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REDUCING RELOCATION RISK IN URBAN AREAS

India

Diagnostic Report

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India
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List of abbreviations

ADB	Asian Development Bank
AMRUT	Atal Mission for Rejuvenation and Urban Transformation
CBA	Cost and Benefit Analysis
CRDA	Capital Region Development Authority
CRZ	Coastal Regulation Zone
CSMC	Central Sanction and Monitoring Committee
DMR	Delhi Metro Rail
EIA	Environmental Impact Assessment
GDP	Gross Domestic Product
GoI	Government of India
GoO	Government of Odisha
GSDMA	Gujarat State Disaster Management Authority/Act
H&UDD	Housing and Urban Development Department
HH	Households
HTL	High Tide Line
IDP	Internally Displaced Populations
IR	Involuntary Resettlement
IRDA	Insurance and Regulatory Development Authority
JNNURM	Jawaharlal Nehru Urban Renewal Mission
L&D	Loss and Damage
LARR	Land Acquisition Rehabilitation and Resettlement Bill, 2011 or Act 2013
LULC	Land Use Land Cover
MEERP	Maharashtra Earthquake Emergency Rehabilitation Programme
MHA	Ministry of Home Affairs
MIDR	Mining-Induced Displacement and Resettlement
MOHUPA	Ministry of Housing and Urban Poverty Alleviation
NBC	National Building Code
NDMA	National Disaster Management Authority/Act
NDMF	National Disaster Mitigation Fund
NDRF	National Disaster Response Force
NGO/INGO	Non-Government / International Non-Government Organisation
NHA	National Housing Authority, Bangkok
NPRR	National Policy on Rehabilitation and Resettlement
ODCH	Owner-driven Construction of Housing
ODRP	Odisha Disaster Recovery Project
OSDMA	Odisha State Disaster management Authority
PMJDY	Pradhan Mantri Jan-Dhan Yojna
R&R	Resettlement and Relocation (for the purposes of this report)
RAY	Rajiv Awaas Yojna
RCC	Reinforce Cement Concrete
SCs/STs	Scheduled Castes and Scheduled Tribes
SDMA	State Disaster Management Authority
VDC	Village Development Committee
VMC	Vishakhapatnam Municipal Corporation

1. Key concepts and distinctions

Relocation vs. Resettlement vs. Rehabilitation vs. Evictions or Displacement vs. Migration

As defined for this research, resettlement is a major integrated, comprehensive movement of people and families which normally involves significant distance between the original and new location. Resettlement involves not only new housing and services but also new social and economic relations, and new challenges such as access to work and social cohesion (Ferris, 2014). Relocation, meanwhile, refers to non-systematic movements of families or individuals from hazard-prone locations to nearby areas. Relocation therefore would involve less upheaval in terms of access to work and social networks (Ferris, 2012). Rehabilitation could be either relocation or resettlement, but could also mean in-situ upgradation.

Evictions or displacement is referred to as the act of expulsion of someone (such as tenants) from possession of land or house usually by a process of law (Oxford Dictionary 2015). These are cases where households are moved forcibly without an alternate location being planned for the move. One distinction the authors would like to make is also with regards to migration, which seems to have more literature and work done especially in the context of cross international border migration (e.g. between India and Bangladesh, etc.) This project is limited to look at movements within an urban administrative boundary (such as town, city, ward, etc.) which is less studied.

The context of 'R&R' varies quite significantly within various legal frameworks (as well as between the three different study geographies namely LAC, Uganda and India). Legally in India, the Disaster Management Act 2005 refers to R&R as 'rehabilitation and reconstruction'; resettlement does not figure in this regime or in the accompanying frameworks. On the other hand, the Land Acquisition Rehabilitation and Resettlement Bill 2011 frame looks at R&R as 'rehabilitation and resettlement'. This is a crucial distinction. Earlier 'relief and rehabilitation' as R&R was also used in the context of disasters, butrecently reconstruction is added to the mix. Relocation does not figure in either the land or the disaster legal frameworks. It is for the purpose of this project, across the studies in three different geographies that R&R will be referred to as 'resettlement and relocation'.

Risk Management Approaches: Corrective vs. pre-emptive vs. compensatory

Disaster risk management is seen by some (UNISDR, 2011) as comprising three distinct yet complementary types—corrective, whereby existing risk is the centre of attention and reduction the goal; prospective, where the avoidance or prevention (within bounded limits) of future risk is the goal; and compensatory, where residual risk is dealt with through different social and economic mechanisms. The types of intervention possible for each of these types of management are wide in scope. Corrective management involves everything from retrofitting buildings to environmental recovery and reforestation and land use decisions using relocation or resettlement as a tool. Prospective management involves land use and environmental planning decisions to prevent exposure and vulnerability in the future to public investment decisions informed by risk criteria and reduction goals. Avoidance of hazard-prone locations through urban planning mechanisms, identification and access to safe land for poorer populations, etc., are seen as prospective measures. Compensatory management involves dealing with residual risk through mechanisms such as risk transfer, insurance, cash transfers and compensations, social security networks, and resilience building in communities and families. Recovery and reconstruction post impact may be of corrective, prospective or compensatory types.

‘Developmental’ and ‘Climate/Risk reduction’ context

While risk reduction could in itself be a developmental objective or outcome, for the purposes of our work the difference between the two is that the latter is motivated by reducing people/systems/city's risks aspriority, whereas the former seems to aim at larger economic gains or is primarily motivated by uses for the vacated land, or other developmental outcomes.

Voluntary vs. Involuntary

Voluntary R&R could mean people doing it of their own will, self-motivated or in agreement with the institutional aspirations. Involuntary R&R is often seen as evictions, or forced moves to locations without choice. Often these kinds of movements are forced by either the government, or natural circumstances that leave people with no choice to stay.

Definition of ‘Risk’ and who decides

Historically, risk was primarily associated with an event based on an external force or agent but it is now well accepted that risk is a composite of external as well as intrinsic characteristics of elements that affect their propensity to risk[1]. It can arise in relation to natural (tectonic or climatic) as well as man-made hazards (air pollution, industrial hazards, etc.). Some of these hazards are exacerbated both in intensity and frequency by climate change. These are accentuated further by the elements’ physical location and exposing them more to certain external forces. Often people’s and system’s ability to respond to these hazardous events puts them in better or worse situations as compared to some others, and these capacities need to be explored and improved upon in order to reduce overall impacts of risk. These risks vary over time – both in impact and their accumulation – and vary significantly by geographical location of the elements. The underlying reasons for vulnerabilities may arise out of socio-economic processes, which may ultimately be quite remote from the hazard event itself but it is due to these vulnerabilities that the impacts felt by some people may be more severe than others.

Often, there are deeper socio-political reasons that certain people (usually of the weaker economic sections) are forced to live in areas which makes them more exposed to hazards, and thereby exposed to greater risks. This lack of choice exacerbates their vulnerabilities, exposure and often also the abilities to respond leaving them more vulnerable than before in the face of an event. It is this that Wisner called the cause and effect model of vulnerability (Wisner, Blaikie, Cannon, & Davis, 2003). Hazards and their outcomes are not only limited to the spontaneous, sudden ruinous events but also accumulate over time in the form of recurring conditions of moderate intensities. Intensive risks are associated with the exposure of large concentrations of people and economic activities to intense hazard events such as high intensity earthquakes, severe floods and cyclones, etc., which can lead to potentially catastrophic disaster impacts involving high mortality and asset loss. On the other hand, extensive risks are widespread risks associated with the exposure of dispersed populations to repeated or persistent hazard conditions of low or moderate intensity often of a highly localized nature, which can lead to debilitating cumulative disaster impacts (UNISDR, 2009).

What individuals and communities might identify as risk, informed by their own capacities to cope, often varies from institutional imagination of risk. For example, people may have learnt to move temporarily in the face of floods or cyclones but would consider access to work, schools and health systems as major risks which are not always within their control, whereas institutions continue to respond to hazard risk and this leads to varying risk reduction responses from the various involved stakeholders. The authors urge the readers to distinguish risk definition by who defines and who bears the risk throughout the report and following work in this project.

Nature of seismic vs. hydro-meteorological hazards

Following from the definition of risk is another distinction between seismic and hydro-meteorological risks. While the latter can be predicted using early warning systems and responses planned accordingly, the former has had no such technological advances yet. When institutions take decisions on risk reduction measures, they may consider this distinction and try and avoid resettlements and relocations as much as possible for ‘cheaper’ alternatives such as early warning systems, better communications etc. particularly in the context of non-seismic (most often climatic) risks. (This is aligned with the Latin American policy context of ‘un-mitigable’ risk, where resettlement is considered as the last resort when everything else is more ‘costly’ and less effective in reducing risks.)

Costs and benefits of relocations: How to calculate; costs and benefits for who?

This would require an in-depth enquiry of what are the costs and benefits and who bears these costs and benefits in the face of risks. This project will delve into some methods in the next stages.

1 UNISDR defines risk as the probability or threat of quantifiable damage, injury, liability, loss, or any other negative occurrence that is caused by external or internal vulnerabilities, and that may be avoided through pre-emptive action.

2. Introduction

"Resettlement is a complex social process; at its best it should support and nourish the coping and adaptation processes that enable a population to regain the functionality and coherence of a viable community, resilient enough to deal with social and environmental stressors. Central to these tasks are the issues of rights, poverty, vulnerability and other forms of social marginality that are intrinsically linked to displacement."

~ Oliver-Smith and de Sherbinin, Forced Migration Review, 2014 (Oliver-Smith & de Sherbinin, 2014)

Resettlement and relocation (R&R) in the context of climatic and non-climatic disasters as well as that due to development projects has been followed the world over with varied experiences. Many international and regional frameworks exist, but despite that there is very little understanding of how resettlement is enacted on the ground (drivers, context, implementation process and short and long-term impacts). With climate change, the pressures for resettlement in urban areas are increasing thus requiring greater knowledge to improve outcomes including the option of non-movement and on-site upgrading of communities.

The aim of this diagnostic report is to learn more about the existing work on resettlements and relocations in India, both in literature as well as practice, and find gaps that can help improve the outcomes of such projects for people and cities at large. The aim is also to understand the context at the country and city-level in relation to the nature of climate induced risks and how societal structures manifest themselves in location choices and affect exposure. The report also aims to learn how land use planning and resettlement policies, and legal and normative frameworks work at the regional, national and local levels. This diagnostic work will lead to the selection of site-specific case studies. The methods include a review of country and city specific literature on disaster risks and urban development, which will be complemented by consultations with local experts and key-informant interviews and workshops. The objectives for this work are as follows:

- Identify the factors that contribute to and define urban climate related risk and systematise information on the legal and policy frameworks and guidelines governing 'resettlement' (and relocation) of affected communities.

- Define a typology of approaches to reducing climate risk for urban communities including relocation, and gauge their relative importance in achieving socially just outcomes for individuals and communities, as well as for society.

This work will further lead into enquiring about the following issues in the next phases:

- Define and characterise the underlying rationale and decision process associated with resettlement strategies enacted in different urban geographical contexts.

- Compare similar and different types of solutions enacted across continents, systematise costs and benefits and lessons learnt; advantages and disadvantages with regard to reduction of future economic and social costs; and best policies for maximising beneficial outcomes.

There is a paucity of literature that examines the urban context of R&R. While cities agglomerate risk, create risk and often serve as respondents to risk experienced elsewhere, they also offer transformational opportunity to address these risks—building on the established institutional and financial capacities of the cities as well as their limited numbers as compared to rural locations. More risk can be mitigated by directing the research and other resources to the most vulnerable urban centres

particularly in small and medium sized towns, which are often the sites where the most vulnerable are forced to live. If planned ahead, it would not just safeguard cities' future, but it could actually provide for more enhanced lives for its future citizens.

The review of the existing institutional and regulatory framework shows that while there are national and state policies for 'resettlement and rehabilitation' of project affected families in the context of land acquisition through Eminent Domain for 'public purposes', there seems to be no legal framework or safety net for those who are moved in case of disasters, and people are compensated by the State on a case to case basis. This is in no way suggesting a policy for R&R in the disaster context. Rather knowing that R&R is highly 'costly' to both individuals and the city, this should be the last resort for risk reduction. Only once it is suitably understood that it is truly the last resort and all other means of mitigation will be less effective and more costly, should there be a 'safety net' policy for people who are being resettled for risk reduction. The authors remain wary of the implications that an R&R policy could have, and the dangers of its practice and pretext particularly for those with less political powers.

Besides policies, there are national programmes for rehabilitating slum dwellers (Rajiv Awaas Yojna, et al.), but most of them do not consider hazard risk mitigation measures in their planning—even though some have improved their socio-economic outlook.

The report also outlines case studies to illustrate some of the experiences of R&R in the Indian (as well as South Asian) context. There is also a significant lack of evidence particularly on cross continental experiences and R&R outcomes. The project at large draws on cases from Africa, Asia and Latin America and will enable the development of internationally relevant typologies and methodologies.

This report is structured in four broad sections. The first section on 'Urban Risks' details how climatic and other socio-economic risks manifest themselves in urban areas. It also uses the states of Orissa and Andhra Pradesh as cases to illustrate some of the existing risks, as they may form the regions from which case studies would be selected. The section on 'Institutional and Regulatory Frameworks' looks into the current policy regime and the gaps within that. The section on 'Literature Review' is a diagnosis of the existing literature in the Indian context for resettlements and relocations. It is best to read this section in alignment with the global literature review prepared separately. The section on 'Case Studies' lays out several examples to illustrate the various kinds of R&R projects taking place in India (with some examples from the South Asian context).

A. Urban Risks in India

Urban risk is constituted through natural hazards, exposure, vulnerability, and capacity of the various elements. This section is a summary on the expression of urban risks in the country as a whole and the political economy processes that have been leading to hydro-meteorological hazards and risks for human settlements. It is a basic characterisation of urban economies and livelihood patterns, how the cities are growing and prospects for urban growth and change in future, why people live in risk areas, how they access land in the city etc.

According to the recent data collected by the Centre for Research on the Epidemiology of Disasters[1], India, in the last millennium, has lost about 9 million people to nearly 580 large scale natural events. These disasters have also left another 2 billion severely affected. The economic losses as documented by them are of the order of 56 billion USD, which amounts to nearly 0.03 per cent of the National GDP every year for 100 years. Another study indicates that natural disaster losses equate up to 2 per cent of India's GDP and up to 12 per cent of federal government revenues (Appendix 1).

It is also observed that more economic losses and people are affected by extensive risks as compared to intensive risks, although the number of lives lost are still higher due to intensive risks.

These numbers, however high, still do not capture secondary order and long term losses, such as those to health, quality of life with disabilities and effects on livelihoods. Also, due to the lack of disaggregated data, it is hard to identify how much of these losses were in urban locations. Yet, going forward with increasing urbanisation, these losses are going to increase and become more concentrated in cities.

Exposure to climate related hazards

India is one of the more vulnerable and high-risk countries in the world (IFRC, 2005). It is highly vulnerable to natural hazards, particularly earthquakes, floods, droughts, cyclones and landslides. About 40 per cent of India's total population lives within 100 km of the coastline. Analysis for the period 1980-2000 indicates that on average, 370 million people are exposed to cyclones in India annually.

Of all the climate related disasters, floods are the most frequent and devastating. Floods on 26 July 2005 in Mumbai killed 1200 people, affected more than two lakh people, and cost Rs 20 thousand crore in losses (IFRC, 2010). In the 2006 floods in Surat, 77 per cent of the working population lost 15-30 days' work (Bhat,

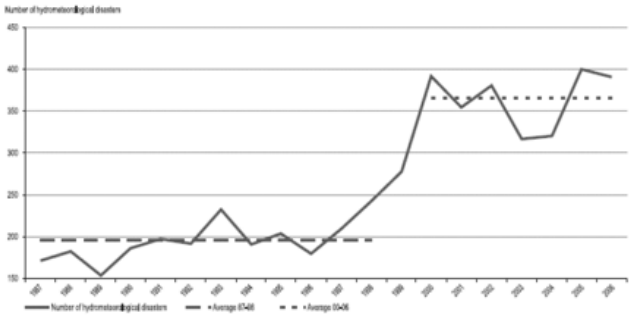
1 http://www.emdat.be/

Karanth, Dashora, & Rajasekar, 2013). The 2009 floods in Kurnool were considered one of the worst in 100 years, and inundated the city with more than 30 feet of water (Ramachandraiah, 2011). Losses from the 2013 floods in Jammu & Kashmir is estimated at Rs. 1 trillion (Aon Benfield, 2014).

Climate change is also increasing the number of disasters and their devastating impacts (Revi, Satterthwaite, Aragón-Durand, Corfee-Morlot, Kiunsi, Pelling, Roberts, et al., 2014). From 1988 to 2007, 76 per cent of all disaster events around the world were hydrological, meteorological or climatological in nature. These accounted for 45 per cent of the deaths and 79 per cent of the economic losses caused by natural hazards(ISDR, 2008) . The likelihood of increased weather extremes in the future therefore gives great concern that the number or scale of weather-related disasters will also increase.

As climate change and variability become more pronounced, the frequency, intensity and/or duration of extreme weather events is set to increase. According to EMDAT data, nearly 90 per cent of all the disasters that occurred in India in the last decade, were climate related.

Figure 1: Occurence of hydro-meteorological hazards, 1987-2006



Source: Guha-Saphir, Hoyois, Scheuern, Below, and WHO (2007)

Climate change and variability is now known to have primary and secondary order impacts in various ways (Revi, Satterthwaite, Aragón-Durand, Corfee-Morlot, Kiunsi, Pelling, Roberts, et al., 2014) Some of the climate-related hazard events include rising sea levels, storm surges, extreme precipitation, inland and coastal flooding, landslides, and drought and with these hazards, risks are likely to increase because of climate change. There are one-time events like floods and there are slow on-set events like droughts, heat-waves etc. which are spread over days, and months to years.Some of the urban aspects of these impacts would include urban temperature variation; drought and water scarcity; coastal flooding, sea level rise and storm surge; inland flooding, hydrological and geo-hydrological hazards at urban scale; and, other emerging human health, disease and epidemiological issues. (Gajjar et al., 2013; Jain, Jigyasu, Gajjar, & Malladi, 2015); (Bank, 2011) ; (Rosenzweig, Solecki, Hammer, & Mehrotra, 2011) This note is an attempt to analyse the current status of urban risks in India especially related to climate related hazards such as cyclone, storm surge, drought, landslides due to precipitation, and heat waves.

Urbanisation processes and increased exposure and vulnerability to climate related hazards

In India, 31 per cent (337 million) of the total population live in urban areas. Within this, 42.6 per cent live in 53 cities with more than one million population/urban agglomeration. (Census of India, 2011) The urban population in India is likely to increase to 50 per cent by 2050 (UN DESA, 2014) and it is expected that by then most of the people living in India will reside in urban areas, of which 138 of them will have populations above 500,000 people (World Urbanisation Prospects)[1] . With people increasingly living in cities, the densities are bound to increase, and with them other assets and sources of economic output. Many of the million plus urban centres are exposed to multiple hazards, especially earthquake, cyclone, storm surge, drought, floods and fires. Growing concentrations of people, built and economic assets in cities is exponentially increasing their propensity to disaster risk. The limited housing stock further forces people to live in informal housing, often in more dangerous and un-developable areas.

Large scale disasters between June 1999 and March 2000 alone highlight the terrible convergence of urbanisation and natural hazards. The two cyclones that hit India's state of Orissa in October killed well over 10,000 people and made 8 million homeless. The second cyclone devastated the state's administrative capital, Bhubaneswar, the commercial capital, Cuttack, and the port town of Paradip before moving on to smaller towns and villages (Sanderson, 2000).

Even the planned capital for the state of Andhra Pradesh in the Amravati region is proposed to be located on the banks of the river Krishna, a region which is prone to floods every year. As one of the flood mitigation measures, the Capital Region Development Authority (CRDA) has plans to elevate nearly 10,000 acres of land by 2 meters at a cost of Rs.15,000 crore.

1 http://esa.un.org/unup/unup/p2k0data.asp

Urban Vulnerabilities

Urban risks associated with climate related hazards result from exposure of cities or urban areas to these hazards and their physical, economic, social, environmental and institutional vulnerabilities. The following section will discuss these vulnerabilities in detail.

Physical vulnerability: In the absence of proper enforcement of building regulations, lack of maintenance and lack of financial resources, a large proportion of the built fabric in cities is highly vulnerable to natural hazards. This issue is more pronounced in the case of the urban poor who are unable to afford good housing. The Ministry of Urban Affairs' 1999 Draft National Slum Policy[2] makes no reference at all to the vulnerability of slum dwellers to natural disaster.

Moreover, much of urban India's infrastructure is in relatively poor shape, especially in the non-metropolitan cities. Urban development schemes such as the Jawaharlal Nehru Urban Renewal Mission (JNNURM) started changing that for a fraction of the cities in the country, but the investment and absorption deficits are so large that it is becoming difficult even to catch-up with the expanding informality and growth in city sizes.

Economic Vulnerability: Cities agglomerate people and economic output in small geographic areas (Jain et al., 2015). Urban areas account for a disproportionately small amount of India's terrain when compared with their significant and rising share of economic output. According to the Census of India 2011 as well as calculations by the IIHS Geospatial Lab (Revi et al., 2011), the top 10 cities of India account for almost 8 per cent of India's population, produce 15 per cent of total economic output but only occupy approximately 0.1 per cent of the total land area. This also explains the contestation for land and limited access for the poor for proper housing. Similarly, the 53 million plus cities are estimated to account for 13 per cent of the population, produce about a third of total economic output and occupy approximately 0.2 per cent of the land. The top 100 cities are estimated to account for 16 per cent of the population, produce 43 per cent of India's total output and occupy approximately 0.26 per cent of the land. These estimates are necessarily rough given the absence of reliable disaggregated data for urban areas but the emerging economic importance of cities as well their increasing demographic presence is clear.

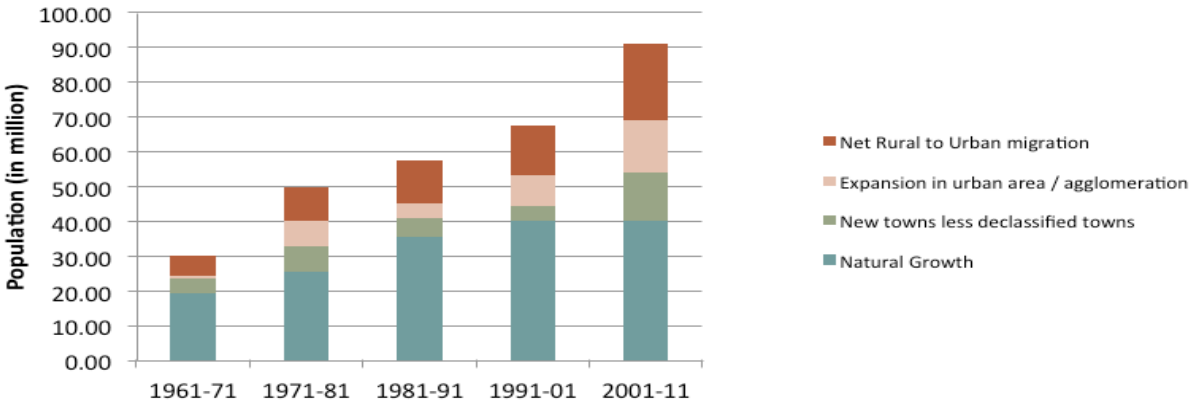
2 Ministry of Urban Affairs and Employment (1999), Agenda 21, Report on Promoting Sustainable Human Settlement Development, 17th session of the UN Commission on Human Settlements, Nairobi, May 1999, Indian government publication, page 21.

It is also important to look beyond city boundaries on hazards that can have direct and indirect impact on cities and urban systems (Satterthwaite (2013), and Bhat et al. (2013). For example, drought impact on agriculture in the peri-urban and rural areas can increase the food prices, lead to migration to the cities and affect the local economy (Since 2001, India has experienced three severe drought years in 2002, 2004 and 2009).

Social Vulnerability: There seems to be a persistence of poverty and inequality in urban areas, particularly seen through the lens of slums and unemployment. Although the proportion of the poor in the total population is falling both in urban and rural areas, the absolute number of urban poor is increasing (Chen & Raveendran, 2012). Million plus cities are indeed home to 40 per cent of the slum population. However, the majority of the poor are, in fact, concentrated in medium and small towns— 80 per cent of the urban poor reside in cities with populations less than one million (Revi et al., 2011). In terms of employment, the extent of informality in urban employment is high at around 70 per cent. It has remained largely unchanged over the course of the past decade. Almost 60 per cent of the total urban employed are wage workers, and 67 per cent of this category are informal wage workers. The remaining are largely the urban self-employed, which includes own account workers, employers, and contributing family workers (Chen & Raveendran, 2012).

Distress migrants — people who are forced to move in the face of a calamity from rural to urban, and non-migrants in the urban areas —are more vulnerable due to lack of choices. While much of the research conducted in the fields of human migration, environmental climate change, development, economics and human health have done so through a narrow disciplinary lens, a common vulnerability unites the impoverished and displaced in countries of South-Asia. Aromar Revi writes: "Having limited skills, education, capital and access to the social networks that underpin much of economic and social mobility, in urban India, more of the landless and small and marginal farmers are forced to migrate, often forming the most vulnerable groups in cities. They often live in illegal, un-serviced settlements exposed to a wide range of environmental risks from flooding to fire, and continual cycles of demotion and eviction by civil authorities. In many cases, they settle along the flood plains of the river or along the coast that are highly vulnerable to climate related hazards. They are, therefore, dual victims of existing natural hazards and emerging climate change - displaced from their original places of residence and occupations, and challenged by urban risks in their new urban places of residence" (Revi, 2008). According to studies based on National Sample Survey data, rural to urban migration in India is increasing over the past 50 years (Revi et al., 2011). There are other studies that

Figure 2: Components of Urban Population Growth: 1961 – 2011



Source : (Revi et al., 2011)

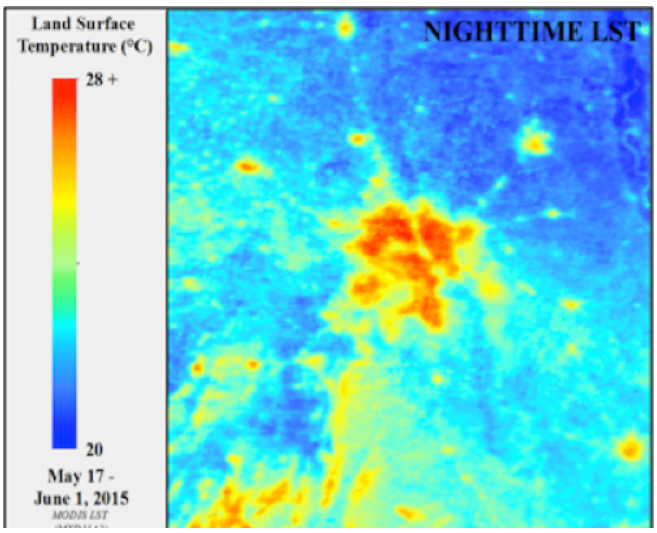
also show that rural to urban migrants have a greater risk of being below the poverty line than the urban to urban migrants, and both these streams report a lower risk than non-migrants residing in urban areas (Kundu & Sarangi, 2007).

