a location. Loss and damage assessment can add value to understanding of overall impacts to quantify the negative consequences of hazard events, which generally refer to the damages (full or partial), injuries, loss of life, property, environment, and/or disruption to business and livelihoods that can be quantified by some unit of measure. Losses are often quantified in economic or monetary terms. Development of impact advisories is the final step towards development of an impact-based forecasting services. Hazard-specific advisories can be developed and disseminated with risk levels from very low to high. These advisories focus on what necessary actions to take and can be modified and tailored as per sector-specific requirements at various levels from the provincial to the local level. Most users of such advisories are national, provincial and district-level disaster management

organisations as well as international developmental organisations.

Conclusions

Impact-based forecasting and warning services are highly useful in changing climatic conditions in a multi-hazard-prone country like India in South Asia, where current forecast and warning information will not suffice in future to trigger mitigation actions by informed citizens. There is a need to shift from the current focus of hazard forecasting in country to impact-based forecasting and warning at regional level, which is understandable and actionable and can be tailored to the requirements of different types of users including decision-makers and citizens as well as sectors such as agriculture, water, infrastructure, disaster management and health. Precise and timely impact-based forecasts and warnings provide an opportunity for mandated agencies to prevent the hazards from becoming disasters.

There is a felt need of South-South Cooperation for impact-based forecasting and warning. Currently, National Meteorological Service in India has taken responsibility for the preparation of annual regional forecast outlook for the South-West Monsoon Season rainfall under the regional forum known as the South Asian Climate Outlook Forum (SASCOF). The SASCOF is a regional platform for National Meteorological Services from South Asia to have meaningful exchanges on summer monsoon. The countries participating in SASCOF are: Afghanistan, Bangladesh, Bhutan, India, Maldives, Myanmar, Nepal, Pakistan and Sri Lanka (WMO, 2019).

National Meteorological Service of India also coordinates with neighboring countries as a Regional Specialized Meteorological Centre (RSMC). It has the responsibility of issuing Tropical Weather Outlook and Tropical Cyclone Advisories for the benefit of the countries in the World Meteorological Organization (WMO)/ Economic and Social Co-operation for Asia and the Pacific (ESCAP) Panel region bordering the Bay of Bengal and the Arabian Sea, namely, Bangladesh, Iran, Maldives, Myanmar, Pakistan, Qatar, Saudi Arabia, Sultanate of Oman, Sri Lanka, Thailand, United Arab Emirates and Yemen. It also has the responsibility as a Tropical Cyclone Advisory Centre (TCAC) to provide Tropical Cyclone Advisories to the designated International Airports as per requirement of International Civil Aviation Organization (ICAO). The National Centre for Medium Range Weather Forecasting (NCMRWF) continuously develop advanced numerical weather prediction systems, with increased reliability and accuracy over India and neighboring regions in South Asia through research, development and demonstration of new and novel applications, maintaining highest level of knowledge, skills and technical bases.

However, it is important to highlight that for better South-South cooperation for well-established impact-based forecasting and warning in South Asia, there is a urgent need to "desecuritize" and "declassify" trans-boundary climate, weather data and other hazard information to enhance public access to this information throughout the region (Prasai and Surie, 2015), as well as establish more robust infrastructure and enhance capacities of NMHS through increased national, regional and international collaboration, to enable them to provide more effective early warning.

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Risk-Informed Development – Integrating Disaster and Climate Risks into Development

*Rajeev Issar**

"Risk-informed development means instituting a risk management approach and connecting immediate to medium to longer-term development and risk management priorities and projections."

Abstract: Risk-informed development is one of the universal principles underlying all strands of the 2030 Agenda. It has also become imperative for countries and communities for protecting investments in development and livelihoods in view of increasing frequency, magnitude and impact of disaster events of multiple hues including pandemics. However, a proper understanding of the concept and its application is yet to inform all levels of development planning and implementation. This implies a focus on the risk information cycle involving analysis, generation, communication and application of risk information. Hence, understanding disaster-development interface becomes a key imperative to achieve this objective.

Realising the imperatives of risk-informing the development processes, international community and countries are investing in risk-proofing hard-earned development investments and gains. With shared risk and vulnerability contexts, inter-connected development pathways and socio-economic processes across countries and regions, the potential for mutually beneficial cross-learning and replication of experiences and successes has grown manifold. This has created greater avenues for South-South Cooperation. Putting in place requisite protocols to bolster existing cooperation through established regional, sub-regional and global processes can help protect scarce development assets and resources from disaster risks and climate impacts while ensuring their sustainability. Connecting national, sub-national, sectoral and community development planning and implementation processes and cross-fertilising the approaches can help realize the risk-informed development objective enshrined in the 2030 Agenda.

Key words: risk-informed development, multi-dimensional risks, disaster risk governance, risk information cycle, mainstreaming risks into development, national and sectoral development planning

Introduction

The global pursuit of securing a sustainable and resilient development trajectory makes it imperative to address the issues of disaster/climate risks and sustainable development in tandem. Increasing incidence of large and small-scale localised disasters and climate impacts undermine peoples'

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resilience and constitute a fundamental threat to sustainable human development and poverty eradication (UNDRR, 2019).

The adoption of the 2030 Agenda has explicitly recognised the need to secure development gains from being eroded due to their exposure and vulnerability to risks of multiple hues. Total global average annual disaster risk (which includes estimates of indirect economic losses and extensive risks) is now estimated at USD1.2 trillion representing approximately 50 per cent of annual GDP growth. This led to recognition of risk-informed development as one of the principles defining the intent and action of the SDGs as expatiated in the sections below. The predecessor Millennium Development Goals (MDGs) did not recognise the impact of risks on ensuring sustainability of development gains. An increasing number of countries reported their inability to achieve the MDGs or suffered a reversal of progress towards achieving the same due to disaster and climatic risks (United Nations, 2015a). Risk-informed development has thus become an underpinning notion in the 2030 Agenda. It is based on the realisation that development needs to be risk-informed in order to achieve the objectives of long-term sustainability, resilience, poverty eradication and leaving no one behind.

In this context, the paper analyses the evolution of the risk-informed development principle and its recognition by the development community. This has been envisioned as a critical input towards sustainable development and resilience building objectives since 1992 Earth Summit[1] where the goal of sustainable development was first articulated by countries and practitioners. It explores the current and emerging risk and development landscape while establishing the imperatives and tries to delineate potential pathways to foster a development approach.

Principle of Risk-informed Development in the Global Development Discourse

The experience of countries and communities during the MDGs decade was taken cognisance of in the deliberations leading to the adoption of the 2030 Agenda viz. "*Transforming Our World: The 2030 Agenda for Sustainable Development*" (United Nations, 2015b). The increasing incidence, magnitude and socio-economic impact of extreme events as well as small-scale disasters, coupled with greater scientific evidence related to the impact of global warming and climate change, led to the realisation of the need to protect development investments made and progress gained from being reversed by risks. Countries and communities invest scarce development resources towards socio-economic assets and livelihoods amidst competing priorities. The need to ensure their sustainability and resilience becomes essential. Hence, the idea that *it is not sustainable, if it is not risk-informed* became the defining cornerstone of the 2030 Agenda.

In fact, disaster risk management community had acknowledged the close interface disaster-development interface much before it was recognized by the development community. The Yokohama Strategy and Plan of Action for a Safer World (1994), (UN, 1994) the first international framework for disaster risk reduction emphasized that "*disaster prevention, mitigation, preparedness and relief*

are four elements which contribute to and gain from the implementation of sustainable development policies. These elements, along with environmental protection and sustainable development, are closely interrelated". The ***Hyogo Framework for Action (HFA)*** (2005-15)[2] highlighted the mutually reinforcing disaster-development nexus and observed that "*disaster risk reduction is a cross-cutting issue in the context of sustainable development and therefore an important element for the achievement of internationally agreed development goals, including those contained in the Millennium Declaration.*"

The **2012 UN Conference on Sustainable Development, Rio+20**,[3] in its Outcome Document titled *'The Future We Want'* called for "*the building of resilience to disasters to be addressed with a renewed sense of urgency in the context of sustainable development and poverty eradication and as appropriate to be integrated at all levels."*

The successor framework to the HFA, viz. the ***Sendai Framework for Disaster Risk Reduction (SFDRR)*** (2015-2030)[4] sets out specific target (Target-D) for a substantial reduction in economic losses, damage to critical infrastructure and disruption of basic services. The Sendai Framework's **Priority for Action-3** provides the critical pillar *'Investing in DRR for Resilience'*, where 'risk' most clearly connects with 'development', while one of the Guiding Principles identifies *"disaster risk reduction is essential to achieve sustainable development."*

The need to hardwire disaster risks and climate impacts into the development processes at all levels is further re-affirmed in ***the 2030 Agenda for Sustainable Development***.[5] It recognises that *"…more frequent and intense natural disasters…. threaten to reverse much of the development progress made in recent decades"* and that *"climate change is one of the greatest challenges of our time and its adverse impacts undermine the ability of all countries to achieve sustainable development."* [*GA Resolution A/RES/70/1 – Transforming our world: the 2030 Agenda for Sustainable Development]*

As a result, the goals, targets and indicators of the SDGs framework identify specific opportunities to contribute to reducing disaster risk and building resilience to advance and secure achievement of sustainable development. As such, there are nearly 6 SDG goals and 9 targets with explicit DRR dimensions and nearly 25 targets with implicit DRR implications while having 6 other goals with targets related to climate mitigation and adaptation.

The ***Paris Agreement on Climate Change***[6] highlights the need to address risk in the context of climate change. Article-7 on adaptation calls on countries to strengthen cooperation and enhance action on adaptation while Article-8 recognizes the importance of averting, minimising and addressing loss and damage associated with the adverse impacts of climate change. The targets of the Sendai Framework on DRR and the articles on Adaptation and Loss and Damage in the Paris Agreement outline a complementary approach towards a risk-informed development pathway.

The political declaration of the 2019 Sustainable Development Goals Summit[7] includes disaster risk reduction as one of the 10 priorities of the Decade of Action for SDG implementation to emphasize that all development policies and investments are risk-assessed and risk-informed. The

cross-fertilisation of risk management dimensions across different strands of the 2030 Agenda has contributed to a growing acknowledgement of the need to risk-inform the development processes as well as of the increasing multi-dimensionality of risks.

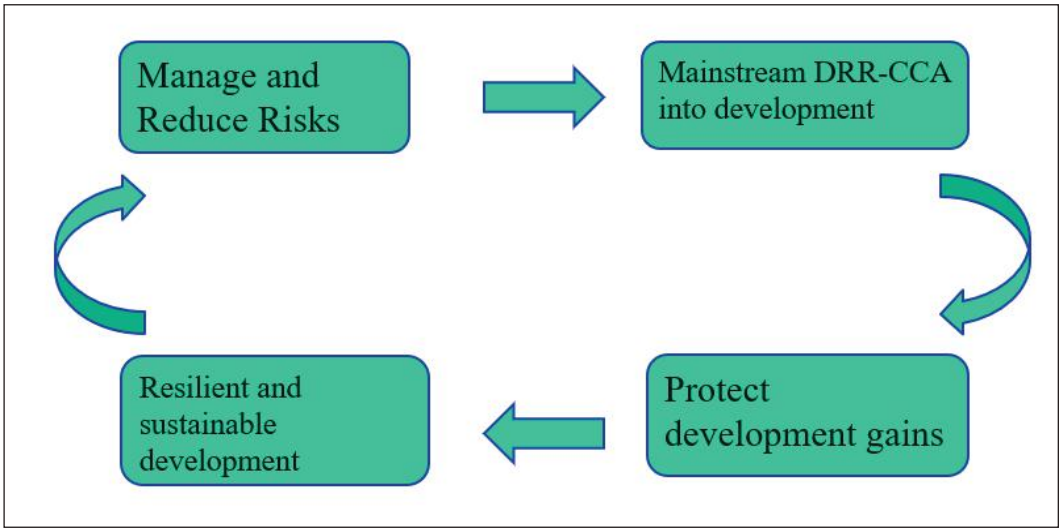
Getting to Know It: Understanding Risk-informed Development

Risk-informed development entails moving beyond a mere management of risks to pro-active governance and reduction of risks. With the nature and characteristics of risks becoming increasingly multi-dimensional and inter-connected, risk-informed development calls for adopting a more integrated risk management approach with closer interface between disaster risk reduction and climate change adaptation (DRR-CCA). It is a crucial input into building resilience and sustainability, as understood by the cycle of resilient and sustainable development, viz: (See figure 1)

An abiding link between disaster risk and development choices made by countries and communities makes it imperative to ensure that these choices help reduce exposure and vulnerabilities to risks. This is based on the notion that risk is primarily a social construct (UNDRR, 2019). Thus, risk is not exogenous to development; rather development itself is a key driver of risk. For example, use of floodplains for construction or settlements or cutting down of mangroves and land reclamation on seacoasts for hotels or human settlements etc. only tend to amplify susceptibility to existing risks while creating newer ones for the future.

Risk-informed development provides the potential to design a new development paradigm by addressing two key dimensions, viz. "**risks to" and "risks from" development**. This stipulates that while, on one hand, it is imperative to ensure that all developmental assets are resilient to shocks and disasters yet at the same time, it also seeks to ensure that the development process itself and its

Figure 1: Risk Informed Development



Source: UNDP.

assets do not contribute to sharpening or accentuating the risk profile. Thus, preventing an exacerbation of existing risks and avoiding the creation of new risks through risk-informed investments would require that both public and private investments screen and manage disaster and climate risks. For example, setting-up or expansion of industries needs to ensure emission reduction so that it does not lead to more global warming creating a higher risk of climate-induced disasters.

In short, risk-informed development means instituting a risk management approach and connecting immediate to medium to longer-term development and risk management priorities and projections. It means protecting existing developmental assets from disaster risks while ensuring that public and private development processes today do not in any way contribute to increasing future risks. The key steps in fostering risk-informed development include a thorough understanding of existing and emerging risks, connecting risk information to risk governance, analysing political and development decision-making and investing in resilience at local and community level through a better connect between national, sub-national, sectoral and local socio-economic development processes.

Establishing the Imperative: Examining the Rationale

An evidentiary increase in the incidence, frequency and magnitude of disasters reflect a world of increasingly multi-dimensional and persistent risk and uncertainty. Underlying risk drivers like climate change, rapid urbanisation, globalized economic environment, socio-economic factors like poverty, inequality, exclusion, etc. are exacerbating the risk landscape. The cumulative impacts of increasing exposure and vulnerability to disaster risks and climatic events has led to a manifold increase in protracted and extreme disaster events over the past decade (Chase Sova, 2017).

As we look at the stark reality from disaster events over the past 10-15 years especially in South Asia and South-East Asia region (while also being true for other developing countries), the centrality of mainstreaming risk information into development planning and decision-making becomes a sine qua non. It is borne out by the experience from the 2004 Indian Ocean Tsunami which resulted in increase in proportion of people living below the poverty line from 30 per cent to 50 per cent in Aceh, Indonesia[8] while the post-disaster needs assessment after the 2015 Nepal Earthquakes (Government of Nepal, 2015) estimated that over 750,000 people (3-5 per cent of the population) were likely to be pushed back into poverty due to disaster impacts.

The frequency and magnitude of disaster events is inflicting an exponential spike in economic losses in urban centers. Thailand floods of 2011 (loss of US$45.7bn, [GAR 2013]), Hurricane Sandy in New York in 2012 (US$65bn) and disasters like the Japan EQ and Tsunami in 2011 caused heavy economic losses, disrupted national and global business processes and undermined national and societal development.

At the same time, there is compelling evidence that recurring small-scale disasters (unseasonal rains, hailstorms, heat waves, localised and concentrated rainfall, flash floods etc.) and climate

impacts (like alterations/variations in precipitation, temperature, seasonality etc.) often have much higher cumulative losses, retard development and erode the resilience of individuals and communities especially on the weaker and the marginalized in poor countries than all the high-profile mega disasters taken together. The trends over the recent decades indicate an increasing incidence of small to medium-sized disasters. For example, in Colombia, more than 19,000 small and moderate events have been recorded between 1971-2002 (Marulanda, Cardona, & Barbat, 2010) which took lives, destroyed assets and infrastructure while during the same period EM-DAT (Emergency Events Database) recorded only 97 major disasters.

With over 90 per cent of recorded disasters over the past 20 years linked to weather, climate change and cyclical conditions[9], such as El Nino and concentrated rainfall incidents causing flash floods, the need to systematically dovetail Sendai Framework and Paris Agreement on CC to successfully avert disaster risks and adapt to climate change.

The Much-Neglected Pre-Requisites: Assessing Risks and Mainstreaming into Development

Preventing creation of new risks, reducing existing ones and managing the residual ones must be at the core of development, and connected economic, social and environmental policies at all levels. Every decision whether by an individual, a community, a socio-economic activity, large project or infrastructure or even construction of a house involves making a choice. It invariably entails the need to strike the right balance between pros and cons to select the best viable option. This trade-off, contextualised in the risk context, involves having the right information related to potential risks based on a cost-benefit analysis. Adopting process-centric approach to risk-informed development (ODI, 2019) helps us identify the steps likely to be used to advance the same – though these need not necessarily follow the same sequence in which these are enumerated below - as the entry points catalyzing the same can vary depending upon the country, development and risk management context as well as the overall or sectoral development needs and priorities. Some of the key steps to lay the ground and initiate the process are, viz.

- Understanding risks – analyze, assess, communicate and apply risk information including the interplay of risk drivers or factors.
- Risk governance – disaster and climate risk governance has assumed centrality in the discourse as it focuses on political and development decision-making process while ensuring a participative, multi-stakeholder and accountable approach based on sound institutional, legislative and policy frameworks as well as political economy analysis.
- Financing risk management – identifying the resources (not just financial but even technical, human and knowledge related) and encouraging dedicated allocations within each sectoral development plan as well as tapping into private and financial sector ones.
- Preparedness for contingency management – ensuring systems and

processes are in place to address any risk that may arise outside and beyond the scope of risk management process.

Apart from these, a good analysis of policy, legal and institutional context, stakeholder roles, knowledge and finance are equally important. However, in this analysis, the first three elements will be examined to expatiate some of the key perspectives and elements.

Much neglected but a key pre-requisite to advance risk-informed development is the need to understand risks and generate actionable risk information. Given the multi-hazard risk context of India and their mutually reinforcing nature, thoroughly analyzing risks assumes importance so that the nature, characteristics and behavioural patterns of various types of risks, exposure and vulnerability of socio-economic assets and communities thereto is better understood.

