Risk governance and investing in resilience

The World Conference on Disaster Risk Reduction (2015) saw 187 nations come together and adopt the Sendai Framework for Disaster Risk Reduction (SFDRR). This Framework sets an ambitious agenda for building disaster resilience across the world, calling to move beyond disaster management to disaster *risk* management. Recognising that disaster risk is endogenous to the process of development, and not separate or external from it, the Framework calls for an all-of-society approach to disaster risk management. Embracing this spirit, Delhi hosted the 7th Asian Ministerial Conference on Disaster Risk Reduction on 2-5 November 2016. Several curtain raiser events were organised in anticipation of this conference and the National Institute of Public Finance and Policy (NIPFP), in collaboration with the National Disaster Management Authority (NDMA), organised a workshop on Risk Governance and Investing in Resilience on 27th October 2016. The main purpose of the event was to take stock of initiatives that are currently underway in the country, reflect on the road ahead for implementing Sendai priorities, and to foster broader engagement on the SFDRR by reaching out to wider audiences, including the student community; academics; and professional associations, among others. This report summarises the key policy discussions that emerged from the workshop across the following five themes:

1. Mainstreaming Disaster Risk Reduction;
2. Ten Years of Implementation of the Disaster Management Act;
3. Risk financing;
4. Financing Disaster Risk Reduction, Response and Recovery; and
5. Regulating the Built Environment.

1 Mainstreaming Disaster Risk Reduction

Approximately one in ten global disasters occur in India. With 22 of the country's 29 states vulnerable to various disasters, multi-hazard disasters impact about 85 percent of the country's total landmass and account for an estimated loss of 9.8 billion annually (2% of GDP, amounting to the annual budget for education and twice the amount of budget for healthcare). Unplanned rapid urbanisation, poverty and the climate change effects are only adding to this vulnerability. However, disaster risk is endogenous to the process of development, and vulnerability can increase or decrease based on whether disaster management has been mainstreamed into the development process. India acknowledged this nexus in its 10th Five Year Plan (2002-06), which noted that:

"the impact of major disasters cannot be mitigated by the provision of immediate relief alone, which is the primary focus of calamity relief efforts. Disasters can have devastating effects on the economy; they cause huge human and economic losses, and can significantly set back development efforts of a region or a State ... the development process needs to be sensitive towards disaster prevention and mitigation aspects. There is thus need to look at disasters from a development perspective as well."

In 2005, the Government of India enacted the Disaster Management Act, creating both NDMA and State Disaster Management Authorities (SDMAs) to develop an integrated approach to disaster management in India. There are schemes addressing some aspects of disaster management, both in the rural as well as the urban context. Three main rural schemes addressing disaster management are the:

1. Pradhan Mantri Awas Yojna (PMAY), which addresses housing typology according to the geographic locations, and provides skilled masons for constructing disaster resilient houses in rural areas;
2. Pradhan Mantri Gram Sadak Yojna (PMGSY), which aims to provide good all-weather road connectivity to unconnected villages, addressing disaster related aspects over a 5 years maintenance period; and
3. Implementation of the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), which addresses water resource management and flood mitigation, and follows a Natural Resource Management framework.

Similarly in the urban context, schemes like the Atal Mission for Rejuvenation and Urban Transformation (AMRUT) also take disaster management into consideration. The Building Materials and Technology Promotion Council (BMTPC) is working extensively on skill development with NDMA. Organisations such as the Housing and Urban Development Corporation (HUDCO) have an inbuilt provision stopping finance unless disaster management is taken into consideration. The Aizawl Municipal

Corporation, for example, has taken several initiatives to mainstream disaster management, by introducing ward level preparedness activities; strengthening school plans; and changing the building bylaws. It is the first city in the country with a Landslide Policy Committee, and has formulated the "*road map to stability*" action plan.

Despite that, much of India's development has occurred without adequately mainstreaming disaster management and, as a result, has increased disaster risk. Local capacity, as well as understanding of disaster risk reduction among most development professionals, is lacking. For example, settlements on the *Adyar* river's flood plain in Chennai have grown rapidly from 2000 to 2015, making it vulnerable to the threats of flooding. Similarly, in *Aizawl* (Mizoram), the growing population and migration has exceeded the carrying capacity of the city. People live with the risk of earthquakes and landslides due to the inaccessible roads and poor housing structure. *Uttarakhand* settlements are built on ridge areas, and population growth is increasing stress on existing services. The landslides and flash floods in hill areas cause permanent loss of land, and river bed upgradation is a major concern as it reduces carrying capacity of rivers due to dams and other structures.