Environmental Vulnerability: Due to rapid urbanisation, increased stress on the environment is creating new risks while also making more complex already existing risks. City services like water supply, sanitation and roads are unable to keep pace with rapid population growth and expanding cities (W. B. World Bank & United Nations, 2010). This can be clearly illustrated using the example of Bangalore. Bangalore's population nearly doubled in the last decade. In 2012, for the first time, parts of Bangalore city were declared as drought hit (M. A. Kumar, 2012). To partly meet water demand of its 84 lakh population, Bangalore draws water from a river nearly 100 km away and more than 100 m in height. The piped water supply only reaches some parts of the city while many others depend on groundwater extracted by bore wells as well as water tankers to meet their water demand (Nagendra, Sudhira, Katti, & Schewenius, 2013). Only some sections of the city can afford the costs of private water supply. Hegde and Chandra (2012) estimated that currently 22 lakh people face water scarcity in Bangalore and an additional 24 lakh will be affected with over pumping of groundwater and risk of city's aquifer systems going dry.

Land Use Land Cover (LULC) analysis by Mohan, Pathan, Narendrareddy, Kandya, and Pandey (2011) for the city of New Delhi, emphasizes the importance of preserving natural land use classes to improve the quality of life in urban areas. With rapid change of land use within the cities and out growth, there is little or no available land for groundwater recharge, which makes cities highly vulnerable to droughts.

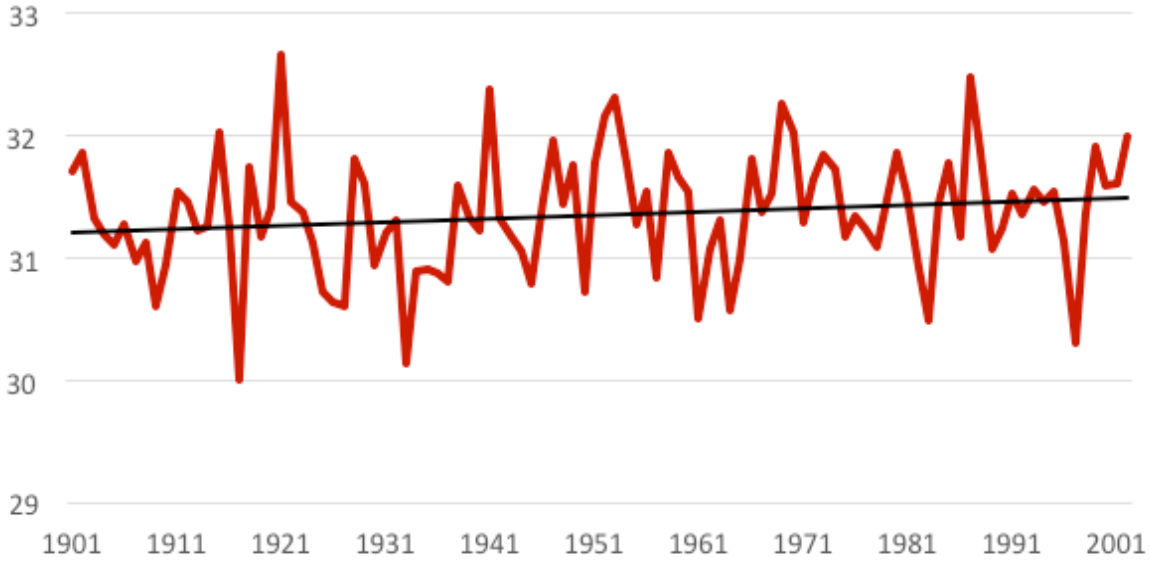
'Cities and city regions are sufficiently dense at spatial scale to influence their local micro-climate ' – Revi, Satterthwaite, Aragón-Durand, Corfee-Morlot, Kiunsi, Pelling, and Solecki (2014). Changes in the local temperature in cities are clear example of this. With increased air pollution, building density, the temperature are particularly higher in the central parts of the cities during the day and also in the night, creating Urban Heat Islands. Mohan, Kandya, and Battiprolu (2011) conclude that there is a rise in mean temperature in New Delhi, especially after 1990. The surface temperature map from 17th May to 1st June 2015 of New Delhi, shown in the figure below, shows the difference of 5 – 8 degree temperature difference from the city core to the outskirts. Rising minimum and maximum temperature will have direct health impacts and increased energy costs for cooling.

Figure 3: Night-time Land Surface Temperature in New Delhi



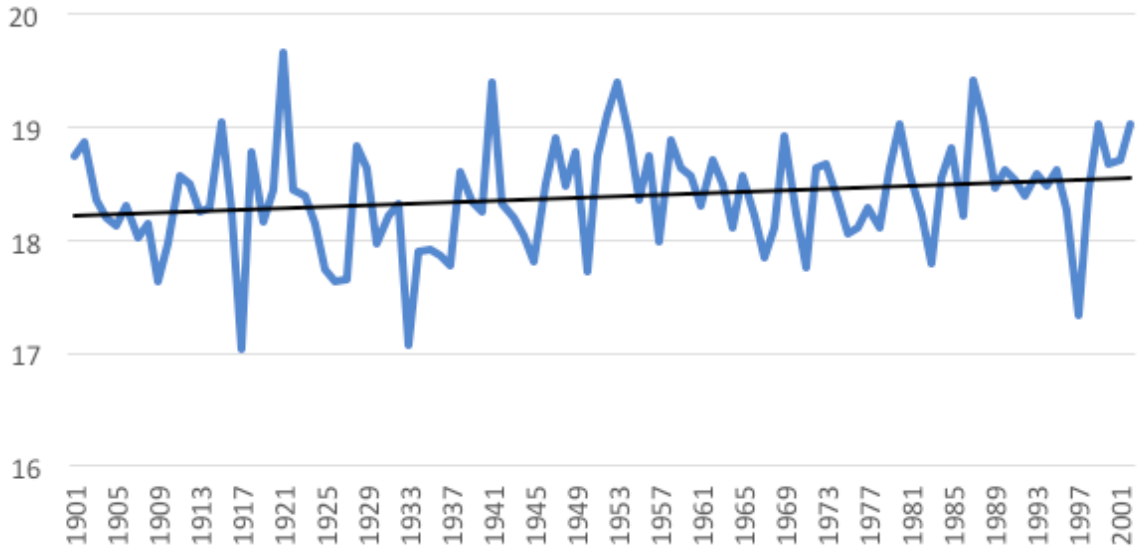
Source: NASA MODIS Aqua

Figure 4: Annual Mean Maximum Temperature, Delhi 1901 - 2002



Source: India Meteorological Department

Figure 5: Annual Mean Minimum Temperature, Delhi 1901 - 2002



Source: India Meteorological Department

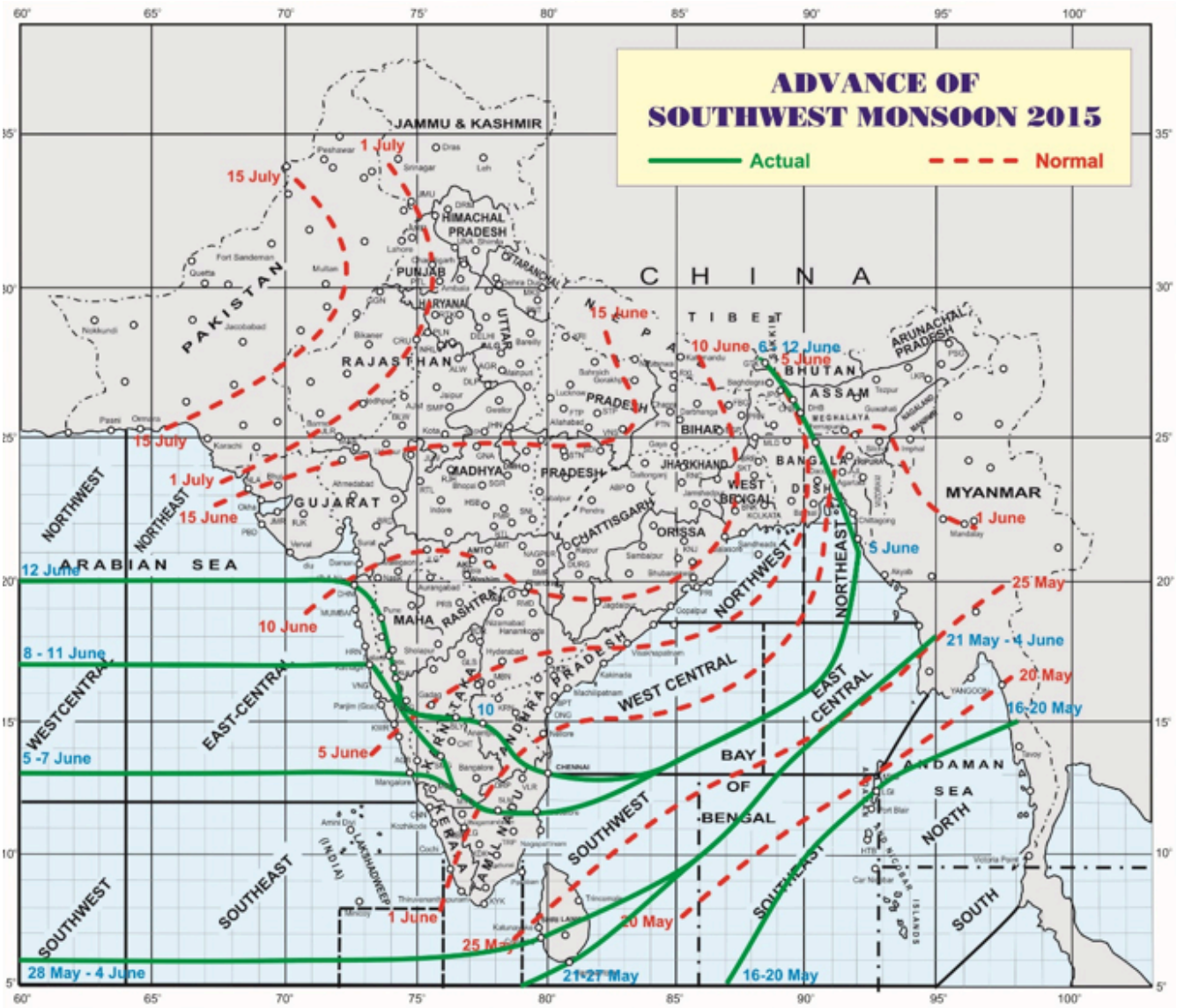
Box 1: Heat Wave in India in 2015

"Heat waves and droughts lack the spectacular and sudden violence of other hazards, such as tropical cyclones or flash floods but the consequences can be severe." –WMO and WHO (2015)

The direct impact of heat wave is death. In India, 2015 heat wave killed more than 2500 people[1] . State of Andhra Pradesh was the worst hit (1719 deaths), followed by Telangana (585 deaths) [2].

1 "India heatwave - The Telegraph." 2015. 30 Jun. 2015 <http://www.telegraph.co.uk/news/worldnews/asia/india/11645731/India-heat-wave-death-toll-passes-2500-as-victim-families-fight-for-compensation.html>
2 "Heatwave Toll Crosses 2300, Andhra Pradesh Reports Over ..." 2015. 6 Jul. 2015 <http://www.ndtv.com/india-news/heatwave-toll-crosses-2300-andhra-pradesh-reports-over-1700-deaths-767856>

Figure 6: India Meteorological Department Advance of Southwest Monsoon 2015 on 10 June 2015



Source: India Meteorological Department, 2015

Other affected are states of Odisha, Uttar Pradesh, Rajasthan and New Delhi. The delay in 2015 south west monsoon had resulted in longer span of heat wave.

Odisha state declared heat-wave along with 7 other disaster as State Specific Disasters for providing compensation to the affected families. Earlier the compensation was only given to Central Government approved disasters, which included frost and cold-wave, but not heat-wave7. Currently, Ahmedabad is the only city with Heat Action Plan in place. The Heat Action Plan was first published in 2013, in the wake of the 2010 heat wave, which killed 1344 people in the city of Ahmedabad (AMC, 2015). The Plan focuses on public awareness of precautions, early warning systems for extreme temperature alerts, action plan for city governments for coordination and information between various departments, capacity building for health professionals for identifying heat-wave related illness, first aid and treatment, mitigation and adaptation measures for reducing exposure of vulnerable population to heat waves[1].

1 "Odisha Declares 8 Disasters as State Specific Disasters ..." 2015. 6 Jul. 2015 <http://www.newindianexpress.com/states/odisha/Odisha-Declares-8-Disasters-as-State-Specific-Disasters/2015/06/03/article2846184.ece>

Institutional Vulnerability and Capacity in India: Despite sufficient evidence presented by the International Panel on Climate Change (Revi, Satterthwaite, Aragón-Durand, Corfee-Morlot, Kiunsi, Pelling, Roberts, et al., 2014) that there exists a strong correlation between changing climate and increasing frequencies and intensities of hazards, the level of preparedness for such events, particularly in developing countries like India, is still very low. With limited resources available to direct towards planning and resilience building, low income countries end up prioritising rehabilitation and rescue in the face of an event. Lack of data, access to technology and lack of technical and institutional capacities exacerbates this situation further. These changes and poor management makes them the locus of large and small scale disasters.

These issues are especially pronounced in cities as the municipalities often face paucity of financial and human resources. This is compounded by the fact that funds for disaster risk reduction are often controlled by the district and state level authorities. Lack of technical capacity of the staff is another challenge.

However, India has begun to develop its disaster risk management capabilities in recent years. Its response to two of the biggest disasters of the current decade — the Gujarat earthquake in 2005 and the Indian Ocean Tsunami in 2004 — were efficient and effective. Throughout this period, India has made some progress in shifting from reactive emergency response activities to being proactive and implementing disaster preparedness and risk reduction initiatives. India enacted the Central Disaster Management Act in 2005 and established the National Disaster Management Authority (NDMA) and State Disaster Management Authorities (SDMAs). District wise setups are also envisaged under the Act. NDMA has proactively formulated guidelines and procedures for dealing with specific calamities and is mandated to frame policies, plans, and guidelines for disaster risk management. In April 2007, the NDMA formulated "National Disaster Management Guidelines for Management of Earthquakes" in consultation with various stakeholders of central Ministries and Departments, scientific and technical institutions, academics, technocrats, architects and humanitarian organisations. In addition, the Risk Management Framework developed in India has served as a blue print and best practice model for other countries" (Comptroller And Auditor General Of India, 2012).

Please refer to Appendix 2 for more details on urban risks in the states of Orissa and Andhra Pradesh. Within these, Ganjam (district) and cities of Berhampur and Vishakapatnam are also discussed in great detail as they may be chosen for areas of primary field work.

Conclusion

While cities agglomerate risk, create risk and often serve as respondents to risk experienced elsewhere, they also offer transformational opportunity to address these risks building on the established institutional and financial capacities of the cities as well as their limited numbers as compared to rural locations. More risk can be mitigated by directing the research and other resources to the most vulnerable urban centres. Particularly interesting locations could be the second tier cities, which are in the process of developing and growing. If planned ahead with pre-emptive risk reduction practices, it could not just safeguard their future but could also provide for more enhanced lives for its future citizens.

B. Institutional and Regulatory Frameworks

Governance for resettlements and relocations in the context of extreme events in India

This section looks at the current policies, programmes and plans as well as the governance and institutional structures in India that deal with resettlements and relocations, particularly those in the context of risks and disasters.

National Policies and legal frameworks

India has a weak national policy and legal institutional framework to deal with internally displaced populations. The 1995 Draft National Rehabilitation and Resettlement Policy proposed by the Ministry of Rural Development was not meant to deal with most types of displacements, except those arising from land acquisition (Lama, 2000). The policy prioritised people displaced by dam projects and failed to address all other displacements, including other development related displacements. This has influenced the provisions for rehabilitation at large (Dhagamwar, De, & Verma, 2003).

The National Policy on Rehabilitation and Resettlement 2004 did not accommodate the government's own experience of resettlements and relocations in the past 50 years of dealing with development, disaster, and ethnicity-induced displacement. At best, the policy provided for 'resettlement' or 'relocation' but no attempts were made for 'rehabilitation'[1] The policy made no provisions for dealing with urbanisation and semi-urban cases, not even that arising out of projects such as railways, highways, mines, industrial townships etc.[2] The policy gives no guidelines of calculating the cost or damage to a family but arbitrarily fixes an amount which given the past experience would ultimately harm the interests of the affected family (M. Kumar, Das, & Banerjee, 2004). The policy did recognise 'avoidance of involuntary resettlement where feasible or minimising it by exploring all alternatives' and 'minimise displacement of persons and identify non-displacing or least displacing alternatives in consultation with the requiring body' but overall, had limited actions outlined to achieve the same. It also remained gender blind in many ways, including compensations provided only to the adult sons but not the adult daughters of the beneficiaries.

Some of these concerns continue to remain even in the 2007 Policy (MoRD, 2007) as well as the 2007 Bill. While they still remain limited to Project Affected Families post land acquisition for development projects, they fail to include land owners, vulnerable groups and the poorest from the decision making process. Though the purpose of the Policy is to "provide for the rehabilitation and resettlement" of affected persons, the Bill itself does not require that these persons be resettled. Moreover, it does not specify a clear timeframe for rehabilitation. There are no benefits for small intensity displacements, and no right to say 'no' to being displaced. A Review by the Asian Centre for Human Rights also condemned this policy for not providing adequate safeguards for the project affected families, including vulnerable groups like SC/STs and women. There are other discrepancies between the two. The National Rehabilitation Policy, 2007 requires residency for 3 years in the affected area for displacement benefits, whereas the Bill requires 5 years.

The latest Land Acquisition Rehabilitation and Resettlement Act, 2013 (LARR) based on the draft Bill 2011 was a means to replace the older Land Acquisition Act 1894. Its purpose was to provide fair rehabilitation of land owners and those directly affected by the loss of livelihoods with fair compensation of land. The 2011 draft amendment included persons residing in areas affected by natural calamities as a provision under the 'Urgency Clause' apart from the project affected people for residential purposes and the poor or landless. But it is noted that the abuse of the 'Urgency Clause' leads to question land acquisitions in such scenarios, or their pretext, and what goes beneath, 'in the guise of development' (Goswami, 2011). (Please refer to

Appendix for a list of other enactments pertaining to land acquisition, some which also override the LARR)

Coastal Regulation Zone (CRZ) Notification, 1991 is another legal instrument stipulating that no development should be allowed within 500 m of the High Tide Line (HTL) in order to maintain the beauty and ecological integrity of the nation's beaches (MoEF, 1991). This regulation restricts habitation and industrial uses in these regions and yet development pressures are giving rise to various kinds of conflicts (Purohit & Markus, 2013). The coastline extends over 7,500 km and hosts a quarter of the country's population, including fishermen and other communities, who engage in a whole range of livelihoods and occupations such as fisheries, salt production, horticulture and shrimp farming (Menon, Kapoor, Venkatram, Kohli, & Kaur, 2015). This would require more detailed analysis of planning instruments used at local level. This would require more detailed

1 Here 'rehabilitation' is used as is quoted by (Asif, 2000) and involves "replacing the lost economic assets, rebuilding the community systems that have been weakened by displacement, attending to the psycho-logical trauma of forced alienation from livelihood, transition to a new economy which is alien to those from a predominantly informal society and preparing them to encounter the new society as equals and not just suppliers of cheap raw materials and labour that they are in today's system of displacement without any transition"

2 It mentions, 'In case of projects relating to Railway Lines, Highways, Transmission Lines and laying pipelines wherein only a narrow stretch of land extending over several kilometres is being acquired, the Project Affected Families will be offered an ex-gratia amount of Rs. 10,000/- per family, and no other Resettlement & Rehabilitation benefits shall be available to them'.

analysis of planning instruments used at local levels to assess for resettlement provisions of those living in the CRZ.

National Disaster Management Authoity and their issued guidelines

The traumatic experiences from past disasters (particularly the Odisha super cyclone in 1999, the Gujarat earthquake in 2001, and the tsunami of 2004) have brought disaster management to the forefront of India's development agenda with the Disaster Management Act in 2005. The Ministry of Home Affairs (MHA) is the key nodal agency for coordinating hazard relief and mitigation activities, in conjunction with the National Disaster Management Authority (NDMA), the State Disaster Management Authorities (SDMAs), and the National Disaster Response Force (NDRF). Some states like Odisha and Gujarat are forerunners in this process while other states aren't as well prepared (Nambiar, 2015). Besides, the guidelines proposed by the NDMA are not mainstreamed into developmental planning instruments such as Master Plans and other financial guides. It has been noted early on at the inception itself that dissemination of warning and risk avoidance action, depend crucially on the inhabitants or people in the disaster-prone areas and that the Government apparatus needs to ensure that both planning as well as implementation are people-centric (Das, 2005).

National Programmes for Urban development

According to Jain et al 2015, National and state programmes such as the Jawaharlal Nehru National Urban Renewal Mission (JNNURM) and Rajiv Awaas Yojna (RAY) are project focussed and do not have a holistic risk reduction perspective. RAY, while making a decision for the Slum Redevelopment Model, does not consider in situ or relocation based on risk exposure of the sites (MoHUPA, 2012). While these developments are considered for better access to basic services, better access to finances, community participation and better livelihood opportunities, these are often recreating the risk these settlements had in the first place.

According to the RAY guidelines---*"untenable slums/vacant lands will be only those which are a 'safety' or 'health hazard' to the inhabitants or their neighbourhoods, even if redeveloped. Such untenable sites or portions will be earmarked for relocation to other redevelopment/vacant sites, preferably within the same zone."* But as low-income households build dwellings and settlements over time, in-situ upgradation is often rejected by public authorities arguing that the community is 'untenable' not because of any hazard but because they do not adhere to the minimum development control norms or service level benchmarks (Bhan, Anand, & Harish, 2014). The Ministry of Urban Affairs' 1999 Draft National Slum Policy[3] makes no reference at all to the vulnerability of slum dwellers to natural disaster.

The 100 Smart Cities, PM's Housing for All Scheme, and the 500 Cities Atal Mission for Rejuvenation and Urban Transformation (AMRUT) (some of which are meant to succeed the previous JNNURM) were launched on 25-26 June 2015 in New Delhi, by the Prime Minister. Appendix 2 documents the overview of all three but in brief, none of the three account for disaster risk planning and prospective risk reduction as they head out to make the future cities of India and provide additional housing to fill the gaps.

Over the years the policies on R&R have included more project affected family friendly measures. However in India, successful implementation of these measures is extremely rare because of negligence by the project proponents itself and external influences such as political interference, etc. (Kumari et al., 2008).

International development agencies and their policies

World Bank was the first development agency to adopt an explicit policy concerning involuntary resettlement in 1980, through a policy formulated by social scientists and grounded in social research (Sahaee, 2003). Dr Michael M Cernea, senior adviser to World Bank also observed:

"Our study found that impoverishment and brutal violation of basic human rights happen most frequently in programmes that are not subject to agreements on policy guidelines and [by] professionals outside review, supervision and evaluation. Such domestic projects account for overwhelming majority – at least 95 per cent – of the millions and millions of people forcibly displaced worldwide. This fact is irrefutable argument for adoption of national policies and legal framework for resettlement in all developing countries".

World Bank's (WB) policy on Involuntary Resettlement (IR)[4] (OP 4.12 December 2001) is meant for all borrowers undertaking loans for a project that may affect involuntary displacement. The details of the policy are elaborated in Appendix 3. It also focuses

3 Ministry of Urban Affairs and Employment (1999), Agenda 21, Report on Promoting Sustainable Human Settlement Development, 17th session of the UN Commission on Human Settlements, Nairobi, May 1999, Indian government publication, page 21.

4 According to World Bank, 'involuntary resettlement' refers to two distinct but related processes. Displacement is a process by which development projects cause people to lose land or other assets, or access to resources. This may result in physical dislocation, loss of income, or other adverse impacts. Resettlement or rehabilitation is a process by which those adversely affected are assisted in their efforts to improve, or at least to restore, their incomes and living standards.

on developmental project based resettlements. Post the evaluation of 56 WB funded projects that lead to resettlements, it recognised[1] serious flaws in the current policy with regards to the implementation and tracking of the inclusion of the policy in such developmental projects. This policy is currently (as of March 2015) undergoing revisions so as to strengthen the existing environmental and social framework apart from improving the monitoring mechanisms.

Asian Development Bank's Policy on Involuntary Resettlement was adopted in 1995 and became operational in January 1996. The Policy requires that involuntary resettlement be an integral part of project design, dealt with from the earliest stages of the project cycle. It is modelled along the lines of the World Bank's policy described above, and further includes building and strengthening developing member countries' capacities and national frameworks for resettlement (ADB, 1995). But this also remains specific to developmental projects that require resettlements and relocations.

Financial and Compensatory mechanisms

The current institutional mechanisms and authorities view the entire process of resettlement and rehabilitation as a means of welfare and relief rather than as people's right to resettle. Compensations for disaster hit people are always under ex-gratia (moral obligation) by the state or national government.

The Prime Minister's National Relief Fund was originally instituted in order to compensate people dislocated during the partition in 1947. It is now "utilised primarily to render immediate relief to families of those killed in natural calamities like floods, cyclones and earthquakes, etc. and to the victims of major accidents and riots. The fund consists entirely of public contributions and does not get any budgetary support." This fund can only be used as compensation, and not for pre-emptive action for risk reduction.

A National Disaster Response Fund (NDRF) is constituted under the National Disaster Management (NDM) Act, 2005. It is applied by the National Executive Committee (NEC) towards meeting the expenses for emergency response, relief and rehabilitation, in accordance with the guidelines laid down by the Central Government in consultation with the NDM Authority. While the Act also recommends a National Disaster Mitigation Fund (NDMF) exclusively for the purpose of mitigation, it is yet to be constituted and modalities of its sources and uses of funds need to be formulated (Jain et al., 2015).

While some states have recognised particular hazards (including cold waves) as priorities for relief, debates are still on about whether to include heat waves as one of those[2], despite the vast number of deaths that the country has seen over the years (please refer to the urban risks in India section for more details). The city of Ahmedabad had prepared a Heat Action Plan, and is referred to by many other cities post this recent calamity in the summer of 2015.

The question whether compensation prevents impoverishments in the future still remains unanswered (Cernea & Mathur, 2007).