A sound risk assessment provides the empirical evidence by making risk information accessible in an easy-to-understand format to decision and policy makers and by facilitating its application by public and private sector stakeholders. It emphasizes the centrality of risk information cycle[10] comprising four stages viz. (i) generation of risk information through evidence-based risk assessments and modeling; (ii) risk management by providing dynamic risk profiling; (iii) risk communication and dissemination in a user-friendly format and visualisation; and (iv) use/application of risk information through effective risk governance institutions and systems at national and sectoral levels.

An initial understanding of risks and their impact on development sectors can be based on the secondary data and information available and can, if required, be followed up with an in-depth risk assessment. Such an assessment can also help identify the drivers of risk in a particular context, their impacts on different sections of society and implications for key development sectors. This is important as risks are disproportionately shared by people and the ones with weaker livelihood and asset base are more vulnerable. Similarly, the formal sector is much less affected and better able to cope with impacts as opposed to the informal sector.

Investment in risk information and its dissemination accompanied by the design of appropriate accountability mechanisms as part of strengthened disaster/climate risk governance help advance the objectives of sustainable development and resilience building at all levels and across all socio-economic development sectors.

Considering that the centrality of integrating disaster/climate risks into development cuts across the three dimensions of sustainable development viz. (i) social, (ii) economic and (iii) environmental, a risk management process addressing the entire spectrum of risks (i.e. social, environmental, political, climate and disaster, crises, conflict, migration, socio-economic factors etc.) and their multi-dimensional nature is imperative. However, the process is beset with peculiar operational, institutional and other barriers, viz. inadequate political will, risk-blind development, lack of actionable risk information, weak governance mechanisms/systems impeding risk integration, financial and technical resources to support the process, etc. These challenges are further compounded by the fact that comprehensive risk information

encompassing all types of risks is not readily available. This makes it harder for development community to take informed decisions.

With widening scope and nature of risks including the pandemics, it has become imperative to invest in strengthening disaster risk governance (UNDP, 2017) at all levels. It means understanding the process of development decision-making and the key imperatives prompting the same i.e. the how and why of decision-making. In spite of having developed sound institutional, policy and legislative frameworks for DRM, the risk governance approach is yet to be institutionalised. Impelled by overwhelming disaster events, some progress has been made but the development decisions and investments continue to be made without factoring in hazards and other risks. It is unclear as to how many kilometers of roads out of the on-going national push to expand the network of roads is factoring in the risk considerations, if at all. One way to advance this objective is by keeping a dedicated pool of funds for risk assessment of the area in which project is sought to be executed and by linking up a technical or engineering institute to provide the required risk information. While it might inject some delay in project execution but then that is the trade-off that has to be established and decided upon as part of risk governance work. Hence, informing the political and policy decision-makers with appropriate risk information and advancing its application in a calibrated manner is key component of governing risks.

A connected issue is availability of financial resources considering that generating risk information is a resource intensive and time-consuming process. Most of the funding for disaster management in India is under the National/State Disaster Response Funds (NDRFs or SDRFs) whose primary orientation is towards post-disaster support and not on risk mitigation. In spite of the fact that DM Act, 2005[11] provides for setting up of disaster mitigation funds, it has not been established as yet. Thereafter, the-then Planning Commission had recommended allocating dedicated resources for mitigation and risk management. However, most of the budgetary allocations and plans of development sectors have not initiated the practice of earmarking resources for risk mitigation and management – either in the public or in the private sectors.

Considering that development process are complex and non-linear, an incremental approach identifying the right entry points to ensure a more deepened ownership by stakeholders is more likely to address the development-related risks.

Augmenting the Action: Identifying Key Sectors and their Contributions

With the genesis of the risk-informed development concept emerging primarily from the disaster risk management community, it is only natural that DRR/DRM and climate change adaptation/mitigation practice has the leading role to advance this objective. Yet the action needs to move beyond disaster and climate risk management to include sectors with close bearing on advancing this objective. This requires focusing on the interface of disaster and climatic risks with (i) *infrastructure* including the productive sectors of economy; (ii) *assets* – socio-economic development assets at

both community and individual level; and (iii) *people, livelihoods and access to health*. Disaster risks and climate impacts bring the productive sectors as well as livelihoods under serious stress and shared vulnerabilities across risks tend to multiply their impacts beyond traditional sectors and regions.

A number/range of strategies, involving an incremental and multi-layered approach, can be adopted and implemented to complement disaster and climate risk management measures to help the affected and the vulnerable. These include a judicious mix/combination of all or some of the following depending on the context in addition to the focus on infrastructure, education, awareness, access to risk information etc.:

- *Natural resource management* – ensuring access of communities and people to natural resources like water, forests, environmental services, etc. can help sustain livelihoods while also protecting against the adverse impacts of disasters and climate change.
- *Livelihood diversification* – one of the key reasons for increasing vulnerability of communities and livelihoods to disasters and climate change is the extremely narrow livelihood and socio-economic asset base. Considering the increasing stress on production processes, fostering diversification of livelihoods and creating alternative productive assets through skill development, alternative crops, animal husbandry etc. can help reduce risk exposure and vulnerabilities.
- *Financial inclusion* – developing social protection, insurance and micro-insurance, micro-credit and other financial instruments can help advance access of the marginalised and the vulnerable to financial assets and schemes to invest in developing their asset base, risk management measures and resilience building. This is particularly relevant for gender inclusion and empowerment through dedicated support to women-led households engaged in agriculture, livestock rearing and farming, etc.
- *Governance* – strengthening governance mechanisms, including risk governance, through effective institutions, laws, policies, strategies, programs, capacities and resources help foster a systemic approach to risk-informed development and resilience. Governance is one of the key determinants of making a country and community less vulnerable and development more resilient while ensuring access to social protection and to services like health, education, etc.

Walking the Talk: India's Global and Regional Initiatives

Recognising this need, India has already taken a lead in partnership with UN agencies like the UN Office for DRR (UNDRR) and United Nations Development Programme (UNDP) to launch a global initiative Coalition for Disaster Resilient Infrastructure (CDRI)[12] at the UN Climate Summit in September 2019. Analysis of recent disasters indicate that up to 66 per cent of total public sector losses in weather and climate related extreme events are related to infrastructure damage. Hence, investments in resilient infrastructure and ensuring that DRR considerations are factored in at all stages of their planning and implementation process are key to achieve this objective. CDRI works with national government, UN agencies, multilateral development banks and financial institutions, private

sector and technical institutions to promote resilience of new and existing development infrastructure to disaster and climate risks thereby ensuring sustainable development.

Similarly, the launch of the International Solar Alliance[13] by Prime Minister Shri Narendra Modi and former President of France Francois Hollande at the CoP21 in Paris in November 2015 to enhance cooperation among solar-resource-rich countries to increase use and quality of solar energy and engage a range of stakeholders from the government, private sector, development and financial institutions and others to meet energy needs and reduce dependence on fossil fuels to curb carbon emissions.

The CDRI initiative currently has a membership of 15 countries as founding members while the International Solar Alliance currently boasts of a membership of 86 countries. With investments in development infrastructure expected to be to the tune $94 trillion over coming decades, it is critical for countries to ensure that precious resources invested therein are protected from adverse disaster and climate impacts while at the same time ensuring that the new infrastructure does not aggravate existing risks. This is fostered by reducing the carbon footprint of new infrastructure and informing its development with risk information and resilience benchmarking.

Both the initiatives spearheaded by India link up with the SDG Goal-9 (Resilient infrastructure) and Goal-13 (Climate action) and actively contribute towards advancing the achievement of Target-D of the Sendai Framework for DRR related to resilience of critical infrastructure and basic services.

The need to protect valuable national and community investments in socio-economic development assets from risks is being realized and addressed pro-actively by a number of countries. It is based on the realisation that risk-informed development saves costs and protects valuable investments in development. It is a cost-effective proposition as evidenced by a study by regional civil engineering experts (ProVention, 2007) in the Caribbean which indicated that spending 1 per cent of a structure's value on vulnerability reduction helped reduce losses from disasters by about a third. Similarly, a study to determine the impact of investment in flood defense in the State of Tabasco, Mexico, between 2007 and 2010, found that the cost-benefit ratio of these investments was 4:1, contributing to avoided damages and losses when floods occurred in 2010 equivalent to US$3 billion or 7 per cent of the GDP of Tabasco (World Bank, 2014). It is not just the investments in 'hard' infrastructure but also the 'soft' infrastructure which contribute to reducing risks and protecting development resources from going waste in the face of hazards. For example, a mangrove plantation programme implemented in select provinces in Vietnam by the Red Cross over 1994-2001 cost an average US$0.13 million a year but helped reduce the annual cost of dyke maintenance by US$7.1 million. [https://www.prevention web. net/files/globalplat form/entry_bg_paper~ mangroveimpactreportfinallowapril2011.pdf]

India, in partnership with Japan, has decided to collaborate on the Asia Africa Growth Corridor (AAGC)[14] initiative announced jointly by the Prime Minister's of Japan and India with disaster and climate risk management having been identified as one of the key pillars to complement the efforts of countries and communities in African continent to build resilience.

India has already set ambitious targets for itself with regard to addressing both aspects of risk-informed development viz. "risks to" and "risks from" disaster and climate risks. Of course, more needs to be done and an incremental approach implemented in a phased structured manner over coming years will help advance the objective of building resilience and sustainability of socio-economic development assets by adequately factoring in risk concerns.

Looking Ahead

The experience across countries and development contexts has shown that risk-informing the development agenda will help reduce vulnerabilities, address risks, connect immediate to medium to long-term development and risk management needs while ensuring sustainability of development investments and resilience of livelihoods. This is relevant not only for achieving the Sendai Framework Outcome aimed at "*substantial reduction of disaster risk and losses*" but will also advance the resilient and sustainable development vision permeating all strands of 2030 Agenda.

Keeping in mind the already high, and steadily amplifying risk characteristics and behaviour patterns, exposure and vulnerability of people, development assets and community livelihoods across South, South-East Asia and the Indian Ocean Rim countries along with the mounting economic cost of disasters, a pressing need to protect painstakingly secured development gains has become quite pronounced. Many countries have already adopted innovative policies and informed development processes with a view to prevent and mitigate the impacts of disasters. Countries like Japan, Vietnam, Bangladesh, Indonesia, Philippines and others offers very valuable learning and experiences.

This offers potential for advancing greater South-South Cooperation through mutual learning and sharing of information. India has already taken the lead through its ambitious global initiatives and can further enhance cooperation with other countries to share technical knowledge and expertise for risk assessment and its application by involving its vast network of engineering and technical institutions. Learning from other countries can help create a mutually beneficial development paradigm. In fact, risk-informed development can deliver the development dividend imperative for countries and communities in the region. A lead needs to be taken and India is well-positioned to champion the same.

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India's Role in Strengthening Regional Response Cooperation for DRR

*Balaji S. Chowhan**

"It is well demonstrated that regional cooperation provides an opportunity to share knowledge, capability and resources for preparedness, capacity building, and to introduce innovative financial arrangement that could fund costs of response and recovery."

Abstract: Increase in frequency and impact of natural disaster events exacerbated by climate change calls for innovative management approaches. Regional cooperation in various locations is found to be beneficial and effective. South, South-East Asia witnesses a number of natural disaster events and India with its intent and capabilities can play a critical role in fostering regional cooperation. India is already actively cooperating with different countries for humanitarian cause and institutionalising this involvement in a structured mechanism will make it more effective and sustainable. There are many demonstrated examples of regional cooperation globally and some of them are discussed in this paper. India could study these mechanisms and identify suitable options to pursue. From the point of India's strengths, setting up a dedicated training facility for South Asian countries to train on search and rescue skills, Incident Command System, EOC operations, setting up regional EOC for coordination of trans-boundary disaster events and operations, finalising SOPs and protocols for regional response mechanism, setting up a regional warehouse for non-food relief, building regional DRR database system and launching a regional risk transfer mechanism could be some suitable options. With demonstrated intent and aspiration to become a global citizen who is looking to contribute to building a strong humanitarian value system, India is ideally suited to promote regional cooperation in South and South East Asia.

Key words: India, regional cooperation, regional response mechanism, regional disaster response, South Asia DRR

Introduction

Regional cooperation for disaster risk reduction offers tremendous scope to demonstrate humanitarian values by its member countries towards other members, foster people to people engagement, and hold mirror to global humanitarian concerns. Regional collaboration offers an opportunity to cut lead time for response, implement useful DRR projects,

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help to learn lessons, share intelligence and training capabilities, provide surge capacity to launch emergency response during large and catastrophic events, and pool financial and non-financial resources during response, rehabilitation and recovery phases of a disaster. It is well demonstrated that regional cooperation provides an opportunity to share knowledge, capability and resources for preparedness, capacity building, and to introduce innovative financial arrangement that could fund costs of response and recovery. Countries in a region tend to share risks, vulnerabilities, administrative and developmental challenges, financial and capacity constraints. Enhanced regional cooperation offers tremendous potential to overcome the limitations and augment resources with valuable experience and expertise to address increasing incidence of transboundary risks. Regional cooperation offers a strategic way ahead to reinforce efforts towards a comprehensive risk management approach.

Global Assessment Report on Disaster Risk Reduction 2019 (GAR, 2019), published by the United Nations Office for Disaster Risk Reduction (UNDRR) quoted: *"while regional cooperation mechanisms can provide key support to knowledge-sharing and capacity-building among countries with similar risk profiles and regional concerns, aspects such as regional risk assessment, risk information systems and national capacity-building must be more actively promoted."* Climate change, now accepted as one of the key accelerators of disaster risk, and regional collaborations hold key in mitigating climate risks as risks induced by climate change are not known to respect national boundaries.

Some Relevant Examples of Regional Cooperation

There are many examples of existing regional cooperation for disaster risk reduction that have clearly demonstrated the benefits of such cooperation. Following are some of them:

ASEAN: The Association of South East Asian Nations (ASEAN) with 10 member countries started cooperation on disaster management under the ASEAN Agreement on Disaster Management and Emergency Response (AADMER) signed in 2005 and effective since 2009. *ASEAN Regional Programme on Disaster Management* which includes sharing resources, information, capacity building, contingency plans which are driven by several agreements among the member countries. Disaster Management is considered a tool to nurture solidarity, and "ASEAN regional disaster management cooperation is now supported politically"(Rum, 2016). ASEAN Coordinating Centre for Humanitarian Assistance on disaster management (AHA Centre) which was established in Jakarta in collaboration with several donors undertakes surveillance of disaster events and drives training, surge and other collaborations among the members countries.

ARC: African Risk Capacity (ARC) founded in 2012 is led by 34 African Member Country States. ARC is a specialised agency that supports its member states to better plan, prepare, and respond to extreme weather events and natural disasters. Using collaborative and innovative risk financing tools, ARC ensures predictable access to finances to protect food security and livelihoods of

vulnerable population. ARC comprises of African Risk Capacity Agency and ARC Insurance Company Limited.

PIF: Pacific Islands Forum with its secretariat in Suva, Fiji is an association of 18 member countries including Australia and New Zealand. Disaster Management function includes disaster relief grants for the member countries. India has a dialogue partner status in this association.

CCRIF: The Caribbean Catastrophe Risk Financing Facility (CCRIF) with 16 Caribbean countries is a risk pooling facility designed to limit the financial impact of catastrophic hurricanes and earthquakes to Caribbean governments by quickly providing short term insurance payouts when a policy is triggered. CCRIF was developed under the technical leadership of the World Bank and with a grant from the Government of Japan. The Facility was capitalised by European Union, the World Bank, the governments of the UK, France, Ireland and Bermuda and the Caribbean Development Bank. The participating members also pay a membership fee.

India and the Regional Disaster Context

India measures about 3.3 million square kilometres with approximately 1.3. billion people (1.1 billion as per 2011 census). India's geophysical and climatic features significantly contribute to its natural disaster risks. India faces considerable exposure to hydro meteorological events in the form of cyclones, seasonal as well as flash floods, heat and cold waves, drought, devastating seismic events, avalanches, landslides, lightening, glacier lake outbursts, industrial accidents, locust attacks and pandemics. India is a rapidly growing economy with thriving agriculture, mineral and human resources contributing to robust industrial and service activities and hence the need to safeguard investments is critical in keeping the economic momentum. Its computer software industry is considered one of the best in the world and is the backbone of the world's software industry. India's Diaspora makes laudable contributions to host economies where they live, as well as to India's economy, and many of them are considered invaluable scientific resources and strengthen India's global standing. India's science research infrastructure and scientific community play a commendable role in solving internal as well as global challenges. India's space and meteorological agencies have contributed immensely by forecasting various cyclones, tsunamis and precipitation patterns helping in disaster monitoring and surveillance. These agencies also work with different international forecasting institutions by sharing data and observations to sharpen forecast of disaster events globally. Such attributes backed by thriving democracy, all round preparedness make India an important stakeholder on the global humanitarian stage and places a great responsibility to address its own and regional humanitarian challenges.

Asia-Pacific is one of the global hotspots for disaster risk which is further aggravated due to extensive poverty and climate change. The Asia Pacific Disaster report – 2019 published by UNESCAP mentioned: "In 2018, almost half of the 281 natural disasters events worldwide occurred in Asia and Pacific"

(UNESCAP, 2019). The report also mentioned that approximately two million people succumbed to natural disasters in the Asia Pacific region since 1978 contributing to 59 per cent of global fatalities. The report also mentions about increasing number of people seeking immediate relief after disaster events and increasing losses from about 0.1 percent of the GDP to 0.3 per cent annually. These facts reflect the trend towards expanding needs immediately after the events as well as more financial needs to support economic losses.

India located in South Asia region carries significant disaster risk due to its geophysical and climatic conditions. The Himalayan range of mountains in this region are seismically active causing earthquakes, the Himalayas are also a source for several river system which carry significant sediment and cause regular flooding. Much of the water requirement is met by monsoon rains occurring over a short period of 3-4 months. Excess or intensive monsoon activity causes flooding and failure of monsoons causes drought affecting millions of rural livelihood opportunities. Cyclones originating from the Bay of Bengal and Arabian Sea have potential to cause severe damage especially impacting the coastal nations of South Asia such as Bangladesh, India, Sri Lanka, Myanmar, and Pakistan. There is a significant human habitation in the areas seismically active as well as areas as cyclone and flood prone areas. Cyclonic winds are also known to cause damage in Nepal and Bhutan. Climate change impact is considered very high in South Asian countries; Maldives, Bangladesh, India and Sri Lanka carry significant risk due to climate change.

India and Regional Cooperation

Due to similar geophysical features, India shares its natural disaster risk along with many of its neighbours. Further, India also shares disaster concerns with many other countries on account of its concern for humanity and as a responsible regional power and a concerned global citizen. India is a part of the South Asia Association for Regional Cooperation (SAARC) along with Afghanistan, Bangladesh, Bhutan, Maldives, Nepal, Pakistan, and Sri Lanka and together they share many common disasters risks. India has demonstrated its willingness to support SAARC partners in managing their disaster risk.

