

# Post Disaster Impact Assessment and Funding Mechanism

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*It is also important to look into the other new funding options which may further enhance the process for disaster risk reduction and sustainable development in a more integrated format*

**I** KEEP THINKING about disasters which are occurring all across the globe leading to deaths, injury, devastation leading to large scale displacement and long term impact of the event. Always, my mind wonders why it all happens? Is there any method to reduce its impact or it is a completely natural phenomenon so it is beyond the human capacity to address and hence we leave everything to God and become fatalistic? Over the years, disasters has been defined and understood differently by different people with the broader consensus that hazards are natural but disasters are un-natural. In the present paper I would like to unfold the 'Disaster' and see how a natural hazard gets converted into disaster? How disaster impacts are being assessed? What development implication it has and how we should start understanding and treating disasters and its risk differently?

First let me explain that all disasters are human induced. No

disaster is natural. Earthquakes, Cyclone, Floods, Cloudburst, Tsunami, Droughts and Landslides are natural hazards or natural activities which have been occurring since the existence of the mother Earth. If these events takes place in no man's land it is not called as disaster or not even noticed. However on the contrary, if the same activity occurs where it interfaces with human existence and the entire infrastructure created around by the people leading to lot of damages, deaths and millions getting affected, we call it a Disaster. So it is not the natural activity (a Hazard) that kills people and leads to colossal damage of the property, but it is the weak infrastructure which has been created created by us all around us in all the sectors for achieving larger 'developmental' goals. And, this has been created without the acknowledgement of the natural activities which have occurred or have being occurring in the vicinity and hence facing the consequences of natural activities as disaster. Development planners and society as a whole is not able to

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protect development infrastructure (housing, hospitals, roads, bridges, irrigation facilities, schools, water, electricity etc.) created over the years for the attainment of development goals, instead faced disasters. These natural activities are certainly having potential to damage and that is why it is termed as hazard, not disaster. It is called disasters only after it has adverse impacts. Let me explain this with example of the Gujarat earthquake which took place on the 26<sup>th</sup> January 2001 which is still alive in the memory of many. The earthquake which created huge impact on the lives, property and eroded development initiatives completely in the Kutch area. On the other hand, a bigger earthquake took place in California just after the week of the Gujarat earthquake which went unnoticed. Nobody even noticed and remembers the incident. The question is why California earthquake went unnoticed and not considered as disaster even though it was bigger on the Richter scale? The answer is very simple. Only those events are remembered which have larger impact in terms deaths, injury, number of affected people and colossal damage of property. South-Asian Tsunami 2004; Kashmir earthquake 2005; Kosi floods, 2008; Pakistan floods 2010; Katrina hurricane 2005; Haiti earthquake 2010 and Japan Tsunami 2011 are a few examples. The California earthquake was not converted into disaster because infrastructure could withstand the force of earthquake; people have developed their resilience (capacity of a system, community or society to resist or to change in order that it may obtain an acceptable level in functioning and structure). This is determined by the degree to which the social system is capable of organizing itself, and the ability to increase its capacity for learning

and adaptation, including the capacity to recover from a disaster). Hence we may say that hazards are natural but disasters are un-natural. The size and scale of disasters are determined by us. And hence power to reduce its impact is also within our hands and not only in the hands of nature alone. It is not the act of God, it is our creation.

Geo-climatic and socio-economic vulnerabilities and bad development practices make India prone to various disasters. People get deprived of the outcomes of development. More than 360 natural disasters have been recorded over the past 35 years. Within the first nine years of the 21<sup>st</sup> century alone, various natural disasters claimed nearly 400 thousands lives and 247,480 thousand got affected. People who lost their lives are mostly poor. Natural disasters have a great impact on the Indian economy. The reported direct losses on public and private economic infrastructure in India have amounted to around \$30 billion over the past 35 years. Reported direct losses from natural disasters has more than quadrupled during the 15 –year period 1981-1995 (\$13.8 billion) compared to the losses reported during the previous 15-years(\$2.9 billion). This alarming trend continues; the total losses reported in most recent six years period (1996-2001) of US \$ 13.8 billion have already exceeded total losses incurred over the last fifteen year period. The Gujarat earthquake alone is estimated to have caused a US\$491-655 million loss of output and a US\$2.2 billion negative impact over three years on the state's fiscal deficit loss to property and infrastructure has been estimated at US \$ 4800 crores. Losses are 20 times greater as percentage of GDP in the developing countries than in