2 Ten Years of Implementation of the Disaster Management Act

Despite ten years since the enactment of the Disaster Management Act, the mitigation fund mentioned in the Act has not yet been constituted. Constituting this fund and making budgetary provisions for it needs to be the top priority for the Central Government in the context of Disaster Risk Reduction (DRR). Currently, states have their own separate funds, while Central Government allocations are through schemes i.e. tied funds. Since disaster risk reduction programmes are necessarily multi-sectoral, tied funds are limited in effectiveness, and also run the risk of restricting innovation in DRR. Building basic infrastructure which is disaster-resilient is an essential element of effective DRR and budgetary provisions for all infrastructure projects should therefore factor DRR in their cost calculations. For example, building storm-water drains while building new roads costs more in the short term, but saves long term repair costs as the road is more resistant to flooding.

There are two structural problems with the Disaster Management Act (2005). First, the definition of the term *"disaster"* in the Disaster Management Act (2005) is too broad. Under the existing definition the scope of work of a DMA is unrealistically wide. Second, there is no classification of different typologies of disasters. These two problems in turn hamper the effective implementation of the Act.

The lack of clarity in the roles of different administrative departments presents another significant roadblock in effective disaster management. SDMAs need to define the roles and responsibilities of each administrative department as part of their DRR

and response plans. Since disasters are predominantly local phenomena, Panchayati Raj Institutions (PRIs) and Urban Local Bodies (ULBs) are critical stakeholders in DRR and response, and each should develop ward-level disaster management plans. Sikkim, which has successfully progressed in mainstreaming DRR and improving disaster preparedness of the state, notes that involving PRIs in disaster management planning was instrumental to the process, and that District Disaster Management Authorities (DDMAs) are also needed to create and train local incident response teams consisting of non-government and community-based organisations.

Disaster management authorities lack technical capacity at all levels, in terms of both:

1. Use of technology (e.g. early warning systems); and
2. Domain knowledge (e.g. risk mapping and vulnerability assessment).

Regular capacity needs assessments that are followed by training programmes are essential not only for SDMAs and DDMAs, but also for the other administrative departments involved in disaster management, and all downstream stakeholders such as PRIs and ULBs, local incidence response teams etc.

Early warning systems need to be more widely deployed across the country, and should be complemented by regular risk and vulnerability assessments. SDMAs, DDMAs, PRIs and ULBs need to be trained in their use. In addition, variation across states in the constitution and functioning of SDMAs allows them flexibility to adapt to local requirements. While this flexibility is necessary, creating a standardised assessment framework to measure the performance of each SDMA in DRR is also required. The assessments should include mock-drills to test the actual disaster preparedness of each state.

3 Risk Financing

Finance and disaster management are interlinked. Building resilience comes at a cost, and there is therefore a risk-return trade-off to consider (for example, roads with safety are more costly than roads without safety). Similarly, in order to provide effective insurance coverage to protect against the risk of disasters, insurance markets must first be well-functioning. At the same time, public finances are impacted in the context of a large-scale disaster. The extent to which the impact of a disaster is minimised is also linked to the credit rating of the country. As a result, neither finance nor disaster management can be fully addressed independently of each other.

Addressing both disaster management and finance requires designing appropriate risk-return matrices, for which liquid well-functioning financial markets are required. For example, construction related risk financing requires a well-functioning bond market. Similarly, distribution of risk between public and private players requires well-functioning insurance markets. However, these markets for risk financing can only be developed once the underlying markets they are dependant on are well functioning. For example, agriculture insurance markets require reasonably well-developed land

market and, as India does not have a well-developed system of land records, the *Digital India Land Records Modernisation Programme* would require strengthening before agriculture insurance markets can grow.

In addition to risks associated with regular disasters, calamities such as flash floods lead to greater infrastructure damages in India. Investment in research is required in order to develop more disaster resilient material. While a 7-10% additional cost may be required for infrastructure projects to avert this damage, willingness to incur this cost is lacking, and lenders often find it difficult to build this risk into their project appraisal. Though there is growing realisation among private sector developers to use more disaster resilient material, ground level implementation is lacking. Avenues such as green bonds/climate bonds can be considered for financing the additional cost of infrastructure projects.