Similarly, India is a part of Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) along with Bangladesh, Bhutan, Myanmar, Sri Lanka and Thailand with whom it shares disaster risk on the eastern parts of the country. India also has a observer status in 10 members of the Association of Southeast Asian Nations (ASEAN) countries.

Seeking to play a more constructive role in the wider Indian Ocean region, India plays an active role in Indian Ocean Tsunami Warning and Monitoring System (IOTWS) set up after the Indian Ocean Tsunami in 2004, and through this effort contributes significantly to global tsunami warning system. India is also part of, Indian Ocean Rim Association (IORA) along with a number of countries in the India Ocean. One of the objectives of IORA is disaster management along with protection of environment.

India historically has strong partnership with Africa. Some key elements of this partnership pertain to strengthening

Africa's agriculture, and addressing the challenges of climate change. India further binds with several nations during the hours of humanitarian crisis. With a view to scale up the engagement and partnership with African countries, institutions and communities, India has partnered with Japan to initiate the Asia Africa Growth Corridor (AAGC) in which collaboration across disaster and climate risk management issues has been identified as one of the key pillars of cooperation to foster resilience of socio-economic development sectors and to enhance the effectiveness of disaster risk management systems in the continent.

Humanitarian concerns were demonstrated during evacuation of nationals from different countries during the situation of crisis including the COVID-19 pandemic. India also plays a significant role in the UN supporting peace and anti-poverty ideas. Recently, India launched a global Coalition for Disaster Resilient Infrastructure (CDRI) to help make infrastructure investments disaster resilient. India's associations, actions and concerns quite eloquently demonstrate its belief in its humanism ideals and stated philosophy of *Vasudaiva Kutumbakam* which means the global humanity is one family. With such strengths, and in the changing geopolitical and disaster risk context, India can play crucial role to promote regional cooperation especially in South-Pacific Asia.

In spite of complex political landscape, there were consistent efforts made in South Asia region for establishing regional cooperation mechanism through SAARC Disaster Management Centre and more recently through BIMSTEC initiatives. India had been playing a major role in pursuing the path of regional cooperation by contributing knowledge and resources. India organised demonstrations for SAARC as well as BIMSTEC countries to impart search and rescue skills. India also allows participation of officers from other countries for various training programmes and India is well placed to lead the regional cooperation arrangements especially in South and South East Asia.

Indian DRR Capabilities

In addition to strong intent, India has strong operational, science-based capabilities which will be extremely useful in fostering and promoting regional cooperation. Some of such key capabilities are discussed below:

A. Search and Rescue: India set up the National Disaster Response Force (NDRF) in 2006 as per the provisions provided in the 2005 Disaster Management Act. It started as a force comprising of eight Battalions drawn from different paramilitary forces. The strength was expanded and currently the NDRF consists of 12 Battalions, each battalion consisting of 1149 personnel. The NDRF is trained and equipped to undertake Collapsed structure search and rescue, Water Rescue, High Altitude search and rescue and other kinds of rescue functions. NDRF also holds capabilities to operate during nuclear, biological, chemical and radiological events and has participated in several search and rescue operations in and away from India. The NDRF has both centralised and decentralised training facilities and a well-planned training system. NDRF was the first overseas resource to reach Nepal during the 2015

earthquake and successfully rescued many from the damaged building. In addition to NDRF, many states of India have State Disaster Response Force (SDRF) which are deployed at state level for search and rescue functions.

B. Early warning System: India has well developed network of scientific agencies. The Indian Meteorological Department (IMD) and National Centre for Medium Range Weather Forecasting (NCMRWF) and Indian National Centre for Oceanic Information Services are capable of formulating pinpointed cyclone landfall which help in evacuation of vulnerable population and pre deployment of relief at the threatened sites. Indian Space Research Organization (ISRO) provides required remote and satellite imagery which further sharpens the weather forecasts. These capabilities helped India in precise forecasting of cyclone Amphan and Nisarga recently and reduced human casualties to insignificant numbers in comparison to casualties during 1999 Odisha super cyclone. In 2017, India launched a satellite dedicated to serve its South Asian neighbours in different fields including disaster management. The Central Water Commission (CWC), India maintains a network of gauges that monitor rise in river levels and in combination with the precipitation forecast it receives from IMD, the Central Water Commission is able to provide intelligence related to inundation and flooding.

C. Institutional framework : Following the enactment of Disaster Management Act in 2005, India has set up a robust institutional framework for proactive decision making, and also designed different financial tools to support disaster preparedness, response and mitigation activities. Further, following the Disaster Management Act, India established the National Disaster Management Authority (NDMA), the National Disaster Response Force (NDRF) and National Institute of Disaster Management (NIDM). This all-round institutional framework replicated at the State and district levels through respective State and District DM Authorities have played a critical role to strengthen DRR in the country. These examples could offer significant value for countries who are embarking in designing or refining their disaster management institutional framework.

D. Incident Response System (IRS): On site incident response coordination is a very critical function during disaster response. Often, disaster response needs to bring different operational jurisdictions on under a single umbrella to ensure setting common objectives, resource sharing and mobilisation, data sharing for effective decision making, operational effectiveness and responder safety. Short term incident planning, documentation and logistics become very critical functions during response. All such requirement will demand setting up a temporary organisation which could respond in a planned manner. Realising this need for professionalising response mechanism, and based on the recommendations made by the High Powered Committee (HPC) established in 1999, India embarked on institutionalising Incident Command System (ICS) in partnership with U.S. Forest Service International Programs. As a result, India currently has well documented guidelines for institutionalising ICS (referred as Incident Response System in India), availability of trainers and training

curriculum adapted to India context. India is in a position to offer its IRS knowledge and expertise to other countries.

E. Community Based Disaster Risk Reduction: The Government of India and United Nations Development Program (UNDP) launched a community-based Disaster Risk Management (DRM) programme in 17 states and 176 multi hazard districts. This effort was instrumental in community to the centre stage through training communities on bottom up disaster risk management planning and skills required during response phase. India was also able to incorporate disaster management education in the school curriculum from grade 7 to 10. India also has a system to promote volunteering. These efforts have potential to offer insights in designing and planning of community-based programmes.

F. Role of business and civil society participation in DRR: India has successfully ensured participation of business and civil society actors to join hands with the government to promote DRR activities at the community level. The law to promote corporate social responsibility through amendments to the Company Act in 2013, and facilitating civil society participation at grass route level are some examples which India offer. There are many specialised civil society organisations in India that support government in risk reduction studies, designing strategies and emergency response. India is able to ensure civil society participation without abdicating government accountability and responsibility.

With several such capabilities India is in highly suitable to redefine its regional role. Some strategies and mechanisms are discussed in the following part.

Suggestion to Strengthen Regional Cooperation

India with its strong intent and significant DRR capabilities could play a critical role to foster DRR regional cooperation. Following are some suggestions which could help strengthen this process.

Institutional mechanism to deal with regional cooperation

India participates in different regional cooperation initiatives and bringing planning and funding elements of all such initiatives will help in building a coherent plan and timely decision making. India could explore to set up a structured and independent institutional mechanism with a committed funding to evaluate and act upon different regional DRR ideas. Such an independent mechanism could be set up in agreement with the Ministry of External Affairs, Government of India which has the jurisdiction for activities outside India, and Ministry of Home Affairs which is mandated to deal with the subject of disaster management. Alternatively, such a separate and independent secretariat could be nested within the National Disaster Management Authority (NDMA) which is headed by the Honourable Prime Minister, Government of India. An independent mechanism will provide impetus to deal with different opportunities and challenges in the domain of regional cooperation. Different existing mechanisms such as SAARC, SDMC, BIMSTEC and Indian NGOs could be used for implementing the action plan formulated by this entity. Such an independent mechanism will be effectively able to involve relevant administrative organs and address number

of relevant issues, some of which may have disaster risk reduction orientation. Ability to address a number of issues will be beneficial from long-term and sustainability perspective.

Set up hazard or theme based regional groups

India could work towards establishing hazard based or theme-based groups. Such grouping will help in active participation as a result of enlightened self-interest of different countries. Grouping based on coastal hazards through BIMSTEC is a step in the right direction. Similar groups for seismic hazards as well as groups based on functional interest, such as Search and Rescue, Incident Response System, Emergency Operations Centre etc. could help in bringing countries who are interested in learning and acting on such themes. In view of growing transboundary risks like cyclones or pandemics, possibility of regional/global impacts due to some in-country disasters like the Thailand Floods of 2011, adopting a broader regional or sub-regional risk management orientation will not only benefit the national agencies but also strengthen effective and timely response to and management of transboundary risks.

Establish Regional DRR database management System

Today appropriate data is a felt need. There is a growing relevance for DRR data to communicate as well as to make quick and appropriate decisions. India could take a lead in establishing such a regional database mechanism which will drive DRR decision making and strategies. Such a system will help not only during response but also for post -disaster needs assessment. India with its software industry and with the support of its scientific community and along with professionals from the participating countries can establish and drive such a process. The Sendai Framework for DRR calls for adopting a multi-hazard approach to risk management. This will entail analysing risks from a multi-dimensional risk perspective to ensure that the inter-connected nature of hazards and risks is taken due cognisance of in national and regional risk management strategies.

Establish a regional EOC

Effective coordination of response and activation of regional cooperation are critical during large scale disaster events. An EOC staffed by personnel from different countries could help in this process. India could lead this process by establishing EOC decision support system, operation protocols and hosting the facility. Such a facility could also be used for maintaining regional DRR data, maps, policies, and other instruments and contribute to business continuity plan of participating countries. AHA Centre in Jakarta for ASEAN countries serves such a purpose for the countries in that region.

Regional insurance mechanism for livelihoods

South Asia region is a home for a significant number of poor populations who are dependent on fragile livelihood mechanism such as subsistence agriculture or urban informal sector. These sections of people are highly vulnerable as disasters tend to aggravate their poverty. Appropriate regional insurance mechanism will be extremely helpful for such communities as well as countries at the time of disasters. India has a vibrant public as well as private insurance industry and it can bring them

together for setting up a robust insurance mechanism to safeguard the livelihoods and absorb shocks and stresses of disaster events.

Establish a Regional DRR Training Academy

There is a considerable demand in the South Asia region for various DRR training programmes. Such training could be skills based training such as: search and rescue training, medical first response training, fire suppression and management or management based training such as: Incident Command System (ICS), EOC Operations, Hospital Incident Command System (HICS) or Knowledge based training such as preparation of disaster management plans, post disaster needs assessment, etc. India could set up a regional training centre bringing human resources from different regional countries and run these courses. Over a period of time such training will contribute to strengthening inter-operability, and surge.

Strengthen regional response mechanism

SDMC has supported the SAARC countries to formulate a Regional Response Mechanism which is endorsed by the parliaments of SAARC countries. Appropriate Standard Operating Procedures (SOPs) and Protocols could be developed, field tested and finalised. India could take a role in ensuring completion of this process. Use of Regional Response Plan by all SAARC countries will have a far-reaching impact by strengthening mutual cooperation among the countries in the South-Asia region. Such a response mechanism should involve preparation of a database of persons who could be deployed for supporting internal, regional and international coordination and identify pool of human resources who could be deployed to augment the national resources. Similarly, a Regional Warehouse consisting of non-food material could be set up to contribute to immediate relief support to the countries in the region.

Institutionalise preparedness meetings before cyclone and monsoon season

Every year, Ministry of Home Affairs holds a meeting with all states to evaluate flood preparedness before onset of monsoon season and holds exercises to identify actions for preparedness. Such a practice could be institutionalised with different countries in the region to strengthen immediate plans for flood data sharing and response.

Establish Regional Mechanism for early warning communication

Early warning communication play a critical role in reducing disaster risks. India with its advanced scientific capabilities is already early warning information pertaining to cyclonic systems, and tsunami early warning. There is a possibility of expanding such a scope and include early warning pertaining to precipitation, water releases, and river carrying capacities to enhance flood preparedness in this region.

Conclusions

There is a need for extended regional cooperation in South Asia, South-East Asia as well as in the wider Indian Ocean Rim region. The shared exposure and vulnerabilities to similar hazards, common developmental challenges and administrative constrains, capacity and financial limitations and mutually

dependent socio-economic needs further underscore this pathway.

India with its intent and abilities can play a leadership role to strengthen regional cooperation. The current context provides a great occasion to launch systematic regional cooperation efforts. With recent unopposed election of India to the UN Security Council as a non-permanent member on behalf of Asia-Pacific countries and rapidly increasing profile of cooperation across a number of spheres with countries in the region, India should pro-actively take the initiative to engage with counterpart regional inter-governmental entities, national counterpart agencies to socialise the idea of setting-up a regional response mechanism. This can help pool technical resources and capacities to help each other during emergent situations. Cooperation in the disaster management area will help create the goodwill with countries and communities and has the potential to generate spin-off benefits and mutual win-wins across a range of sectors. There are some very specific time tested and proven actions that India could initiate to put momentum in to this process. India's support and experience during the recent COVID-19 response wherein it supported a number of countries in the region like Sri Lanka, Nepal, Maldives and others with medical expertise and medicines can be a good guide to work out the modalities and give it a more structured shape.

Leading the setting-up and operationalisation of such a mechanism will also be a guide for other regions. This will help India make its rightful contribution among the comity of nations.

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Reaching the Goal on Paris Agreement – Role of Corporate and Government Leadership on Climate Action in India

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Abstract: This paper provides a background on increasing frequency of disasters in Asia and India, the science behind it and links to the need for increased mitigation efforts. The focus of the paper is on GHG emission reduction and mitigation efforts and how Governments and businesses are the key stakeholders in achieving the carbon balance and therefore reducing the risks of extreme disasters that are already knocking at our doors. The paper also puts into perspective the need and urgency for achievement of Paris Agreement and role of the climate decade- the 2020s in doing so. Scientific studies predict that, we have 11 years to make critical changes in the way we operate to avoid grave irreversible and fatal impacts of climate change. Amplified and collective action is almost mandatory to address the existential threat of climate change, and government and business leadership are the key levers to change the course of history.

Global and Regional Perspective of Climate Action – The Context

"Climate change, as an issue is common for all and global in nature and no single entity can solve the challenge in isolation."

We are living in unprecedented times in the history of mankind. Amidst COVID-19, while this paper is being written, we find ourselves at the crossroads of taking a decision on our future once and for all. Enough deliberations have happened, enough time and money has been spent on discussions, collecting evidence, proving climate sceptics wrong and thinking of acting someday in future postponing important decisions today. Climate change is no more a distant threat, no more a matter of debate. It is here and now knocking at our doors influencing our daily lives and decisions and questioning our very existence. It is high time we consider it as an existential crisis; we only have a decade ahead of us till 2030 - the year by which humans would

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have reduced the global temperature rise to 1.5°C as per the Paris Agreement.

We should not have needed a COVID-19 to wake us up, we should not question the climate community to be thinking of climate action when the world is looming with the pressure of impacts and uncertainty that COVID-19 has presented before us. Climate change had begun to show its impacts in many varied ways and had started affecting us already and long-term even before the pandemic, the pandemic in itself has had us back to the wall and presents an opportunity to correct our ways and chart out a path that is clean and green.

The global risk index (Eckstein, Hutfils, & Winges, 2019), counted 11599 extreme weather events between 1998 and 2017 amounting to 526,000 deaths and losses of USD 3.47 trillion globally. As per the report, Asia houses five out of 10 most affected countries due to climate change that will see catastrophic effects. India ranks 14 in the list of most vulnerable countries. In 2017 alone heat waves, storms, floods and droughts caused a loss of about USD 13.8 billion to India. Heatwaves have become more extreme and frequent and will lead to even bigger problems with increasing global warming, according to a 2018 study published in Nature (Mora *et al.* 2017).

In 2019 only, Asia region witnessed unprecedented extreme events. Delayed monsoon rains led to water scarce conditions in South Asia and caused heatwave that was second longest ever recorded in the region. In India, the heat wave claimed 184 lives in Bihar, the highest temperature recorded in Rajasthan went up to 50°C, city of Chennai was hit by extreme water crisis and mountain city of Shimla went water zero and had to request tourists to avoid reaching the city that summer. According to a 2018 study by Indian government think tank NITI Aayog, 21 Indian cities will run out of groundwater by 2020. The same report outlines India Meteorological Department's statistics on the year's monsoon that arrived late, saw the highest amount of rain in more than 25 years and was the latest to withdraw in recorded history. More recently, North India was globe's hottest region this year on 26th May 2020 (TNN, 2020).

As the globe warms, the impacts of this phenomenon are becoming more severe. According to the Intergovernmental Panel on Climate Change (IPCC), global warming is set to increase the frequency of El Niño weather events in the Pacific, which cause surface waters to warm up. This, in turn, will intensify rainfall and tropical storms such as the cyclone Amphan that ravaged the east Indian states of West Bengal and Odisha in May 2020.

IPCC's special report (2018) 'Global warming of 1.5°C (IPCC, 2018) shows that 1.5°C target is achievable by the laws of physics and chemistry but would need higher degree of efforts and commitment from all the players including governments and private sector. As per the report there are serious deviations on commitments made during the Paris Agreement to limit global warming to 2°C. If we fail to keep this commitment which will ideally be limiting global warming to 1.5°C, we will be facing catastrophic consequences and irreversible loss to critical ecosystems, people and societies.

Why Does Climate Leadership Matter?

Climate actions are urgent and therefore leadership matters

If we continue with the current fossil fuel intensive pathways unabatedly, we run the danger of being hit very badly not only in terms of physical climate impacts but also financial impacts of climate change. Climate change impacts will have the potential to reduce about 9 per cent of South Asian economy every year by the end of this century. This will be exacerbated by the human and financial toll in the event of damage from floods, droughts and other extreme weather (UNFCCC, 2014). If countries around the world act together to keep the commitment made under Paris Agreement, then not only will countries find themselves better off on economic indicators but will be able to almost halve the cost of protecting from the worst of the impacts that climate change would bring.

Climate leadership also matters because of commitments of national governments to achieving sustainable development goals. SDG 13 on Climate Action particularly deals with mobilising resources for climate adaptation as well as investing in low carbon development. The goal aims to mobilise USD100 billion annually by 2020 (UNDP, 2020)[1]. However, considering significant attention that is getting diverted to COVID-19 recovery, this commitment may see a set-back if not continued with priority parallel to COVID-19 recovery.