industrialized (MHA: 2011 p.4). Sudden onset and low frequency natural catastrophes (the subject of this study) in India have primarily been associated with flooding, windstorm, and earthquake and have had significant stock impacts. Flooding triggered by torrential and heavy monsoon rains has been a significant source of losses, reported at more than US \$13 billion over the past decade. Strong tropical storms and cyclones have inflicted disasters losses of approximately \$6.6 billion while earthquakes have inflicted damages of close to \$5 billion over the past ten years (WB Report, 2002).

The economic costs of the disaster deserves our attention also because disaster erodes all development gains and cuts across the political boundaries created by man. Disaster incident of one country may have serious impact on the other geographical regions of the world. It is very true in the case of India and South Asia region (eg. heavy rains in Nepal may flood India). These natural catastrophes pose a serious and growing challenge to development.

Disaster losses include not only the shocking direct effects that we see in news, such as the loss of life, housing and infrastructure but also indirect effects such as the foregone production of goods and services caused by interruptions in utility services, transport, labour supplies, suppliers, or markets lives lost, social networks disrupted and capital investments destroyed. Funds targeted for development are reallocated to finance relief and reconstruction efforts, jeopardizing long-term development goals. Post disaster-reconstruction activities strain public finances and divert funds from economic development, which further escalates the losses

which are often not directly accounted for by the different government bodies.

Hence, it is important for the development planners to understand that how disaster may impact development. To take the agenda of prevention forward, it is also important to know that how the potential or probable risks are known and quantified? And, how much impact it may create? Accordingly, initiative may be designed to reduce the risks to minimize the impact of potential disasters. A few questions may be emphasized as how the impact of any disaster in India is captured and documented. What are the tools applied and who all are the persons engaged in capturing the impact? Are we getting the real picture of disaster impact? And do we have some alternatives?

Having understood the imperatives of the economic losses on the developmental economy of a country, let us review the process of disaster impact assessment in India. Disaster impacts are difficult to quantify. Soon after the event of disaster the first attempt is to make a situational report so that relief and response could be made effective. After the situational report, the detailed damage assessment reports are made by the affected state government and submitted to Central Government. Most of the post disaster damage assessments have been done in the country on the basis of direct loss basis with the replacement value on current price basis. Assessment of indirect loss is not a practice in the country unless it is funded by multilateral support for long term recovery. These losses of assets and the impact on flows of goods and services are important to quantify and assessed. Direct and indirect loss assessment and their effect on the different sectors of the economy are done in distinct

ways. Present method only makes an assessment of infrastructure (stock) but does not cover the revenue loss (flow) and assess the overall economic impact of disaster. Further, this also does not give any alternative to the decision maker for prioritizing long term recovery investment.

In many other countries, Economic Commission Latin America and Caribbean (ECLAC) methodology has been applied which was evolved in 1972 in the Latin America and Caribbean region. The methodology has also been applied in other regions of the world, most notably in Asia and, recently, in Africa to quantitatively determine the effects of major disasters. A damage and loss assessment following disasters can be used advantageously to determine post-disaster needs, including economic recovery planning and reconstruction program design. It can also be used later for monitoring progress of economic recovery and reconstruction program. There are two distinct potential uses of the results of a damage and loss assessment: in the short term, to define government interventions for the immediate aftermath of the disaster, which aim to lessen peoples suffering and to initiate economic recovery. In the medium to long term, the assessment is used to define the required financial needs to achieve overall recovery and reconstruction. In addition to revealing the magnitude of effects caused by a disaster, the damage and loss assessment provides information to define effects and impacts on most geographical areas and sectors of the economy, as well as on overall economic performance.

Damage is defined as total or partial destruction of physical assets existing in the affected

area. Damage occurs during and immediately after the disaster and is measured in physical units (i.e. square metres of housing, kilometres of roads, etc). Its monetary value is expressed in terms of replacement costs according to prices prevailing just before the event.

Whereas Loss is change in economic loss arising from the disaster. They occur until full economic recovery and reconstruction is achieved and in some cases lasting for several years. Typical losses include the decline in output, in productive sectors (agriculture, livestock, fisheries, industry and commerce) and lower revenues and higher operational costs in the provision of services (education, health, water and sanitation, electricity, transport and communications). Also considered losses are the unexpected expenditures to meet humanitarian needs during the post-disaster emergency phase. Losses are expressed in current values.