An important part of resilience is how well urban societies are able to cope with the financial consequences of a disaster, which includes access to the requisite funding for relief, recovery and reconstruction. Risk transfer through insurance is one such means which can be an alternative strategy for risk impact mitigation other than R&R, yet, the gap between economic and insured losses is large because insurance penetration is relatively low. Apart from large scale infrastructure, households face additional extensive risks, and often don't recognise the need or benefits of insurance (Jain, 2014). Insurance has long been the topic of considerable policy interest and debate in India. However, concerns around its penetration and breadth have remained unaddressed for multiple reasons. In contrast with the USA and Europe, insured losses in developing countries are only about 5-10 per cent of the total disaster costs (IRDA, 2010). Scholars like Damon P. Coppola hold that this difference is due to reasons like low insurance awareness, unavailability of the right insurance cover, premiums that are beyond one's ability/willingness to pay and a lack of faith that the insurance company would pay at the time of the disaster (Coppola, 2006). Risk exposure faced by urban areas remains underexplored, largely due to the lack of detailed hazard information and poor data quality. This also poses a challenge for designing better insurance mechanisms and risk indices. Information and data can assist governments to conduct risk assessments; and help develop standards and procedures for enhancing resilience.

The Insurance and Regulatory Development Authority (IRDA) regulates and develops the insurance industry in India. It was constituted by an Act called Insurance Regulatory and Development Authority Act, 1999 and duly passed by the GoI. IRDA's regulatory and development role – defining the concept, approving products, strengthening intermediary networks etc. – seems progressive, and it has learnt from the recent incidences of disasters. There have been

1 http://www.theguardian.com/global-development-professionals-network/2015/mar/09/world-bank-president-jim-yong-kim-resettlement-land-rights

2 http://www.newindianexpress.com/states/odisha/Odisha-Declares-8-Disasters-as-State-Specific-Disasters/2015/06/03/article2846184.ece

post-earthquake efforts in Gujarat for publicising and obtaining insurance for socially weaker segments. There has also been a debate around the inclusion of an insurance premium in property taxes, which could be especially beneficial for small-scale and individual private owners. A proposal on establishing a National Insurance Fund was shot down because any insurance cover in which the premium is paid fully by the Centre and the states would not reduce the financial burden of the government in dealing with natural calamities, and expecting the vulnerable, usually also the poorest of the poor, to pay insurance premiums would not be viable (FCI, 2009). Moreover, it is generally economical to pool risks arising out of low frequency-high intensity disasters, but it is not economical to pool risks arising out of high frequency-low intensity disasters.

Select state and local policies and governance frameworks on Resettlement and Rehabilitation

There are some state level (Gujarat, Jharkhand, Mizoram, Orissa, etc.) policies for displaced persons during rehabilitation and resettlements, some including provisions for compensations. But most of these, just like their National counterparts, remain ignorant to disaster related resettlements and relocations.

The Orissa Resettlement and Rehabilitation Policy, 2006 aimed at avoiding displacement wherever possible. It also defines compensation mechanisms and amounts for the displaced families, but remains limited to being based on developmental project such as industrial, mining, irrigation or national parks, urban projects, or others and not disaster affected communities (Government of Orissa, 2006; Jena, 2006) While the National LARR Act is a step further from these policies, it is still devoid of any disaster related debates.

The Department of Disaster Management and Rehabilitation in Mizoram, like most other state level departments in India, is limited to response and relief and has very limited vision with respect to pre-emptive actions for rehabilitation and reconstruction. The following is as stated on their website:

"The Department of Relief and Rehabilitation Department (now renamed as the Disaster Management & Rehabilitation) is functioning only with few officers and staff at Directorate Level. Having no District offices all the Deputy Commissioner in the Districts are entrusted with the responsibility of immediate relief payments to the victims of Natural Calamities as per the Norms of CRF. The purview of the Department has been widened to the Pre-Disaster Management besides giving immediate relief and rehabilitation… comprising the following subjects (1) Natural Calamity/Drought and Flood Relief; (2) Gratuitous Relief; (3) Disaster Management: a. Pre-disaster management as pro-active strategy including preparedness, prevention and mitigation b. Post-disaster management as re-active strategy including relief, rehabilitation and reconstruction[3]."

Meanwhile, there are some other states where disaster related resettlement and rehabilitations are treated as priority. Gujarat Earthquake Rehabilitation and Reconstruction Policy (GSDMA, 2001a) attempted at a comprehensive 'framework of entitlement and a prospectus of development' for post 2001 earthquake recovery. Apart from housing needs, it includes in the scope to respond to the needs of livelihoods, infrastructure, social and community development, and all this through outlined means of community participation and institutional arrangements for programme implementation. It allowed for people to make a choice to relocate or to continue to stay in the same location as before (Clause 2.4.4). It was also in conjunction that the GSDM Policy (GSDMA, 2001b) and GSDM Authority were instituted to implement the Reconstruction and Rehabilitation Programme. This was soon followed by the GSDM Act (GSDMA, 2003), a predecessor of the National DM act of 2005.

The state of Gujarat offers much to learn from for other states that face natural hazards, except the nature of risk is somewhat different. Seismic risks are harder to predict using early warning systems and therefore leave limited options for risk reduction measures other than resettlement of exposed populations, whereas hydro-meteorological hazards can be predicted to some accuracy, and other measures of mitigation could be considered by the states and cities which offer less costs and more benefits.

3 http://dmr.mizoram.gov.in/ as on 13 June 2015

3. Literature review

This section provides an overview of what has been said on the subject of resettlement and relocations at the country level in the literature, as well as in the newspapers and popular media.

Methodology

The review process proceeded by looking for literature in academic journals and databases, as well as a Google search under the keywords of "relocation" "resettlement" coupled with the keywords, "post-disaster", "development", "India", "risk", "floods", "cyclones". Specific searches were done based on known cases such as the Delhi Metro project, Sardar Sarovar project, etc. Further reports produced by the World Bank and ADB were also reviewed. The search included articles in the time range 1950 to 2014. The article selection was done based on the following criteria 1) climate related risks, disasters and development induced relocation and resettlement cases, 2) issues and challenges of implementation of relocation and resettlement projects, and 3) problems faced by the affected persons post relocation.

In addition, 70 news articles from over 26 national and regional publications were reviewed for recent and local information on relocation and resettlement issues. The news articles helped understand the scale and type of displacements that occurred in the past decade. The news article search was carried out using 'Google News' advanced search engine and 'India Environment Portal' webpage. The keywords for the article searches are 'relocation', 'resettlement', 'rehabilitation', 'reconstruction', 'displacement' during the last decade (from ' January 01, 2005' to 'May 31, 2015').

Articles related to 'violence and displacement' and other issues involved in post resettlement conditions such as school dropout rates, violence, etc. are out of scope of this review, however these issues must be considered for future studies.

Overview

Peer-reviewed journal articles are the primary source of information for identifying existing knowledge gaps in the literature. Some working papers and reports are included in the review to bring more practice perspectives into the research. From 63 selected articles, 34 are in the context of climate or risk related resettlements, and most literature that is available is on relocations or evictions in the development context. Overall, 55 pieces were shortlisted for this review. Among them, about 40 are peer- reviewed journal articles, and the rest are reports and working papers.

- Of the 55 articles, 26 articles were published after 2010, 24 were published between 2000- 2010, and 5 articles before 2000.
- 26 out of 55 focussed on the urban while the rest covered issues across other regions.
- 44 out of 55 were case based studies and the rest explain theoretical frameworks.
- Social and economic issues due to relocation and resettlement were discussed in 32 articles, 7 articles discussed issues related to health problems and 10 articles mentioned aspects related to gender.
- 34 articles discussed planning and other technical aspects related to relocation sites.
- 33 articles discussed the provision of basic services or issues related to implementation of such projects.

Lessons Learnt

The literature reviewed focused on the displacement induced by developmental activities and climate related risks and disasters. There's much work done by Hari Mohan Mathur and Michael M. Cernea on the subject of

resettlement and relocations in the development context, including that on socio-economic impacts, policy gaps, and compensations, amongst others (Cernea & Mathur, 2007; Mathur, 1995a, 1995b, 2006a, 2006b, 2006c; Mathur & Marsden, 1998).

Similar parallels of work in the disaster risk or climate risk context are in nascent stages. Much of the literature reviewed was related to climate related risks and disasters focused on floods in urban areas. Loss of land due to erosion, and losses to frequent floods were identified to be the main reasons for displacement (Chandra, 2003; Cronin & Guthrie, 2011; S. Gupta, Javed, & Datt, 2003; Iqbal, 2010; Prasad, 2005).In the urban context, relocation is resulting in change of land-use in peri-urban areas. As the land can be acquired cheaply and also that they are mostly owned by government, most of the relocation sites are located on the peripheries of the city (Adaikalam, 2010; Banda & Sheikh, 2014; Desai, 2012; Dupont, 2008; Haritas, 2013; N. Mathur, 2012; Patel & Mandhyan, 2014; Patel, Sliuzas, & Mathur, 2015; Sheikh, Banda, & Mandelkern, 2014) but this approach is leading to failure of most of the relocation projects as the livelihoods, social networks, access to services and markets is destroyed. Providing infrastructure to such remote areas can also be expensive.

Without proper planning and implementation, the affected families in these relocation sites can have the same set of risks and vulnerabilities that existed before (Sheikh et al., 2014). In some cases, locals oppose evicted families from relocating in their villages for various reasons of caste, religion, social status etc. resulting in conflicts which force them to move back to their original sites (Adaikalam, 2010). Land tenure or entitlement is an incentive offered for families to relocate. Families that can prove their identity and proof of residence in the city for certain years are considered ‘eligible’ for such incentives (Desai, 2012; Modi, 2009c; Rawat, Bhushan, & Sujata, 2011; Sheikh et al., 2014) but those families that are not eligible or not rehabilitated properly or families from unplanned and poorly implemented evictions move back to their original or unsafe locations resulting in the creation of new squatters or densification of existing squatters (Dupont, 2008). Lack of awareness on legal terms is also important factors. In most cases the land in these relocation sites is only allotted or leased to the affected families but rights for transactions are not allowed. Unaware of these terms, original beneficiaries sell their properties for profits which is illegal.

Any form of relocation traumatises affected families and also affect their relationship with society. The relocation transforms self-employed and self-organized communities to dependents on charities and government welfare schemes (N. Mathur, 2012). All the case studies related to relocations in the urban context mention the use of government schemes such as JNNURM, BSUP for housing construction but none of them mention implementation of projects for provision of basic services for water, sanitation etc. As discussed above, the success of the relocation project depends on the efficiency of the quality and implementation of the basic services and infrastructure provided. As discussed by Cronin and Guthrie (2011),a community led relocation project in Pune proved to be successful in reducing flood risks, but resulted in poorer quality of lives. A study by Patel and Mandhyan (2014) of off-site relocations and on site upgradation found that the on-site upgradation was more successful.

Unplanned sudden evictions and demolition of squatters, ambiguity on the number of project affected persons, lack of transparency and clarity on relocation and rehabilitation packages and processes were of some of the other issues highlighted in the literature(Adaikalam, 2010; Banda & Sheikh, 2014; Desai, 2012; Lama, 2000; Modi, 2009a, 2009b; Ghazala Shahabuddin, Ravi Kumar, & Manish Shrivastava, 2006; van Eerd, 2008). It was highlighted that because of the issues with lack of documentation and clarity on the relocation and rehabilitation projects, it was difficult for the affected families to approach the judiciary and in some cases, they were denied their rights. It was pointed in a few cases that provision of basic services in these relocation sites was the main agenda during elections and that was the time for families to get their demands fulfilled in exchange for their votes. The role of governance and other actors like NGOs and CBOs are explored in a few cases. The relation of the projected affected persons with such actors have serious impacts on outcomes.

The scale of relocation in rural is larger compared to those in urban areas. Dam induced displacement, relocation from protected forest areas and natural reserves, mining related, SEZ and industries were found to be the reasons for displacement(Bank, 2000b; Karanth, 2007; Lasgorceix & Kothari, 2009b; Lok Sabha Secretariat, 2013; Mariotti, 2012; Rawat et al., 2011; G. Shahabuddin, Ravi Kumar, & M. Shrivastava, 2006). Land for land compensation was the most preferred form of compensation in the rural context. The quality of land, and the level of resources available in the relocation sites is an important factor in such a context. Rehabilitation packages without attention to livelihoods in these areas where most of the families are dependent on agriculture and forest produce, will have long-term impact, also to the following generations. Cash transactions are the least preferred as the money is found to be spent on the daily expenses instead of investment and livelihood generation.

Many of the articles have proposed recommendations and policy interventions for relocation projects as follows:

- A more transparent and participatory approach is required in the relocation process.
- Special focus should be given to the marginalised, and the community should be involved in decision making about what kind of houses they require, in the creation of livelihoods and services in relocation sites etc.
- There should also be awareness among the communities in the kind of impacts they face in the new sites.
- The relocation should be complete and ready before the relocation physically takes place.
- The role of the government and other organisations should end immediately after the relocation, but should take care of the long term rehabilitation to avert impoverishment in the relocation sites.
- There should be community associations formed and supported for operation and maintenance of the relocation sites.

Gaps

Some of the gaps found in the reviewed literature were as follows:

There isn't one database for past, on-going and planned relocations including scale, reasons, impacts etc.

- There isn't one national database for past, on-going and planned relocations including scale, reasons, impacts etc. and also best practices for projects for governments and organisations to learn and implement in their context.
- Relocation has been attempted in many cities across India; however either most of the projects did not involve long term follow up of the displaced people or if they did, there is no information on these issues found from the literature.
- The reviewed articles gives us an idea about the number of people/communities that were displaced, reasons for displacement, but there very little information on the experiences of displaced families.
- None of the studies have pointed out if there were any environmental impact assessments that have been carried out to understand the impact of relocation sites on the environment.
- None of the literature reported on disaster-led displacements.
- Only four articles (Balaji & Rout, 2004; E.G.Thukral, 1996; Haritas, 2013; Jason, 2004) discussed gender related issues.
- There is limited understanding on the types of housing provided to people post displacement, i.e. whether they are tenements or individual houses or whether they were contract driven or owner driven.
- None of the articles from the selected literature focussed on insurance, impacts of displacement on the lives of children and their education.

For a more detailed review of developmental, CC and DRR related literature as well newspaper articles, please refer to Appendix 7, Appendix 8 and Appendix 9.

4. Case studies

Select Case Studies of Resettlement and Relocations in Urban areas

This section illustrates some examples of resettlements, relocations, rehabilitations and evictions that have taken place in the South Asian context. It is by no means exhaustive of the types, but just gives a sense of the typology and nature of risk management in cities.

Methodology: A typology was developed in conjunction with cases from two other geographies (Africa and Latin America) and was used to describe the nature of risk management at the project level, and differentiate between the old and new locations, which is often observed to impact the implementation outcomes. The detailed typology tables used for the cases is presented in Appendix 10.

Some of the key findings regarding resettlement and relocation case studies in India are as follows:

- While there are many instances of institutionally driven resettlements and relocations that have taken place due to developmental objectives, most of those in the risk reduction context are still 'voluntary' or due to the lack of an alternative on the part of the people.
- There is a dominance of post-impact R&R rather than pre-emptive. Those that are pre-emptive are at most using the pretext of risk reduction, as the land thereafter is being used for other purposes, or the welfare of people is not taken care of.
- Even on sites where affected people are moved, others 'not as affected' are left behind and not made part of the resettlement projects. This additionally illustrates the lack of pre-emptive nature of action.
- The prevalence of R&R is still in cases of extreme events, including landslides where land has seized to exist.
- Movements of people have happened in all scales – small, medium and large.
- Lack of legislation leads to irregular compensations and provisions of other sources of employment, social services, etc.
- There is much more evidence on experience in rural context of R&R regarding holistic development of the people being moved out of harms way – but not as much same in urban.
- When outcomes of benefits are at city-level, it's observed that costs are born by a few and the redistribution is inequitable.
- R&R older than 10-15 years also seems to show more adaptation on the part of the people.
- Few instances of community participation in the implementation and long term management, but almost none in the planning phases.

4.1 Re-creating hazard risk: Case of Krishna Nagar

Rajiv Awaas Yojna Pilot Project for Krishna Nagar Slum in Shimla, Himachal Pradesh

Krishna Nagar is the largest conglomeration of slum dwellers in the city of Shimla. It has more than 5000 people living here as part of 1213 households, constituting about 40 per cent of the total slum

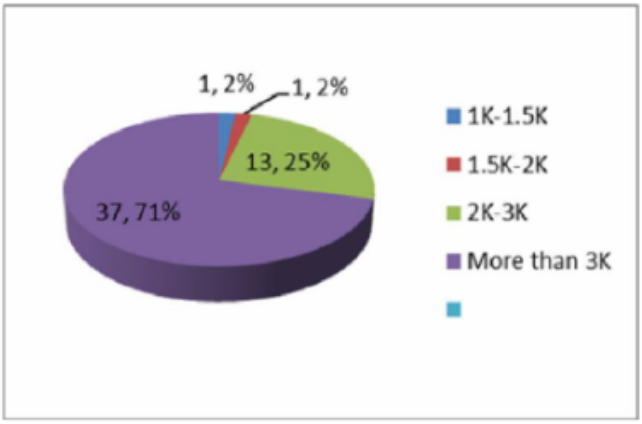
population of Shimla. It is now around 90 years old and is scattered on a 4 sq. km. area, which is located on what has been identified as 'non-developable' under the city Master Plan. The houses constructed are untenable because of the poor quality of construction and the land's steep slope with high propensity for sliding. (Urban population of the city: 169758; Total slum population of the city: 11574) Despite its proximity to the centre of the city, it has very low land value owing to its high risk exposure to landslides. Yet, people came from different states of the country and settled here with most of them working as construction labourers in the city. The people who 'chose' to live here were likely the ones who otherwise could not afford to live in any other part of the city.

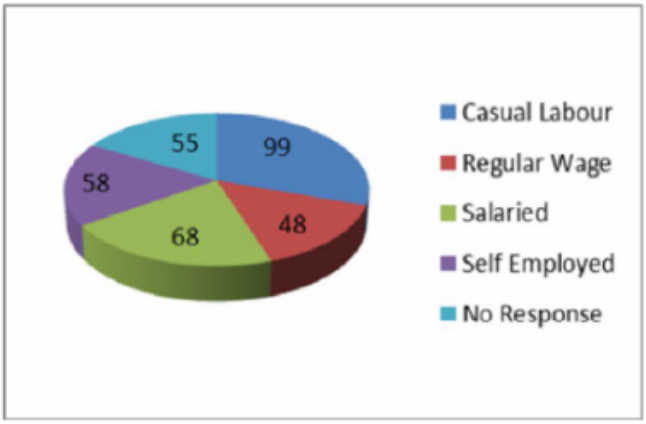
Detailed socio-economic and livelihoods surveys have been conducted by the city. Municipal water supply is available in vicinity. According to the detailed project report, “The entire waste [from] the Mall road and the Lower Bazar areas flows in the nalahs (drains), which is open. During the rainy season, the water level is so high that the nalahs flowing in this ward get choked and the dirty water enters into the houses of the people. The nalah was constructed in the British time after [which] no repair has been done. The people from lower income groups have constructed katchha (impermanent) houses on the [sides] of the nalahs and with the passage of time they have developed cracks and is considered not safe to live in. These houses have been declared unsafe by the Government but due to poor financial conditions, [people] cannot move to safer places but continue living in these katchha houses. The houses constructed by the people are either on forest land or are untenable because they are situated on sinking zone/hazardous area. The primary school building located in this area was constructed far back in the year 1960 and with the passage of time it developed cracks making it unsafe for the students to study and had to be shifted to Government Senior Secondary School Lalpani. No proper education is being given to the children and the parents cannot send their children to other school because they are not financially strong. People living in the areas are finding it difficult to live as the sewerage is open and there is no proper sanitation. This problem arises more in the rainy season when the sewerage gets blocked due to which many health problems arise.”

Image 1: Krishna Nagar Slum after the 2013 landslide

Source: Garima Jain

Figure 7: Case of Krishna Nagar— Monthly income and employment status of people living in the identified slum age 1: Krishna Nagar Slum after the 2013 landslide





Source: RAY Detail project report

These houses have been declared unsafe by the government – but due to their poor financial condition, these people are unable to move to safer places and continue living here. The fate of these houses is not certain as various courts have already given direction to the Municipal Corporation of Shimla to demolish these 'unauthorised' houses. The Municipal Corporation as well as the state government has filed an affidavit before the court to review this decision in light of Rajiv Awaas Yojna (RAY), which is the Government of India's Ministry of Housing and Urban Poverty Alleviation (MoHUPA) programme that attempts to help slum dwellers gain appropriate housing and address the processes by which slums are created and reproduced.

After a recent landslide in June 2013, some of these houses were washed away. The residents were temporarily moved to tents at another location, but soon after were moved back to the original location. Under the RAY, there is a plan to rebuild and rehabilitate a section of this neighbourhood (226 households), 'in situ', and the question of exposure is still not addressed. Houses not taken up in the project are those which are found to be structurally sound with a safe foundation, reinforced cement concrete roof and adequate natural lighting and ventilation with individual toilet and individual tap water supply connection. Slums covered under the scheme shall be de-notified after implementation of all development works and construction of new houses. The State has agreed to confer only lease rights (99 years on lease) to the slum dwellers. Allotment of dwelling unit shall be made in the name of the wife or in the joint name of wife and husband of the identified beneficiary. Land, where new development is planned, is currently in possession of the Implementing Agency or the Shimla Municipal Corporation.

Pilot Project for Krishna Nagar Slum amounting to Rs 3399.65 lacs has been approved by the Central Sanctioning & Monitoring Committee in its 8th Meeting held on 28th Feb, 2013.

Housing: Total Dwelling Units 300 Beneficiary Housing 224 Rental Housing 76

Social Infrastructure: Community Centre, Children Park. A clinic has been proposed in the Community Centre. A drug rehabilitation centre has also been proposed in the Community Centre along with a 6-bed ward for patients, and a chemist shop. New schools are not proposed as they exist within 0.5 km from the site.

Utility/Physical Infrastructure: Water supply, sewerage, storm water drain, roads and pavements, external electrification, solid waste management, fencing/railing, retaining wall/ cutting & levelling, rain water harvesting and fire-fighting systems have been proposed.

Table 1: Case of Krishna Nagar - Prevailing Land Tenure status

S.No	Status	No.
1	Rented	285
2	Public land enchroached	633
3	Private land enchroached	36
4	Possession certificate	53
5	Patta	79
6	No response	24
	Total	**1110**

Source: RAY Detailed Project Report

Table 2: Case of Krishna Nagar - Project Finances

S.No	Status	No.
1	Project Cost (Rs in lacs)	3399.65
2	Central Share (Rs. in lacs)	2762.21
3	State Share	439.39
4	ULB Share	50.17
5	Beneficiary contribution per dwelling unit	0.66

S.No	Status	No.
6	Dwelling Unit Cost	6.60
7	Physical Infrastructure cost per dwelling unit	2.84
8	Social Infrastructure Cost per DU	0.68
Source: RAY Detailed Project Report		

The beneficiary contribution proposed is a minimum of 12 per cent (Gen Category)/10 per cent (SC/ST/BC/OBC, PH & other weaker sections) of dwelling unit cost. In case of higher contribution, it is certified that the EMI burden (bank/soft loan) does not exceed 25 per cent of the monthly income of the beneficiary household. Other project plans include provisions for solar water heating and rain water harvesting

Table 3: Summary of typology for Krishna Nagar Case in Shimla, Himachal Pradesh, India

A.	Physical Characterisitcs	
A1	Type of Project	In situ rebuilding / up gradation, partly relocation
A2	Type of Risk Management	Corrective / post impact
A3	Nature of Planning	Planned with social and economic risk measures but without hazard risk measures for landslides
A4	Level of planned participation	People consulted during planning process and implementation, as well as included in the long-term management post completion
A5	Motivation/Nature of Hazard	Post extreme climatic event, loss of land post an extreme event, as well as developmental to reduce low-intensity high-frequency events
A6	Level of attribution of CC to hazard frequency and intensity	Low
A7	Primary Decision Maker In case of a combination, please describe in the note	Government
A8	Distance between old and new locations	0 to 1 km
A9	Time between decision and implementation	More than 2 years
A10	Time taken to complete the project	Yet to start on ground
A11	Age of the project (time since completion)	Yet to start
A12	Size of the Project	Medium (226 HH)
A13	Nature of dividing the population	Part of the HH moved together to one place

A14	Financing Sources	Govt. funded along with contribution of funds from different sources including the beneficiaries
B	**Original Settlement level characteristics**	
B1	Type of land tenancy	Right to occupy
B2	Age of settlement (before the move)	5-10 years
B3	Size of the settlement	No. of HH being moved is medium (226 HH), while the overall size of the original settlement is large (about 1213 HH)
B4	Most dominant nature of livelihood options for HH	Most work as labourers or informal workers and travel 0-1km for work
B5	Level of Hazard Risk Exposure	High
B6	Type of Urban form	Cluster housing, but in parts some also have another floor added to their ground floor structures
B7	Levels of social infrastructure distinguished by provider	Poor – self provisions
B8	Strength of social networking (language, caste, livelihoods, regional, etc.)	Medium
B9	Most dominant form of family structures	Mixed – nuclear and joint families but primarily with male family heads
B10	Use given to abandoned site	Planned housing (eventually as an extension of the same programme)
C	**New settlement level characteristics**	
C1	Level of hazard exposure	High
C2	Type of land tenancy	Right to occupy
C3	Type of new Urban form	Similar but not exactly the same
C4	Level of planning and provisions (Good, medium, minimum, none)	Houses are designed with sufficient structural measures. Provision of road access, which would provide public transport. Water and sanitation and electricity to be provided by the city. Schools are located nearby, so no new proposed. A drug rehabilitation centre proposed in the area. No separate market places designed as part of planning.

Source: RAY Detailed Project Report

4.2 Risk to the City: Case of Bellandur Lake evictions

Case of evictions for environmental rejuvenation in Bangalore

With growing urbanisation levels, Bangalore has noticed a severe decrease in the number of its lakes (Sudhira & Ramachandra, 2007; Sudhira, Ramachandra, & Subrahmanya, 2007) in the last few decades. At the same time, it is also facing a contrary battle with urban flooding (Ramachandra & Mujumdar, 2009) leading to massive losses, primarily attributed to the same patterns of urbanisation, land-use, city and population growth, wetland degeneration and waste disposal (A. K. Gupta & Nair, 2011). This unplanned rapid urbanisation particularly post 2000, witnessed large scale conversion of watershed areas like Bellandur to residential and commercial layouts, which has altered the hydrological regime at large of the city (Vinay & Lone, 2013).