Many developing countries (including emerging market peers) have already taken steps to implement risk financing. For example in Mexico, further to Hurricanes Mathew and Patricia, financing is pooled through various sources. The State plays a significant role, and their Mitigation Fund is administered at the federal level. Similarly, Ecuador has also developed robust systems towards disaster risk financing. In Costa-Rica, risk financing is primarily based on *Contingent Debt Financing*, while Malawi uses *Parametric Insurance*. Some insurance is available in India in the event of catastrophes (e.g. life insurance, accident insurance, project risk covers, etc.) but, as it is inadequate, a considerable part of loss remains uninsured. Various modes of ex-ante and ex-post risk financing are used internationally, and India should:

1. Explore these options in order to decipher and develop its own risk financing framework;
2. Develop this framework in parallel to mitigation efforts (while insurance is most suitable for high-severity low-frequency events, risk mitigation is crucial for high-risk high-severity events); and
3. Conduct a comprehensive review of all financing sources along with an analysis of their opportunity cost, to explore all available alternatives for funding (for example, if the current *National Disaster Response Fund* is subsumed into GST, alternatives need to be explored).

4 Financing Disaster Risk Reduction, Response and Recovery

Financing disaster management in India has evolved over time. While the Disaster Management Act (2005) provides for various funds to be created, it does not address financial allocation, or how the funds are to be linked. As a result, fund allocation has historically fallen on the Finance Commissions. Even before the Disaster Management Act (2005), the 2nd Finance Commission required states to keep margin amounts to

address disasters, though this amount was never sufficient. The 6th Finance Commission noted that there needs to be a way to address financing disaster management, but provided no solution. Under the 9th Finance Commission, the Calamity Relief Fund was created at the state and Centre level. However, budget allocation was inadequate as it was based on the past expenditure, which had never been sufficient to finance disaster management effectively. The 13th Finance Commission made significant recommendations on the topic (and the Disaster Management Act (2005) was passed at the same time), though budget allocation was still based on past expenditure. The 14th Finance Commission made provisions for the State Disaster Response Fund (SDRF) and the National Disaster Response Fund (NDRF) as created under the Disaster Management Act (2005), but recovery and mitigation were not discussed and allocation for these was also based on past expenditure.

Today, immediate disaster response is funded through insufficient NDRF and SDRFs. DRR is financed through a state's regular finances or through large multi-state programs. Although the Disaster Management Act (2005) calls for establishing a mitigation fund, there is no such separate funding window. This is partly due to the fact that the Finance Commissions' primary role is to address fund allocation, not to create new ones; they also do not have the necessary data or expertise to address disaster management. While the Ministry of Home Affairs develops the norms for the disaster risk funds, most of the initiatives with respect to disaster management have been through the Finance Commissions, which is not an optimal arrangement.

Further, the current norms governing disaster respond funds are rigid and therefore difficult to apply. In addition, the relief they mandate is unrealistic given overall financial constraints. Relief operations are conducted as per the conditions of gratuitous relief, which cannot exceed 25 percent of the SDRF allocation; this has proven to be highly insufficient. As a result, even if a state tries to follow the norms, it may not be financially possible to do so. These norms, which are recommendations and not mandatory in nature, are therefore often overlooked. In addition, they do not cover long-term recovery and reconstruction, which is often usually through external financing or by states themselves.

Going forward, supply side intervention needs strengthening (e.g. building of earthquake resilient houses, training MNREGA workers to build earthquake resilient houses, crop damage relief, transfer of technical knowhow). Separate windows of funding for response, relief and recovery need to be developed, along with a robust database for disaster management, in a way that leaves the past expenditure-based model behind. A new risk management framework consisting of the following two elements should be developed:

1. Public financial management; and
2. Market based risk management.

India also needs to consider alternative sources of funding. Currently, the NDRF is collected as a cess from certain items. Should this fund get subsumed into GST (which has no cess), the Centre would need to create a new source of financing from the Consolidated Fund of India. While insurance affordability remains an issue for many in India, making it mandatory in certain situations can be explored, such as when building a house in seismic zone 4.

Problems in current disaster management efforts also need to be understood and addressed. For example, when relief camps are established, they are currently done so for 60 days, regardless of the severity of the situation; those in relief camps are not eligible for gratuitous relief. Similarly, 10% of the funds available under the SDRF can be used by a state for occurrences which that state considers to be "*disasters*" within its local context. This fund is insufficient to address all definitions of "*disaster*", and the norms should be amended to bring clarity on this.