The value of damage is used as the basis for estimating reconstruction needs. The value and type of losses provide the means for estimating the overall socio-economic impact of the disaster and the needs for economic recovery. In India, estimation of post disaster damage loss and need assessment and making an analysis of its impact on development is not a practice. It is assumed that the need assessment is required only when country is planning to go for long term recovery. Hence, even after so many disasters are occurring in the country, we do not have assessment done which can give an understanding of disaster and its impact on development. We still are making speculations about the damage and losses occurring due to various disasters. For understanding disaster impact, India is still dependent on the single

study conducted by the World Bank 2001 which has estimated India losing 2 percent of the GDP and 12 percent of the revenue per annum due to natural disasters.

### **The new dimension of disaster loss in global economy**

It is being observed that in the time of globalization, disaster happening in one country is leading to huge loss in other countries. The damages of stock (infrastructure) are determining the flow (revenue) of either neighbouring or distantly located countries. For example, during the recent flood in Thailand, the Federation of Thai Industries estimated that the damage of the record flooding to industry will total \$6.2 billion. Disruptions were felt in Japan and to a lesser extent, in United States because the closed industrial estates host high-tech and automotive manufacturers like Western Digital, Seagate, Nissan, Toyota, Isuzu, ON Semiconductor, and TDK Magnecomp. Four automotive factories, accounting for 630,000 Toyotas and 240,000 Hondas annually, have closed. Over 300 Japanese companies were directly affected by the disaster and estimates suggest they will take months to recover. In consumer electronics, the hard disk drive (HDD) industry also felt the flood's effects. California-based Western Digital is expected to see a 40 percent decline in its exports from Thailand, which is worth \$6.5 billion a year, as two of its plants in Bang pa-in have been forced to close. Western Digital produces 33 percent of the world's HDDs and sells to major computer manufacturers like Acer, Dell, and Hewlett-Packard. Apple CEO Tim Cook said that Apple has suffered supply chain snags due to factory closures as well (Times of India on 3rd November, 2011).

### **From Damage to Losses to Needs Assessment**

A subsequent use of the assessment results is to estimate the requirements or needs of financial resources necessary for recovery and reconstruction activities. The value and the spatial, time and by-sector distribution of losses are used to estimate the requirements of economic recovery while the value, geographical and by-sector distribution of damage is used to estimate the requirements of reconstruction. Typical objectives of an overall economic recovery programme include the restoration of personal and family income, and the resumption of essential services and production activities in the affected areas. The main objective of the reconstruction programme is to replace or repair physical damaged asset to restore economic losses and hence the growth path. There is need for moving ahead from making post disaster damage assessment to loss and recovery need and investment priority assessment. And, all the state governments may be encouraged to do so. This tool would act as barometer for measuring development recovery.

### **Financing Post Disaster Immediate and Long Term Recovery**

The responsibility for disaster funding in the aftermath of a natural catastrophe has been shared by the state and central governments. While the affected state manages the relief work and reconstruction efforts, the central government provides financial support. Originally, the central government financed catastrophe relief efforts through margin money allocated to the states from the successive Finance Commissions. However, the general experience under this system was that actual calamity expenditures consistently outpaced underlying budget expectations. Under the

Ninth Finance Commission, the government revised the system and created a Calamity Relief Fund (CRF) from which states can draw upon under emergencies. The additional funds will be provided by the centre from National Calamity Contingency Fund (NCCF), after the submission of memorandum (damage assessment report) by the States to the Center. The 13<sup>th</sup> Finance Commission has merged CRF and NCCF into one fund called National Disaster Response Fund (NDRF). All these funds could be utilized only for the immediate relief given to the affected one and immediate temporary recovery of critical installations. There is no provision or dedicated fund available for long term recovery.