The Supreme Court in Civil appeal number 1132/2011 at SLP (C) 3109/2011 on 28 January 2011 expressed concern regarding encroachment of common property resources, more particularly lakes, and directed the state governments for removal of encroachments on all community lands. As per Karnataka Public Premises Act, 1974 and the Karnataka Land Revenue Act, 1964, these 'illegal encroachments' needed to be evicted to reclaim the city's ecological balance and address the growing water shortages. The High Court had issued an order in August 2014 to free the lake of all encroachments disposing off a PIL filed by People's Campaign for the Right to Water. Tahsildar Bengaluru (South) had, then, conducted a survey and submitted a report to the High Court showing 135 encroachments in the lake area. According to that, 34 acres of the 84 acres of the lake area had been encroached by private layouts and other establishments. According to newspaper reports, the development included a private dental college, a temple and 68 residential buildings in survey number five of Sarakki village, 30 commercial complexes, 42 residential buildings, six temples in survey number five of Puttenahalli village and around 40 residential buildings in survey number seven of Jaraganahalli village. A part of the Bruhat Bangalore Mahanagara Palike (BBMP) built road also encroached on the lake area and it would be cleared.

This encroached land across these three urban villages is claimed to be worth around Rs 2,000 crore [about 20 mil GBP] in the open market. It was with these motivations that the operation to evict these areas started on 16 April, 2015.

But the residents of these villages have claimed to have bought land from previous inhabitants, and therefore do not consider themselves to be 'encroachers'. Meanwhile, the residents claim to have been paying all taxes required and the Bangalore Development Authority and BBMP have also seemed to have taken betterment charges from [some of] the residents in the year 1998-99, which should ideally bring these residences under the A-Khata [local term for legal tenure]. People have lived here for over a decade, and got a 1-month notice before the eviction drive started. Some relevant questions most of the residents seem to be raising include—What was the government doing when they were constructing the houses and started living here? Why were no objections raised when they registered their properties? Why was tax collected by the BBMP? —amongst many others.

Some of the layouts in similar eviction drives are in fact BDA layouts (such as the Banasawadi BDA Layout). Questions being raised are: Why was the city allowed to make layouts in seemingly lake beds then, and why should people pay for their mistakes?

In light of these facts, the questions that remain unanswered are:

- What does the city do in the face of large unplanned development that is creating future risks for its residents and how can it plan better?
- What do the residents who have lived on the land and have used it as an integral part of their resources do, once this risk is realised at a later stage? How can they be best compensated?
- What are the costs and benefits of letting people stay or move? Who pays and who gets the benefits? Are there alternatives for risk reduction in such scenarios that do not involve relocation costs?

Table 4: Summary typology for the Bellandur Evictions case in Bangalore, Karnataka, India		
A.	**Physical Characterisitcs**	
A1	Type of Project	Evictions
A2	Type of Risk Management	Prospective / pre-emptive
A3	Nature of Planning	No new location provided
A4	Level of planned participation	People are vehemently opposed
A5	Motivation/Nature of Hazard	Low-intensity High Frequency events – Water scarcity in the city
A6	Level of attribution of CC to hazard frequency and intensity	High
A7	Primary Decision Maker	Government
A8	Distance between old and new locations	No new location provided. People are moving where they have alternatives, yet many living in temporary shelters close to the original lands
A9	Time between decision and implementation	Less than a year
A10	Time taken to complete the project	Less than a year
A11	Age of the project (time since completion)	A few months from early 2015
A12	Size of the Project	Large (including the number of HH in the overall evictions drive at the city level)
A13	Nature of dividing the population	Part of HH moved and scattered in different locations
A14	Financing Sources	
B	**Original Settlement level characteristics**	
B1	Type of land tenancy	Owned
B2	Age of settlement (before the move)	More than 10 years
B3	Size of the settlement	Small (1-100 HH)
B4	Most dominant nature of livelihood options for HH	Mixed nature of work, but most people travelled within the city to work
B5	Level of Hazard Risk Exposure	High
B6	Type of Urban form	Multi-storey Row Housing
B7	Levels of social infrastructure distinguished by provider	Good – provided by the government

B8	Strength of social networking	Medium
B9	Most dominant form of family structures	Nuclear family with male family head
B10	Use given to abandoned site	Environmental land use (the city will use this land to rejuvenate the lakes)
C	**New settlement level characteristics**	
C1	Level of hazard exposure	No new settlement location planned as part of the evictions
C2	Type of land tenancy	
C3	Type of new Urban form	
C4	Level of planning and provisions (Good, medium, minimum, none)	

Source: Based on information from experts.

4.3 Adaptation and re-growth: Case of Arilova in Vishakapatnam

As part of the Vishakhapatnam Slum Improvement Programme, Vishakhapatnam Municipal Corporation (VMC), supported by the Overseas Development Institute (ODI), moved settlements from various encroached lands in the city to the outskirts of Arilova located to the north of Kailasagiri hills near Mudasarlova reservoir. The project period was between 1988 and1997 and nearly 15,000 families were relocated. As part of this project, all the relocated families were allotted land titles and VMC's role was to provide basic infrastructure, whereas beneficiaries were responsible for the construction of the houses. The basic infrastructure included water supply and sewerage network, electricity, internal roads, community health centre, work sheds and market places. Some families moved back to the city and started living in the informal settlements due to lack of access to the city for daily work, lack access to schools and hospitals.

With the expansion of VMC limits and the construction of National Highway-5, Arilova attracted lot of development in the last two decades. density settlement with multi-storeyed structures.

With provision of basic services and increasing land prices, families started to return to their land or sold at higher prices for profits. As of 2015, Arilova is one of the major centres in the city and transformed into a high

As told by Mr. Pathrudu, who worked on project in the 90's 'Arilova resettlement project is one of the successful resettlement projects implemented by the government. Even though there was a hue and cry initially, people's perceptions have changed over the last two decades and they are satisfied with their present living standards. It takes time for people to realize the impacts of relocation on their lives. The project was successful because people were given individual plots as there was plenty of land available. However in present conditions with limited availability of land, implementation of such projects is very difficult. People were given certificates for residence and not ownership. But this has not stopped them from selling.'

Image 2: Landsat Image of Arilova site at the time of planning (1988) and now (in 2015). Each pixel represents 30m x 30 m area on ground

Source: Landsat 5

Source: Landsat 8

Table 5: Summary table of typology for the Arilova Case		
A.	**Project level Characterisitcs**	
A1	Type of Project	Resettlement
A2	Type of Risk Management	Developmental along with some pretext of flood and other risk reduction
A3	Nature of Planning	Planned without risk measures
A4	Level of planned participation	Forced relocation of communities before the implementation of infrastructure services and amenities.
A5	Motivation/Nature of Hazard	Development
A6	Level of attribution of CC to hazard frequency and intensity	Not considered
A7	Primary Decision Maker	Combination of local government and international funding agencies.
A8	Distance between old and new locations	More than 5 km to outskirts of the city.
A9	Time between decision and implementation	More than 2 years
A10	Time taken to complete the project	More than 5 years (1988 – 1995)
A11	Age of the project (time since completion)	Nearly 20 years (1995). Initially people left the site and moved back to the city due to lack of services like transport, water, electricity. However with development in the city, project location got included into city limits and is completely developed as of 2015.
A12	Size of the Project	Large (nearly 15,000 families)
A13	Nature of dividing the population	Communities on encroached lands from various parts of the city moved to one place
A14	Financing Sources	Contribution of funds from local government, ODI for basic services and beneficiaries responsible for construction of houses.
Note: The information is based on several interviews with officials, including those who worked on this project. Other secondary resources of information are unavailable.		

4.4 Adaptation and change in rural context: Case of Marathwada Resettlements

Post-Earthquake Rural Resettlements in Marathwada, Maharashtra, India

The 1993 Marathwada Earthquake and Post-Earthquake Reconstruction Process: A devastating earthquake of magnitude 6.3 on the Richter scale hit Latur and Osmanabad districts of Marathwada region in Maharashtra state of India in the early hours of 30 September 1993. The earthquake affected about 190,000 houses distributed in over 2,500 villages; 52 villages counting a total of 28,000 houses were completely destroyed.

The government evolved a rather comprehensive rehabilitation programme called Maharashtra Earthquake Emergency Rehabilitation Programme (MEERP) – a USD 326 million worth aid programme that targeted over 2,64,500 households in 13 agricultural districts. This was the first of its kind in India, both in terms of the numbers of shelters reconstructed and the sheer size of the government's investment. It was funded by a soft loan from the World Bank, and conceived and executed with the support of the World Bank, UNDP, several bilateral donor agencies and NGOs. The programme had five main components, namely housing, infrastructure development, economic rehabilitation, social rehabilitation, community rehabilitation and technical assistance, training and equipment. However, the programme mainly focused on the housing component, under which the construction or reconstruction of permanent housing was financed.

For housing rehabilitation the affected villages were divided into three damage categories: relocation and full reconstruction was foreseen for the 52 most heavily damaged 'category A' villages; reconstruction in situ through financial assistance for 'category B' villages; repair and seismic retrofitting of about 190,000 damaged houses for 'category C' villages. The villages to be relocated were those where more than 70 per cent of the houses were damaged, where a certain number of deaths were reported, and where the ground had black cotton soil up to a depth of 2 meters.

Entitlements to housing assistance were divided into three categories: landless and marginal landholders who had land up to 1 hectare would be given houses of 250 square feet; households owning between one and seven hectares of land would get houses of 400 square feet; and households owning more than 7 hectares of land would get houses of 750 square feet. New standards were set for housing construction that advocated the use of earthquake-resistant technology. The government managed to arrange the participation of a large number of non-governmental agencies in the programme, including commercial firms, international donor agencies, religious groups, and political parties, among others. These agencies came up with a variety of building technologies to demonstrate seismic resistance. The entire reconstruction activity was primarily contractor-driven where contractors and labour were hired by donor agencies mostly coming from outside the region to undertake reconstruction.

The planning of relocated settlements was also taken up by various donor and government agencies and consequently many different layouts and designs were explored of which the most common was a grid iron pattern. Traditional settlements were characterised by narrow streets, a hierarchy of public and private open spaces used for religious as well as other activities, and clusters of housing with distinct typologies were determined by traditional occupation patterns. However, in most of the cases, what was designed for them was a complete 'city-like' plan with wide streets forming a grid pattern, and row housing. Only in some rare instances was cluster-type planning done supposedly inspired by the traditional village layout.

The new designs didn't include spaces for several traditional activities, especially those for people from service sector like artisans. Moreover, the new villages' area was much larger (sometimes up to ten times) than the old ones'. This meant expensive infrastructure, which was again 'provided' by the Government. The lack of village committees' financial resources to maintain this huge infrastructure in the future was not thought through. Even though the community participation was a very elaborate process, at times the community input was not correctly interpreted.

Transformations and Adaptation Strategies in Relocated Settlements after 18 Years: Given the abundant space available, the reconstructed villages have transformed over the span of 18 years (1993-2011) according to the growing population and villagers' needs. It is seen that the green areas in the layout of reconstructed villages (such as Lamjhana) remain mostly unused and are in some instances used by villagers for open defecation. These spaces were created with an urban vision of having open green spaces for social interactions. However rural activities and lifestyle did not require them. On the contrary, people have added social meaning to some open spaces that originally had no specific purpose. For example, in Malkondji village, the well-shaded road next to the main chowk (village centre) became the place for the elderly to gather and relax under the shades of the Gulmohur trees. Gubbal village has become culturally and socially richer due to the addition of a big mosque and two temples in open areas. The scarce development of some community spaces is mostly because of the weak interaction between social groups, while certain usages that were

not foreseen at the time of design evolved later as the villagers tried to adapt given spaces to their socio-cultural needs.

In some relocated villages, public buildings accommodating new spaces like a gymnasium, library and centres, were constructed according to the original plan. However, except for the Women's Centre, most of these buildings are now either locked up or not being used as the design intended. As a result, these are deteriorating due to lack of maintenance. Nevertheless, buildings like the Women's Centre actually contributed towards strengthening the cooperation among women by providing a common space where they could meet and interact. This space is also used as an adult education centre where social workers impart basic education and inform the villagers about recent government schemes regarding subsidies and public funding for improved agriculture and irrigation methods. Over a period of ten years from the time of reconstruction, new buildings have been constructed by the villagers to cater to their special needs; like in the case of the grain storage in Malkondji village. Other public buildings which address local needs and therefore were successfully used in the villages are the Panchayat building, child day care and primary schools.

In many relocated villages, temples and mosques have been added through joint efforts of the community. For instance, in Sirsal village, the temple was constructed jointly by inhabitants and the village Panchayat (the local governing body) with an elaborate spire. It is dedicated to Lord Shiva and is used by the Hindu community for religious and cultural gatherings.

In Malkondji, the villagers reinstated all the major deities from the old village and made new temples for them. Also, the original Deep mal (lamp-tower) was brought from the old to the new village. Villagers employed expert masons to first dismantle the Deep mal at its original site and later got it perfectly reconstructed in the main public square of the new village, opposite the main temple. This is a very significant attempt by the villagers to revive the old village ambience and culture in the new village.

However, many villagers still visit the shrines in the old village, especially during special festival days. For example, in the relocated village of Lamjhana, people visit the shrine of a saint in the old village and organise an annual fair (Urs) around it. Also, after marriage ceremonies, the newlywed couple pays a customary visit to the temple in the old village to get the blessing from the local deity. Similarly, in Malkondji, a seven day festival is celebrated and organised around the temple of the local deity, situated in the old village.

A big change is seen in the use of materials and construction systems in the extensions done by the villagers to suit their lifestyle and cultural needs. Economically well off owners have raised the boundary wall to transform the house again into introvert traditional 'Wada' (courtyard) typology. As a result, the enclosed space becomes much more personal to the inhabitants of the household. Dhelaj is the traditional space at the entrance of a Wada which acts as a portico for the house. Formal male guests are received here by the head of the family. The space determined by a raised platform on both sides of the entrance is used to relax and also store grains. As such, Dhelaj serves as a perfect buffer between the outside and inside of a Wada type house. In Malkondji particularly, people have tried to salvage the material like stone and elaborate wooden doors from their houses in the old village and have made Wada style Dhelaj entrances for their houses. So strong is the urge to recreate traditional entrances to new houses that at times people have just erected the façade and left the rest of the enclosure to be done later as they gather savings.

It is very interesting to note that at places people have just constructed free standing walls of stone to define the entrance of the house. The attempt, to bring back the original traditional style of architecture is very strong; and since such houses mostly belong to the wealthier section of the community, these also reflect the general aspiration of the villagers to showcase their status.

Lessons Learnt

The case study shows how inhabitants of relocated villages adapt to their new physical environment and re-establish linkages with their traditional socio-cultural patterns. It also demonstrates innovative ways in which communities utilise the new built environment to create new social and economic opportunities.

Acknowledgement

This case study is based on the research carried out in 2011 in Latur within the framework of a research project on "Understanding habitat, housing and social changes in post-disaster traditional and relocated rural settlements in India" ,funded by the Swiss National Science Foundation.

Table 6: Summary typology table for Rural Marathwada Case in Maharashtra, India		
A	**Project level Characterisitcs**	
A1	Type of Project	Resettlement
A2	Type of Risk Management	Corrective / post impact
A3	Nature of Planning	Planned with risk measures
A4	Level of planned participation	People were made part of the decision-making, planning, implementation as well as long-term management plan, but it is observed that the inputs given by the people were not very well interpreted.
A5	Motivation/Nature of Hazard	Non-climatic event (earthquake)
A6	Level of attribution of CC to hazard frequency and intensity	Not applicable
A7	Primary Decision Maker	A combination of government, international funding agencies, NGOs as well as religious communities
A8	Distance between old and new locations	More than 5 km
A9	Time between decision and implementation	1 to 2 years
A10	Time taken to complete the project	2 to 5 years
A11	Age of the project (time since completion)	More than 10 years
A12	Size of the Project	Large
A13	Nature of dividing the population	Whole population moved to one place
A14	Financing Sources	Contribution of funds from different sources but none from the beneficiaries
B	**Original Settlement level characteristics**	
B1	Type of land tenancy	Owned
B2	Age of settlement (before the move)	More than 10 years
B3	Size of the settlement	Large (spread over multiple villages)
B4	Most dominant nature of livelihood options for HH	At home work including artisans and farmers
B5	Level of Hazard Risk Exposure	High
B6	Type of Urban form	Cluster housing

B	Original Settlement level characteristics	
B7.	Levels of social infrastructure distinguished by provider	Good – self/community created
B8.	Strength of social networking	High
B9.	Most dominant form of family structures	Joint family with male family head
B10.	Use given to abandoned site	No use planned
C1.	Level of hazard exposure	Low
C2.	Type of land tenancy	Owned
C3.	Type of new Urban form	Similar but not exactly the same
C4.	Level of planning and provisions	While there were social infrastructure provisions made, but most were not used by the communities. Other physical infrastructure of water and sanitation and electricity were provided, but transportation access was still felt as a challenge.

Source: Based on information from experts.

4.5 Pretext of reducing hazard risk, creating new socio-economic risks: Case of Yamuna Pushta evictions

On the pretext in part of saving people from floods on the river bank, over 35,000 households were forcibly evicted in 2003 from the Yamuna Pushta Colony. Those 'eligible' were to be given plots in Bawana, 25 km outside Delhi. The 'eligible' were those who could prove they had lived there either before 1990 (entitled to 18 sq m) or before 1998 (entitled to 12.5 sq m). Families had to pay Rs 7,000 for the larger plots and Rs 5,000 for the smaller ones, although, in the process of proving their right most families had to pay much more in bribes. The lease on the plots extended to five years with no guarantee that it would be renewed. There were only 6000 plots made available in Bawana in total (Bharucha, 2006; Menon-Sen, 2006; Menon-Sen & Bhan, 2008). The Ministry of Tourism also decided to re-use the vacated land next to the river for 'beautification' and attracting tourists by making parks and other commercial functions. Other developments such as a Delhi Metro Station, a large Hindu Temple and an IT park have all come up in and around the same Yamuna flood plain despite similar flood risks, and environmental hazards.

Kalpana Sharma notes in her book review of 'Swept off the Map' by Menon-Den and Bhan (2008):

"In all respects, the families that moved are worse-off today than they were when they lived in Yamuna Pushta. In Bawana, many women chose to travel to Delhi every day to hold on to their jobs as domestics as they saw no other option. This meant waking up at 4 am, doing household tasks, taking a two-hour bus ride into Delhi, working through the day in one or several households, and then returning in the evening to continue with household chores. Men looking for work as daily labourers also went into the city but stayed there during the week only to return on weekends. Travel costs constituted up to 28 per cent of a family's monthly income. Almost half the population studied felt they had no option but to commute to the city for work

The lack of work opportunities and the higher costs also forced many more members of each family to undertake wage employment. A direct impact of this was evident in school enrolment where 40 per cent of those in the 5-18 age-groups were not enrolled in school. Yet, half these dropouts did attend school in Pushta. So it is evident that the new location and its impact on livelihood had contributed to the higher dropout rate."

The authors of Swept off the Map conclude that "impoverishment and violations of rights are an integral and inevitable part of the kind of resettlement that is being implemented in Delhi".

Table 7: Summary Typology table for Yamuna Pushta and Bawana Case

A	**Project level Characterisitcs**	
A1	Type of Project	Eviction
A2	Type of Risk Management	Prospective / pre-emptive
A3	Nature of Planning	Planned without risk measures, or socio-economic sensitivity
A4	Level of planned participation	People were not consulted in any manner. There was vehement resistance, yet families were forcibly evicted.
A5	Motivation/Nature of Hazard	Development and low-intensity and high frequency flood hazard as a pretext
A6	Level of attribution of CC to hazard frequency and intensity	High

A	**Project level Characterisitcs**	
A7	Primary Decision Maker	Government
A8	Distance between old and new locations	More than 5 km (25 km)
A9	Time between decision and implementation	0 to 1 years
A10.	Time taken to complete the project	A few days
A11.	Age of the project (time since completion)	5 to 10 years
A12.	Size of the Project	Large (more than 35,000 HH)
A13.	Nature of dividing the population	Whole population moved and scattered in different locations
A14.	Financing Sources	Contribution of funds from different sources including the 'eligible' beneficiaries
B	**Original Settlement level characteristics**	
B1.	Type of land tenancy	No explicit/legal rights
B2.	Age of settlement (before the move)	More than 10 years
B3.	Size of the settlement	Large (more than 35,000 HH)
B4.	Most dominant nature of livelihood options for HH	Travel 0-1km for work and mixed nature of work
B5.	Level of Hazard Risk Exposure	Medium
B6.	Type of Urban form	Cluster housing
B7.	Levels of social infrastructure distinguished by provider	Poor – self provisions
B8.	Strength of social networking	High
B9.	Most dominant form of family structures	Joint family with male as well as many with female family heads
B10.	Use given to abandoned site	Planned commercial and tourist locations
C	**New settlement level characteristics**	
C1	Level of hazard exposure	Low
C2	Type of land tenancy	Right to occupy but no legal right
C3	Type of new Urban form	Multi-storey structures and absolutely different from the earlier cluster form
C4	Level of planning and provisions (Good, medium, minimum, none)	With no planning for basic services and infrastructure

Source: Based on information from experts.

Box 2: Experiences of Flood Planning in South Asia: 'Problem' vs. 'Development'

Greater Mekong Region: The case of risk redistribution at the city level:

"Floods, benign and destructive, are an important feature of the landscape, livelihood and culture of the greater Mekong region. In the main valleys and plains rapid economic and social development over the past several decades has altered the use of land and water in ways that profoundly affect vulnerability of households, firms and regional economies to flood events. Disaster risk reduction measures usually involve structural interventions in the form of walls, channel modification, diversions and storage dams. Institutional measures are designed to reduce risks to certain subsets of the population or places, like central business districts. Current flood management policies and practices in the Mekong region, often claimed to be about reducing risks, are often more about shifting risks on to already vulnerable and disadvantaged groups."

Source: (Lebel, Sinh, Garden, Hien, et al., 2009)

Bangkok Flood Protection Planning: Diversion of Risk:

"The promise of protection by [flood] diversions repeatedly appeals to a discourse of sacrifice. 'Bangkok has been saved once again by the heroes of our time, as communities in Ayutthaya, Ang Thong and more than a handful of other provinces in the countryside paid the price for its serenity. People in these provinces are the ones crying. Losing one's shelter for the good of the country is patriotic, yet painful. (Bangkok Post 2006)'. It was noted that Nakhon Pathom was 'being drowned to protect Bangkok'."

Source: (Lebel, Sinh, Garden, Seng, et al., 2009)
(Blake, Friend, & Promphakping, 2009; Breukers, 1998)

Box 3: Bangkok Slum Relocations: Experiences of Informal Workers

In Bangkok, where many of the slum relocations took place in the 1980s and early 1990s, several of the focus groups discussed the struggle to get basic infrastructure services, road connections, public transport services, and social services where they now live. One group of home-based workers and their families, a group that prepares chili paste for a living, described how they had been relocated by the National Housing Authority (NHA) in an area prone to flooding with no public transport. This group originally lived in Klong Toey on land belonging to the Port Authority of Thailand, which the NHA later reclaimed in order to build the Queen Sirikit Convention Centre on the site. The forced eviction of this community helped spur an anti-slum eviction movement in Thailand. As one of the group members commented: "At the beginning, we were living like beggars". Eventually, the NHA provided housing loans to the community and promised to build a new road and provide public transportation. What follows, is what members of three of the focus groups from the Informal Economy Monitoring Study in Bangkok reported about the eviction-relocation process.

Large-scale evictions and relocations in Bangkok date back to the late 1960s. The National Housing Authority, set up in 1973, evicted 38 per cent of the slum population of Bangkok between 1977 and 1982 (Boonyabancha 1982). Evictions/relocations were carried out in three basic ways: evictions without relocation, evictions with relocation to low-priced land on the outskirt of Bangkok, upgrading of slum housing to flats or apartments (Ibid). Many of the study participants in Bangkok live in low-income housing colonies on the outskirts of the city, having been forcibly relocated from slum or squatter settlements in central Bangkok in the late 1980s or early 1990s. Here is what members of three focus groups who participated in the WIEGO Informal Economy Monitoring Study in Bangkok had to say about their evictions/relocations

Evictions

Most of those who were evicted were given at least three-month notice, provided transport to where they were relocated, given wood to build a new house, and given between 30,000 and 90,000 baht per family as compensation. One group was provided cooked meals by the military for three months after their eviction. One family, which owned 4 hectares of land where the Suvarnabhumi international airport was built, was given 800,000 baht in compensation. A home-based worker from that family used to raise fish; she now sorts plastic waste. She still misses her original home and lifestyle: "Whenever I see the airplanes fly by overhead, I am reminded of our original home" (FG 6).

Resettlements

In most cases, the National Housing Authority determined where the families were to be relocated. The group which was evicted from the site of the international airport negotiated with a local temple to rent them land at a very modest rate: around 500 baht per year for 42 square meters. This group later registered as a community with the District Office. In order to buy land and build a house at the relocation site, those who are evicted need a family residence certificate. The focus group participants paid the District Office/Officers anywhere from 700 to 15,000 baht to get this certificate. It was not clear how much was the official fee and how much was in bribes. Two sisters registered on the same day in the same District Office but with different officers. One paid 700 baht, while the other paid 4,500 baht. Also, the process of registration takes a long time. The two sisters and their families lived in bamboo-and-thatch houses for seven years until they got their families registered and were able to buy land and build houses.

Land & Housing

Those who bought land and built houses at the relocation sites paid around 200,000 baht (on instalment) for 42 square meters of land and around 150,000 baht to build a modest one-story home. They also had to pay around 12,000 baht to have the design or plan of their house approved. Some have not been able to buy land or build a house because they have not been able to register or do not have sufficient capital. They rent homes for around 900-1,000 baht per month (a similar size home in central Bangkok would, they said, rent for 3,000 baht). Families who buy land, but do not build a house on it within three years, have to return the land to the National Housing Authority.

Basic Infrastructure & Transport Services

Those who were relocated had to negotiate and demand basic infrastructure and transport services, which took 8-10 years or more. Meanwhile, they had to use wells for water and tap electricity illegally. The National Housing Authority would send water tankers to their homes. Illegal electrical connections cost 5-6 baht per unit per month while legal electrical connections cost 2.5 baht per unit per month. In some areas, the local roads have been paved only recently and public bus service is still inadequate. In one area, the bus service began in 2007 with two buses in the morning and two in the evening. Those who live on the temple land have to spend 20-40 baht to hire a private motorcycle to take them to the nearest bus station. Many, for this reason, have bought their own motorcycles or cars on instalment.

Education & Health Services

There are schools and hospital or clinics near most of the relocation sites. However in one area, the nearest hospital is one hour away by bus. Reaching the hospital requires taking three buses the one-way fare for which is between 20-45 baht. If the relocation site is near a small town or middle-class residential area, the schools and hospitals tend to be better but families have to be registered to be able to enrol their children in the local schools and to avail of free health services under the Thai Universal Health Scheme. Several families kept their children in their original schools and continued to work in their original areas until they were registered as a family in the relocation area. As one woman put it, "I only felt at home in our new area after we were registered as a family and my children were enrolled in local schools" (FG 10).