Every step taken towards fulfilment of Goal 13, will have positive impacts on the achievement of other sustainable development goals. It is a documented understanding that there are several co-benefits to climate action. For example, bold climate action globally could trigger at least USD 26 trillion in economic benefits by 2030, while the energy sector alone will create around 18 million more jobs focused specifically on sustainable energy by the same year. As per a research carried out by London School of Economics and C40 (C40, 2016), Health, Transport and Land use are top three sectors that can generate around 40 co-benefits such as enhanced quality of life, positive environmental and economic impacts apart from climate benefits. Waste, air quality, transport and energy offer high number of mitigations co benefits, while land use, health, water and education sectors will have both mitigation and adaptation co benefits.

It is still possible that with an urgent and ambitious collective action, strong political will powered by increased investments driven by significant leadership actions, we can accelerate concerted actions over a long-term horizon but should speed up now by diverting influential policies and investments.

The year 2020 was a significant moment for the climate discourse after the landmark 2015 Paris agreement when countries were expected to ratchet up their climate ambitions. Now with the postponement of the United Nations Climate Summit, Conference of Parties (COP26) to 2021, attention diverted to addressing impacts of COVID-19 and rising climate related natural disasters around the globe, it is urgent that we collectively push climate agenda despite all odds to avoid climate catastrophe. And we can do this by fostering purposeful leadership from governments

and businesses around the world. There is significant potential for local governments as well as corporates and businesses to reduce greenhouse gas emissions and overachieve the commitments under Paris Agreements if they take concerted efforts along with working through international partnerships like Under2 Coalition, Global Covenant of Mayors, C40, so on and so forth (New Climate Institute, 2019). New Climate Institute (2019) study suggests that world's biggest-emitting economies including India and China, could reduce greenhouse gas emissions by 1.2 to 2 gigatons of carbon dioxide equivalent (GtCO2e) per year by 2030 if efforts are ramped up within city regions and businesses to do so. A prerequisite to that would be that individual commitments are fully implemented.

The Climate Tracker (2019) positions India positively in the achievement potential of commitments towards 2°C, having emerged as a global leader in renewable energy after adopting its National Electricity Plan (NEP) in 2018. For last three years, renewable energy investment in India topped that of fossil fuel-related power investments and in 2018, solar investments exceeded those in coal. Through initiatives such as the 'International Solar Alliance' and the recently announced 'One Sun One World One Grid' (FE Bureau, 2020) which aims to build global consensus about sharing solar resources among more than 140 countries of West Asia and South East Asia, India is positioning itself as the climate leader in the region. However, India's policy on expansion of coal and compulsion to majorly depend on coal-based power generation may deter the agreed global climate agreement. . This is where alliances between business and governments could be instrumental in amplifying on-going efforts and support the achievement of national global climate goals in this critical decade without delay.

National, Provincial and Local Governments Have All a Part to Play

IPCC's special report (IPCC, 2018) cautions significant risks and economic costs that governments and nations will have to bear if climate action to keep warming below the stipulated measure is not achieved. (The Climate Group, 2019) suggests that this is achievable if national governments can lead on major and immediate transformation in the way economies use and produce energy and calls for all levels of government to strengthen action, without delay. Bearing the mandate of implementing policies, the state governments are critical in supporting both national and municipal governments in achieving climate goals. Indian government has taken significant steps towards climate action through making unprecedented international commitments through its INDCs as well as translating these commitments into the National Action Plan on Climate Change with its eight national sectoral missions. These eight national missions coupled with the State Action Plan on Climate Change (SAPCC) build a robust basis to climate policy in action for India. However, there have been challenges to implementing the state action plan on climate change that range from inadequate leadership, institutional barriers, the quality of the plans, and resource constraints (OPM, 2017). Studies reflect that despite challenges states can direct meaningful processes towards climate resilience through implementation of SAPCCs. Some of the

solutions to fostering implementation of SAPCCC include manoeuvring the political economy of climate change; addressing institutional bottlenecks; moving towards investment-ready plans at local levels; mainstreaming climate action in line departments (Chaturvedi *et al.*, 2019), and better leveraging available resources.

All actions at the higher levels of governments could logically converge at the local level, because of the sheer proximity to the community and their ability to respond faster at the time of climate calamity (Deri & Alam, 2008). Besides this, there are many synergies to climate action at local level for example urban local bodies are responsible for designing and implementing building codes that have the potential to reduce energy use or develop development regulations that may promote pedestrianisation and discourage use of private vehicles. IPCC's special report also suggests that cities and regions may also fuel ambitious mitigation and adaptation measures that are hard to legislate and implement at the national level.

Businesses and Corporates Can Drive the Demand and Influence Markets

Business action on climate change mitigation will have long term impacts on business resilience and profitability while also creating larger demand and market influence. Businesses have the potential to harness climate action to deliver emission reductions while also reaping co benefits like innovation, competitiveness, risk management and growth. By 2030, businesses have the potential to cut its greenhouse gas emissions globally by 3.7 bn metric tons of CO_2 equivalent a year. This will amount to 60 per cent of total emission cuts pledged in Paris by NDCs (UNFCCC, 2016). As per CDP's second annual analysis on tracking corporate action on climate change, companies are stepping up for climate action and are already setting more ambitious targets towards low-carbon transition (CDP, 2017). A recent survey (The Climate Group, 2020) by The Climate Group of 100 of the world's leading private sector sustainability professionals exemplifies businesses support towards rebuilding after the worst of the pandemic.

Major highlights of the survey

- 97 per cent of business professionals say their long-term sustainability strategy remains unchanged
- 80 per cent say their company has been able to maintain their current climate actions during the crisis

While there is strong business support for green measures, nearly half (47 per cent) said they still need more supportive government policies to be able to achieve their sustainability goals.

How Global Initiatives are Driving Purposeful Climate Action?

Several global initiatives are driving purposeful climate action joining hands with businesses and governments and accelerating actions across sectors.

The Climate Group (TCG), a UK based international non-profit is working towards the goal of a world of no more than 1.5°C of global warming and greater prosperity for all by bringing together powerful networks of businesses and governments. TCG is driving coalitions

of businesses and governments to accelerate adoption of ambitious climate actions. Acting as a catalyst, The Climate Group's Business Actions work is championing corporate climate action by seeking ambitious commitments across renewable electricity, energy efficiency and electric mobility through the three campaigns RE100, EP100 and EV100 respectively. RE100, a 200+ members network, is targeting 100 per cent renewable electricity, by 2028 on average and one in three members are now more than 75 per cent renewable and more than 30 companies have reached their 100 per cent goals (RE100, 2019). EP100 brings together a growing group of 50+ energy-smart companies committed to doing more with less to improve their energy productivity while delivering on emissions reduction goals. To date, members have avoided using over 730 Terawatt hour (TWh) of energy – nearly half the annual electricity consumption of India (IEA, 2018). EV100 is a coalition of 77+ forward-looking companies committed to accelerating the transition to electric vehicles (EVs) and making electric transport the new normal by 2030. To date, more than two million vehicles are committed under EV100 and members and they have committed to install charging infrastructure at around 2,000 workplace and customer parking sites. EV100 has also been endorsed by the Government of India thinktank NITI Aayog in 2018 as a crucial platform for driving corporate leadership on electric transport. More recently, the Department of Environment, State of West Bengal, agreed to co-build TCG's initiatives on electric mobility.

The Climate Group is the secretariat to the Under2 Coalition, a global community of about 220 state and regional governments committed to ambitious climate action in line with the Paris Agreement. The coalition represents 43 per cent of the global economy and has been accelerating subnational climate actions since 2015. The coalition is driving bold climate action in the member states across the globe in three key workstreams: 2050 Pathways, Policy Action and Transparency.

The Under 2 Coalition has been empowering subnational governments to accelerate climate action, through strategic project funding, peer to peer learning, climate action disclosures thereby showcasing a commitment to transparency and bold climate leadership and accelerating climate policy development. The coalition has a cumulative emissions reduction potential of 4.6 - 5.0 gigatons of CO2e emissions per year by 2030 – around 15 per cent of annual global emissions. *15 per cent of the Under2 Coalition member states and regions now have net-zero targets.*

Global Covenant of Mayors (GCoM) is a global alliance for city climate leadership with commitments from over 10,000 cities and local governments from 138 countries. GCoM's Regional National Covenants convene, encourage, and strengthen stakeholders at the local, national, and regional levels to accelerate climate action. 23 cities from six South Asian countries are part of the GCoM global network with 15 cities only from India.

Collectively actions by GCoM members could result in upto 2.3 billion tons CO2e of annual emissions reduction by 2030 - equivalent to yearly passenger road emissions from the U.S., China, France, Mexico, Russia, and Argentina combined (GCoM, 2019).

C40 is a network of close to 100 of world's megacities to take bold climate action, leading the way towards a healthier and more sustainable future. Six Indian cities are currently members of C40 namely Bengaluru, Chennai, Delhi NCT, Jaipur, Kolkata and Mumbai. As per C40 Cities Annual Report (C40, 2019), 24 C40 cities have committed to achieving 100 per cent renewable electricity by 2030, compared to five in 2010.

ICLEI – Local Governments for Sustainability is a global network of more than 1,750 local and regional governments committed to sustainable urban development. With a presence in 100+ countries, ICLEI is driving local action for low emission, nature-based, equitable, resilient and circular development by influencing sustainable policies. One of the key projects of ICLEI in the South Asia region is 'Urban Low Emission Development Strategies (Urban LEDS)' which aims to contribute to the reduction of GHG emissions in cities/ towns in emerging economies including India and least developed countries (ICLEI, 2019).[2]

Recognising the transition to a zero-carbon economy as the only way to secure sustainable economic growth and prosperity for all, the 1271 members strong We Mean Business (WMB) coalition is catalysing business action and driving policy ambition to accelerate this transition. WMB is part of leading initiatives namely Science-Based Target (SBT) and Net Zero 2050, which are critically built on science and benchmarking efforts to accelerate adoption of ambitious climate actions by businesses and governments. Currently 909 companies are taking science-based climate action out of which 35 per cent of company executives have increased regulatory resilience thereby helping them be better prepared to adapt to the changing regulatory and business environment.[3]

The 100 Resilient Cities, a pathbreaking initiative supported by the Rockefeller Foundation, catalysed city level resilience efforts in the participating city governments to prepare city-wide resilience strategies for each city for six years till 2019. With inputs from scores of subject matter experts and partner organisations, the programme provided technical support to strengthen city level resilience on economic development, transport, buildings, water and sanitation and technology. It led to formulation of 70 resilience strategies and delivering 10,000+ hours of capacity building training to the City Resilience Officers (Rockefeller Foundation, 2019). The 100 Resilient Cities program is now rechristened as new Global Resilient Cities Network (GRCN)[4] in September 2019. The GRCN is comprised of 98 member cities in 40 countries of the former 100 Resilient Cities initiative.

Despite catering to different target groups, all these initiatives have one common goal – driving climate action. On one hand, Under2 Coalition, GCoM, C40, and ICLEI and other similar initiatives are informing broad city and state level climate policies, on the other hand WMB and TCG's Business Actions work is focussed more on campaign-led corporate ambition to drive actions around decarbonising key economy sectors such as industry, transport and energy. The 100 Resilient Program has specifically dealt with city resilience across infrastructure and buildings, transport, technology, health, etc.

Climate change, as an issue is common for all and global in nature and no single entity can solve the challenge in isolation. Recognising this, these initiatives have been successfully leveraging the power of collaboration to foster greater climate action through either sector-based model or a wider climate strategy approach.

What Does the Future Hold - Promises and Challenges

As per IPCC's recent warning (Watts, 2018), the world has limited time to avoid risks of extreme weather events and poverty for hundreds of millions of people. Further, this year marks a critical timeline towards enhancing nationally determined contributions (NDCs) post the landmark Paris Agreement in 2015 and bring increased ambition for action in this vital climate decade. There is no denying that economies worldwide are critically hit by COVID-19 which could potentially delay climate actions thereby threatening achieving the global climate agenda on time. It thus calls for a stronger collective action and a united response to address what lies ahead of us, similar to what we are witnessing in the case of COVID-19.

Response to COVID-19: Need to Build Back Sustainably

With the global economies coming to a temporary halt, there are significant opportunities for business and governments to leverage this new normal by prioritising sustainable ways of doing business and policy making. In May 2020, a group of more than 150 companies including Adobe Inc., Unilever NV came forward and signed up for a just, grounded and green recovery post COVID-19 (Rathi & Seal, 2020). While climate targets and goals are mostly top down, the role of states is pivotal in realising them as policies and programmes are driven through efforts at the sub-national level. As businesses step up to shift markets, subnational governments can complement efforts by creating a thriving ecosystem through enabling policies to amplify the overall impact.

This decade is also the Climate Decade and thus it is critical that the actions we take today are going to determine the future that we have tomorrow. Despite rising climate stresses across the globe, we have been constantly dealing with the menace in a fragmented approach. Thus, faster progress is needed to combat climate change and the floor is set for businesses and governments to amplify actions by forging stronger and purposeful collaborations. Time is limited and the scientific community is suggesting (IPCC, 2018) with alarm that we:

- Level out global CO_2 emissions to net-zero by 2050
- Level out all global greenhouse gas emissions to net-zero by 2070

Jointly with the International Monetary Fund (IMF), the International Energy Agency (IEA) has also set out a three-year holistic plan (IEA, 2020) for a sustainable recovery encompassing economic growth, creation of jobs and building more clean and resilient energy systems. The plan outlined by IEA calls for global investment of about USD One trillion annually over the next three years in six key sectors – electricity, transport, industry, buildings, fuels and emerging low-carbon

technologies. This represents about 0.7 per cent of global GDP. It will also lead to reduction of annual energy-related greenhouse gas emissions by up to 4.5 billion tonnes in 2023. However, deployment of the plan is contingent on robust policies, initiatives and new regulatory frameworks. This could be achieved through bold corporate actions which will drive investments and shift markets and ambitious policies across sectors to support the transition.

Endnotes

1 See: UNDP Website, Goal 13 – Climate action

2 See: ICLEI Website

3 Science Based Targets. See: https://sciencebasedtargets.org/why-set-a-science-based-target/

4 Global Resilient Cities Network. See: https://www.rockpa.org/project/global-resilient-cities-network/

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Brazil's Humanitarian Cooperation in Haiti in the Aftermath of the 2010 Earthquake

*André de Mello e Souza**

"In many ways, Brazil's efforts in Haiti in the aftermath of the 2010 earthquake can be considered the highpoint of its engagement in South-South Cooperation."

The MINUSTAH, the Earthquake and Brazil's Role

Haiti was struck by a devastating 7.0 Richter-scale earthquake on 12 January, 2010. Its epicenter was about 25 kilometers from the capital Port-au-Prince. The earthquake caused about 300,000 deaths and displaced around 2 million residents. Estimates on property damage amount to US$14 billion, which corresponded to about 46 years of Haiti's national budget (UN, 2011; Podur, 2012, p. 138).

Brazil had led the United Nations Stabilization Mission in Haiti (MINUSTAH) since 2004, and had therefore already a considerable ground force in the country at the time the earthquake occurred. Indeed, 21 Brazilians were among those who lost their lives to the earthquake in Haiti, including the Principal Deputy Special Representative for MINUSTAH, Luiz Carlos da Costa.

While humanitarian response and relief in the aftermath of this disaster was carried out by many other countries, not least those from the North[1], Brazil played a prominent role in international cooperation efforts largely because of its previous leadership and involvement in peacekeeping in Haiti. Some consider that the MINUSTAH would have become the "most successful peacekeeping mission sponsored by the UN" (Fernandes, 2017 p. 115) were it not for the earthquake, though others are much more critical of the impact of this mission, the violence it employed and its role in the country's reconstruction (Podur, 2012).

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In any case, there is no doubt that the 2010 earthquake represented a milestone in the history of Brazilian development cooperation in Haiti, one that caused an abrupt discontinuity of earlier efforts and imposed new and urgent priorities. As stated by the Brigadier General Ajax Porto Pinheiro (2011, p. 32), of the Brazilian Army, who had spent the previous eight months preparing for his mission in Haiti and should have landed in Port-au-Prince the same time the earthquake struck, *"if before the main challenge was ensuring the order of elections scheduled for February 2010, now we knew that they would no longer occur and that other unexpected missions would emerge. When analyzing the classic factors of the decision, I stated that, as for the mission was concerned (…), everything had changed."*

Accordingly, the Brazilian response to the disaster was immediate. Just two days after the earthquake took place, then Minister of Defense, Nelson Jobim, presented the Haitian government with a comprehensive emergency relief plan. The Brazilian Battalion (BRABATT) more than doubled its capacity of 1200 soldiers with the incorporation of an additional second full contingent of 1300 soldiers, approved by the National Congress in January 2010 (Nasser, 2012, p. 222). On January 27th, a Presidential decree destined US$ 203 million for emergency relief in Haiti, of which US$ 111 million was directed to the Defense Ministry for upholding MINUSTAH and US$ 73 million was directed to the Ministry of Health (Kastrup *et al*., 2017, p. 639).

The challenges facing Brazilian peacekeepers were daunting. Their mission before the earthquake was still to be accomplished, yet it became much more difficult than it had been when Brazil took over command of MINUSTAH in 2004. As a result of the earthquake, around 4,500 prisoners were released and spread across the country, most of them concentrated in Port-au-Prince, armed with what they stole from penitentiary guards. Among these, 529 were known to be highly dangerous. They were very probably returning to their old strongholds in the slums of Cité Soleil, Cité Militaire and Bel Air, among others. These were the very areas originally targeted by MINUSTAH. Brazilian intelligence was used in identifying and locating criminals. The population started to denounce them through a "hotline" and, three months after the earthquake, around 120 prisoners were recaptured and delivered to the local judicial system (Pinheiro, 2011 pp. 32, 36).

New and unanticipated challenges also had to be confronted. The terrain in Haiti had changed. Bel Air was impenetrable. As a result of the amount of debris on the roads, only a few armoured vehicles were able to move, even if with great difficulty, on some routes. Many survivors abandoned their homes and contact with local leaders no longer existed. Brazilian engineers fulfilled their mission by clearing the streets and alleys and, at the same time, in coordination with humanitarian assistance agencies, buried hundreds of bodies in collective ditches.

Furthermore, new providers of cooperation who were not present in Haiti before the earthquake began to arrive, presenting new logistical demands. Non-Governmental Organizations (NGOs) staff disembarked in Port-au-Prince after the resumption of flights. Similarly, armies of countries that did not make up the MINUSTAH arrived on ships and daily flights (Pinheiro, 2011 p. 32).

The Brazilian Ministry of Health was at the outset mandated to contribute with the construction and maintenance of care and hospital units, the acquisition of ambulances, health equipment and supplies, the structuring of the health system, and the prevention and control of communicable diseases, including cholera.

In the medium term, in the ambit of a Triangular Cooperation scheme partnering with Cuba – hence, involving only partners from the South – the Brazilian Health Ministry's Oswaldo Cruz Institute engaged in the training of human resources and capacitation in Haiti. In particular, these partners promoted the qualification of care management and epidemiological surveillance as well as the strengthening of primary health care (Kastrup *et al.*, 2017).