5 Regulating the Built Environment

A built environment consists of man-made surroundings that, unless regulated effectively, can lead to a wide range of threats to the health and life of people. The *State* plays a vital role in supporting the built environment at various levels, both by:

1. Ensuring provision of common infrastructure (such as buildings, parks, dams, roads, highways, sewage systems, etc.) through various channels, including procurement, PPP, direct provisioning and other contracting; and
2. Regulating the balance between quality, cost and risks.

The role of regulation has increased in importance as, in India, reliance on third-party skills to develop the built environment has increased exponentially. The *State* has shifted from using taxpayer money to using private resources, with huge amounts of infrastructure being created using private capacity and both private and public capital since the 11th Five Year Plan (2007-12). As a result, the *State* has become more of an enabler, where infrastructure is being built increasingly on a PPP basis. The resultant higher dependency on experts such as architects and civil engineers has added to risk, given the diverse service quality in India. As a result, there is space for market failure that regulation needs to address, due to:

- Consumers not knowing what they are buying (information asymmetry); and
- Propensity for minimising private costs (stemming from lack of information).

This poses potential risks to human life and health. Ex-post actions are extremely expensive compared to preventive steps and, at present, India is not equipped to prevent this failure adequately. One key reason for this is that there is a shortage of skilled civil engineers in India. Upgrading regulatory capacity should be treated as most important by imposing building codes and other engineering norms. For enhancing capacity building at the local body level, skilled architects and civil engineers need to be appointed.

A regulated and developed profession assures proficiency and quality of service due to adequate technical expertise and domain knowledge. As professions are market driven, it is difficult to create them through regulations. However, unregulated professions increase risk as the professional might lack the qualification and expertise required for the service, and may not incorporate the norms and standards required. Greater professionalism can be created by providing high standards for professionals on the basis of theoretical knowledge and experience. This would create a suitable barrier for entering into the profession, and only skilled and qualified professionals would be able to enter it. Consumers could then differentiate between recognised and unrecognised professionals, and professionals failing to follow the standards and codes would face pre-defined consequences.

The fundamental characteristics of professionalism are the ability and skill to self-regulate. This method of professional self-regulation has proven to be an effective method globally, and validation is conducted by the peers who have specialised knowledge necessary for the profession. A self-regulatory body maintains the standard of expertise and conduct. It enables members to be more competitive and meet the professional standards. To develop a self-regulatory body, a professional association is formed to provide service to the members and further authorise designations; standards; and a code of ethics to ensure quality. The *State* grants recognition to the association and acknowledges it as a self regulatory body. In India, there are limited success stories for professions with a *State*-led model of development. Self Regulatory Organisations (SRO) with statutory status do not discourage misconduct, and the *State* limits the number of SROs by making them monopolies. To address these issues, the *State* should:

- Designate engineering as a profession by law;
- Acknowledge the role of professional associations; and
- Further encourage these associations to act as a self-regulating organisation.

The *State* should motivate the growth of SROs by removing barriers like limiting numbers and creating monopolies. Education and training programs should be conducted to avoid the regulation limitation. To ensure that the services provided by the professionals are up to acceptable standards, the *State* should ensure that non-adherence to standards will lead to consequences, such as expulsion from the self-regulatory organisation, and consequent loss of business. Audits and inspections should be conducted by the *State* or other professionals to check the quality of service, and the professional should face consequences in the case of any errant or unfit service. For the purpose of auditing and inspection of services, the *State* needs to build capacity and, while doing so, it should take the following factors into consideration:

- What are the precise market failures that regulation of the built environment aims to address?
- How should the *State* build capacity for improving regulatory enforcement?

- Is greater professionalism of architects and civil engineers a solution?
- If yes, what mechanisms can induce greater professionalism (state regulation/self-regulation/hybrid models)?
- What are the associated costs and benefits of each intervention?

5.1 Today's context

Currently in India, building a new construction is regulated across the following factors:

- Land size;
- Building size and shape; and
- Distance between proposed construction and boundaries.

There is no legal obligation to ensure safety. As a result, there is little incentive to incur the additional cost of ensuring the construction is safe. On a policy level, legislation for structural safety needs to be developed. Further, as engineers are currently only registered, a mechanism to license them based on competence needs to be created. This is particularly important as there is no peer-review for safety in relation to new constructions, and only a "self-certification" from the engineer is required. Various existing bylaws should be amended to include safety elements, and manuals on implementation should be developed in line with this.