Employment Opportunities

All of the focus group participants agreed that employment opportunities were better – and they could earn more – where they used to live than where they live now. Many of the women, as well as their husbands, had been street vendors. The women are now home-based workers. Those who stitch garments on sub-contracts can earn 250-400 baht per day, and those who recycle plastic waste earn 150-200 baht per day. The men work in construction (earning around 20,000 baht per month, when work is steady) or drive taxis (earning about 700 baht per day). Some men run mechanical repair shops near their homes.

Consider the case of two sisters who now run a five-woman production group that stitches shirts and blouses for an export company. Before being evicted from central Bangkok in 1996, they made and sold papaya salad and other traditional food items. Working together, they each earned around 500 baht per day in the mid-1990s. For seven years after being evicted, they continued to make and sell papaya salad – commuting to central Bangkok in a pick-up truck they owned. But the commute proved too tiring and expensive so that, once they were registered in the relocation area, they began looking for other employment opportunities. One sister got a job as a cleaner in an industrial estate, earning 280 baht per day; the other got a sub-contract to make nightgowns, earning around 120 baht per day (she was paid 3 baht per nightgown and could make around 40 pieces a day). Four years later, with a contract negotiated by HomeNet Thailand, the sisters set up a sewing group producing blouses and shirts for a local firm that exports some of the goods and sells others to Bangkok boutiques. When they have orders, they can now earn between 8000-12,000 baht per month – or 266 to 400 baht per day each – depending on which part of the shirts/blouses they stitch: some women stitch the basic seams; one applies the collars, pockets, and cuffs.

Conclusion

It took a decade or so for those who were evicted and relocated to secure their housing, stabilise their livelihoods, and leverage basic infrastructure and transport services. Most reported that they have fewer employment opportunities and earn less than before they were relocated, but enjoy better housing and more open residential areas.

Acknowledgement

This case note was provided by Martha Alter Chen from the WIEGO Network. It was written as part of another project fieldwork.

4.6 Multi-stakeholder Partnership: Case of Orissa Disaster Recovery Project (ODRP)

The Government of Odisha (GoO) and the World Bank together funded the ODRP project which began in October 2013. They decided to provide "dignified" housing to people affected by Phailin and Hud-Hud. The project was implemented in 5 blocks in Ganjam district namely Chikiti, Chhatrapur, Ganjam, Kolikote and Rangelgunda.

On 12 October 2013 a very severe cyclonic storm Phailin hit the state of Odisha near Gopalpur in Ganjam district with maximum recorded wind speeds of 220 kmph. The cumulative precipitation recorded during the cyclone was 250mm and the storm surges reported up to 3 meters, inundating coastal areas up to one kilometre from the coast. Nearly 90,000 houses ,many made of temporary materials such as mud/thatched houses and mostly owned by fishing communities, farmers and the poor, were partially or fully damaged in the coastal districts. Ganjam, Puri, and Khordha districts were the most affected and of all sectors, the housing sector was the most severely hit with reconstruction needs estimated to be around US$480 million(WB, ADB, & GoO, 2013).

Based on the request from the Government of India, the World Bank extended financial assistance to GoO in rebuilding houses, improving slums, and building capacity under the Odisha Disaster Recovery Project (ODRP).

The implementing agencies for the project were Odisha State Disaster Management Agency (OSDMA) for Component-1, and Housing and Urban Development Department (H&UDD) for Component -2. The project components and financial details are given in the table below.

Under Component 1, GoO released 'Policy Guidelines for Post Cyclone Phailin Resilient Housing' in December'2013 for housing construction under ODRP. As per this guideline, GoO targeted building liveable and dignified housing for all the Phailin affected houses and the reconstruction of all kuccha (temporary) houses to pucca (permanent) houses within 5 km from the High Tide Line (HTL) in Ganjam, Khordha and Puri Districts. The guidelines listed the eligibility criteria for identification of the beneficiary and also proposed that the minimum size of the plot should be 25' X 40' (OSDMA, 2013).

OSDMA in coordination with district administrations initiated the beneficiary identification process in December 2013, two months after the cyclone had hit. This process included damage assessment of the house, and verifying proof of identity and land records of each beneficiary by Revenue and Disaster Management Department officials at district and block level. The final list was then discussed in *palli sabha* (village committee) for endorsement and was submitted to OSDMA.

Table 8: ODRP Project Components and Financial Details

		INR in Crore		
	Compenent details	**Total Cost**	**IDA Financing**	**State Financing**
Component	**Financing Proportion**	**100%**	**70%**	**30%**
Component -1	Resilient Housing Reconstruction & Community Infrastructure	1,003.80	702.6	301.2
Component -2	Urban Infrastructure in Berhampur	172.2	120.6	51.6
Component -3	Capacity Building for Disaster Risk Management	48	33.6	14.4
Component -4	Implementation Support	88.2	61.8	26.4
Component -5	Contingency Emergency Response	-	-	-
Total		**1,312.20**	**918.6**	**393.6**

Source: OSDMA 2015

Depending on the availability and suitability of land, the beneficiary was allowed in-situ reconstruction, and in other cases they were relocated to a new location identified by the district administration. Most of the relocation sites were located in government lands nearer to the original village, or else suitable lands were acquired and the new plots were registered in the name of the beneficiary. Two approaches were initially considered for the housing reconstruction: 1) Owner driven construction of houses (ODCH) and 2) contractor driven housing construction, but later ODCH approach was preferred and adopted for the project. A sum of Rs. 3 lacs is provided to each beneficiary for constructing a 294 sq. ft. house (one bed room, one drawing-cum-bed room, kitchen & toilet). They are also provided other facilities like electricity and water supply facilities, roads and other infrastructure. Beneficiaries will receive the money in tranches directly to their bank accounts.

Table 9: ODRP Funding Instalment Details for Each Beneficiary

Sl. No	Installement	Condition	Amount (INR)
1	First	On signing of agreement for construction	20,000/-
2	Second	Construction up to plinth level	50,000/-
3	Third	Construction up to roof level	100,000/-
4	Fourth	Casting of the roof	50,000/-
5	Fifth	After removal of Centring	50,000/-
6	Sixth	After completion of the house in all respect	30,000/-
		Total	**3,00,000/-**

Source: OSDMA, 2005

Table 10: Beneficiary details by Districts

District	Block	No. of Villages	In-Situ	Relocation	Total Beneficiary
GANJAM	Chatrapur	12	93	2216	2309
	Khalikote	29	558	3167	3707
	Ganjam	23	1056	2319	3377
	Chikiti	10	55	3393	3448
	Rangeilunda	33	29	4109	4140
Sub Total		107	1791	15204	16981
KHORDHA	Chilika	59	176	9	185
	Tangi	11	61	22	83
Sub Total		70	237	31	268
Grand Total		177	2028	15235	17249

Source: OSDMA, 2015

For beneficiaries who did not have bank accounts, new accounts were opened in local banks with the support of the district administration under the Pradhan Mantri Jan-Dhan Yojna (PMJDY). An additional amount of Rs.20, 000 was allotted to each beneficiary under Swachh Bharat Abhiyan for constructing a toilet in each house.

According to OSDMA status report, 16,981 beneficiaries were identified in Ganjam district and 268 beneficiaries in Khordha district. Due to local political issues, the work was delayed indefinitely in Puri district.

OSDMA engaged local NGO 'Gram Vikas' as the socio technical partner for the project. Gram Vikas was responsible for habitat planning, mason training, community mobilization and motivation, MIS development and project documentation.

Beneficiaries were provided with design and construction guidelines and material specifications to be followed for house construction. An on-site engineer and supervisor were appointed for a group of villages to check the quality of construction and ensure the on-time completion of the project. Multi Risk Insurance for a period of 10 years is also proposed for all the houses constructed under the ODRP project (OSDMA, 2014). At the end of the construction in each village, a Village Development Committee (VDC), which will be responsible for operation and maintenance of village, will be formed facilitated by Gram Vikas.

The urban Component 2 of the ODRP project is aimed at improving urban infrastructure services, slum improvement services in Berhampur Municipality. Housing and Urban Development Department (H&UDD) is responsible for implementing the project in the city of Berhampur. These include construction of roads, laying of water pipelines and drainage lines, and street lighting. Under ODRP, infrastructure will be provided to nearly 80 slums that are being upgraded by the Government of India's RAY housing scheme (World Bank, 2015).

4.6.1 Patinsonpore

Tirlochan, the community mobiliser from Gram Vikas, took the team around to the village and the new construction site. The village as well as the new site are accessible by a boat across the river, although connected by land from Andhra Pradesh, the neighbouring state. The villages were severely damaged during the 2013 cyclone, and came under the purview of the ODRP project. There are four sites in Patinsonpore. While some of the communities here are Telugu speaking, others are Oriya speaking. Getting them to live together was a challenge initially, but with constant efforts by the Gram Vikas community mobilisers, they are now building houses together.

1. Pallaya community has nearly 192 beneficiaries. This is a predominantly Telugu speaking community and most families depend on fishing for their livelihoods. This community lives about 500m from Bavuda Sea. The master mason on the site is also a beneficiary. He has trained more than 50 beneficiaries in 4 months (by March 2015). The construction of the houses is underway, but the toilets are not yet constructed.

2. Nolya community has nearly 400 beneficiaries. Work has started in 387 houses and more than 160 houses have additional rooms. 6 more houses are yet to be constructed. It is a beneficiary driven housing.

3. Antharaipore has a total of 87 beneficiaries. Update on construction status is not available.

4. Sonapur has a total of 366 beneficiaries and 330 have started construction.

Table 11: Summary typology table for Patinsonpore Case in Orissa, India

A	**Project level Characterisitcs**	
A1	Type of Project	Resettlement (although moved to adjacent site, but provisions of other social and physical infrastructure)
A2	Type of Risk Management	Corrective / post-impact
A3	Nature of Planning	Planned with risk measures
A4	Level of planned participation	Communities involved during planning, implementation and long term sustenance
A5	Motivation/Nature of Hazard	Climatic event (flood and cyclone)

A6	Level of attribution of CC to hazard frequency and intensity	CC not in the project document
A7	Primary Decision Maker	A combination of government, international funding agencies and NGOs along with the beneficiaries
A8	Distance between old and new locations	The Pallaya community is just 500m from the Bavuda sea. The old and new sites are adjacent to each other.
A9	Time between decision and implementation	Less than 1 year
A10	Time taken to complete the project	About 2 years (likely to complete soon)
A11	Age of the project (time since completion)	On going
A12	Size of the Project	Large
A13	Nature of dividing the population	Whole population moved to one place. There are three different communities namely Pallaya, Nolya and Antharaipore with 192, 400, 87 beneficiaries respectively. But people continue to own the older sites as well.
A14	Financing Sources	Contribution of funds from different sources, and people have added their own money for extensions and upgradation
B	**Original Settlement level characteristics**	
B1	Type of land tenancy	Owned
B2	Age of settlement (before the move)	More than 10 years
B3	Size of the settlement	Large (spread over multiple villages)
B4	Most dominant nature of livelihood options for HH	Daily wage workers, fishermen
B5	Level of Hazard Risk Exposure	High
B6	Type of Urban form	Clusters around the main access street
B7	Levels of social infrastructure distinguished by provider	Poor and self-provided, although some instances of government and INGOs water supply provisions after the 1999 cyclone.
B8	Strength of social networking	High
B9	Most dominant form of family structures	Joint families (new site is allocated to each married son – dividing them into nuclear families)

B10	Use given to abandoned site. Also comment on who owns, plans and implements the new use – public sector, private sector, communities themselves, etc	Owned by beneficiaries
C	**New settlement level characteristics**	
C1	Level of hazard exposure	High
C2	Type of land tenancy	Owned
C3	Type of new Urban form	Similar but not exactly the same
C4	Level of planning and provisions (Good, medium, minimum, none)	Planning and provisions of water, electricity and markets. But water is through bore wells and may need to be replenished after a period of time. No provisions for rainwater recharge, or any renewable forms of electricity.
Source: Information is based on the interviews with Gram Vikas coordinator and beneficiaries during field visit to Odisha from 27 April to 2 May , 2015. The current status is from the ODRP website		

4.6.2 New Golabandha

New Golabandha is the name of the settlement near the military site. It is the one with the most number of houses (1008).

Mr.Taradutt (ex-MD of the OSDMA) said that this is the second time the families are being relocated. The families were evicted initially as the land they were living on was allotted to the Army Defense College. Army officials were initially against the relocation as the proposed site is adjacent to missile dump yard, but after public consultations and with special request from the government, they agreed and are now also providing financial support for the new approach road (under construction in March 2015) to the village. The new settlement is adjacent to the existing settlement although within 500m from the coast.

The current access to the old village is from the military site, but once completed, they have to take a longer route to reach their village. All the construction work in the site is done by contract workers, contracted by the beneficiaries. A group of beneficiaries together appoint one contractor for the construction. The workers we interacted with were from Srikakulam, Andhra Pradesh and are working on nearly 30 houses. They were hired by one of the beneficiaries who works in Vishakapatnam. House designs were reworked to join walls and make space for boats and nets. Plinths were raised by several feet to mitigate surge problems during cyclones. Livelihood included fishing, as well as renting out their cashew trees to commercial set ups (both location centric).

Table 12: Summary Typology Table for New Golabandha Case in Orissa, India

A	**Project level Characterisitcs**	
A1	Type of Project	Resettlement (although moved to adjacent site, but provisions of other social and physical infrastructure)
A2	Type of Risk Management	Corrective / post-impact
A3	Nature of Planning	Planned with risk measures. Plinths are raised by several feet to prevent impacts of storm surge. Buildings are designed with good structural measures for wind speeds during cyclone.

A4.	Level of planned participation	People involved in planning (including location of land), implementation and long term sustenance.
A5	Motivation/Nature of Hazard	Climatic event (flood and cyclone)
A6	Level of attribution of CC to hazard frequency and intensity	No mention of climate change in the project reports or during interviews
A7	Primary Decision Maker	A combination of government, international funding agencies and NGOs along with beneficiaries
A8	Distance between old and new locations	Less than 1km
A9	Time between decision and implementation	Less than 1 year
A10	Time taken to complete the project	About two years
A11	Age of the project (time since completion)	Ongoing
A12	Size of the Project	Large (1008 houses)
A13	Nature of dividing the population	Only people who suffered losses moved to new houses. The rest continue to live in older locations. Some are also in-situ upgradation, depending on their minimum size of land holding requirement as per the project. All those with lesser land than required, are moved.
A14	Financing Sources	Contribution of funds from different sources, and people have invested their own for modifications
B	**Original Settlement level characteristics**	
B1	Type of land tenancy	Owned
B2	Age of settlement (before the move)	More than 10 years
B3	Size of the settlement	Large
B4	Most dominant nature of livelihood options for HH	Daily wage workers, fishermen
B5	Level of Hazard Risk Exposure	High
B6	Type of Urban form	Cluster
B7	Levels of social infrastructure distinguished by provider	Poor self provisions. Primarily open defecation. Hand pump water and some electricity, but not all.
B8	Strength of social networking	High
B9	Most dominant form of family structures	Joint families

B10	Use given to abandoned site. Also comment on who owns, plans and implements the new use – public sector, private sector, communities themselves, etc	Continued ownership by beneficiaries
C	**New settlement level characteristics**	
C1	Level of hazard exposure	High
C2	Type of land tenancy	Owned
C3	Type of new Urban form	Similar but not exactly the same
C4	Level of planning and provisions (Good, medium, minimum, none)	Good with provisions of physical and social infrastructure (incl. markets)
Source: The information is based on interviews with Tara Dutt, Gram Vikas coordinator and beneficiaries during field visit to Odisha from 27 April to 2 May, 2015.		

Appendices

Appendix 1: Summary of Natural Disaster Losses in India from 1900 to 2014

Summerized table of Natural Disasters in India from 1900 to 2014								
	No. of events	No of people killed	No. of people affected	Damage (1000 USD)	% of total events	% of total killed	% of total affected	% of total economic loss
Drought	14	4,250,320	1,061,841,000	2,441,122	2%	47%	53%	4%
Earthquake and Tsunamis	28	78,208	28,554,245	5,107,300	5%	1%	1%	9%
Epidemic	68	4,543,874	421,473	-	12%	50%	0%	0%
Extreme temperatures	52	14,808	250	544,000	9%	0%	0%	1%
Flood	253	66,500	817,329,149	37,146,188	44%	1%	41%	66%
Insect infestation	1	-	-	-	0%	0%	0%	0%
Strom	159	164,334	93,614,562	11,427,525	28%	2%	5%	20%
Wildfire	2	6	-	2,000	0%	0%	0%	0%
Total (between 1990 and 2014)	577	9,118,050	2,001,823,679	56,668,135	100%	100%	100%	100%
Average per year	5	82,891	18,198,397	515,165	1%	1%	1%	1%

Source: EM-DAT, 2014

Appendix 2: Urban Risks in Orissa and Andhra Pradesh

Risks in Orissa

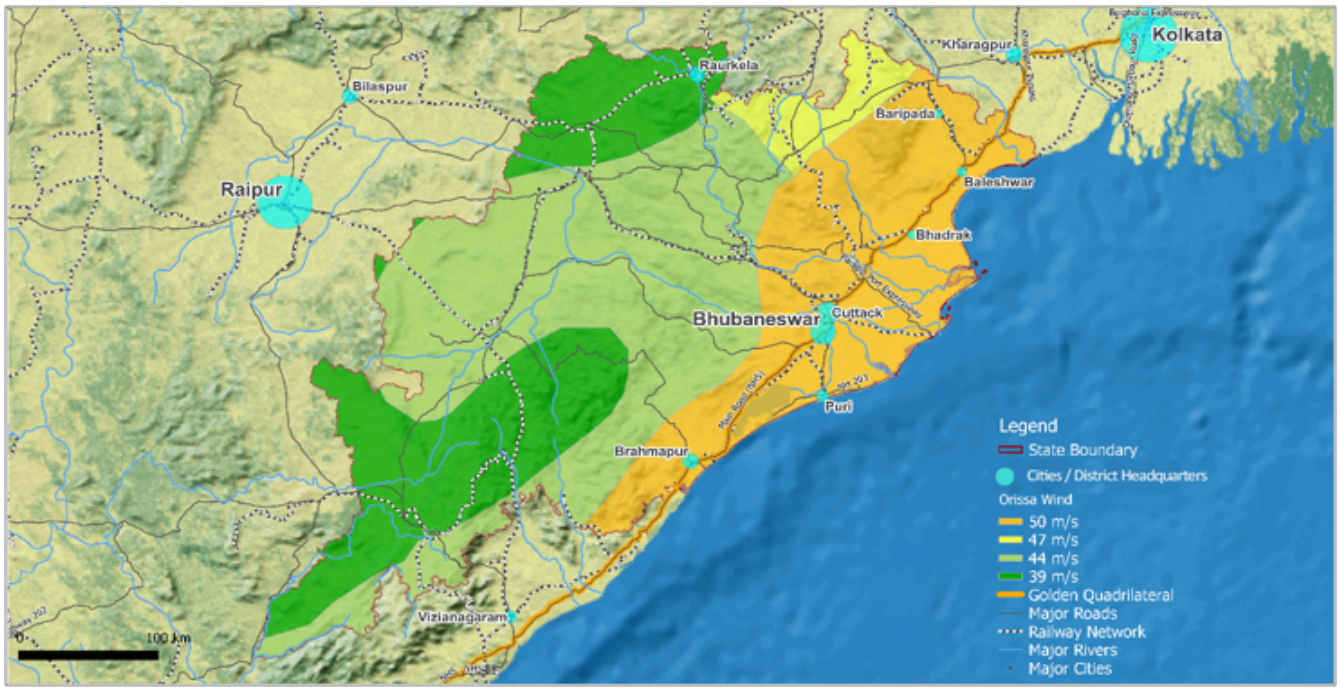
The 1999 super cyclone that hit Odisha was one of the most intense and devastating cyclones that the state has experienced to date. With increased understanding and emphasis on disaster preparedness and prevention, a number of risk mitigation measures were taken in the last decade, resulting in much lower levels of losses during Cyclone Phailin in 2013. About one-third of cyclonic and super cyclonic storms formed in the Bay of Bengal have crossed Odisha's coast (OSDMA, 2013). All coastal districts—Gajapati, Ganjam Puri, Jagatsinghpur, Kendrapara, Bhadrak, and Balasore—are exposed to severe cyclonic storms. Nearly 20 out of 30 districts are exposed to cyclonic wind speeds greater than 150 km/hr, and the remaining are exposed to wind speeds greater than 100 km/hr.

During cyclonic storms, road, railway and power networks are often severely impacted. Large population centres that are highly vulnerable to cyclonic storms are the coastal towns of Puri, Berhampur, Paradip, and Baleshwar. Bhubaneswar and Cuttack, being further inland, face lower levels of vulnerability.

According to the wind pressure map of Odisha most of the coastal region, including inland cities such as Bhubaneswar and Cuttack lie in a very high damage risk zone, which can experience wind speeds of more than 50 m/s. The entire 480 km coastline of Odisha is highly vulnerable to storm surges that occur during cyclonic events.

According to the combined storm surge, tide and wave set map, coastal areas of Baleshwar and Bhadrak districts could be impacted by surges as high as 9 metres above mean sea level. Other coastal districts can experience surges of between 4 and 9 metres.

Figure 8: Wind Pressure Zones in Odisha

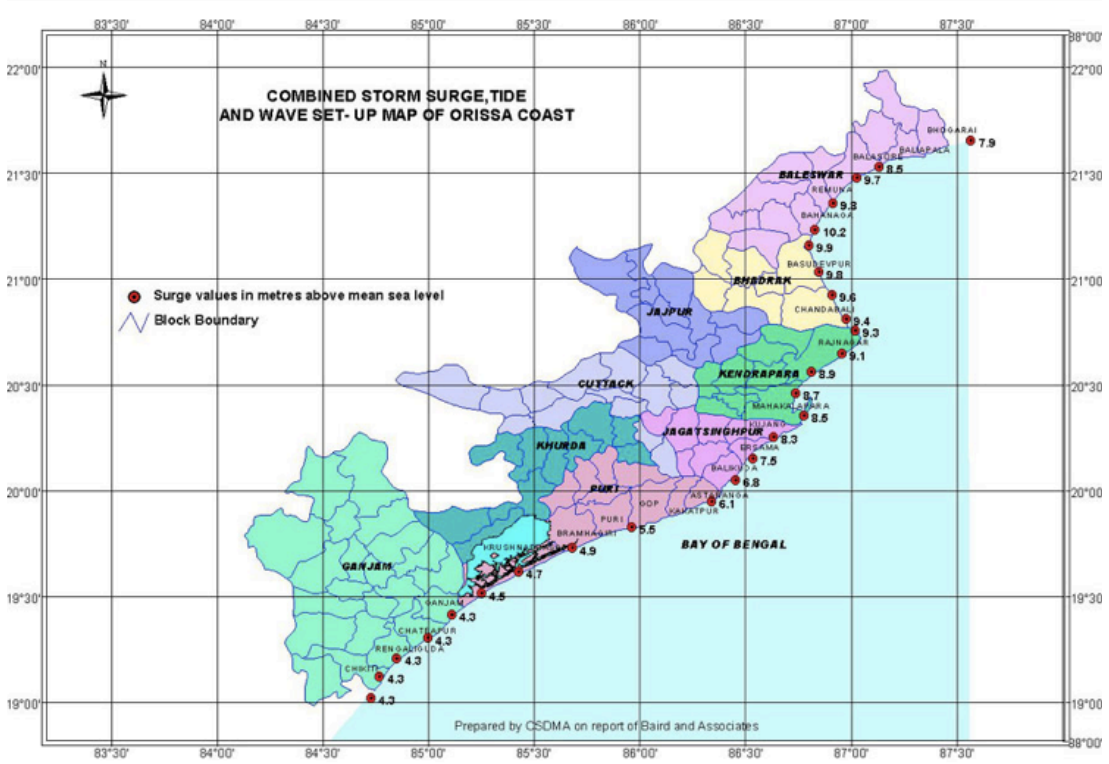


Source: NBC (2005)

A large number of inland settlements in the Mahanadi delta were severely impacted by the surges during the 1999 super cyclone. In the last decade, Odisha has experienced floods in 2006, 2007, 2008, 2011 and 2013. Of the twelve major rivers flowing in the state—Mahanadi, Subarnarekha, Brahmani, Baitarani, Rushikulya, Vansadhara, Budhabalanga, Jambhira, Nagabali, Indravati, Kolab, and Bahuda—the Mahanadi is the largest river system. Rivers flowing south east into the Bay of Bengal expose large populations to risk of floods. The Mahanadi , Brahmani and Baitarini delta along the coast is highly flood prone as are the districts in these deltas such as Puri, Jagatnagar, Cuttack, Khurda, Jajapur, Bhadrak and Baleswar.

Heavy rain in the state and in river catchments due to depressions and cyclonic storms in the Bay of Bengal are the primary reasons for flooding in the state. The situation gets worse during storm surge events and heavy tides, which block the river water from draining into the sea, causing flooding in these regions and making most of the coast vulnerable to floods. Increasing population density in these river basins and delta regions and along river banks chokes the river and

Figure 9: Combined Storm Surge, Tide and Wave Set Map of Odisha Coast



Source: Odisha State Disaster Management Authority (2004)

reduces its carrying capacity resulting in recurrent and intense floods. Other causes include soil erosion, mining activities in the catchment causing heavy siltation, and rising height of river beds, resulting in overflow of the river over its bank. Some parts in the Eastern Ghats are prone to landslides that are triggered by heavy rain. Deforestation, soil erosion, rail and road construction activity can affect slope stability resulting in landslides during heavy rainfall events. Parts of Ganjam, Nayagarh, Cuttack, Baleshwar, Anugul, Sambalpur, Deogarh and Sundargarh are prone to low-to-moderate landslide hazard.