Brazilian private humanitarian cooperation was also significant and carried out jointly with MINUSTAH, as the NGO Viva Rio participated in multiple food distribution initiatives while the BRABATT provided security and logistical support. About 80 tons of food was distributed daily in 5 or 6 hours in two locations in Port-au-Prince, much of it in cooperation with the UN World Food Program. In addition to food, medicines, tents and water were donated by Brazilians in their own military base (Pinheiro, 2011, p. 35). Viva Rio's community center in the shantytown of Bel Air suddenly was turned into a 'refugee camp' where about 2000 people sought shelter after the earthquake (Fernandes, 2017 p. 115).

The Brazilian experience in Haiti raises a number of conceptual as well as practical issues regarding South-South Cooperation. First, the extent to which humanitarian cooperation – as well as peacekeeping, for that matter – should be considered as instances of development cooperation is a still debated and controversial issue. Second, the principle of mutual benefits championed by South-South development cooperation providers, while controversial and difficult to identify and measure, also may arguably have been put into practice in many diverse ways during Brazil's military and humanitarian engagement in Haiti. This article discusses these particular issues from the perspective of South-South Cooperation concepts, approaches and debates.

Humanitarian Cooperation as Development Cooperation

Traditionally, there has been a clear distinction between 'humanitarian cooperation' or aid, associated with short-term relief, and longer-term, more 'structural development cooperation'. Yet, the growing complexity of both development and humanitarian crises tends to blur the distinction, making it increasingly unclear when cooperation ceases to be strictly humanitarian and becomes aimed at development (Medinilla and Cangas, 2016, pp. 1, 4).

This is not merely an academic conceptual debate, as it has arguably profound implications for the stakeholders and institutions delivering cooperation. These disagree on whether humanitarian and sustainable development goals should be treated as one and the same. On the one hand, the United Nations Secretary General's report "One Humanity: Shared Responsibility" (2016) prescribed transcending "humanitarian-development divides" and asserted that humanitarian goals and the Sustainable Development Goals should be treated as a single global challenge.

On the other hand, NGO critics maintain the particularity of humanitarian cooperation and the risks of politicisation involved in merging it with a broader development agenda. Whereas it is imperative that humanitarian cooperation be based on needs-based operations, sustainable development would be inevitably more responsive to internal and foreign political objectives (Medinilla and Cangas, 2016, p. 4). Accordingly, in general transnational NGOs follow, in practice as well as discourse, a humanitarian logic in opposition to a developmentalist one in allocating their resources for international cooperation (Büthe, Major and de Mello e Souza, 2012). NGO Doctors without Borders, most notably, pulled out completely from the World Humanitarian Summit because its "focus would seem to be an incorporation of humanitarian assistance into a broader development and resilience agenda" rather than addressing "the weaknesses in the humanitarian action and emergency response" (Médecins Sans Frontières, 2016).

Brazil's overall approach has tended to maintain the inseparability of humanitarian and development cooperation. The country has championed its concept of 'structuring cooperation'. Structuring cooperation referred originally to Brazilian international health cooperation, and defends more holistic, long-term and transformative development projects fundamentally based on the capacitation of partner human resources and institutions (Buss and Ferreira, 2017). Hence, this approach would tend to exclude humanitarian cooperation from Brazilian development cooperation, as the former would, almost by definition, require urgent, immediate and short-term actions characteristic of emergency relief.

In addition, Brazil has long endorsed the view that development and security are inextricably linked. Accordingly, Brazil's diplomatic tradition has called for the international community to address the social and economic roots of armed conflicts. Particularly in the ambit of MINUSTAH, the country has emphasised the need to balance security with longer term development cooperation projects (Abdenur et al., 2017, p. 108). Brazilian diplomacy defended a vision of long-term commitment to Haiti in order to address the fundamental causes of the problems faced on the basis of the tripod of security, political reconciliation and development (Marcondes de Souza Neto, 2012, p. 248). While emergency relief efforts following Haiti's 2010 earthquake can by no means be reduced to security imperatives, much of Brazil's participation in these efforts involved ensuring public safety and safeguarding humanitarian efforts, including the delivery of food and medicine.

Moreover, in the only official attempt to map and quantify its own international development cooperation, carried out by the Institute for Applied Economic Research (IPEA) in the COBRADI reports, humanitarian cooperation is included as a separate modality – as is also peacekeeping, for that matter (Ipea, 2010, 2013, 2017, 2018). This similarly suggests that Brazil sees humanitarian cooperation and peacekeeping both as an integral part of its development cooperation.

The Brazilian experience in Haiti is particularly interesting in this regard precisely because it combined, in an unexpected way, the imperatives of long term, structural and development cooperation goals incorporated by

MINUSTAH with those of sudden, immediate and unexpected emergency relief. On the one hand, the need for security/military tasks performed by the BRABATT before the earthquake persisted after it hit, even if they became more complex and difficult to be carried out (Pinheiro, 2011). On the other hand, the trilateral cooperation with Cuba implemented shortly after the earthquake illustrates how structuring development cooperation also has an important role to play, even in humanitarian disasters.

How Did Brazil Benefit from Its Cooperation in Haiti?

One of the main distinctive principles of South-South Cooperation refers to mutual gains. According to this principle, the benefits stemming from such cooperation are bidirectional and internalized by all partners involved, rather than solely by a recipient country. While Brazil has stressed solidarity as the driving motivation behind its South-South Cooperation, mutual benefits in principle can be of a different nature, including political, economic and commercial. Institutional learning of cooperating institutions can also generate improvements in the design and implementation of public policy. These benefits are oftentimes difficult to predict and measure and become evident only in the medium term (Pomeroy, Waisbich and Lopes, 2017, p. 5).

Political gains for Brazil derived from its experience in Haiti include the strengthening of multilateralism and democracy in Latin America and the Caribbean (Sardenberg, 2005). Many analysts have explained Brazil's decision to lead MINUSTAH as partly motivated by its ambition to expand its role in international security, and especially to gain a permanent seat in the UN Security Council (Lima and Hirst, 2006; Mello e Souza, 2012, p. 92). Others identify as political benefits the expansion of Brazilian soft power in the region and the strengthening of its regional leadership; the increase of Brazil's international prestige; and the establishment of a counterpoint to US geopolitical power in the hemisphere (Abdenur *et al.*, 2017, pp. 104).

The academic literature also stresses Brazil's role in debates on the norms of international humanitarian interventions, especially with regard to the use of force and human rights. Most notably, the MINUSTAH offered Brazil an opportunity to put into practice the principle it proposed and championed of Responsibility while Protecting (RwP) (Abdenur *et al.*, 2017, pp. 104-105).[2]

With regard to the policy learning benefits reaped by Brazil in its development cooperation in Haiti, those related to crime control and policing stand out. MINUSTAH brought back to life a domestic debate on the employment of the Armed Forces in the fight against organised crime in Brazilian cities (Palma, 2015). Additionally, lessons learned while confronting gangs in Haiti and policing the communities of Bel Air and Cité Soleil served to test and improve policies for combatting drug trafficking in the favelas of Rio de Janeiro (Oliveira, 2009, *apud* Abdenur *et al.*, 2017, p. 106). In particular, the permanent occupation of these favelas by community policing became the core of the Pacifying Police Units (UPP, in Portuguese) policy adopted since 2008 (Vasconcellos, 2010; Salgado, 2015). According to the press, 60 per cent of the 800 soldiers mobilised to occupy

the set of favelas known as the 'Complexo do Alemão', had been part of the force in MINUSTAH (Marcondes de Souza Neto, 2012, p. 257).

UN interventions also allow the Army to compare strategic operations with those of other armed forces, gain experience in logistics and intelligence, improve technology use and acquire training from other nations. As the nations of South America are the main contributors to MINUSTAH, the peacekeeping mission in Haiti allows for greater regional military cooperation as well (Bracey, 2011, p. 327).

Brazil's leadership in MINUSTAH also caused enhanced dealings between civilians and the military in Brazil. Not only did it strengthen interactions and led to greater integration between foreign and defense policies, but also various activities were carried out to advance joint research projects by civilian and military institutions (Abdenur *et al.*, 2017, p. 106).

Furthermore, Brazilian private cooperation in Haiti also learned valuable lessons. According to Viva Rio leader Rubem César Fernandes (2017, p. 115), "Haiti has trained Viva Rio to engage in other peacekeeping missions. It taught us also to work in foreign territories, in close collaboration with the Brazilian Armed Forces. We are, for instance, in Goma, in the Democratic Republic of Congo (..) and we count on the participation of capoeira dancers/fighters that we formed in São Gonçalo, in the State of Rio, and in Bel Air, in Haiti."

Finally, largely because of Brazilian development cooperation in Haiti, Brazil became the main destination in Latin America for Haitian immigrants since 2004. This increased presence of Haitians in Brazil has not only led to changes in Brazilian migration policy but also to increased cultural, culinary and linguistic interactions in the communities where they settled (Abdenur et al., 2017, p. 106).

Final Considerations

While Brazil was in 2010 an emerging country experiencing high economic growth rates, enjoying membership in the BRICS and looking to project its influence and soft power globally, Haiti was the poorest country in the Western Hemisphere, plagued by political and criminal violence, political instability and natural disasters. Brazil and Haiti may have had similar homicide and crime rates (Podur, 2012, p. 125), but the similarities arguably only go so far.

Hence, it may be difficult to see the comparative advantages enjoyed by partners facing similar development challenges and needs in Brazil's development cooperation in Haiti. Whatever knowledge and experience Brazil could use in its efforts in Haiti after the earthquake seemed to come not so much from domestic policies but rather from the learning that took place in MINUSTAH itself. As stated by Fernandes (2017, p. 115), "we Brazilians, who had already been part of the territory for some years, who suffered even deep casualties, therefore had the knowledge advantage. We knew the terrain; we had human and logistical resources installed."

Yet, the benefits related to policy and institutional learning Brazil arguably reaped from its cooperation with Haiti suggest otherwise. In certain aspects of development, particularly policing and public safety, Brazil and Haiti had much in

common. The pacification of crime stricken poor communities seems to have provided ample challenges and needs shared by both partners, thereby offering promising sectors on which to cooperate. Brazil also gained politically from its presence in Haiti, which served well its foreign policy goals of the time.

However, if leading MINUSTAH was a deliberate and well-planned decision, Brazil's role in emergency relief efforts in the aftermath of the 2010 earthquake in Haiti was virtually imposed. The sudden and unexpected nature of this earthquake prevented any deliberation or planning.

If peacekeeping could be considered a pre-requisite for more structural processes of development in Haiti, the earthquake brought even more basic and immediate imperatives to Brazilian cooperation. In so doing, it dramatically illustrated the links between humanitarian cooperation and development. It would quite simply have been impossible to think about holding free elections (which took place in 2011), building institutions and promoting economic recovery in Haiti without first ensuring the provision of food and medicine, urban mobility and the minimum standards of social order and public safety.

Finally, the reconstruction of Haiti needed to be a collective endeavor. Brazil depended, most crucially, on US support in the port and airport of Port-au-Prince. Triangular cooperation with Cuba and the World Food Program also was key in offering health capacitation and food provision to a helpless population - and it needed to be put in place in a short period of time.

In many ways, Brazil's efforts in Haiti in the aftermath of the 2010 earthquake can be considered the highpoint of its engagement in South-South Cooperation. In terms of the volume of resources employed, 2010 is the year when Brazil's South-South cooperation reached its peak – amounting to US$ 923 million (IPEA, 2013) – largely because of its involvement in emergency relief efforts in response to this natural disaster. Brazil's economy was growing at a high rate during that year (over 7 per cent of GDP growth). Finally, the country's experience in Haiti seemed in conformity with the foreign policy pursued by the government of President Luiz Inácio Lula da Silva, that sought to increase its influence internationally by taking on greater responsibility in solving global and regional crises, and providing global and regional public goods.

Endnotes

1 The United States, Canada, France and Italy were those most involved in post-earthquake reconstruction efforts in Haiti (Pinheiro, 2011 p. 32).

2 This principle innovates by adapting the Responsibility to Protect (R2P) principle.

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PRESIDENT OF UN GENERAL ASSEMBLY CALLS FOR GLOBAL COOPERATION IN THE POST-COVID WORLD

The president of UN General Assembly, Tijjani Muhammad-Bande, has asked world leaders to plan for the elimination of poverty and strengthen cooperation post-COVID. He emphasized upon the relevance of South-South Cooperation among developing countries which could serve as a model for nations to work together to face global challenges. Under his leadership, new methods of voting and holding elections were adopted by the Assembly to meet the crisis.

He also said the pandemic has brought out the limitations of the current system to the fore. He talked about the urgency for financing for development and also emphasised upon the need for cooperation on technical issues and learning from others. Education world over has been affected by the pandemic and technological inequalities should be addressed in order to ensure universal education. There are differences amongst countries in terms of their access to technology and spread of technology for agriculture, education, etc., is important. UNGA President also focused on the importance of giving scholarships by developing countries to citizens from different parts of the world. He also stressed upon the need for both North-South and South-South Cooperation.

He said it is crucial for developing countries to work with regional organisations like African Union, and others like the Commonwealth and the Non-Aligned Movement. It is essential to learn through the experiences of others.

Source: Louis, A. (2020, June 1). UNGA president calls for global cooperation for post-COVID world. Outlook. Retrieved from https://www.outlookindia.com/newsscroll/unga-president-calls-for-global-cooperation-for-postCOVID-world-ians-interview/1852232

Post-Cyclone Idai Response and Recovery in Mozambique – Strengthening India's Post-disaster Role in Indian Ocean Rim Countries

*Rajeev Issar**

"There is tremendous opportunity for South-South Cooperation in the field of disaster risk management and India's strong credentials, established systems, capacities and expertise are widely acknowledged in the region as well as globally."

Just over an year after the back-to-back devastating disasters in Mozambique viz. Cyclone Idai on 15 March and Cyclone Kenneth on 25 April 2019[1], it is surely an appropriate time to take stock of how the post-disaster response and recovery, both immediate and long-term, has been undertaken, the extent of progress, the crucial lessons learned and the critical recommendations emerging there from to help inform the national and international response to such disaster events – which are projected to amplify in coming years.

It is well known that the incidence, frequency, magnitude and impact of hydro-met extreme events is likely to further intensify over coming years (IPCC, 2012) due to climate change and other processes. In this context, it will be pertinent to look at the post-disaster response and recovery efforts in Mozambique and draw requisite learning to improve the international community's assistance. This will also be significant for India considering that it actively supported the Government of Mozambique in the immediate aftermath of Cyclone Idai in the search and rescue, evacuation and rehabilitation of affected people and communities. Hence, it will be important for India too to derive key insights to imbue a qualitative dimension to its support to countries and communities during and after disaster events.

Recognising this emerging imperative, the Government of India has been consistently investing in increasing the capacity, capability and expertise of national disaster

* UNDP, Bangkok. Views expressed are personal.

management (DM) agencies, weather monitoring and forecasting, early warning system and disaster response in India with required technical and financial resources. This has, over the years, helped the country to mount an effective and timely response to various disaster events affecting States and communities in the country. For instance, evacuation of over one million people from the projected trajectory of Cyclone Fani in Orissa in May 2019 (Marques, 2019) helped reduce the loss of life to negligible numbers (only 89 killed as compared to the mortality figure of over 10,000 in a similar intensity super-cyclone in 1999) (India Today, 2019) is being recognised as an international best practice.

Hence, it will be in fitness of things for India to take a longer-term perspective towards its post-disaster response, recovery and reconstruction support to countries in South Asia, South-East Asia and Indian Ocean Rim countries commensurate with its growing global and regional stature. It will also help identify specific areas of support from an immediate to long-term perspective to help shape the Government of India's humanitarian response and development assistance. The rapid expansion of India's space technology and its application for weather monitoring, forecasting, early warning and for planning pre- and post-disaster evacuation, response, relief and reconstruction provides a tremendous strategic advantage to India. Harnessing this capability to support countries and communities in India's immediate neighborhood including Indian Ocean Rim countries and other regions of interest will help advance India's heft to create avenues for socio-economic, cultural and diplomatic goodwill.

The Context – A Harrowing Disaster Unfolds in Mozambique

The devastating Cyclone Idai in March 2019, followed by Cyclone Kenneth over a month thereafter, was the worst-ever disaster to strike south-east Africa region and Mozambique in particular. The unusual trajectory and freak behaviour of the cyclone (Leahy, 2019) defied conventional understanding of cyclones as its pathway, intensity and uncharacteristic twin landfalls impacted communities and cities over a vast swathe of territory across three countries, viz. Mozambique, Malawi and Zimbabwe.[2] The Cyclone clearly carried the imprint of climate change as evidenced by its unusually aggressive behavior and prolonged intensity overwhelmed the mitigation, response and coping capacities of affected countries and communities.

Path of Cycone Idai and Cyclone Kenneth

Source: PDNA Report, UNDP-WB-EU.

Forming as a tropical depression off the eastern coast of Mozambique, its first landfall brought torrential rains in Mozambique and Malawi. Instead of dissipating, the depression veered off back to the sea to pack more power and intensity

to swing back with reinforced strength towards central Mozambique with greater force to make the second landfall near the Port of Beira. Its severity virtually ripped the city and the hinterland areas apart before moving towards Zimbabwe to unleash further destruction and devastation. The Cyclone produced a 14 feet high storm surge causing extensive flooding – "an inland ocean" visible even from the outer space (Cardovillis, *et al*., 2019). The Cyclone affected over 3 million people across three countries -- killing nearly 1000 people, fully or partially destroying 240,000 homes leaving hundreds of thousands homeless, impacting crops and livelihoods of an estimated 433,000 small-scale farmers while displacing nearly 400,000 people in its wake (Amnesty International, 2019). As the epicenter bearing the brunt, nearly 90 per cent of the city of Beira was destroyed (IFRC, 2019) with damages to vital infrastructure such as schools, roads, sanitation, communication networks including all 17 of the city's hospitals and health centers.

The Governments of all affected countries declared a state of emergency and called upon international community and other stakeholders to support humanitarian response, search and rescue, relief and rehabilitation efforts.

Immediate Response – India's "Fortuitous" Opportunity

The first country to reach out to help the people and the Government of Mozambique was India. Aided by a queer "fortuitous" circumstance, three Indian Navy ships, viz. INS Sujata, ICGS Sarathi and INS Shardul, and personnel from its First Training Squadron were operating in the south Indian Ocean region on a training mission (Upadhyaya, 2019).