National Disaster Management Act 2005 has made provision for constitution of two funds viz. *National Disaster Response Fund and National Disaster Mitigation Fund*. The National Disaster Response Fund, as specified in the Act, would be used for meeting any threatening disaster situation or disaster. The Response Fund would be available with the National Executive Committee, who would use it towards meeting the expenses for emergency response, relief and rehabilitation according to the guidelines laid down by the Government, in consultation with the National Authority. The National Disaster Mitigation Fund has been provided exclusively for the purpose of mitigation and would be used only for mitigation projects. The corpus of the fund would be provided by the Central Government after due appropriation made by Parliament, by law. This fund would be applied by the National Authority.

The Act has also made provisions for similar funds at the State and district levels. The State Disaster

Response Fund shall be available with the State Executive Committee for emergency response, relief and rehabilitation at the State level, while the State Disaster Mitigation Fund shall be made available to the State Disaster Management Authority for mitigation projects.

For the allocation of CRF to the states the successive finance commissions have taken disasters and expenditure occurred in managing the disasters as one of the important criteria which itself has inherent lacuna. Firstly, many states have very long return period of big disasters leading to huge loss but that doesn't get reflected in the expenditure. On the other hand they keep facing smaller disasters on a regular basis which becomes the basis of funding. Secondly, few states fall in the category of low probability high risk area and many are into high probability and low risk area, this may also be seen and analyzed. Thirdly, many states are willing to spend more money for managing disasters but they are constrained to do that due to financial health of the state. Hence considering the expenditure criteria only is not an appropriate indicator for the allocation of funds to the state. This may be revisited by the finance commission. Vulnerability of the states could also be seen as one of the criteria for allocation.

All these provision of disaster funding is limited to immediate and intermediate disaster recovery. Still, long term recovery funding is an unaddressed issue. In India, long term recovery programmes conducted can be counted on fingers. After so many disasters in the country, India has just gone for a few long term recovery programmes with objective of 'build back better' by incorporating mitigation into reconstruction programmes such

as Maharashtra Latur earthquake (1994), AP Cyclone (1997), Orissa Cyclone(1999), Gujarat earthquake (2001), Tsunami (2004), Leh cloud burst (2010) and now Sikkim earthquake (2011). Many recent catastrophic disasters remained unattended for long term recovery (Bihar, Orissa and Assam successive floods, Karnataka and Andhra floods 2008, Bengal Cyclone 2010).

It is important to highlight that direct damages (stock) induce indirect damages (flow). If the long term recovery goes unaddressed, the loss of flow gets added every day and in ultimate analysis it creates huge pressure on economy and the development process. Along with mitigation and response fund, there is also an urgent need to start pondering over Disaster Long Term Recovery Fund, both at the national and state level. In all the disaster situations, the growing problem of funding natural catastrophe losses has been recognized by the Finance Commissions. India's traditional practice of dependence on Central Government funds to finance relief and recovery efforts in the aftermath of natural disasters has contributed to underdeveloped state level risk management and private insurance mechanisms. In the last decade the situation has been exacerbated by the fact that most states and the Central Government have been running deficits on revenue account, and resources for post disaster reconstruction in particular have been increasingly constrained and dependent on donor funding.

### **Disaster Mitigation Funding**

For mitigation (disaster risk reduction) funding, the first and foremost thing which may be done is to do the risk assessment in quantified manner. The identified quantified risk should be on the

basis of probabilistic theory which may like to take 50, 100 and 150 years of return period. On the basis of quantified losses risk-zonation may be done accordingly. Once the quantified maximum probable risk is known, after the risk-zonation, different risk management modules can be worked out. Mitigation investment (structural and non structural) can be planned further for risk reduction.

### **Conclusion**

Hence in the light of the above, it is important to first acknowledge that disaster is not the problem of disaster management per se but is a larger development issue for protecting development gains and making development sustainable. Secondly, we have to have a complete picture before us as to how any catastrophic disaster affects country's economy directly and indirectly. And for that mere damage memorandum is not enough instead, we should have a policy shift for making damage, loss and need assessment with micro-macro impact analysis. Thirdly, along with immediate recovery we should also plan long term recovery and make funding provisions accordingly. Fourthly, making assessment of financial tools available for disaster funding and also innovate new funding mechanisms (risk transfer, risk sharing, insurance, bonds, etc.) so that the losses occurring over the years due to disaster can be minimized. And, fifthly, disaster mitigation funds should be designed and planned on the basis of probabilistic risk assessment and risk exposures assessment. It is also important to look into the other new funding options which may further enhance the process for disaster risk reduction and sustainable development in a more integrated format. □