Figure 10: Flood Frequency Regions of Odisha

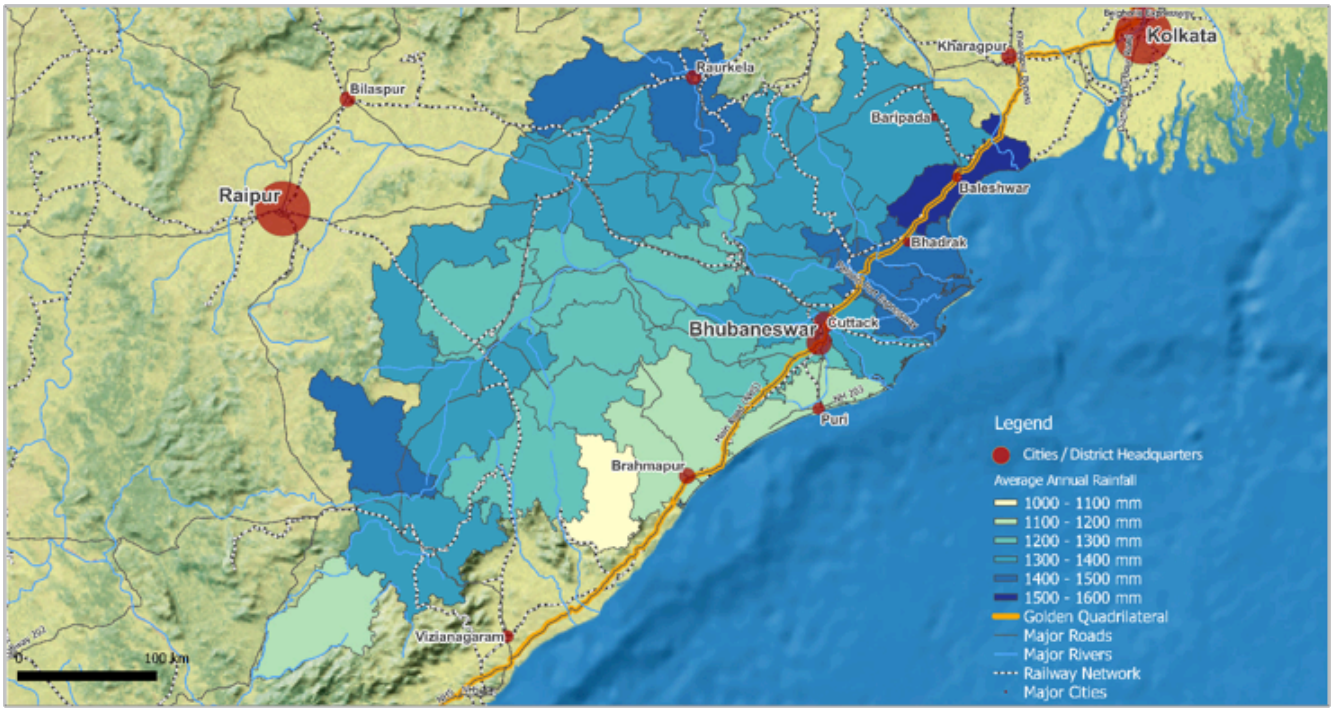
Source: UNEP/GRID-Geneva

Figure 11: Landslide (triggered by precipitation) Zones in Odisha

Source: Norwegian Geotechnical Institute

Odisha has experienced severe drought events in the past. In the context of climate change, there is increasing risk of changes in precipitation patterns, dry spells and rising temperatures as 29 out of 30 districts in the state receive rainfall less than 1,500 mm per annum. The government has identified parts of Kandhamal, Kalahandi, Balangir and Nuapada as chronic drought-prone zones (GoO, 2004).

Figure 12: District Wise Average Annual Rainfall in Odisha



Source: Indian Meteorological Department

Ganjam District

Ganjam district is one of the southern districts in the state of Odisha, with Chhatrapur as it its headquarters. Located on the east coast between 19.4 to 20.17 degree North Latitude and 84.7 to 85.12 degree East Longitude, it spreads over an area of 8260 sq.km with a population of more than 35 lakhs. The district is characterised by coastal plains on the east and the Eastern Ghats on the west .As per census 2011, agriculture and fishing are the major economic activities in the district. This district hosts Gopalpur port, one of the new commercial ports on the east coast.

The coast of Odisha is one of the most cyclone prone regions in the east. Ganjam district is also frequently affected by floods, storm surges, heat waves, droughts and coastal erosion. Nearly 46 per cent of the census houses have roofs made of temporary material such as thatch, GI sheets, plastic etc. and are most vulnerable in the event of a cyclone. According to NBC's wind pressure map, the eastern part of Ganjam district falls into a very high damage risk zone (wind speeds greater than 50m/s) and the rest falls under high damage risk zone (wind speeds greater than 47m/s). A very severe cyclonic storm Phailin crossed Ganjam district near Gopalpur on 12 October 2013 with a sustained maximum surface wind speed of 215 kmph (IMD, 2013) and damaged nearly 90,000 structures. An estimated height 2.5 m of storm surge inundated all low lying areas up to 1 km from the coast in Ganjam district (IMD, 2013). Ganjam, Chatrapur, Chikiti, Rangeilunda, Khallikote are the five coastal blocks in Ganjam district that are highly prone to cyclonic storms and storm surges.

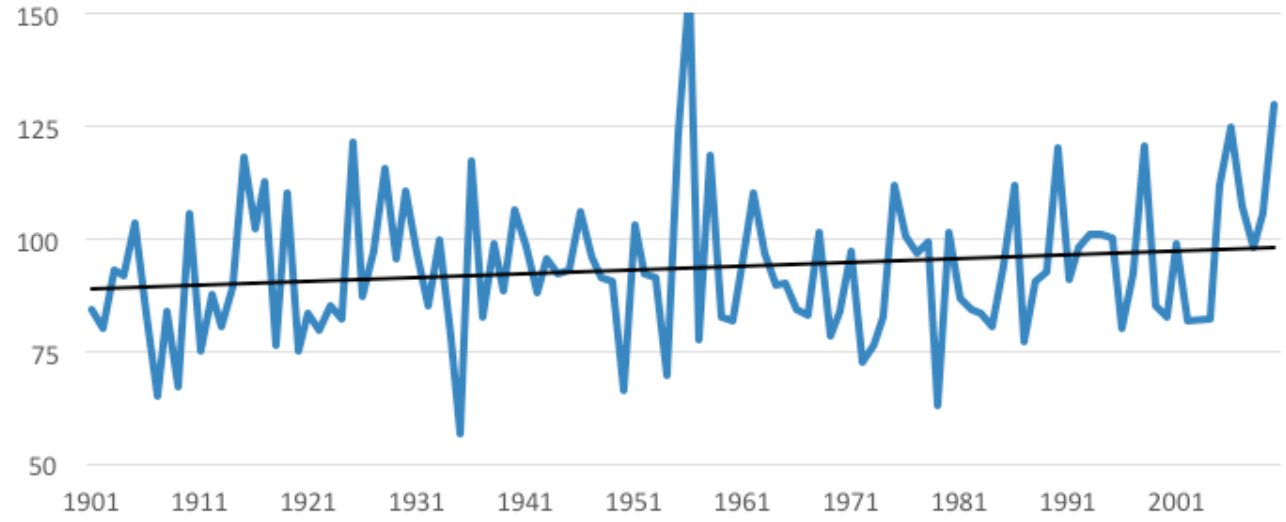
Sea coast erosion is a major threat to coastal communities. The erosion is severe during monsoons and storm surges and this will worsen in the future with sea level rise due to climate change. For example, the village of Arjyappali near Gopalpur port is at high risk because of the erosion caused by port activity. With wave breakers disrupting the sand sedimentation process, the coast near Arjypalli to the north of the port is rapidly eroding (DDMA, 2014).

Ganjam district has experienced floods every year from year 2006(DDMA, 2014). Rainfall during monsoons and cyclonic depressions are the major cause of floods in the region. Rushikulya, Dhanei, Bahuda, and Ghoda are the major rivers and streams flowing through Ganjam district. During Cyclone Phailin, the district received a cumulative rainfall of 241 mm causing widespread flooding and affecting nearly 2800 villages (IMD, 2013). IMD precipitation data between 1901 -2010 shows that there is a rising trend in the observed annual mean precipitation values for Ganjam District. 10 out of 22 blocks (Ganjam, Khalikote, Beguniapada, Purushottampur, Kabisuryanagar (part), Chikiti, Rangeilunda, Patrapur, Digapahandi, Sanakhemundi) are vulnerable to floods(DDMA, 2014).

Table 13: Ganjam District Profile

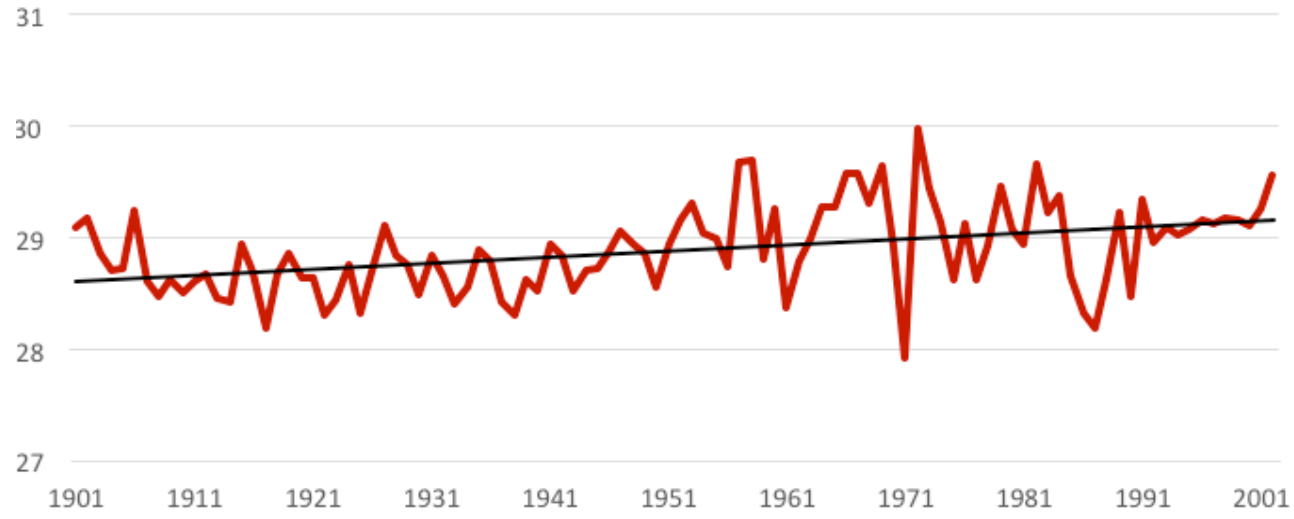
Area	**8260 sq.km**
Population, 2011	35,29,031
Population density	431 persons/ sq km
Number of Subdivisions	3
Number of Blocks	22
Number of Tehsils	23
Number of Municipal Corporations	1 (Berhampur)
No. of Inhabited Villages :	2838
No. of households	758267
Population below age of 6 years	420158
Literacy rate	22,10,050(62 per cent)
Total Working Population	15,01,772 (42 per cent)

Figure 13: Annual Mean Precipitation for Ganjam District (1901 - 2010)



Source: Indian Meteorological Department

Figure 14: Annual Mean Maximum Temperature Observed in Ganjam District (1901-2001)



Source: Indian Meteorological Department

Maximum and minimum temperatures recorded in the district in the last century have also shown an increasing trend. Rising temperatures are amplifying the effects of droughts and heat waves in the region. In the last decade, Ganjam district experienced severe drought in the years 2009 and 2011 affecting more than 6 lakh farmers (DDMA, 2014).

Berhampur

Berhampur is the largest urban area and the only municipality in Ganjam District. It spreads over an area of 87sq.km and has a population of nearly 3.5 lakhs. Berhampur's proximity to the major ports of Vishakhapatnam, Paradip and Gopalpur makes it one of the major hubs in the southern Odisha

Berhampur falls in a very high damage risk zone according to the wind pressure map with damaging wind speeds of up to 50m/s. 24 out 27 wards in the city (ward no's 1-9, 12-15, 17, 19, 22-24, 28,29, 33-37) have more than 25 per cent of their houses with roofs made of temporary materials. Ward no 1 with more than 50 per cent houses are vulnerable to cyclonic wind speeds. Berhampur, located 10 km inland to the west of the coast, is safe from storm surges and coastal flooding. As the city is not located near any rivers, it is not exposed to fluvial floods. However, during monsoon and cyclonic storms, low lying areas are inundated.

Access to treated drinking water and sanitation are the major vulnerabilities in the city of Berhampur. 29 out of 27 (Ward no's 1, 2, 4, 6-10, 12-14, 17, 19, 20 – 31, 33 – 37) wards have more than 25 per cent of their population consuming water from an untreated source. 6 wards (Ward no's 1, 8, 23, 23, 33, 35) have more than 25 per cent of their population without access to sanitation systems.

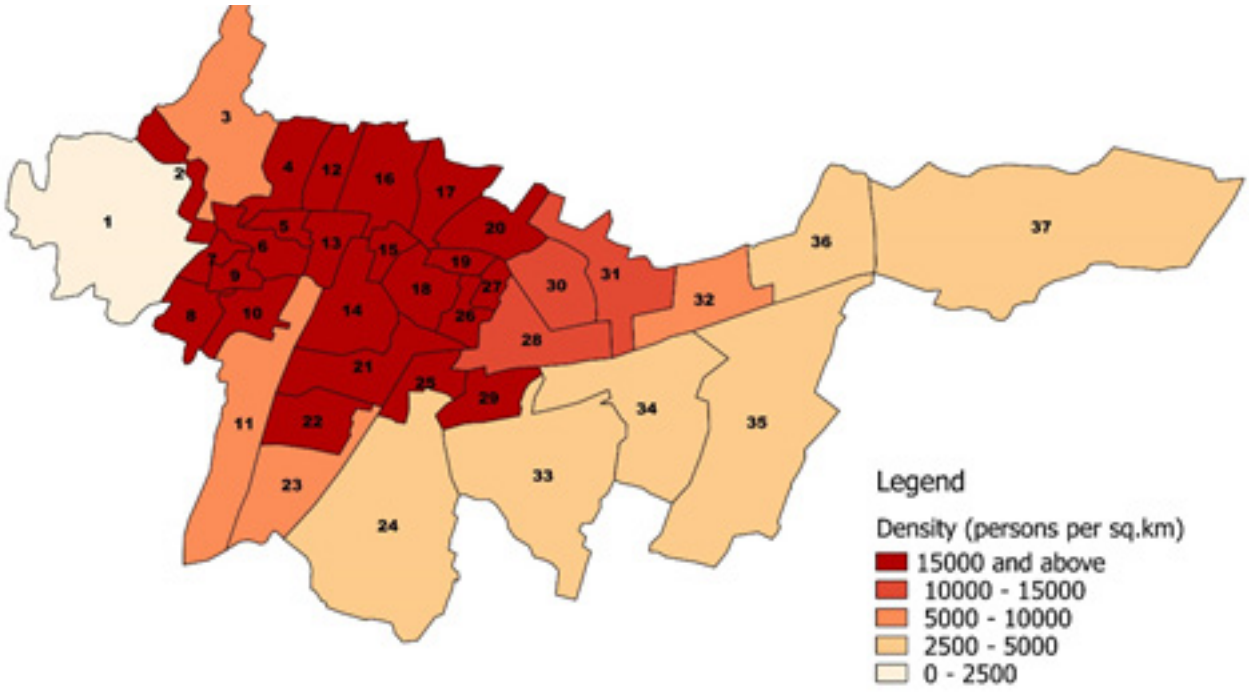
As of 2009, nearly 25 per cent of the city's population were living in 137 slums across the city occupying only 1 per cent of the city's total area. Ward no's 3, 7- 9, 12, 13, 17, 34, 13, 17 have more than five thousand people living in the slums.

Table 14: Berhampur City Profile

Area	**87 sq.km**
Number of wards	32
Population, 2011	3,56,598
Population density	4098 persons/ sq km
No. of households	74,720
Population below age of 6 years	32,174
Literacy rate	2,89,590 (81 per cent)
Total Working Population	1,20,553 (35 per cent)
No. of Slums	137
Slum Population	91,893 (26 per cent)
Water supply (2009)	50 mld
Road Network (2009)	385 kms
Sewerage Network (2009)	487 km

Source: (Census of India, 2011) Berhampur Municpal Corporation (2009)

Figure 15: Ward level Population Density Map of Berhampur



Source:(Census of India, 2011) Berhampur Municpal Corporation (2009)

Table 15: Berhampur City Slum Population, 2009

Number of Slums (Authorised + Unauthorised)	POPULATION			AREA IN SQM		
	Authorized	Unauthorized	Total	Authorized	Unauthorized	Total
106 + 31 = 137	104836	12705	117541	1529964	185662	1715626

Source: Berhampur Municipal Corporation (http://www.berhampur.gov.in/Demographic_Feature.asp)

Risks in Andhra Pradesh

Andhra Pradesh is one of the most hazard-prone states along the eastern coast. Most parts of the state receive average to scanty rainfall. The coastal northern districts are the only ones to get more than 1000 mm average annual rainfall.

Keeping these patterns in mind, drought is the most severe risk that much of AP is exposed to. With rising temperatures and changing precipitation cycles, the southwest region of Rayalaseema has been declared a chronically drought-prone region by the Indian Meteorological Department (Attri & Tyagi, 2010).

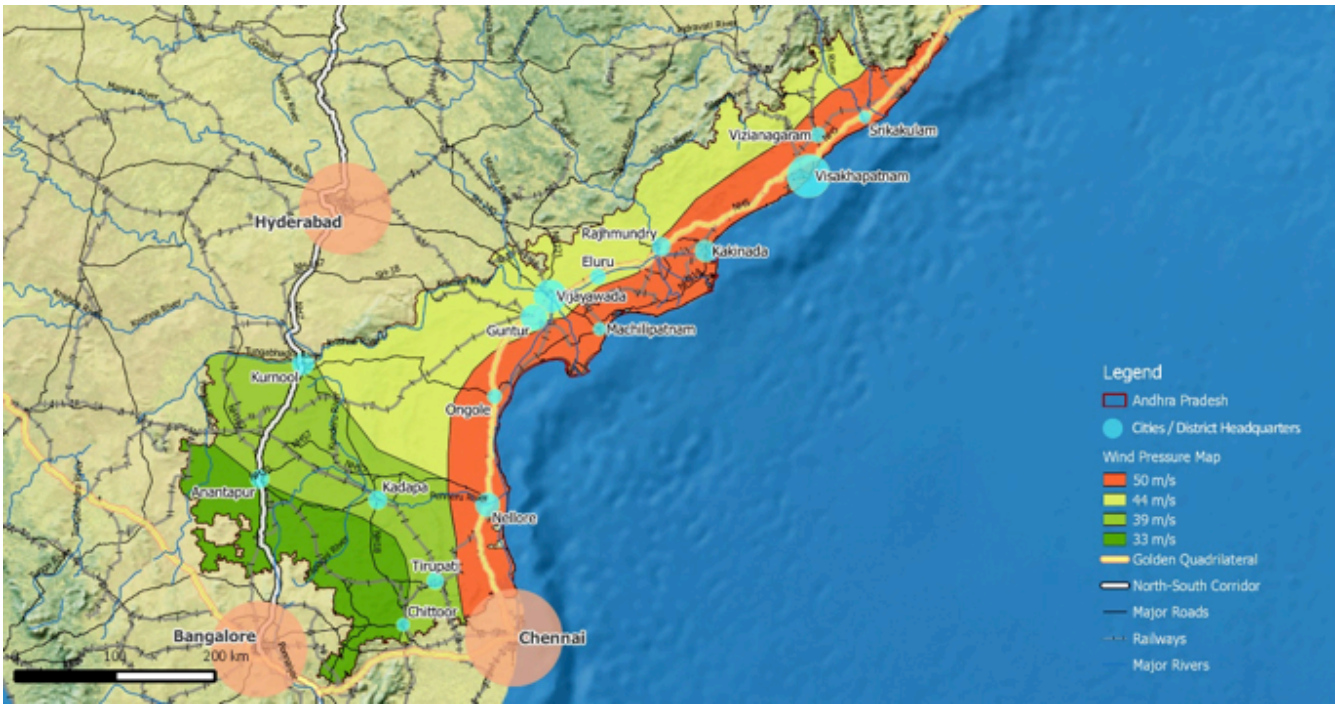
The number and frequency of cyclonic events in the state have increased in the last decade. Most of the coastal regions are highly or very highly exposed to cyclonic storms and storm surge, which is expected to be exacerbated over the century by climate change and sea-level rise. The coastal cities of Vishakhapatnam, Nellore, Ongole, Machlipatanam, Kakinada, Rajamundhry, Srikakulam and Vizianagaram are all at high risk from cyclonic winds and surge.

Relatively large areas of the deltas and coasts of AP are exposed to severe-to-very-severe, fluvial, coastal and local flooding. Floods frequently affect the coastal districts of AP—Krishna, Guntur, East and West Godavari—which are located on the banks of the Krishna and Godavari rivers. The floods which happened in October–November 2009 have been recorded as among the most devastating in recent past. An estimated 20 lakh people were affected in the districts of Kurnool, Guntur and Krishna Districts (APSDMA, 2010).

Figure 16: District wise annual average rainfall in Andhra Pradesh, 1901–2010

Source: Indian Meteorological Department

Figure 17: Wind Pressure Zones in Andhra Pradesh



Source: NBC (2005)

Figure 18: Flood Frequency Regions in Andhra Pradesh

Source: UNEP/GRID-Geneva

Figure 19: Landslide (triggered by precipitation) Zones in Andhra Pradesh

Source: Norwegian Geotechnical Institute (NGI)

Vishakhapatnam

Vishakhapatnam is located on the east coast of India. It is the largest and most populous city of Andhra Pradesh with an area of 544 sq.km and a population more than 17 lakh (3,177 per sq.km). The city serves as the administrative capital for the district of Vishakhapatnam and hosts one of the busiest ports on the east coast. The Greater Vishakhapatnam Municipal Corporation with nearly 4 lakh households, is divided into six zones and 72 administrative wards. 45 per cent of the city's population lives in more than 700 slums in the city[1].

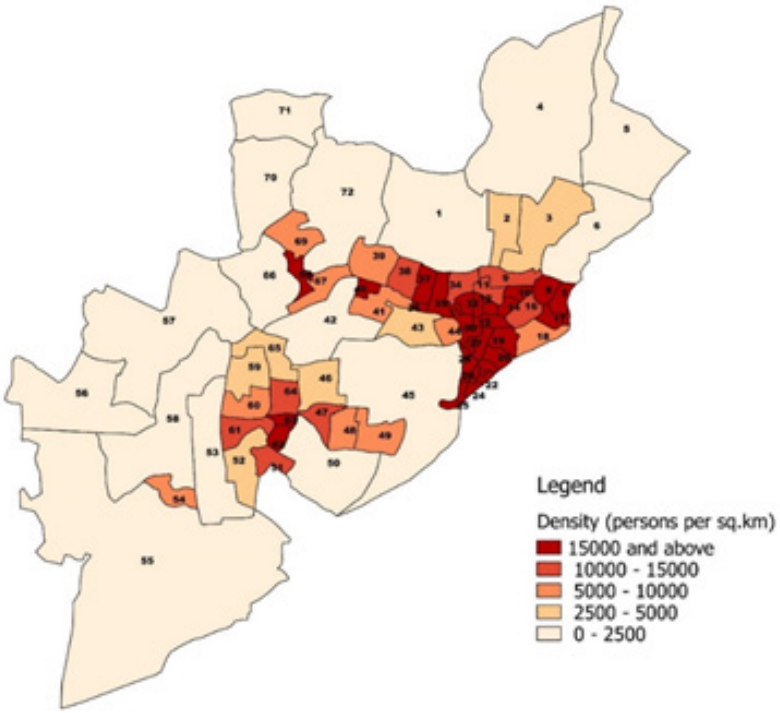
According to the land use and land cover statistics of 2009, nearly 26 per cent of the total areas is under hills and forests and 52 per cent of the total area is built up, which includes, residential, industrial and port areas, roads and railways (Vanum & Hadgu, 2012). The city's expansion is controlled by its terrain. The city is bounded by the Bay of Bengal on the east and hillocks on its north and south. Vishakhapatnam port and steel plant, the main source of livelihood in the city, are located in the south of the city, making this part highly industrialised. The central and northern regions are commercial and residential zones.

Table 16: Vishakhapatnam City Profile	
Area	544 Sq. Km
Number of Wards	72
Population density	3,177 per
No. of households	4,39,335
Total Working Population	6,12,221 (35 per cent)

1 http://www.thehindu.com/todays-paper/tp-national/tp-andhrapradesh/vizag-to-get-slumfree-housing-scheme/article701157.ece

No. of Slums	735
Slum Population	7, 70,971 (44 per cent)
Water supply (2013)	250 mld
Road Network (2013)	3589 kms
Sewerage Network (2013)	1246 km
Source: Census of India (2011); Greater Vishakhapatnam Municipal Corporation	

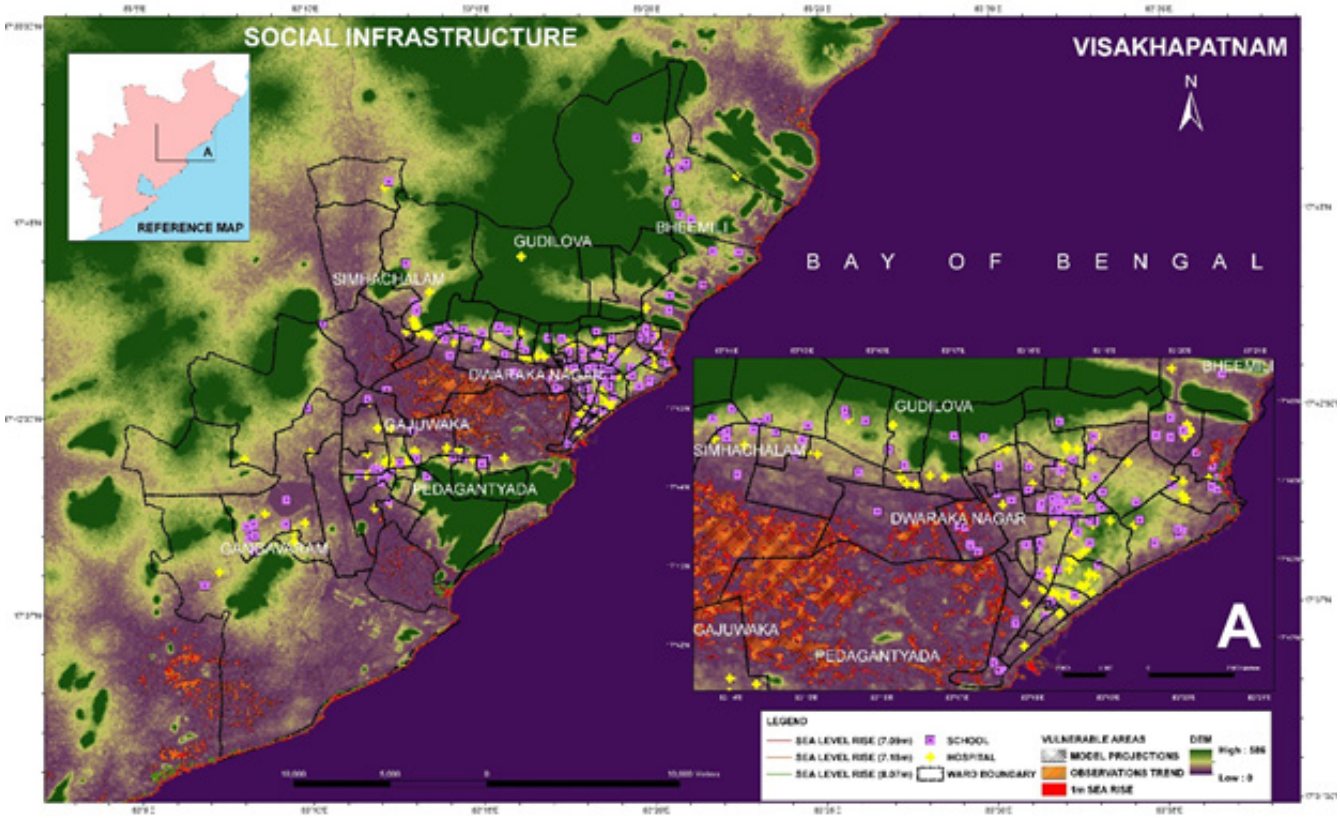
Figure 20: Ward level population density map of Vishakhapatnam



Source: Greater Vishakhapatnam Municipal Corporation

Vishakhapatnam, owing to its location on the east coast, is exposed to several climate-related hazards such as cyclonic storms, storm surge, sea-level rise and other associated disasters. The region was hit by three cyclones in the last two years: Cyclone Phailin (2013), Cyclone Helen (2013) and Cyclone Hud-Hud in 2014. Vishakhapatnam is one of the first Indian cities to be directly hit by cyclones (Rao, 2014). Wind speeds during Cyclone Hud-Hud (2014) peaked at 260 km/h, ripping off the city's greenery, affecting its communication systems and transport networks including the international airport. There was also severe damage to the Vishakhapatnam port, Indian Naval base and fishing harbour, thus disrupting economic activity and affecting many livelihoods. According to the NBC wind pressure map, the city falls in a very high-damage risk zone with wind speeds going up to 50m/s. Nearly 6 per cent of all houses in the city have roofs made of temporary materials such as CGI sheets, thatch, plastic, and so on. All of the city's 72 wards are exposed to severe cyclonic wind speed hazard. With more than 25 per cent of houses in the city having roofs made of temporary material, ward nos 1–4, 44–50, 55, 57, 62 are the most vulnerable to cyclonic activity as they are more exposed compared to other wards in the city. Vishakhapatnam gets flooded frequently during monsoons and cyclonic depressions. Because of its hilly terrain and natural drainage, some parts oo the city are relatively safer from floods, sea-level rise and storm surge hazards. But its natural drains getting blocked due to illegal construction and clogging of drains in general is causing floods even in the low-lying areas of the city.