The Indian Navy diverted these ships to the Port of Beira to provide humanitarian assistance to affected people in spite of the fact that the rescue and relief efforts were made challenging due to strong tides which gave them only "two-to-three-hour" windows of opportunity to act. In fact, the

Indian Navy ships were the first to arrive on the scene and immediately became involved in humanitarian aid and disaster relief (HADR) and search and rescue (SAR) operations in collaboration with local authorities. The learning from the training immediately applied in practice!

Equipped with sophisticated search and rescue equipment, the short time-window was capitalised upon to immediately launch a search and rescue (SAR) support in and around the port city of Beira on 18-19 March. Mandated to carry additional HADR kits to meet such contingencies at sea, the ships were well prepared to undertake relief work. The barges and light boats provided by Indian rescue teams helped move people to safer places out of marooned hamlets which would have otherwise been unreachable for days. While the makeshift kitchen provided meals to rescued people and the rescuers alike, the medical teams from the ship attended to over one thousand injured/casualties.

The operationalisation of the SAR and deployment of boats and helicopters by Indian navy ships and personnel helped rescue nearly 200 stranded people from the worst affected areas to safe shelters. The overall gamut of assistance provided included food, clothing, evacuation to shelters, medical assistance, medicines, drinking water, etc. This helped set the stage for the international humanitarian aid and disaster relief (HADR) and search and rescue (SAR) efforts involving other specialised agencies like the South African Air Force as well as the Government of Mozambique.

In fact, it may be noted that the Financial Tracking Service (FTS)[3], managed by UN OCHA to track and present complete picture on humanitarian funding flows submitted by Government donors, UN-administered funds, UN agencies, NGOs and other humanitarian actors and partners including the private sector since 1992, records the support provided by Government of India in terms of *"Humanitarian Assistance Disaster Relief – ships to provide medical assistance, including 500kg of epidemic related medicines, food supplies, dry provisions, ready-to-eat meals, daily essential and clothing items, 400 tonnes of rice. In addition, fresh water was provided in relief camps, as well as provision of community service including cleaning of debris and repairing damaged roads."*

Another notable aspect is the fact that the FTS system does not record and reflect the post-disaster relief and rehabilitation support provided by China. It implies that Chinese assistance appears to have been more bilateral in nature with prime objective of showcasing its own role than positioning it as part of the larger efforts by the international community.

Later on, INS Magar was also deployed to augment Indian humanitarian and relief efforts.

International Assistance

The magnitude of disaster prompted the international community to rise to the occasion and assist the Government of Mozambique in launching speedy response and effective recovery and rehabilitation measures. Several countries and international agencies supported the initial search and rescue, response and relief efforts while also committing to help longer-term recovery and reconstruction. These included South Africa, United

States and China among others who provided their human resource and technical support for immediate response and relief including positioning their specialized teams and military (army, air force, navy, SAR teams etc.) units. The re-operationalisation of the sea ports and airports in Beira and Chimoio cities within 5-6 days[4] provided a viable entry point for international assistance, helped enhance the scale and scope of relief and rehabilitation support with involvement of more international actors and ensure provision of requisite supplies to affected communities.

European Union provided Euro 15 million (European Commission, 2019) in humanitarian assistance while also deploying civil protection teams for search and rescue, relief and humanitarian assistance. The EU Civil Protection Mechanism (EUCPM) was activated with support from Austria, Denmark, France, Germany, Italy, Luxembourg, Portugal, Spain and UK to deploy eight teams of civil protection specialists with equipment and around 60,000 rescue items to work on water purification, emergency medical response, tents and shelter, hygiene kits, food and satellite communication.

With a view to develop a structured post-cyclone recovery and reconstruction plan aimed at a rapid, resilient and inclusive process, an in-depth post-disaster needs assessment (PDNA) was conducted (UNDP, 2019). The exercise was led by the Government of Mozambique supported by UNDP and other agencies of the UN system, the European Union, the World Bank and the African Development Bank with technical and data support from other development partners through their respective sectoral working groups.

The PDNA estimated recovery needs at USD 3.2 billion including the additional costs for "building back better". The recovery efforts aimed at a rapid, resilient and inclusive process requiring sustained interventions to repair and rebuild infrastructure, restore livelihoods and relaunch economic activities in key sectors such as agriculture, fisheries, industry, commerce and tourism.

Based on the PDNA assessment and projected requirements, an International Pledging Conference (United Nations, 2019) was convened in May-June 2019 which led to pledging commitments of USD 1.2 billion to support the recovery and reconstruction efforts. In addition to financial support by countries and international organisations, technical and programmatic support was announced by international agencies and countries to address specific needs as identified in the post-disaster needs assessment report. A structured work plan was developed to support the affected sectors to ensure timely implementation and periodic monitoring.

The United Nations issued an international appeal for assistance (Besheer *et al.*, 2019) in the amount of USD 282 million and revised Mozambique's humanitarian response plan (UNOCHA, 2019). The UN and I/NGOs also conducted a multi-sector initial rapid assessment (MIRA) to inform the humanitarian response and to provide early recovery support.

Comparative Analysis of Response by India and China

While India was virtually the first country to support Government of Mozambique in search and rescue and evacuation with

the help of the Indian Navy ships and their teams, other countries, including China, initiated post-disaster response and rehabilitation efforts in due course.

The Ministry of Emergency Management, Government of China deployed a 65-member strong search and rescue team along with 20 tonnes of equipment and materials, as well as communication and medical response on 25 March i.e. nearly 8-9 days after the disaster (Yi, 2019). In fact, this marked the first international search and rescue operation by a Chinese team since the setting-up of the Ministry of Emergency Management by the Government of China in March 2018 to address disaster and emergency response/management related issues.

In addition to search and rescue support, China expanded its humanitarian assistance by providing food, drinking water, clothing and medical care (UNOCHA, 2019). With the outbreak of cholera, China also sent doctors to fight cholera outbreak in Beira and sprayed anti-cholera disinfectant supported by some 900,000 cholera vaccine doses delivered by the World Health Organization (WHO).

While India became the first international responder to Cyclone Idai primarily facilitated by the presence of three Indian Naval ships, its support expanded after initial days to cover food, potable drinking water, medicines, blankets, clothing and other relief items to authorities and communities. In fact, the Mozambique Defense Minister visited the Indian Navy ships to "oversee the relief efforts." Expanding its post-disaster humanitarian assistance, India deployed the Chetak helicopters to conduct medical evacuations, rescuing people, air dropping food and providing medical aid. The helicopters from the Naval ship *Shardul* were operated from the local airport for recce and search and rescue.

The stark difference between the Indian and Chinese engagement can be attributed to the timing and circumstances of their interventions. India's support virtually starting on the very first day itself, the focus naturally had primarily to be on evacuation, search and rescue and immediate food, medical and shelter related assistance. By the time the Chinese teams arrived, after about nine days, the needs had clearly shifted towards addressing the clothing, medical treatment, disease outbreak and other post-disaster needs.

Adding Qualitative Dimension to India's Response and Recovery Efforts

The timely assistance by Indian Navy and the professionalism displayed by naval personnel helped strengthen India's relationship with Mozambique while also raising India's standing internationally among the comity of nations. The role of Indian Navy added credibility to India's ambitions to be a regional net security provider and helped promote India's goodwill and influence in Africa and in the wider Indian Ocean Rim countries. This built upon the maritime security agreement signed by Mozambique with India (Defence Web, 2011) in 2011 which facilitated the provision of privileged access to Indian Naval ships to Mozambique's ports. While India has established similar maritime security agreements with other countries in the region, viz. Mauritius, Seychelles, etc., yet it has desisted from

flaunting or leveraging its diplomatic ties to establish a regional naval base at any location in the region.

The "fortuitous" circumstance of presence of Indian Navy ships close to Mozambique when the Cyclone struck worked in favour of India as China or other countries would have otherwise used the opportunity to deploy their larger and more capable ships such as LPDs (Landing Platform Docks). This would have in turn helped these countries to capitalise upon the opportunity to enhance their standing as alternate security providers – greatly undermining India's position as the primary net security provider.

While successful by itself, yet the Mozambique experience calls for a re-evaluation of India's support during and after a natural disaster or other emergencies in countries in its vicinity. It might also be an opportunity for it to re-assess the need to establish naval bases in the Indian Ocean region or to at least enhance its naval presence to bolster its image as primary net security provider in the region. The naval deployment can also be connected to the assessment of likely disaster response needs based on satellite observations and early warnings from its weather monitoring and observation network.

Recognising that climate change is adding a new dimension to the frequency, incidence and magnitude of extreme disaster events, it is quite likely that India will, in all probability, be called upon or be expected to assist countries and communities in its immediate proximity especially in South Asia, South-East Asia and the larger Indian Ocean Rim countries. These sub-regions, while being highly vulnerable to multiple natural hazards, at the same time hold great strategic and geo-political significance. Hence, it will be crucial for India to make strategic relationship building investments with not only the administrative entities but also with other key stakeholders and institutions with a view to earn the goodwill of governments and communities. This can be facilitated by exploring and identifying the specific areas and activities which, based on the experiences emerging from India's engagement in recent and past disasters, are likely to demand interventions at scale.

It is well acknowledged that with the changing characteristics, nature and behavior of natural hazards and their manifestation, there is an increasing element of unpredictability making it harder to have a better understanding of hazard behaviour and how are they likely to unfold in future. Given this context, it will be essential to conduct an historical assessment especially in more vulnerable and at-risk regions and/or countries. This calls for looking at the trends or the big picture of hazard, risk and disaster patterns coupled with a better grasp of the seasonality as well as a typology of disasters.

Based on an assessment of disaster events and an analysis of the post-disaster response and recovery needs in the past and recent years, some of the areas with a potential for India to add value based on its growing expertise and experience are enumerated below viz.:

- *Weather monitoring and early warning system:* India has over the years, especially in the aftermath of the Indian Ocean Tsunami in 2004, invested in developing weather monitoring, forecasting and early warning systems.

The technological and analytical capacity of specialized institutions like INCOIS, IMD, Indian Institute of Tropical Meteorology (IITM), etc. has been vastly augmented over the past decade especially due to dedicated weather monitoring and forecasting satellite launched by ISRO. This capacity can be utilised to share information about impending extreme weather events to provide timely alerts to countries in South Asia, South-East Asia and wider Indian Ocean Rim region. This will help promote partnerships to strengthen early warning systems, effective data and information sharing and provide valuable learning from each other's experience. Weather monitoring, climate information and early warnings remain an area of prime importance for countries not only for managing disaster risks but also for the wider development efforts especially related to agriculture, water management and food production as well as community livelihoods.

- Emergency preparedness and disaster response: The three-tier disaster management structure at national, state and district levels aided by dedicated emergency preparedness organisations like the National Institute for Disaster Management (NIDM) and disaster response entities like the National Disaster Response Force (NDRF) have helped create and institutionalise effective emergency preparedness and response capacity in India. This has helped drastically reduce mortality and provide speedy search and rescue support to affected people within the country.
- However, this capability of India on search and rescue (SAR), humanitarian assistance and disaster response (HADR), steadily augmented by specialized training and capacity building institutions, offers tremendous potential for replication in other countries. Leveraging this strength, the specialised training and capacity building organisations should identify counterpart institutions in other countries to foster closer collaboration, through MoUs, exchange programmes and establishing "sister organisation" arrangements, to help build capacities. The expertise and experience gained by Indian disaster responders over the years, the institutional structure, the training and capacity building curriculum and equipment can help deepen relationships with countries while also opening avenues for pre-disaster collaboration and understanding through mutual assistance arrangements.
- *Post-disaster recovery and reconstruction of housing and socio-economic infrastructure:* One of the strongest imperatives, after the first few days of humanitarian assistance to affected populations, becomes the pressing need to immediately usher into a phase of recovery, rehabilitation and reconstruction. While providing humanitarian aid itself is quite daunting by itself, yet the magnitude of the recovery and reconstruction needs for people and sectors affected clearly outstrips the earlier challenges. More often, the simultaneous, pressing and staggering demands overwhelm the resources and capacities of governments as well as other

stakeholders. This brings into sharp focus the need for technical expertise, capacity support and programmatic interventions for post-disaster recovery and reconstruction. The need to cover a whole lot of sectors, stakeholders and socio-economic arenas becomes imperative to restore socio-economic assets and development infrastructure.

- With a view to address this need, the institutional strengthening and capacity building of counterpart national institutions assumes importance. The need to assess disaster typology based on an analysis of historical data and trends can help identify the likely priorities and prepare accordingly. Harnessing the expertise and capacity of India's institutions like the National Institute for Disaster Management (NIDM)[5], the National Institute of Rural Development and Panchayati Raj (NIRDPR)[6] and other sectoral institutions for health, education, engineering, handicrafts, etc. can also be deployed based on an assessment of needs and priorities in the recipient country. Considering that post-disaster recovery needs get magnified in a rural context due to scarce resources, low capacities and lower administrative prioritisation, the experience of NIRDPR can help engage rural communities, their representative entities as well as elected representatives to foster faster socio-economic recovery through inclusive and participatory approaches.
- Similarly, the support for housing reconstruction and restoration of socio-economic development infrastructure can be extended based on the post-disaster reconstruction experience. The post-Bhuj EQ experience from Gujarat and the Owner-Driven Reconstruction (ODRC)[7] learning in the aftermath of 2015 floods in Bihar along with other such interventions can help provide valuable learning, capacity and expertise. It may be noted that India had shared ODRC-based model with Nepal while supporting training and capacity building of local masons to widen the scope of post-2015 EQ reconstruction and post-disaster recovery efforts. Relevant technical organisations like the NBCC[8] and its subsidiaries can play a major role in supporting housing and infrastructure reconstruction with their vast decadal experience and expertise while also supporting the technical capacity development of counterpart national agencies in affected countries.
- Livelihood regeneration and diversification – A key part of post-disaster recovery, apart from restoration of socio-economic assets and development infrastructure, is the need to create immediate livelihood opportunities or to revive the ones affected. Along with well-devised contextual social protection programmes, livelihood regeneration focus can help affected regions, communities and people to recover faster. India, with its decades of experience on livelihood protection and diversification along with a range of social protection programmes, can offer context-specific solutions to countries to help them recover quickly. Support to develop responsive social protection schemes for the most vulnerable families, women and children can be provided by sharing the policy and programmatic expertise from concerned ministries/agencies and institutions. Developing alternate livelihood sources

like improved agriculture, fisheries, handicrafts and others through skill development interventions can support livelihood diversification to reduce vulnerabilities and build resilience. The on-going programmes like Skill India and others can be used to extend requisite technical, programmatic and implementation support by involving counterpart agencies or institutions.

- *Health and medical assistance:* In any post-disaster or post-crisis context, the number of people injured is overwhelming especially in a situation when a disaster of the magnitude of Cyclone Idai, or an earthquake or tsunami, has also impacted the health system and services severely. In Mozambique, nearly 50 health facilities suffered extensive damage (CGTN Africa, 2019) and the district hospital in Buzi was under nearly 3 feet water requiring shifting the patients and medicines to higher ground. Apart from the people injured, outbreak of epidemics and diseases is quite common due to stagnant waters, lack of hygiene, inadequate shelter and continued exposure to elements which also tends to aggravate pre-existing medical conditions especially among the elderly, the women and children (UNOCHA, 2019). In Mozambique, the cholera outbreak started within few days of the disaster and the number of cases jumped to 271 cases within a week.
- India's extensive medical system and organized networks like the Indian Medical Association (IMA) can be mobilized to deploy teams, specialised equipment and medical facilities including medicines. The pre-planning or preparation for the same can be based on a prior study of previous disaster events to assess potential needs to prepare in time for the same. This will also provide an opportunity to the pharmaceutical industry to prioritize medical needs and cater to the immediate requirements while also creating avenues for continued engagement in the pharmaceutical sector. The experience gained will help augment the efficacy and effectiveness of India's indigenous medical response and preparedness planning. Providing medical care and treatment, including water purification tablets and plants, becomes key priority in the immediate aftermath of a disaster and this is an area where India has tremendous potential as well as wherewithal with its advanced medical system.
- *Capacity building:* In many countries, systems and capacities to manage and respond to any major disaster or crisis are quite underdeveloped. Considering the infrequent nature of high magnitude and high impact disaster events in the past, countries have failed to plan ahead and invest in building human and technical capabilities complemented by requisite institutional, legal and policy frameworks. On the other hand, India has over the past decades developed dedicated institutional mechanisms and focused on capacity development to meet the increasing challenge posed by its exposure to multiple hazards. This is evidenced by the fact that the National Disaster Response Force (NDRF) is widely recognised to be among the best trained, equipped and skilled entity with capacity to undertake search and rescue operations to respond to all types of disaster situations.

- This provides a tremendous opportunity to cross-fertilise the capacity development practices and training programs through a partnership-based approach with relevant counterpart departments/institutions in various countries. This will help institute a strong risk management orientation while also build capacities and provide good experience to Indian trainers and institutions to hone their training and capacity development programs to address multiple disasters and contexts. Specialised and sectoral institutions like the Civil Defense, Fire Services and Disaster Management (NDRF) can offer valuable expertise through their already well-established training programmes and facilities. Fostering inter-institutional coordination and cooperation has the potential of yielding mutually beneficial dividends in the longer term.
- Establishing pre-disaster institutional partnerships and possibly formalised arrangements will help not only to scale-up the qualitative dimensions of India's support but also help scale-out to the broader developmental engagement in these countries. Partnering with relevant counterpart institutions, international agencies and development partners will help build their capability and foster inter-institutional as well as bilateral and regional coordination yielding mutually beneficial dividends.
- There is tremendous opportunity for South-South Cooperation in the field of disaster risk management and India's strong credentials, established systems, capacities and expertise are widely acknowledged in the region as well as globally. Building upon the established partnerships in the field of disaster management with Japan (another acknowledged leader and architect of the Sendai Framework for Disaster Risk Reduction) offers a huge potential for adding a qualitative dimension to India's role.[9] It may be noted that India has signed bilateral agreements with Germany, Russia, Switzerland and Indonesia for cooperation and mutual assistance in the field of disaster management. The experience from the operationalisation of Mutual Assistance agreements between countries who are Members of regional inter-governmental organisations like ASEAN, SCO, etc. can provide valuable guidance as also the bilateral agreements between Canada and the USA.[10] Similarly, Australia and New Zealand have entered into pre-arranged modalities and agreements with many Pacific countries for assistance in the event of a disaster.
- Support development of requisite national policies and frameworks for risk reduction and management: In the immediate aftermath of the Indian Ocean Tsunami in 2004, India had made concerted efforts to build its disaster and climate risk management capacities while also focusing on developing the requisite policy, legislative and regulatory framework at national, state and local (district and city municipality) level.[11] The experience and learning from the operationalisation of these frameworks and institutions can be a good guide for countries in the immediate and wider region and can help emphasise the need to accelerate measures for risk reduction, climate adaptation and mitigation in a complementary manner.