In practice, "*retrofitting*" needs to be conducted for existing unsafe constructions. New safety standards should be developed, alongside continuous safety education and skill development. Existing practices need to be revised to incorporate safety. For example, for projects over Rs 100 crore, it is mandatory to include pre-engineered elements; these elements are particularly high-risk in the context of a disaster, and should not be used unless full-scale testing is first conducted. Similarly, tests are needed to ensure new technologies are safe and old ones are not redundant. In terms of safety education, India needs to scale up. At present, only 7 engineering colleges in the country (i.e. 1% of colleges, both public and private, teaching civil engineering) teach earthquake safety.

Systems governing mitigation and preparedness need developing as the Indian landscape evolves. India has committed to building 100 smart cities. However, much of the public infrastructure in these cities is inadequate in times of disaster. Current sewage systems, for example, are deficient and cannot process and discard waste water effectively, especially in times of flood. qWhile there is a sewage manual in place, implementation is an issue and regulation is needed, especially in order to minimise negative health impacts. Seven steps need to be implemented in this context:

1. Bringing all states at par in relation to amendments of development control and building bylaws;

2. Developing a mechanism for regular review for best management practices (both in India and in other countries);
3. Issuing guidelines across all levels for technical capacity development;
4. Setting guidelines for mandatory third party review of constructions from not just qualified but competent engineers;
5. Setting guidelines that create incentives to implement the previous four points;
6. Licensing engineers and architects; and
7. Linking new projects to this new regime.

In addition, one important area of disaster regulation is that of airports. When a city is flooded, for example, airports provide the best access for relief items/equipment and disaster teams. They should therefore, in the context of flooding, be designed to withstand (at least) a one-in-a-hundred-years flood.

Regulation is also crucial in the context of chemical and biological impacts following a disaster, especially in India where this industry is expanding. Small to Medium Enterprises (SMEs) are largely profit driven and, unless effectively regulated, do not have the incentive to prioritise or even address safety. Options to facilitate their lacking resources include pooling resources for adherence to best practices, or Government subsidies. For this, regulatory oversight is also needed to ensure funds don't "*leak*". Accreditation and auditing is necessary to ensure compliance, and existing institutions such as the Central and state pollution control boards already have the mandate to address this risk.

Risk Governance and Investing in Resilience (27th October, 2016)

Inaugural Session
Welcome address by Ila Patnaik, NIPFP
Keynote speech by Rajiv Mehrishi, Ministry of Home Affairs
Introduction by Kamal Kishore, NDMA

Mainstreaming Disaster Risk Reduction

Chairman:	N.C.Marwah, NDMA
Panel:	Kamal Lochan Mishra, OSDMA Nagesh Singh, Ministry of Rural Development Rajesh Goel, Hindustan Prefab Limited Hari Kumar, GeoHazards International Piyoosh Rautela, DMMC Uttarakhand

Ten Years of Implementation of the Disaster Management Act

Chairman:	N.C.Marwah, NDMA
Panel:	Anil K. Sinha, Ex-BSDMA Vinod Kumar Pipersenia, Government of Assam Vinod Kumar Sharma, Sikkim State Disaster Management Authority

Risk Financing

Chairman:	Ajay Shah, NIPFP
The issues:	K.P.Krishnan, Department of Land Resources
Panel:	Mukundan K., UTI Capital Private Limited Satish Raju, Swisse Re Dhyanesh Bhatt, ICICI Lombard

Financing Disaster Risk Reduction, Response and Recovery

Chairman:	Ashok Lahiri, Bandhan Bank
The issues:	M.Govinda Rao, NIPFP
Panel:	Vyas Ji, BSDMA Krishna S. Vatsa, UNDP Piyoosh Rautela, DMMC Uttarakhand Sumit Bose, NIPFP

Regulating the Built Environment

Chairman:	M.Govinda Rao, NIPFP
The issues:	Anirudh Burman, NIPFP
Panel:	C.V.R.Murty, IIT Jodhpur Shailesh Agarwal, BMTPC Kapil Gupta, IIT Bombay Rajeswari Pillai Rajagopalan, Observer Research Foundation Vote of thanks by Ila Patnaik, NIPFP

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Anil Kumar	Asian Disaster Preparedness Center
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