Figure 21: Social Infrastructure and Digital Elevation Model of Vishakhapatnam



Source: TERI, 2014

Vishakhapatnam gets flooded frequently during monsoons and cyclonic depressions. Because of its hilly terrain and natural drainage, some parts of Vishakhapatnam are relatively safer from floods, sea-level rise and storm surge hazards. But its natural drains getting blocked due to illegal construction and clogging of drains in general is causing floods even in the low-lying areas of the city.

Some of the low-lying areas in the city that are affected by floods are International Airport, Sheelanagar, Pedagantyada, Gajuwaka, Gnanapuram, Lakshmi Talkies and Convent Junction[1].

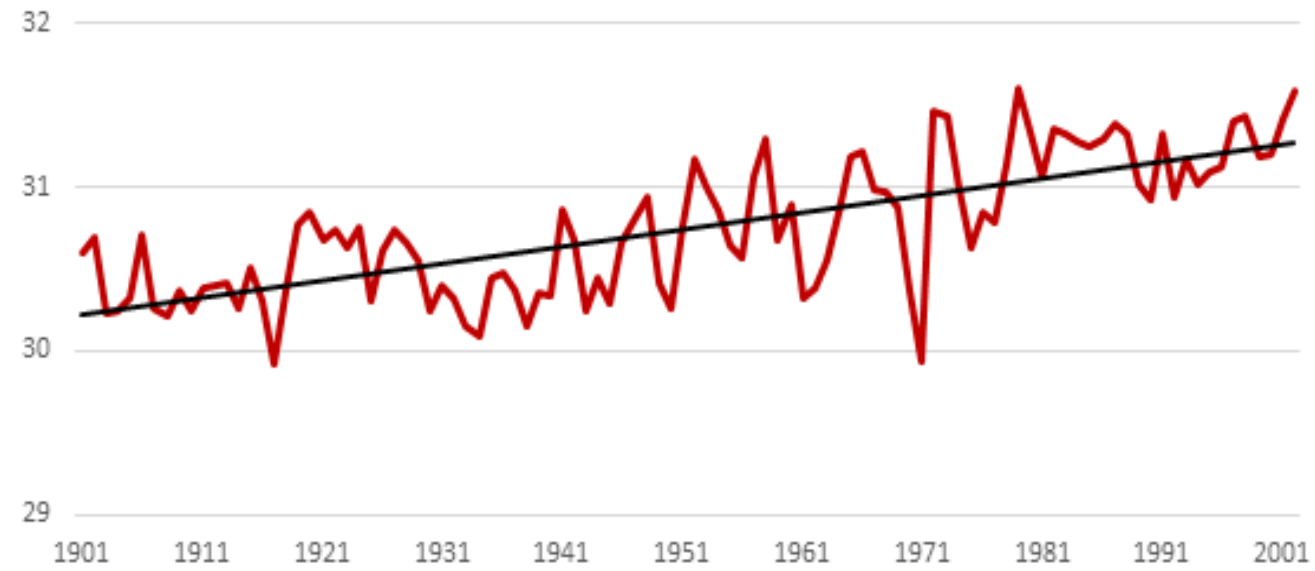
According to the study done by TERI (2014), 25 out of 72 wards in the city located in the low-lying areas are prone to floods, storm surge and sea-level rise. Wards located on the coast (Ward nos 5–7, 17–22, 24, 25, 45 and 55) and in the valley area (40–46, 51–53, 65–67) are exposed to such hazards.

Sea coast erosion is a severe threat faced by the city. The erosion process is especially high during monsoons and storm surges. The rising sea levels will also have a serious impact and increase the rate of coastal erosion in the future. The port being located in the southern part of the city is affecting the littoral drift process making the northern part of the beach more vulnerable. About 50–55 m beach has been lost near the submarine Museum region between 1990–2014[2].

1 http://www.thehindubusinessline.com/todays-paper/tp-logistics/floods-force-closure-of-vizag-airport/article1742051.ece

2 http://pib.nic.in/newsite/PrintRelease.aspx?relid=121070

Figure 22: Annual Mean Maximum Temperature Observed in Vishakhapatnam District (1901–2001)



Source: India Meteorological Department

Image 3: Damaged Road during Cyclone Hud-Hud near Bhimunipatnam

Source: Author, 2015

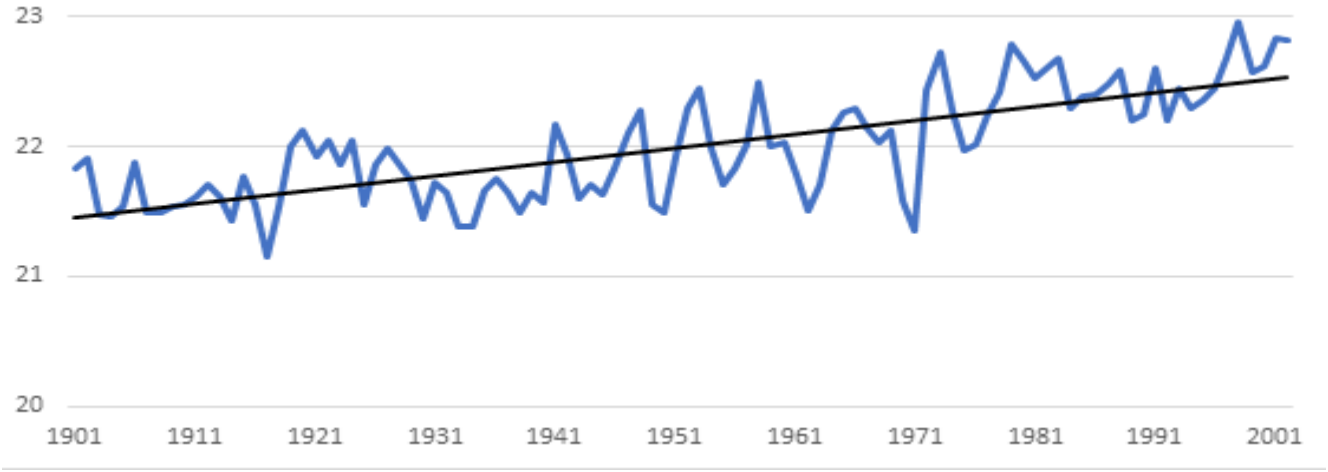
According to IMD data, there is an increasing trend of annual precipitation, and maximum and minimum temperatures in Vishakhapatnam district. Nearly 185 people died in 2015 in Vishakhapatnam because of the heat wave[1]. The city experienced severe heat wave conditions compared to the rest of the district that year. The temperatures recorded in the centre of the city were approximately 10 degrees higher than those in the outskirts indicating the effects of urban heat islands[2].

The increasing rainfall trend indicates high potential risk to the city from floods, precipitation-induced landslides and other vector-borne diseases. There is also the risk of rock slides and landslides triggered by heavy precipitation. Human activities such as housing construction on the slopes and an alteration of the local terrain due to road-widening activities are increasing the risk of landslides in the city.

Mapping done by Anil et al. (2012) shows the increase of construction activity on the hillocks in the city between 1998 and 2010. Increasing construction on the hill slopes resulted in reduced slope stability, environmental degradation and altered natural drainage patterns.

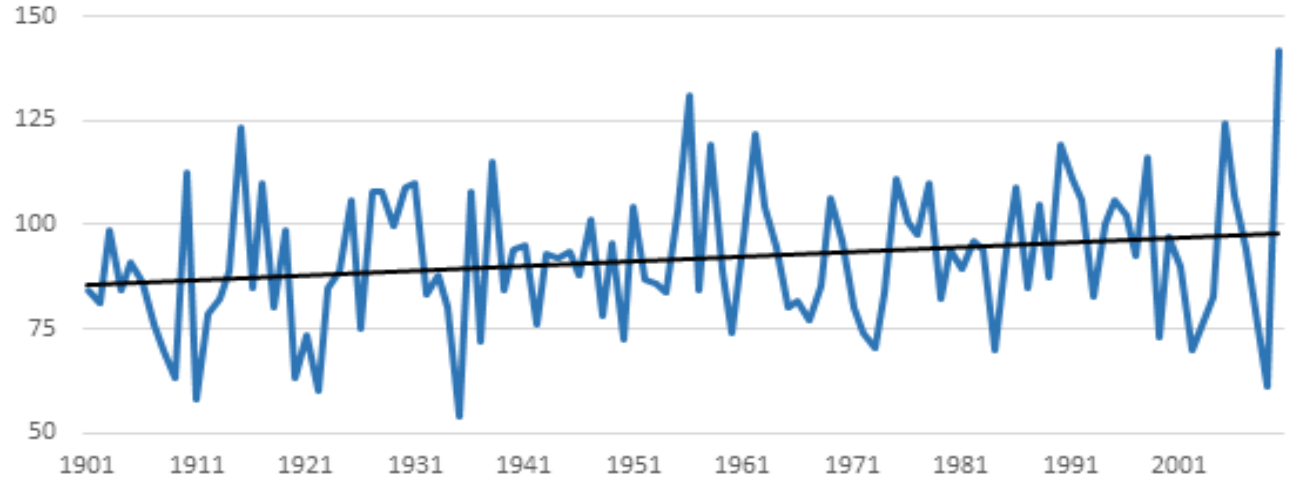
1 http://www.livemint.com/Politics/TGdhyAwU0FOTWdLrS9UpuN/Heat-wave-death-toll-increases-as-doctors-treat-patients-wro.html
2 http://www.thehindu.com/news/cities/Visakhapatnam/big-swing-in-temperatures/article7377537.ece

Figure 23: Annual Mean Minimum Temperature Observed in Vishakhapatnam District (1901–2001)



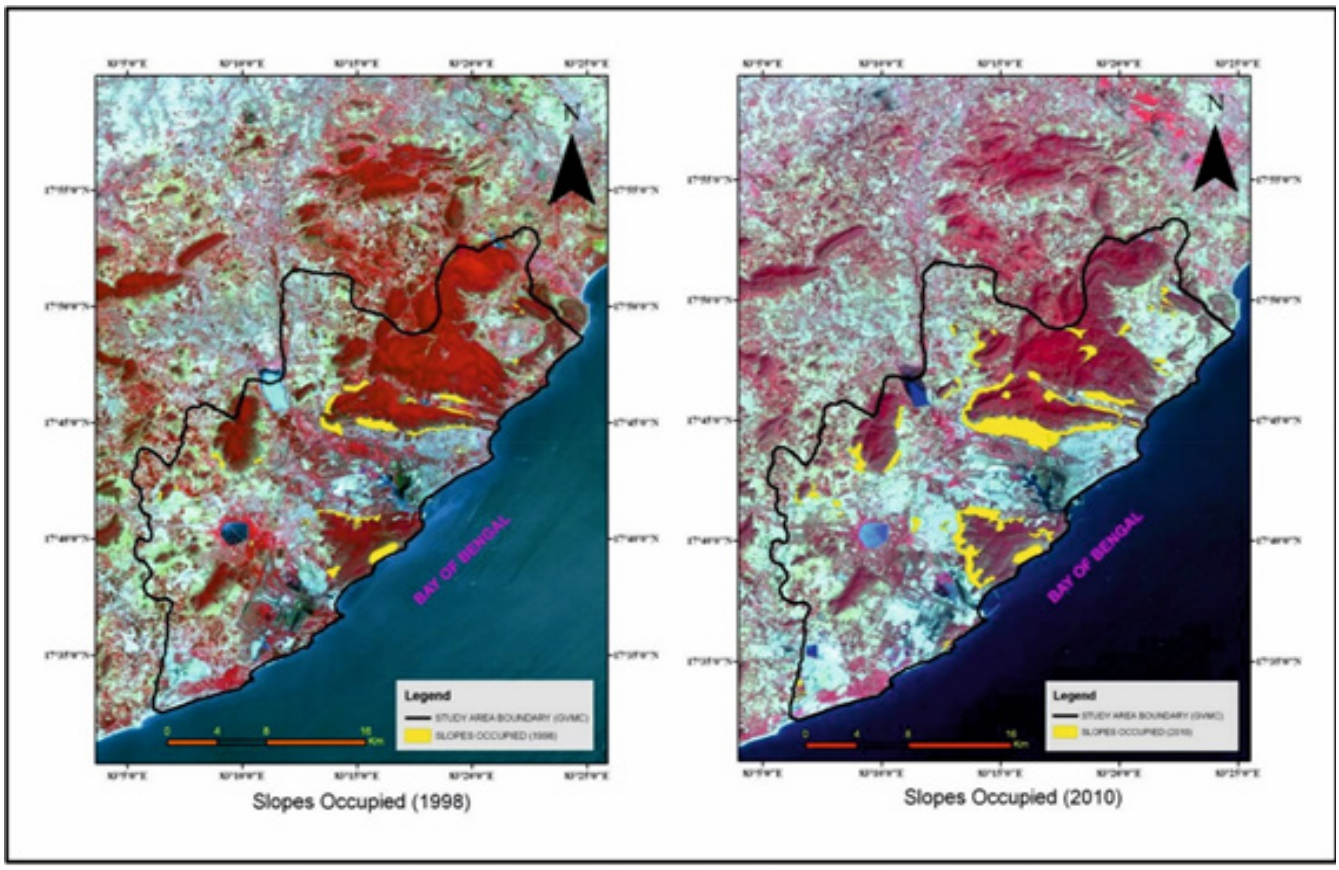
Source: India Meteorological Department

Figure 24: Annual Mean Precipitation Mean for Vishakhapatnam District (1901–2010)



Source: India Meteorological Department

Figure 25: Comparison of Slopes Occupied in the Years 1998 and 2010



Source: India Meteorological Department

Appendix 3:

Impoverishment Risks addressed by NPRR Policy

An attempt is made here to compare the NPRR 2003 Policy aspects with Cernea's and Robinson's model for Impoverishment. Similar exercises need to be undertaken for LARR 2013 and NPRR 2007.

	Various Impoverishment Risks	Ideal Outcomes	NPRR-2003 Provisions
1	Landlessness	Land-based rehabilitation	(6.4) Each PAF owning agricultural land in the affected zone and whose entire land has been acquired may be allotted agricultural land or cultivable waste land to the extent of actual land loss subject to a maximum of one hectare of irrigated land or two hectares of un-irrigated land/cultivable waste land subject to availability of Government land in the districts. (6.17) …wherein only a narrow stretch of land extending over several kilometres is being acquired, the PAFs will be offered an ex-gratia amount of Rs 10,000/- per family, and no other Resettlement & Rehabilitation benefits shall be available to them (emphasis added).

2	Joblessness	Re-employment / Diversification of skills / access to opportunities	(6.14) Each PAF belonging to the category of 'agricultural labourer', or 'non-agricultural labourer' shall be provided a one-time financial assistance equivalent to 625 days of the minimum agricultural wages. (6.18) The PAFs shall be provided necessary training facilities for development of entrepreneurship to take up self-employment projects at the resettlement zone as part of R&R benefits.
3	Homelessness	House construction	(6.2) …may be allotted free of cost house site… (6.3) one-time financial assistance of Rs 25000/- for house construction, only for BPL categories and (6.14) …transit accommodation, pending resettlement and rehabilitation scheme.
4	Marginalisation	Social inclusion	(6.21.4) Tribal PAFs will be re-settled close to their natural habitat in a compact block so that they can retain their ethnic, linguistic and cultural identity.
5	Food insecurity	Adequate nutrition security	(6.11) Each PAF owning agricultural land in the affected zone and whose entire land has been acquired shall get one-time financial assistance equivalent to 750 days minimum agricultural wages for 'loss of livelihood' where neither agricultural land nor regular employment to one member of the PAF has been provided. (6.15) Each displaced PAF shall get a monthly subsistence allowance equivalent to 20 days of minimum agricultural wages per month for a period of one year up to 250 days of MAW.
6	Increased morbidity and mortality	Adequate health care	(6.22.2)It is desirable that provision of …dispensaries... be included in the resettlement plan formulated by the Administrator for R & R.
7	Loss of access to CPRs	Restoration of community assets	(6.21.3) Each Tribal PAF shall get additional financial assistance equivalent to 500 days minimum agriculture wages for loss of customary rights/usages of forest produce… (6.21.9) shall be given fishing rights in the reservoir area.
8	Social disarticulation / disintegration	Community reconstruction	(6.22.1 a) In case the entire population of the village/ area to be shifted belongs to a particular community, such population/families may be resettled en masse in a compact area so that socio-cultural relations (social harmony) amongst shifted families are not disturbed.

9	Loss of access to community services such as schools	Access and provisions to community services	(6.14) …each PAF shall be provided with transit accommodation, pending resettlement and rehabilitation scheme. (6.22.2) It is desirable that provision of drinking water, electricity, schools, dispensaries and access to the resettlement sites amongst others be included in the resettlement plan formulated by the Administrator for R & R.
10	Violation of Human Rights	Respect and restore human rights	(No mention of any provisions which violates rights of PAFs.)
11	Increased vulnerability of women, and children	Empowerment and protection of their rights	(6.6) The Land allotted may be in the joint names of wife and husband of PAF. (7.1.2) The Resettlement & Rehabilitation Committee constituted for dispute redressal mechanism shall inter-alia include as one of its members a representative of women residing in the affected zone.
Source: (M. Kumar et al., 2004)			

Appendix 4:

Some Other National Enactments Pertaining to Land Acquisition in India

1. The Special Economic Zones Act, 2005
2. The Cantonments Act, 2006
3. The Land Acquisition (Mines) Act, 1885
4. The Metro Railways (Construction of Works) Act,1978
5. The National Highways Act, 1956
6. The Petroleum and Minerals Pipelines Act, 1962
7. Resettlement of Displaced Persons (Land Acquisition) Act, 1948
8. The Coal Bearing Areas Act, 2003
9. The Electricity Act, 2003
10. The Railways Act, 1989
11. Works of Defense Act, 1903
12. The Damodar Valley Corporation Act, 1948
13. The Ancient Monuments and Archeological Sites and Remains Act, 1958
14. The Indian Tramways Act, 1886

Appendix 5: Major National Programmes in India

I Smart Cities Mission

- Four types of interventions:
  - o Retrofitting: Work on improvements in an existing area of more than 500 acres.
  - o Greenfield: Building up a vacant area of more than 250 acres.
  - o Redevelopment: Work on replacing existing built-up environment and rebuilding it in an area of more than 50 acres.
  - o Pan-City Solutions: Applying smart solutions using technology, information and data to make existing infrastructure and services better.
- A Smart City plan is a mix of the first three or just one of the first three but has to have a pan-city solution element like IT-enabled customer interface.
- ULBs to lead delivery though Special Purpose Vehicles (SPVs): Entities registered under the Companies Act, majority-owned jointly by ULBs and State governments.
- Fixed number of smart cities have been distributed by state, ostensibly based on urban population sizes (Uttar Pradesh has 13, Tamil Nadu 12, Karnataka 6, Maharashtra 10, Delhi 1, Punjab 3, etc.).
- Challenge model of selected cities in states bidding for Round 1 funding through proposals to be evaluated; 30 cities will be selected in year 1.
- Bloomberg Philanthropies to support the MoUD in helping shortlist, coach and help cities in different stages of bidding. Bilateral donors may help specific cities (e.g., USAID for Agra, Vizag, Kanpur, etc.).
- MoUD has shortlisted agencies that States and Cities can hire for assistance in preparing Smart City Proposals. The latter can select agencies on their own using their own Financial and Procurement rules.
- Each candidate city (proposed by the State Government) to receive Rs 2 crore per city for proposal development, Rs 194 crore in year 1 (for high corpus), and Rs 98 Crore each in balance three years, i.e., total Rs 488 crore per city.

II AMRUT

- 500 cities including all Class I cities, State Capitals and Special cities.
- Smart Cities (and HRIDAY heritage) cities could also be AMRUT Cities
- Focus on basic urban services of:
  - o Water Supply
  - o Sewerage
  - o Septage
  - o Storm Water Drainage
  - o Urban Transport (walking, parking, BRTS only)
  - o Green Space and Parks
  - o 11 Reforms to be undertaken along with services provision listed above. About 10 per cent of annual budgetary outlay to incentivise reforms.

(Solid Waste Management is part of the Swachh Bharat Mission whereas metros will be a part of another MoUD scheme, different from AMRUT).

- Service-level improvement plans (SLIPs) are to be prepared by ULBs, State Annual Action plans (SAAPs) to be prepared by States and presented to GoI Apex Committee for approval. Then, prioritisation across ULBs, etc., to be done by States and DPRs prepared and implemented by ULBs.
- Big change from JNNURM is that project approval lies at the State, not central level.
- ULBs to lead delivery and implementation of projects, States and ULBs to undertake reforms.
- Rs 50,000 Crore outlay for 5 years starting FY 2016; of annual budgetary allocation, 80 per cent will be for projects, 10 per cent for reforms, 8 per cent for States and 2 per cent for MOUD Admin and Office Expenses.
- Central share is lower than in JNNURM: from 30 per cent in bigger cities to 50 per cent in smaller cities. The 14th Finance Commission is cited as the basis for States getting a bigger share to justify this, as is expectation of private funding.

III Housing for All

- Technically applicable to all statutory towns in India but with a 'focus on 500 Class I cities'.

- Opening in 100 cities till 2017, an additional 200 till 2019, and the rest by 2022.

- Four key components:

  - In-situ redevelopment (imagined as a PPP model): Centre will give Rs 1 lakh per house, rest from State, ULB, beneficiary and builder.

  - Interest subvention to expand finance to low-income households: 6.5 per cent subvention for an NPV of 9 per cent for loans up to Rs 6 lakh.

  - Affordable Housing in Partnership with developers: Centre will give Rs 1.5 lakh per house, rest from state, ULB, beneficiary and builder.

  - Subsidy for beneficiary-led individual house construction: Centre will give Rs 1.5 lakh per household.

Appendix 6: World Bank Policy on Involuntary Relocation

It includes the following aspects (W. B. WB, 2001):

1. Policy Objectives include:

   a. Avoiding IR and finding alternatives wherever possible.

   b. When avoiding IR is not possible, persons displaced must be included in the project benefits sufficiently providing opportunity to them to participate in planning and implementation.

   c. Displaced persons should be assisted in improving (or at least restoring) their livelihoods and standards of living.

2. Impacts Covered: Direct economic and social impacts, including loss of land and shelter, access to assets, loss of income sources, etc.

3. Required Measures to be undertaken in the resettlement policy framework:

   a. Ensuring displaced persons are informed about their rights and options, consulted and offered technically and economically feasible choices, and provided prompt and effective compensation [although this may be different in case of a natural calamity scenario].

   b. In case of physical relocation, provide assistance for moving, as well as housing and/or agricultural sites at least equivalent to the advantages of the previous site, support for transition period including livelihoods and standard of living and developmental assistance including training, land preparation and credit facilities.

   c. It requires to include special attention to vulnerable groups of various kind, including cultural identity in case of indigenous communities

   d. Timeliness of these compensations and necessary measures are taken before the displacement takes place

   e. A grievance mechanism for affected people

4. Eligibility for Benefits to be consulted with affected persons (including those who do not have formal rights to land) and communities, local authorities and appropriate non-governmental organisations.

5. Resettlement Planning, Implementation and Monitoring instruments including plans, policy and process frameworks.

Appendix 7 : Literature Review on Disaster and Climate-impact Motivated R&R

This section focuses on resettlement and relocation in the context of climatic and non-climatic hazards[1] in India and the existing knowledge gaps. The literature reviewed (Ahmed & McEvoy, 2014; Athukorala & Resosudarmo, 2005; Bavinck et al., 2014; Chacko, Kulkarni, & Eldho, 2012; Chandra, 2003; Cronin & Guthrie, 2011; Gopalakrishnan & Kuberan, 2005; S. Gupta et al., 2003; Iqbal, 2010; Joerin, Shaw, Takeuchi, & Krishnamurthy, 2012; Kayastha & Yadava, 1985; Shaw & Ahmed, 2010; van Eerd, 2008; World Bank, 2010) focuses primarily on cyclones, earthquakes, river-based floods and tsunamis and not as much on heat or precipitation-induced landslides.

The selected articles (Ahmed & McEvoy, 2014; Barenstein & Iyengar, 2010; Bavinck et al., 2014; Chacko et al., 2012; Chandra, 2003; Cronin & Guthrie, 2011; Duyne Barenstein & Amaratunga, 2015; Ghani, 2001; Gopalakrishnan & Kuberan, 2005; S. Gupta et

1 In the case studies, not much distinction is made between climate related impacts versus disaster risk. Extreme events all seem to come under the purview of 'disasters' and attribution to climate change is limited.

al., 2003; Iqbal, 2010; Joerin et al., 2012; Kayastha & Yadava, 1985; Shaw & Ahmed, 2010; Smith et al., 2014; van Eerd, 2008) emphasize the design aspects and problems during the implementation of the resettlement plan. These were explained in terms of beneficiaries' selection, land acquisition and building design, maintenance, and construction of embankments, flood forecasting, warning signals, allocation of housing and infrastructure services etc. The reviewed articles didn't focus on implications after resettlement process with reference to socio-economic and cultural links of affected families (Bingunath Ingirige, Keraminiyage, & Piyatadsananon, 2013; Duyne Barenstein & Amaratunga, 2015).