These can be framed in a national, sub-national and sectoral policy context centered on risk-informed development including disaster risk reduction, climate adaptation and sustainable development.

In addition, there are several other "soft" areas on which India's experience and expertise on disaster management related issues can surely be used to assist disaster-affected countries. Areas like setting-up dedicated Disaster Management Fund can lend requisite knowledge to help countries initiate contextual risk financing mechanisms and funds to advance effective disaster and climate risk management at all levels.

While with some countries, these arrangements can take a more formal and pre-agreed MoU type of agreement. In others, it can take the form of an institution-to-institution partnership arrangement while with still others, it can be more informal and based on an assessment of the prevailing situation and context.

India has already expressed its intent to be recognized as a global leader in the field of disaster management and climate change by announcing the launch of ambitious multi-year initiatives like the Coalition for Disaster Resilient Infrastructure (CDRI) and the International Solar Alliance and is already committing significant resources and technical manpower into these initiatives. In this backdrop and to bolster India's standing and ambition, it might be timely to undertake a re-appraisal of India's post-disaster response and recovery engagement with other countries to cover a more-wider spectrum of issues related to disaster management and to ensure a sustained continuous engagement for greater mutual dividends.

Looking Ahead

Drawing lessons from India's successful and well-recognised post-disaster response and recovery support in Mozambique, the time calls for a detailed and in-depth appraisal of the potential opportunities for deepening engagement and cooperation with countries in South and South-East Asia as well as the wider Indian Ocean Rim countries. Their location in disaster-prone geographical regions and the high exposure and vulnerability of the people in these regions indicates that the demands for disaster management and response related assistance are likely to inevitably increase in near future.

Accordingly, it will be in fitness of things for India to take a forward-leaning approach and work with these countries to identify the key areas and sectors to ensure a more structured and well-calibrated approach to add a meaningful dimension. This will help develop an immediate to long-term strategy defining India's support to countries and people in South Asia, South-East Asia and the Indian Ocean Rim countries in keeping with the geo-political stature and standing of India.

It is imperative to adopt a more structured approach in keeping with India's growing stature among the comity of nations and the aspirations to be recognized among responsible nations working to contribute towards the larger global good. This is in keeping with the

messages articulated by Hon'ble Prime Minister at the United Nations and will further reinforce India's claim to be a permanent member of the UN Security Council.

At the same time, this experience will help India and its nodal agencies develop systems, capacities and capabilities within. This will yield dividends across the entire spectrum of disaster management system in India as well as in partner countries.

Endnotes

1 See: Cyclones Idai and Kenneth, UNOCHA Website

2 See: Cyclones Idai and Kenneth, UNOCHA Website

3 See: Mozambique Country Data, UNOCHA Website

4 See: Cyclone Idai and Kenneth, UNICEF Website

5 National Institute of Disaster Management, Ministry of Home Affairs Website. See: https://nidm.gov.in/

6 National Institute of Rural Development & Panchayati Raj. See: http://nirdpr.org.in/ced.aspx

7 See: Vahanvati & Beza, 2015 and Gorkha Housing Reconstruction Project (GHRP), UNDP Nepal https://www.np.undp.org/content/nepal/en/home/projects/GHRP.html

8 NBCC (India) Ltd. See: https://www.nbccindia.com/index

9 Disaster Management Division, Ministry of Home Affairs Website. See: https://www.ndmindia.nic.in/mou-with-countries

10 Government of Canada Website. See: https://www.treaty-accord.gc.ca/text-texte.aspx?id=105173

11 See: Ministry of Home Affairs Website https://mha.gov.in/division_of_mha/disaster-management-division and https://www.ndma.gov.in/en/

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Role of IBSA Fund in Disaster Management

*Aditi Gupta**

"IBSA Fund has enhanced the capacity of developing countries in a significant way to tackle various disasters by promoting development partnerships and assisting the developing countries in the attainment of both MDGs and SDGs."

Introduction

The India, Brazil and South Africa Facility for Poverty and Hunger Alleviation (IBSA Fund) was created in 2004 out of the IBSA Dialogue Forum. The Fund became operational in 2006 and was created with the aim of reducing poverty and hunger. The United Nations Office for South-South Cooperation (UNOSSC) serves as the official secretariat and fund manager of the IBSA Fund. The Fund has been created on the principles of sustainable economic development and its objectives include promotion of food security, increasing access to safe drinking water, etc., thus contributing towards MDGs and SDGs.

In the last several decades, India, Brazil and South Africa have increased their developmental partnership with other developing countries and have followed the concept of South-South Cooperation. IBSA Fund has created a new form of institutional structure in development cooperation under which resources from three developing countries have been used for developmental intervention by a multilateral organisation, i.e. UNDP. The Fund supports projects on a demand-driven basis and fosters partnerships at all levels including local and national institutions.

From 2004-2018, the Fund has received a total contribution of USD 35.1 million, has partnered with 19 countries (mostly LDCs) and has worked on 17 SDGs like poverty and hunger eradication, education, gender equality, child and maternal health, HIV/AIDS prevention and care, etc. (IBSA, 2018). The Fund has allocated highest proportion of its resources to Agriculture (34.2 per cent), followed by Employment and Livelihoods (21.2 per cent) and Health (20.9 per cent) (see Figure 1).

According to geographic regions, 37 per cent of the Fund has been allocated to Africa, followed by Latin America and the Caribbean, and Asia and the Pacific (see Figure 2). This indicates that the Fund is focused upon improving basic

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human needs in African countries which has one of the lowest human development indicators in the world. Least developed countries account for 64 per cent of the budget approvals of the Fund and the remaining 36 per cent goes to other developing countries.

There are different criteria for evaluation of proposals under the IBSA Fund that include reduction of poverty and hunger, national ownership and leadership, South-South Cooperation, use of IBSA country capacities, strengthening local capacity, ownership, sustainability, identifiable impact, replicability and innovation (RIS, 2016). Contribution of individual IBSA countries towards humanitarian assistance has been discussed in Kumar, Jardim (2020) in the present issue.

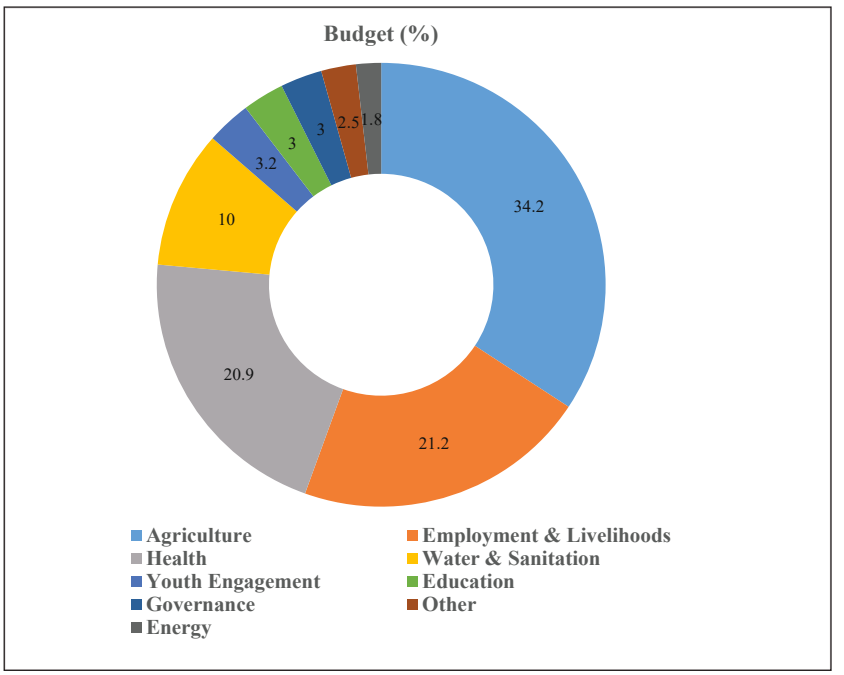
IBSA Fund and Disaster Management

Over the past several years, IBSA has assisted various countries in preventing disasters like flood risks, droughts, etc., and in climate change adaptation. The following projects give an insight into the assistance provided by IBSA in the area of Disaster Management.

Solid Waste collection in Haiti

An IBSA funded project on solid waste collection in Haiti helped the country to not only prevent flood risk but also assisted the country in reconstruction after an earthquake. The partners for the project included Ministry of Public Works, Ministry of the Environment, Municipality of Port-au-Prince, Sanitary Action Committee of Carrefour Feuilles (CASCAF) and UNDP

Figure 1: IBSA Fund Budget Approvals by Thematic Area



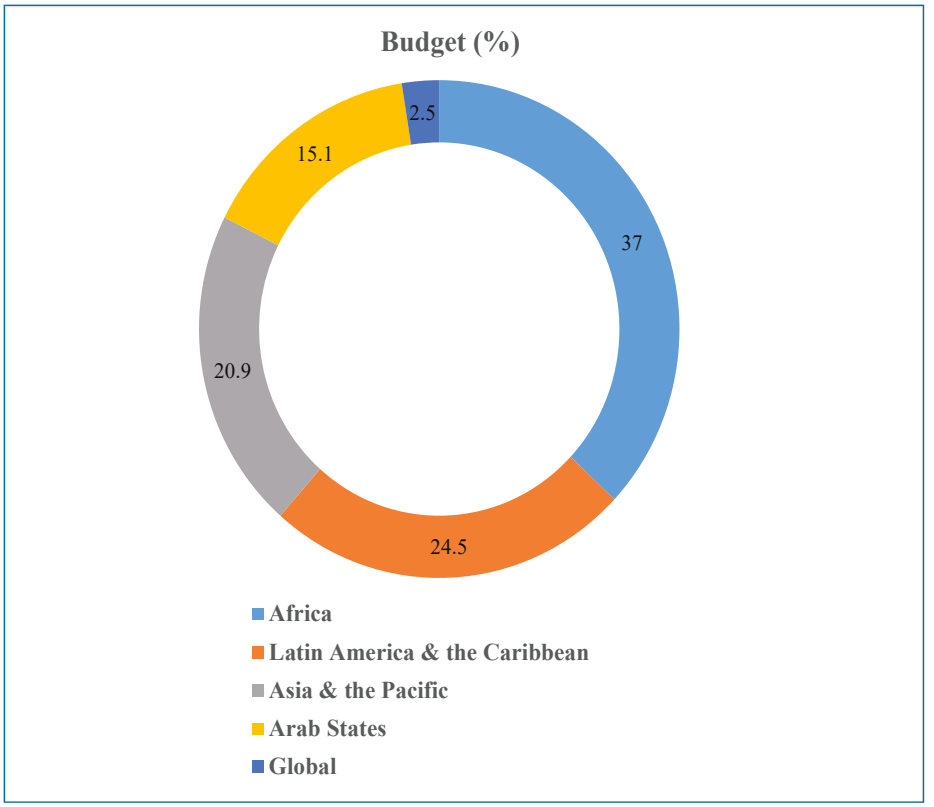
Source: IBSA Report, 2018

Haiti. The project was implemented in 2 phases at an approved budget of USD 2.8 million. As a result of the project a waste management system was created, employment was generated for 400 household heads and urban violence was reduced significantly. Incidence of diseases spread through insects, rodents, waste etc., was reduced as 70 per cent of the neighbourhood waste was removed regularly. The project also led to recycling of 30 per cent of community waste. People started using cooking briquettes made out of recycled paper products as an energy source instead of charcoal. This project encouraged empowerment of women as they constituted 57 per cent of project workers. 50 waste collection points were also created leading to significant improvement in urban infrastructure. The project was also able to withstand an earthquake of magnitude 7.0 that struck the country in 2010 (IBSA, 2018).

Delivering safe drinking water in Cabo Verde

IBSA Fund has also assisted countries in their climate-change adaptation measures. For instance, the supply of water in Cabo Verde was becoming scarce due to global warming and IBSA Fund helped in the availability of safe drinking water in the country. As a result of the provision of safe drinking water the health risks for the

Figure 2: IBSA Fund Budget Approvals by Geographic Region



Source: IBSA Report, 2018

communities were minimized benefitting more than 13,500 individuals. Supply of water became stable for household and agricultural consumption. Amongst the major outcomes was the creation of a water desalination plant, a 1000 m3 reservoir for storage of water, a power transformer unit, etc. Municipality of Ribeira Brava and UNDP Cabo Verde partnered for the project that began in 2009 at an approved budget of USD 1.7 million. All this led to the sustainable water resource management in the country allowing the growth for ecotourism, agriculture and small industries (IBSA, 2018).

Increased access to water and post-drought food security in Bolivia

This project addressed the challenges of water access for the ranchers associations and farming communities for the improvement of their livestock production, livelihoods and food security. Under the project water wells were built for daily use and capacity of ranchers associations for increasing their resilience against droughts was also strengthened. The project resulted in the drilling of 120 water wells for the ranchers associations and urban, rural and indigenous communities. It also strengthened the capacities of Federation of Ranchers of Beni (FEGABENI) to evaluate the drought impact with updated information and design recovery and resilience measures. The project was implemented at a budget of USD 500,000 and its partners included Ministry of Rural Development and Land, Autonomous Departmental Government of Beni, Federation of Ranchers of Beni (FEGABENI), municipalities, indigenous people and UNDP Bolivia (IBSA, 2018).

E-learning project in Vietnam

Recently, an eLearning project that was created with the aim of increasing the coverage and improving the quality of healthcare in North Coastal region of Vietnam through a collaboration between the IBSA Fund and the Hai Phong University of Medicine and Pharmacy (HPMU) through the Ministry of Health (MoH), Vietnam, is being used to respond to COVID-19. The project offers doctors and other healthcare workers accessible online training to increase their skills and knowledge on Noncommunicable diseases. More than 1,200 general medicine students are currently enrolled on the eLearning platform, as of March 2020. To respond better to the COVID-19 outbreak, WHO and HPMU have also added online training modules on COVID-19 on the eLearning platform, in areas like clinical care for severe acute respiratory infections. To make the training courses more accessible to frontline healthcare workers in the country, the modules have been translated into Vietnamese.[1]

All the above instances indicate that IBSA Fund has played a crucial role in the Global South in the area of Disaster Management. It has enhanced the capacity of developing countries in a significant way to tackle various disasters by promoting development partnerships and assisting the developing countries in the attainment of both MDGs and SDGs.

Endnote

1 South-South Galaxy. See: https://www.southsouth-galaxy.org/COVID-19/ibsa-fund-supported-healthcare-elearning-platform-in-viet-nam-used-in-response-to-COVID-19/

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SOUTH-SOUTH COOPERATION CRUCIAL TO SUPPORT ECONOMIC RECOVERY DURING COVID-19, SUGGESTS UNCTAD REPORT

The COVID-19 crisis is testing the capacity of governments of various countries with unexpected shocks. The Trade and Development Report by UNCTAD points out that South-South Cooperation can be significant for economic recovery. Due to COVID-19, several countries have imposed lockdowns and provided support packages to vulnerable groups. For developing countries, where 90 per cent of the workforce is engaged in informal activities, the economic crisis has been huge. Most countries are facing currency collapse, capital flight, reduced foreign exchange earnings and shrinking fiscal space. According to UNCTAD estimates, developing countries will need around USD 2.5 trillion over next 2 years to meet external financing needs. The response by multilateral system to this financial stress has fallen short of what UNCTAD and others have proposed.

South-South Cooperation although cannot be a substitute for the actions of the wider international community, but it can provide support for economic recovery. It can provide a blueprint for international cooperation and coordination. It needs to focus on three broad objectives: enhancing financial resources, improving policy space and building resilience. The New Development Bank and Asian Infrastructure Investment Bank, along with the Islamic Development Bank, have started redirecting their lending programmes towards investment projects related to health. Southern countries could use southern-based funds to expand their liquidity. For instance, BRICS could extend their USD 100 billion Contingent Reserve Arrangement to other developing countries facing liquidity shortages.

Developing countries will need to adopt strategic trade and industrial policies to support important sectors and save jobs. Diversified markets can be provided by South-South trade agreements which can help in leveraging export opportunities. There is also greater opportunity for health cooperation. Collective R&D efforts in medicine should be top priority for coming years. Any important medical discovery should be shared widely and made accessible to all, especially the most vulnerable groups and communities. It is also important to strengthen regional value chains in health related products and services. It is also important for developing countries to develop regional collaboration in agricultural value chains. The global South needs to strengthen strategic partnerships and push towards reforms in the multilateral architecture that will lead to more inclusive global governance.

Source: Wright, R.K. (2020, June 3). COVID-19 crisis: How South-South cooperation can support economic recovery. UNCTAD. Retrieved from https://unctad.org/en/pages/newsdetails.aspx?OriginalVersionID=2381

Coalition for Disaster Resilient Infrastructure (CDRI)

*Mahesh C. Arora**

"CDRI is expected to play a significant role in the regional as well as the global context to promote disaster management infrastructure and help bring about inclusive and sustainable development."

Conceptual Design

The Coalition for Disaster Resilient Infrastructure (CDRI) is a multi-stakeholder global partnership of national governments, UN agencies and programmes, multilateral development banks and financing mechanisms, the private sector, and academic and knowledge institutions. It aims to address the challenges of building resilience into infrastructure systems and development associated with it.

Developed through consultations with more than 35 countries, CDRI envisions enabling measurable reduction in infrastructure losses from disasters, including extreme climate events. CDRI thus aims to enable the achievement of objectives of expanding universal access to basic services and enabling prosperity as enshrined in the Sustainable Development Goals, while also working at the intersection of the Sendai Framework for Disaster Risk Reduction and the Paris Climate Agreement.

Established as a platform for generating and exchanging knowledge, CDRI will conduct country-specific and global activities. CDRI will provide member countries technical support and capacity development, research and knowledge management, and advocacy and partnerships to facilitate and encourage investment in disaster resilient infrastructure systems.

The partnership of national governments, UN agencies and programmes, multilateral development banks, financing mechanisms, private sector, and knowledge institutions is meant to promote the resilience of new and existing infrastructure systems to climate and disaster risks thereby ensuring sustainable development.

*Director (Fin. & Admin), RIS. Views expressed are personal.

Launch

Prime Minister Narendra Modi announced a global Coalition for Disaster Resilient Infrastructure (CDRI) at the UN Climate Action Summit 2019 held in New York on 23 September 2019. On the occasion, he said,

"What is needed today is a comprehensive approach that covers everything including education, values to lifestyle and development philosophies. What we need is a global people's movement to bring about behavioral change; need, not greed is our guiding principal. So, therefore India is here today to present a practical approach and roadmap…In order to make our infrastructure resilient in the face of disasters, India is launching a Coalition for Disaster Resilient Infrastructure. I invite all member states to join this Coalition."

Funding

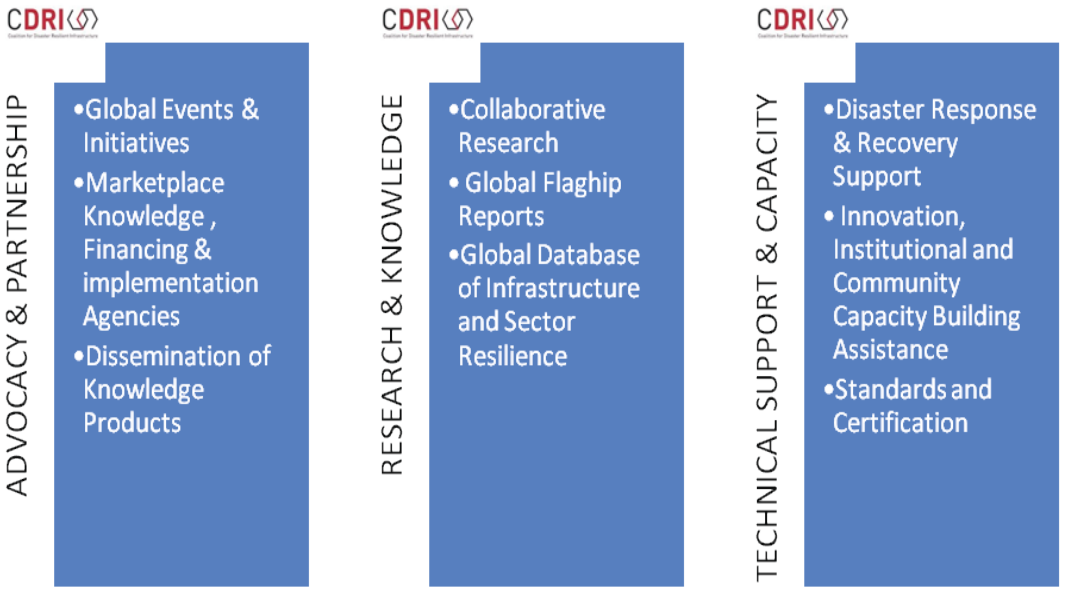
A large share of the estimated fund requirements to cover the core costs over the first five years has been invested by India by its financial support of around USD 67 million towards the CDRI corpus. There are no obligations on the part of members to make financial contributions to CDRI. However, at any point of time members of the CDRI may make voluntary financial or in-kind contributions to the CDRI such as assignment of experts from national institutions to the CDRI Secretariat, hosting of thematic workshops and meetings and travel support.

Membership

The Coalition provides a forum for countries at all stages of development,

Modalities of operation

The CDRI operates using the following modalities to achieve its mandate:



to access knowledge and resources from other members to make their infrastructure resilient and thus, contribute to each other's economic growth.

Envisioned as a partnership, the CDRI is not organized around the notion of rights and obligations. However, national governments that endorse the Charter and become a member of the CDRI have a key role in setting its substantive agenda as well as in its governance. The policies, standards and other outputs of CDRI are not binding on its members. As of now, the CDRI comprises 15 member countries and three 'knowledge and development partners'. Its Secretariat is located at the National Disaster Management Authority (NDMA) in New Delhi.

Tangibles

Having been in operation for less than a year, the CDRI is building the knowledge reserve and forging networks for achieving the mandate provided to it. During the initial year of operations itself, the CDRI has had to face the challenges wrought by the global pandemic associated with the spread of SARS COV2 virus. In response, the CDRI has created a multi-lingual compendium of pandemic management strategies that are being implemented on a country wide basis in India. It has also come up with a guide to manage the psychological and social impacts of the pandemic on the individual. CDRI is also expected to play a significant role in the regional as well as the global context to promote disaster management infrastructure and help bring about inclusive and sustainable development.

AFAD ESTABLISHES NATIONAL PLATFORM OF DISASTER RISK REDUCTION IN TURKEY

AFAD has established the Disaster Risk Reduction Platform of Turkey to provide the disaster risk reduction system by taking into account sustainable development objectives. The platform was established in 2011, with its Directive being approved in 2018 in line with the recommendations of the 2005 Hyogo Framework Action Plan prepared in the UN World Disaster Risk Reduction Conferences and the recommendations of 2015 Sendai Framework. The objective of the DRR platform in Turkey is to make the society more sensitive towards disasters, to support risk reduction activities, to determine the needs for the compliance of risk reduction with plans, policies, and programs at all levels, to contribute towards monitoring and evaluation of practices. The platform will meet at least once a year and is a decision-making mechanism in disaster risk reduction field. The platform takes multi-stakeholding structure as the basis for creating disaster policy and will use common strength, wisdom and conscience to minimize disaster losses. It will also enable the universities, NGOs, private sector, media, and local governments to have a say in the field of disaster risk reduction.

The first meeting of the platform was held on the theme "Understanding Disaster Risk", which is also the first priority of Sendai Framework. The Minister of Interior Mr Süleyman Soylu and AFAD President Dr Mehmet Güllüoğlu attended this meeting which was held on August 21st, 2020. During the meeting, a panel moderated by AFAD President was organized which was attended by representatives of public and private sector, universities, NGOs and media. In the panel, the sectors' perspectives on the theme of understanding disaster risk were evaluated.

Source: Prevention Web. (2020). National Platform of Disaster Risk Reduction in Turkey. Retrieved from https://www.preventionweb.net/news/view/73772

Disaster relief and Humanitarian Assistance from IBSA Member Countries

*Sushil Kumar**

*Camila Amorim Jardim***

Ever since its creation, India-Brazil-South Africa (IBSA) Fund had a cumulative contribution of more than USD 35 million; has partnered with a number of developing countries and implemented 26 projects with two thirds of the allocation meant to assist the Less Developed Country (LDC) partners. [For a brief on IBSA partnership in disaster management see Role of IBSA Fund in Disaster Management by Gupta (2020) in this issue) More than half of all projects have a humanitarian or disaster and risk management footprint, as 21.2 per cent were destined to employment of livelihoods, 20.9 per cent to health and 10 per cent to water and sanitation.[1] The present section notes the contributions of the IBSA member countries in their individual capacities towards development cooperation linked to humanitarian assistance.

India

India's total humanitarian assistance during 2005-2019 was USD 226 million (see Figure 1). In 2015 India was in the forefront of providing relief and rehabilitation assistance to Nepal after the April 2015 earthquake, being the first country to respond with its largest ever disaster relief operation abroad 'Operation Maitri' (Operation Friendship).[2] In 2016 India provided USD 10 million to Mozambique for purchase of wheat for the drought affected population and donation of 100 tons of essential medicines and in 2019 India deployed three Indian naval ships to provide humanitarian assistance and disaster relief in response of IDAI cyclone. Recently India had donated an amount of USD 1 million as a disaster relief towards devasted hurricane Dorian in two major

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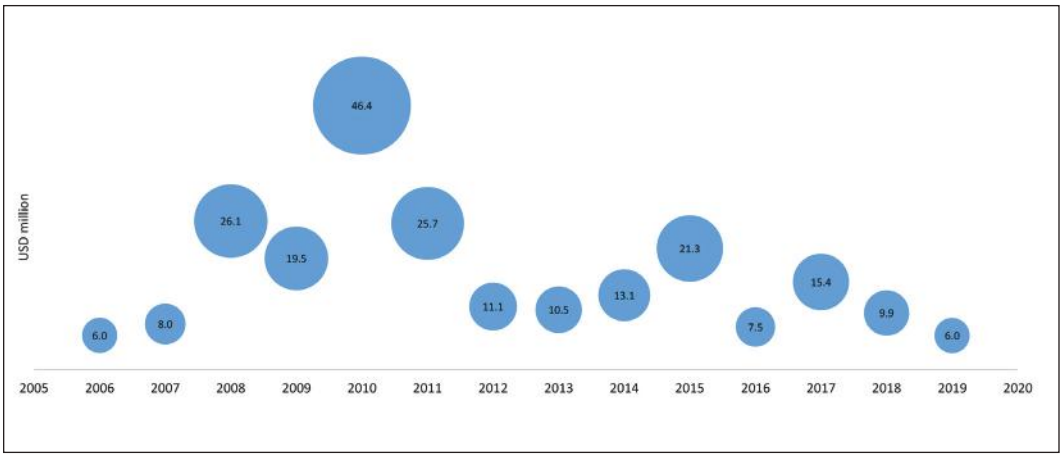
islands of Bahamas and Indian Navy ship Airavat has been diverted to Antsiranana (Madagascar) to provide assistance to the affected population of Madagascar post devastation caused by cyclone Diane.

Brazil

In the period between 2005 and 2013 the Brazilian government destined approximately BRL 822 million (USD 381.24 million) to humanitarian cooperation, 10 percent of a total BRL 7.9 billion (USD 3664.04 million)[3]. In the period, humanitarian cooperation varied from 0.31 percent of the total budget in 2005 to 17.6 percent in 2010, mainly because of the earthquake in Haiti. Between 2007 and 2014, 32 per cent of Brazil's humanitarian cooperation budget was destined to Haiti, the equivalent of USD 125.7 million, where the country led MINUSTAH, the most comprehensive humanitarian mission in Latin America. On the other hand, USD 235.1 million were destined to humanitarian actions in 103 countries, corresponding to 59 per cent of the resources. In the same period, Africa (46 per cent) and Latin America and the Caribbean (30 per cent) were the main recipients of Brazilian cooperation (Lima, 2017). In absolute terms, the expenditures jumped from USD 0.5 million to 161.5 million in 2010. After 2010, they reduced again to USD 21.7 million in 2013 (see figure 2). It is important to note that from 2005 to 2013, Brazil acted in Somalia 25 times, 21 in Mozambique and Nicaragua, 20 in Bolivia, 19 in El Salvador, 15 times in Palestine, Ethiopia and Guatemala, 12 in Cuba and Honduras.

As Brazil does not have a legislative framework that allows the country to be a provider in bilateral financial cooperation, so its main modality of cooperation in disaster management has been in kind contribution of first need material, mainly food donation through the creation of CG Fome (Coordination-General of Humanitarian Cooperation and Fight Against Hunger) in 2004. In 2012, Brazil

Figure 1: India's Humanitarian Assistance (USD million)



Source: RIS database on India's Development Cooperation

was one of the five main food donors in the World Food Program (WFP), the intermediator of Brazilian donations by law (Lima, 2017).

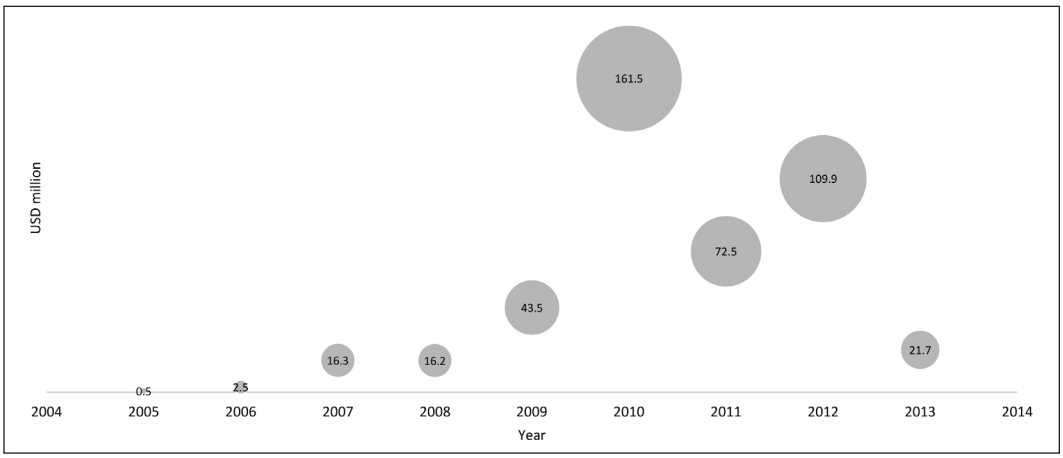
After the economic crisis, many activities were discontinued and currently the main humanitarian activity Brazil is engaged in is the reception of refugees, since 2018, mainly from Venezuela. CG Fome was extinguished and now the main organ responding to humanitarian cooperation matters is the Inter-ministerial Working Group on International Humanitarian Cooperation, coordinated by ABC and including representatives from eighteen national organs.

South Africa

South Africa is the most prominent economy in the Southern African Development Community, a community of 16 countries that seeks the regional cooperation to achieve development, peace and security, economic growth, alleviate poverty, between others. The bloc has stablished a disaster risk management agenda when, in 2007, the region was afflicted with heavy floods that displaced more than a million people. Since then, the group established the Disaster Risk Reduction Unit and the Regional Platform for Disaster Risk Reduction in 2011. SADC also counts with the Climate Services Centre that aims to enhance awareness on droughts, floods and other extreme events, with an annual Forum, the dissemination of meteorological products and an Information Service (SADC, 2020).

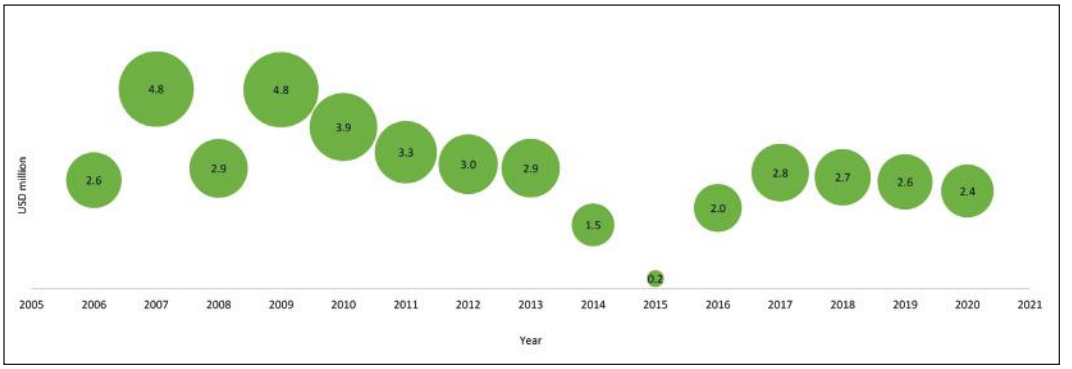
South Africa established in 2000 the African Renaissance and International Cooperation Fund (ARF), aiming to give better cohesion to its development initiatives and had its initial funds around USD 30 million. The South African Government had provided an estimated USD 42.6 million as a humanitarian assistance over the time period 2005-2020 (see Figure 2). In 2016, The South Africa Government committed USD 2.71 million (R 40 million) towards the Emergency Food Assistance project in Swaziland. The project is intended to assist the orphans and vulnerable children (OVC) in different

Figure 2: Brazil's Humanitarian Assistance (USD million)



Source: Institute for Applied Economic Research – ipea 2017.

Figure 3: South Africa's Humanitarian Assistance (USD million)



Source: http://www.treasury.gov.za/documents/national%20budget/2010/enebooklets/default.aspx.

neighbourhood care points (NPCs).[4] Recently, South Africa donated USD 7.14 million (R 100 million) to South Sudan as humanitarian assistance[5] and supplied the in-kind assistance to Malawi, Zimbabwe and Mozambique in the wake of Cyclone Idai.

Endnotes

1. http://www.ibsa-trilateral.org/images/PR_Statement_%20IBSAEvent.pdf
2. MEA 2016-17
3. Lima 2017
4. See http://www.dirco.gov.za/department/african_renaissance_2018_2019/african_renaissance_fund2018_19.pdf
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2. Manuscripts should be prepared using double spacing. The text of manuscripts should not ordinarily exceed 1500 words. Manuscripts sent for peer review section may be limited to 5000 words Such submissions should contain a 200 word abstract, and key words up to six.

3. Use 's' in '-ise' '-isation' words; e.g., 'civilise', 'organisation'. Use British spellings rather than American spellings. Thus, 'labour' not 'labor'. (2 per cent, 3 km, 36 years old, etc.). In general descriptions, numbers below 10 should be spelt out in words. Use thousands, millions, billions, not lakh and crore. Use fuller forms for numbers and dates — for example 1980-88, pp. 200-202 and pp. 178-84. for example 'the eighties', 'the twentieth century', etc.

Reference Style: References should be appended at the end of the paper. References must in double space, and should be same author(s) is cited, then arrange them chronologically by year of publication.

All references should be embedded in the text in the APA style. For details please refer to Course and Subject Guides: https://pitt.libguides.com/c.php?g=12108&p=64730

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Introduction of a Section on Peer Reviewed Articles/Essays

In keeping with suggestions, feedbacks and accumulated experience, we have decided to introduce a section, containing peer reviewed full length articles/essays. Interested scholars willing to contribute are requested to send in their manuscripts (preferably in not more than 5000 words) to the editorial office.

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Development Cooperation Review (DCR) aspires to capture holistic narrative around global development cooperation and fill an important knowledge gap towards theorisation, empirical verification and documentation of Southern-led development cooperation processes. Despite growing volumes of development partnerships around the Southern world, there remains an absence of detailed information, analysis and its contribution to global development processes. Even though there have been sporadic efforts in documenting some of the activities, a continuous effort in chronicling the diverse experiences in South-South Cooperation (SSC) is still absent. RIS, in joint publication with GDI, FIDC and NeST has endeavoured to launch DCR, a quarterly periodical, to fill this gap.

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Established at RIS, the Global Development Initiative (GDI) aims to institutionalise knowledge on India's development initiatives and promote their replication as part of knowledge sharing in Asia and Africa with the help of its institutional partners, including civil society organisations. It attempts to explore and articulate global development processes within a micro framework and works as a unique platform to collate and assimilate learning processes of other countries towards promotion of equity, sustainability and inclusively based on multi-disciplinary and multi-functional approach.

About Network of Southern Think Tanks (NeST)

Knowledge generated endogenously among the Southern partners can help in consolidation of stronger common issues at different global policy fora. Consequent to the consensus reached on many of these issues at the High-Level Conference of Southern Providers in Delhi (March 2013) and establishment of the subsequent Core Group on the SSC within the UNDCF (June 2013), the Network of Southern Think-Tanks (NeST) was formally launched at the Conference on the South-South Cooperation, held at New Delhi during 10-11 March 2016. The purpose of the NeST is to provide a global platform for Southern Think-Tanks for collaboratively generating, systematising, consolidating and sharing knowledge on SSC approaches for international development. @NeST_SSC

About Forum for Indian Development Cooperation (FIDC)

FIDC aims to encourage detailed analysis of broad trends in South-South cooperation and contextualise Indian policies by facilitating discussions across various subject streams and stakeholders based on theoretical and empirical analysis, field work, perception surveys and capacity building needs. @FIDC_NewDelhi

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