Articles authored by Adger et al. (2009); Barenstein and Iyengar (2010); de Sherbinin et al. (2011); Dixit (1994); Lasgorceix and Kothari (2009a); P Mandal and Horton (2007); Prantik Mandal and Pandey (2010); Mascarenhas and Jayakumar (2008) discussed technical aspects of post-disaster approaches and didn't comment on the changes that took place between livelihoods, social networks and settlements of affected people—before and after resettlement process (Ahmed & McEvoy, 2014).

Major or minor climate induced risks accentuate pressure on large parts of urban areas (Chacko et al., 2012). Subsequently, migration or evacuation to relief zones or relocation of affected population is a recent phenomenon depending on the severity of the event (Chacko et al., 2012; Chandra, 2003; Cronin & Guthrie, 2011; Iqbal, 2010; Kayastha & Yadava, 1985; van Eerd, 2008). Resettlement and relocation has been understood from a need's perspective (to relocate affected people -"provision of housing and basic infrastructure services"), fair and just compensation and "settlement planning"(World Bank, 2010). High priority has been given to housing designs, functioning, planning and infrastructure services --overlooking the emerging issues during and after resettlement process such as security, privacy, health, nutrition management, affected mental health and sanitation. Besides this, there is not enough evidence on the changes that took place in terms of income, consumption, and savings of affected families after relocation. The significant part of the research done so far has been indistinct about noting who shares the benefits and burdens in the longer run.

With regard to disaster management, Chandra and Gupta et al said that the actions of state level authorities focus on post-disaster response and recovery actions, particularly proactive in low-lying rural areas although, the government has realised the need for pre-disaster protection measures to tackle climate-related disasters(Chandra, 2003; S. Gupta et al., 2003). However, pre-disaster measures focused on structural measures such as construction of drainage channels, flood diversion structures, storage structures, embankments and dams (Chandra, 2003; Ghani, 2001; Gopalakrishnan & Kuberan, 2005; S. Gupta et al., 2003; Solecki, Leichenko, & O'Brien, 2011). The construction of drainage channels, dams and embankments led to massive resettlement.

These structural measures are an economic means to protect and provide immediate relief rather than a risk reduction measure. For example, the construction of dams and embankments is more to support agricultural productivity and to upgrade irrigation (S. Gupta et al., 2003).Besides, other social and environmental costs associated with these structural measures are neglected while evaluating the effectiveness of the project after the implementation process. Chandra (2003) and Ghani (2001) recognized that structural measures alone would not address the problem of floods, rather an integrated approach with both structural and non-structural measures help to control flood risks. Non-structural measures –such as flood proofing, forecasting, monitoring, afforestation, flood emergencies, cropping strategy, flood insurance and early warning systems have been acknowledged as apparatus for surveillance and coping risk (S. Gupta et al., 2003; Prasad, 2005).S. Gupta et al. (2003) and Stanley Jaya Kumar (2000) claim that non-structural measures which are a part of the evacuation or relocation process have been inadequate in controlling losses and reducing vulnerability(Gopalakrishnan & Kuberan, 2005; Revi & Singh, 2007).

Despite structural or non-structural protective measures initiated for disaster management, pre-disaster or post-disaster processes often lead to relocation, resettlement and voluntary or forced migration (Chandra, 2003; S. Gupta et al., 2003; Prasad, 2005). Tensions associated with climate related disasters such as the loss of property, damage of house furniture, damage of livestock and crops, lack of access to food, and effect on health and education force affected families to migrate or relocate to other areas(Bingunath Ingirige et al., 2013; Iqbal, 2010; Kayastha & Yadava, 1985; Smith et al., 2014). This is evident regardless of other benefits experienced in terms of accessibility to hospitals, schools, work places and markets. The need for shelter, food and water, privacy of women, education, livestock as well as health care and sanitation are the list of priorities identified from the responses of affected families who choose to move from an affected area. These needs are understood from the reviewed literature (Bingunath Ingirige et al., 2013; Chandra, 2003; Cronin & Guthrie, 2011; S. Gupta et al., 2003; Iqbal, 2010; van Eerd, 2008) and specifically asserted by Prasad (2005) in the 'Manual on Community Approach to Flood Management in India'. However, these articles just asserted the importance of these needs but did not mention any implications after relocation.

Experiences of Post-disaster Resettlement or Relocation

Some cases in Box 1 and Box 2 illustrate the resettlement process in practice, particularly in addressing the needs of the people in longer run.

Box 4: Kamgar Putaala Case: Pune

The Kamgar Putala case discussed by Cronin and Guthrie (2011) is considered an effective "community participation based slum-upgrading project brought about by flooding which allowed the relocation of Kamgar Putala to Hadapsar". It was a community-led and NGO initiated resettlement process to secure the well-being and livelihoods of affected people from frequent flood losses. This project was implemented on a built operate transfer (BOT) basis partnering with a private agency and monitored by the public sector. Before relocation, a survey conducted by NGOs and the National Slum Dwellers Federation (NSDF) resulted in a resettlement plan to develop a relocation strategy of community people interest and to move to a new site in Hadapsar. A resettlement plan was implemented after several negotiations with executives following the formation of a new government where resettlement plans were no longer priority for the new administration. After the implementation, the plan was considered successful as it helped to reduce damage from frequent flood losses. Eventually, inhabitants left the poorer quality of life they had after five years because the private agency signed the maintenance contract for only one year after completion of the project. As a result, people left with poor maintenance of basic services such as water supply, sewerage and sanitation, solid waste management and the problem of water leakage. Housing designs couldn't accommodate families with large household sizes. In addition, high spending on travel, lack of space for people who relied on livestock and other artisan works, lack of access to income opportunities within proximity particularly for women, all these problems motivated many affected families to move away from the place they had relocated to(Cronin & Guthrie, 2011) (van Eerd, 2008).

The above case shows that local organizations also fail to share the responsibility when the authority withdraws its role in providing basic services after resettlement (Cronin & Guthrie, 2011; van Eerd, 2008). Chacko et al. (2012); Chandra (2003); Cronin and Guthrie (2011); S. Gupta et al. (2003); Iqbal (2010); van Eerd (2008); World Bank (2010) research presents that the 'authorities' considered resettlement as an effective measure to secure the well-being and livelihoods of affected families from damage by (climate related) disasters. The decisions taken by these authorities without the consideration of needs and responses of affected families impacts the resettlement implementation process. It has been well documented that resettlements, due to implementation aspects, have been countering its benefits which are access to housing, access to basic services and the opportunity to rebuild social capital including access to tenure security for " vulnerable communities that have no assistance or support " (Smith et al., 2014; van Eerd, 2008; World Bank, 2010). van Eerd (2008) claims that it is not necessary that everyone will able to access equal benefits.

Box 5: A case of Chennai's urban poor dwellers

van Eerd (2008) article presents a case of Velacheri located in Chennai city. More than 2000 urban poor dwellers who used to stay beside the railway track, footpaths and tracks of the Mass Tapid Transport System (MRTS) relocated to the immediate outskirts of the city from flood prone areas. This relocation took place in the early 1990's through four phases in different locations over a period of four years. This resettlement process was undertaken as part of a government scheme implemented through the Pavement Dweller Housing Scheme. In this article, van Eerd (2008) discusses the activities of residents after the relocation and how far community participation and involvement of local organisation helps those relocated access services. In this process, the first to relocate were allowed to build their own houses. These people were partially supported by the state government or through loans obtained from HUDCO or additional help from NGOs but, as anticipated, the monetary support provided was not utilised for the purpose of construction of houses (van Eerd, 2008). Later, the local authority made a contract with a private agency to construct the houses. Also, an agreement was made with the beneficiaries that they had to "pay Rs 66 per month and Rs 10 per month for maintenance to the Slum Board for 21 years" (van Eerd, 2008). After 21 years, the beneficiaries would receive a property title. van Eerd (2008) found that the provision of basic services and maintenance by the government has been insufficient. Even efforts taken by local organisations for providing services couldn't' continue after withdrawal of third party distributors. "Relocatees were not happy being relocated because far relocation isolated them from social networks and led to lack of employment opportunities. As a result, high number of relocated people sold off or rented out their house "(van Eerd, 2008)

Box 6 : Case of Gangetic tract at Malda district of West Bengal

Iqbal (2010) describes the case of the Gangetic tract at Malda district, which is consistently affected by floods and erosions caused by the Ganga. The analysis is based on the income-earning activities of the affected families after relocation. He observed that many of the unitary households originated from the fragmentation of joint families, where the income dependency shifted to more than one family member's earnings. Most of them were engaged in informal activities or were cultivators and wage laborers. The respondents were displaced families still living in temporary shelters because of the threat of evictions, or "intended to move back to their old homes as and when the situation improved" (Iqbal, 2010). The damage of property, loss of crops, decrease in soil fertility to cultivate, and the lack of financial support affected their livelihoods. This led to many families migrating to metro cities for better income opportunities and livelihoods.

In this regard, the emerging uncertainties after resettlement such as lack of security, lack of privacy, social and psychological reasons and possibility of thefts force affected families not to shift to relocation areas (Kayastha & Yadava, 1985; Prasad, 2005; Smith et al., 2014; van Eerd, 2008). AWorld Bank (2010) report explains a few other uncertainties such as distance from work place and social networks, allocation of inappropriate area, and insufficient place for livestock and other artisan works. In addition, the loss of identity documents during floods left many affected families ineligible for the resettlement programme and other social security schemes (Mulligan & Nadarajah, 2011; Pande & Pande, 2007). These kinds of uncertainties allow the resettlement process to be an ineffective approach in addressing the needs of affected people in the longer run.

Disaster Risk reduction and Post- relocation. The discussions of disaster risk reduction (DRR) focus on post disaster relocation approaches. In particular, mitigation mechanisms refers to economic rehabilitation and community rehabilitation such as the allocation of housing, income generation sources, recreational spaces and infrastructure services (Pande & Pande, 2007). In the context of DRR and post relocation, the reviewed literature on selected articles (Becker, 2007; Kayser, Wind, & Shankar, 2008; Mulligan & Nadarajah, 2011; Pande & Pande, 2007; World Bank, 2010) focuses on the technical and spatial aspects of relocation such as settlement planning, house design, orientation of kitchen, access to public spaces, repair and maintenance, and extensions and alterations to houses.

Discourse on Mental Health. The arguments in the reviewed literature (Becker, 2007; Kayser et al., 2008) specifically discuss mental trauma and gender. In the context of mental health, Becker claims that the psychological aspects of resettlement efforts are overlooked (Becker, 2007). Besides this, (Becker, 2007) also indicates that public health has been neglected through the initiatives taken by authorities during response and relief programmes. In (Becker, 2007), restoring the disrupted social relations and individual mental health is a key argument. In addition, the (Kayser et al., 2008) article argues that the urgency of social reconstruction or restoration of affected families has led to the emergence of other uncertainties. For example, the practice of marrying young girls became quite common as affected people received benefits (incentive or aid given by state government in the form of money to encourage reunion of families).

Gender Perspective. From a gender-centric approach, many efforts are made to provide and support women with housing, utensils for cooking, medical care, sanitation and immunization without prioritising mental health and the needs to obtain normalcy (Becker, 2007; Kayser et al., 2008; Pande & Pande, 2007). According to Becker (2007); Kayser et al. (2008); Mulligan and Nadarajah (2011); Pande and Pande (2007), the risk of psychosocial trauma was a common concern due to instances of cultural shocks, and the provision of basic needs is considered as the best way to get women back from psychosocial trauma to routine life. However, mental health could not get attention in the interventions undertaken by authorities particularly stress taken by pregnant women, or during preterm births, menstrual disorders, amenorrhea and childbearing functions. From the articles (Becker, 2007; Kayser et al., 2008; Mulligan & Nadarajah, 2011; Pande & Pande, 2007; World Bank, 2010) , it seems that there has been little research conducted on outcomes of mental health such as anxiety and depression, which has been a common setback to attain normalcy. The implications of cultural networks on health and mental health has not been addressed properly.

Mulligan and Nadarajah (2011) identified that incentives provided by state level authorities in the form of training manuals and therapy materials are distributed to teachers, community workers, psychiatrists, nurses, and social workers to provide counseling classes to affected communities but the outcomes and scale of effectiveness after counseling has not been studied.

The lessons learnt from the resettlement or relocation didn't talk about reducing risks after relocation and approaches to respond to risk of future disasters (World Bank, 2010).

According to Revi et al (Revi & Singh, 2007), increasing effectiveness of "social distance" (the way authorities communicate with disadvantaged people) allow people to remain well informed. Other aspects such as health care and sanitation, nutrition management, non-agricultural activities (such as fish, poultry, and handicrafts), toilets and garbage disposal are referred to as major issues in reviewed articles, but they didn't focus on the implications of these aspects after relocation. There is little information about how different social and income groups were affected differently. Also, risks associated with a shift in income sources and changes that took place with respect to social and cultural networks after resettlement process has been not discussed.

Appendix 8 : Literature Review on Development-motivated R&R

Since Independence in 1947, India has been undertaking many developmental projects to achieve rapid economic growth and thereby improve the quality of life of its people. India has therefore invested in dams, industrial projects, mines, power plants, roads and new cities. This has been made possible through massive acquisition of land and subsequent displacement of people. Development displacement population is the single largest category among all Internally Displaced Populations (IDPs). In India around 50 million people have been displaced due to development projects in over 50 years (Lok Sabha Secretariat, 2013) . Around 21.3 million development-induced IDPs include those displaced by dams (16.4 million), mines (2.55 million), industrial development (1.25 million) and wildlife sanctuaries and national parks (0.6 million) (Lok Sabha Secretariat, 2013) mentioned by (H. M. Mathur, 2011) , displacement is a fundamentally disruptive and impoverishing process as it gives rise to several economic, socio, environmental problems. This section of the report provides an overview of the literature on development-induced displacement. It reviews 20 documents which include a few case studies, and in doing so, it provides an overview of the literature, discusses trends that can be extrapolated from that review and identifies possible gaps in the literature.

According to the Planning Commission report, 3,300 big dams have been constructed in India over the last 50 years. Most of these projects have led to large-scale forced displacement of vulnerable people. (Dreze, Samson, & Singh, 1999), provide a comprehensive look at displacement and resettlement in the project. There are other projects like the Upper Krishna in Karnataka where two dams displaced a total of 40,000 households, or about 240,000 people (the largest resettlement operation in the World Bank's history) and in Maharashtra, two much smaller dams displaced about 40,000 people (Bank, 2000a). (Flood, 1997; Sahoo, Prakash, & Sahoo, 2014) in their articles talk about the Sardar Sarovar project, the most controversial and much debated project in India. Sardar Sarovar Dam is a gravity dam in the Narmada river crossing Gujarat. The project has several adverse impacts on the ecology of the region in addition to the submergence of 13385.45 ha of forest area. Large numbers of people getting displaced was the project's main concern. It was estimated that 6,147 families were displaced and nearly 40,245 families affected by this project. Tribal and rural communities were the most affected. Living at the margins of society, these groups lack the voice or power to defend their opinions and thus they are often overrun by such development projects. As discussed by (Bartolome, De Wet, Mander, & Nagraj, 2000) there has been very little or no participation of affected people in the planning or implementation of the dam projects and also in the aspects of rehabilitation and resettlement. However, in the case of the Tehri Dam, the affected people have become more vocal and have been opposing the construction of the dam since the start of the project (Jayantha, 2014). Though the rehabilitation package/compensation of this project has improved over time, (E.G.Thukral, 1996), highlights the gender bias in compensation. He argues that in the case of the Tehri Dam even if a woman were a landowner and she and her husband are together entitled to only one piece of land, compensation would go to the husband. (Balaji & Rout, 2004) and (Jason, 2004) also talk about the issues faced by women during the process of displacement.

A large sum of public money has been invested to establish mass transit systems in cities, but these have largely benefited the middle classes, owing to their important role in the changing production and consumption relationship in cities (L.Fernandes, 2000). The Delhi Metro rail (DMR) has accelerated the processes of dispossession in the city through: (1) displacement of slum dwellers for its construction; (2) prioritising metro routes for middle class settlements and (3) keeping high fares (Randhawa, 2012). According to the Environment Impact Assessment (EIA) of Phase-I of the DMR, 2,502 slum clusters were supposed to be displaced due to it (Rites, 1995). As per the data gathered through the Right to Information Act in 2005 from the Municipal Corporation of Delhi (MCD), 699 slum dwelling families (approximately 3,500 people) inhabiting the land and owned by the MCD were displaced (GNCTD, 2005). As quoted by Delhi Metro has failed to achieve its target of compensations (Randhawa, 2012). Even though DMRC (Delhi Metro Rail Corporation)

may claim to offer double or triple compensations, the displacement of thousands of people from their land is not acceptable.

The relocation and resettlement of people from nature reserves is a controversial issue in the conservation community. More than 580 national parks and sanctuaries (referred together as Protected Areas or PAs) have been set up in India with the aim of conserving biodiversity. Human habitation and their use of natural resources are prohibited within these PAs. (G. Shahabuddin et al., 2006)talks about the Sariska Tiger Reserve area. Here relocation of villages has been undertaken for saving biodiversity. Sariska already has a long history of village relocations. Karnakawas was moved from the Core Area between 1975 and 1977, and unsuccessful attempts have been made to move two other villages, Kirashka and Kanakwari. (Karanth, 2007) analysed a relocation and resettlement project in India's Bhadra Wildlife Sanctuary. The author examined the relocation experience of 419 households who moved to two villages located outside the reserve. In 2006, 52 per cent of households were satisfied with their quality of life. This paper draws out key insights for improving conservation practices related to resettlement efforts. It also documents short to mid-term successes and challenges that affect the communities involved. The paper concludes by saying that relocation may be a viable conservation tool in specific contexts, and that successful resettlement requires substantial financial support to meet people's socio-economic needs, active consultation of the people involved, and partnerships of committed non-governmental and governmental organiations. Similarly (H.M. Mathur, 2006a, 2006b) talks about the role of the government and NGOs in resettlement. He says 'the interest in displacement/ resettlement issues that government has shown in recent years is widely seen as a move to neutralize hostility of protesters.' However, the government has recently introduced a land acquisition and resettlement and rehabilitation bill (LARR Bill 2011). This will convert resettlement policy into a law making it enforceable. The government needs to ensure that as a result of development, displaced people can also improve their level of living and not become even poorer than before. Mathur (2006a,b) also says that the relationship between governments and NGOs need not be entirely combative. The interests of both meet in the fact that everyone wants a fair deal for people who are displaced by these projects.

Thus this corpus of literature gives us an understanding about how the well-being of affected families has turned out to be the most vital and sensitive issue for the development projects. Though displacements are not new in development projects, in the recent years the scale of displacement has assumed serious proportions due to enormous and indiscriminate land acquisition. The numbers of both directly and indirectly affected people have been consistently underrated, and the understanding of the nature and extent of adverse effects has been scanty. Barring very few articles in the development sector, the aspect of gender has been neglected completely. Though articles talk about loss of land, jobs, home during displacement, there is minimal understanding of other fundamental risks as quoted by (Cernea, 2000), like marginalisation, food insecurity, increased morbidity as well as loss of access to common property resources and community disarticulation.

Displacement and resettlement are issues that India has to live with. But the goals of resettlement policies must be ones were the displaced people also benefit from the process. The quality of life of people displaced must improve and not deteriorate. For successful resettlement, a strong commitment from the government is required. Compensation is most often given to people who possess legal titles. As a result, though tenants, wage labourers, encroachers are the most vulnerable they are not usually considered for compensation. This must change and the most vulnerable must also be considered for compensation. Most importantly, affected people must be consulted/involved in all stages of planning, implementation and monitoring. A grievance redressal cell must be set up and the agency must ensure that the grievances are addressed promptly. If these are not fulfilled the policy and practice of development would remain unfair, and become a source of social discontent.

Appendix 9 : Review of Newspaper articles and Popular Media Survey

News Articles provide 'recent' and 'local' information on the widest range of topics. This section is a summary of the issues reported in 70 selected news articles from over 26 national and regional publications on relocation and resettlement in India in the last decade. The news article search was carried out using the 'Google News' advanced search engine and the 'India Environmental Portal' webpage. The keywords for the article search are 'relocation', 'resettlement', 'rehabilitation', 'reconstruction', 'displacement' during the last decade (from 1January 2005' to 31 May 2015). The articles were selected based on: 1) reasons for relocation and resettlement that have taken place, 2) issues and challenges of implementation of relocation and resettlement projects, and 3) problems faced by the families after relocation. Articles/results with similar focus as the mentioned issues and articles related to 'violence and displacement' were not considered.

Out of the 70 selected articles, 35 focused on

development-induced displacement and most of these were from metropolitan cities like Mumbai, Delhi, Chennai, etc. Thousands of families are affected by the ongoing or proposed projects like metro rail, international airports, slum upgradation programmes across the country. Both in-situ and relocation projects have failed in many of the cases. TDR incentives attract real estate developers who collaborate with the government for the construction of rehabilitation housing. New housing units are being constructed with little or no investment from government and beneficiaries. However the tenements built for rehabilitation are lying unoccupied because of the delay in identification and allotment to beneficiaries. With a limited number of units available and in view of the prevailing eligibility criteria, only a section of the project-affected families are eligible for allotment. Local politics also plays an important role in this process. As some sections of their community are left behind, many families refuse to be relocated. There are also some cases of demolition of the existing colonies before making arrangements or identifying sites for relocation leaving the families in limbo.

Opposition to relocation means delay in the implementation of housing and development projects leading to a huge inflation of project costs, making them unfeasible for builders and contractors and delaying the process further. The fresh estimations of Gosikhurd Dam in Bhandara district are at Rs 16,000 crore, which is more than 4,300 per cent higher than the original estimate of Rs 346 crore when the project was conceived in 1984.

Out of the 70 selected articles, 12 report on displacement due to the construction of new dams and increasing the height of water in the existing dams. Few articles track projects that were completed 30 years ago but failed to rehabilitate the affected people. The affected villages are the ones that are submerged by the reservoir and located on the slopes that are affected by the landslides triggered by filling up of the reservoir. The Polavaram project will submerge nearly 40,138 hectares of land displacing a population of two lakh adivasi (tribal) groups who live in about 280 villages. It was reported that some tribals were given farm lands about 20 kms away from the houses provided to them.

It is noted that relocation of the villages from the reserve forests also have a huge impact on the livelihoods of the affected families. However, in the unique case of the Chetty communities living in the core area of the Mudumalai Tiger Reserve, the local people have been demanding to be shifted out of the forest for three decades as the villages do not have basic facilities like electricity, healthcare, higher education and transport because of the prevalent forest and wildlife protection laws. In the case of Simi village, Uttarakhand, the villagers want to be relocated because the houses in the village have collapsed as a result of land sinking after continuous erosion by the Mandakini river. Families affected by disasters like the Kosi floods in Bihar in 2008 and floods in Uttarakhand in 2013 are living in the same location even as the rehabilitation projects await implementation.

Appendix 10: Typology of Case studies

The following are the various characteristics of rehabilitations, a combination of which can be used to define a typology of a rehabilitation. Different rehabilitation case studies from across the three geographies (and beyond) are described for these. This also establishes a scoping exercise which will help shortlist focused case studies for the primary work.

A	Project level Characteristics	
A1	Type of Project Refer to the distinctions between rehabilitation, R&R as defined in the concept note.	(a) In situ rebuilding / up gradation (b) Temporary resettlement (c) Relocation (d) Resettlement
A2	Type of Risk Management Refer to the definitions for corrective, and prospective (and compensatory) risk management in the concept note. Also, note that it could be a combination of two or more of these as well, and when no consideration of risk is given, then none of these may apply.	(a) Corrective / Post impact (b) Prospective / Pre-emptive (c) Not applicable

A3	Nature of Planning	(a) Planned with risk measures (b) Planned without risk measures (c) Unplanned/Organic
A4	Level of planned participation Please note that this could be more than one options as well	(a) Part of decision-making process (b) Part of planning process (c) Part of implementation (d) Part of long-term management post completion
A5	Motivation/Nature of Hazard	(a) Post extreme climatic event (b) Loss of land post an extreme event (c) Low-intensity High Frequency events (d) Non-climatic event (tectonic, etc.) (e) Development
A6	Level of attribution of CC to hazard frequency and intensity	(a) Low (b) Medium (c) High
A7	Primary Decision Maker In case of a combination, please describe in the note	(a) People (b) Civil Society (INGOs, NGOs, etc.) (c) Government (d) Combination
A8	Distance between old and new locations	(a) 0 to 1 km (b) 1 to 5 km (c) More than 5 km
A9	Time between decision and implementation It is observed that the outcomes vary when time elapses between decision and implementation. If that is the case, please describe more in the note.	(a) 0 to 1 years (b) 1 to 2 years (c) More than 2 years
A10	Time taken to complete the project It is observed that with time elapsing at the implementation stage, and leadership changing hands, the outcomes of the project vary. If that is the case, please describe more in the note.	(a) 0 to 2 years (b) 2 to 5 years (c) More than 5 years
A11	Age of the project (time since completion) Over a period of time, people living in the case study sites may have adapted to the changing scenarios, adopted new forms of livelihoods, the urban forms of the city may have changed, or people may have sold or moved elsewhere. If that is the case, please describe in detail in the note.	(a) Less than 5 years (b) 5 to 10 years (c) More than 10 years
A12	Size of the Project	(a) Small (1–100 HH) (b) Medium (101– 500 HH) (c) Large (more than 500 HH)

A13	Nature of dividing the population This kind of division may have affected the social networks in many ways, which needs to be described in the note.	(a) Whole population moved to one place (b) Part of the HH moved together to one place (c) Different settlements in their entirety moved together to one place (d) Different parts of settlements moved together to one place (e) All HH moved but spread in parts (f) Part of HH moved and scattered in different locations
A14	Financing Sources The source as well as the amounts (which are often insufficient) affect the outcome of the project. The monitoring and evaluation frameworks adopted by different agencies for the outcome of the project also impacts the actual outcomes. These need to be described in the note.	(a) 100 per cent Govt funded (b) 100 per cent Donor/ Civil Society funded (c) 100 per cent Community funded (d) Contribution of funds from different sources but none from the beneficiaries (e) Contribution of funds from different sources including the beneficiaries
B.	Original Settlement-level characteristics	
B1	Type of land tenancy	(a) Owned (b) Right to occupy (c) No explicit/legal rights
B2	Age of settlement (before the move) Moving an older settlement could be very different from moving a relatively younger settlement as the networks and bonds with the land are different.	(a) 0–5 years (b) 5–10 years (c) More than 10 years
B3	Size of the settlement	(a) Small (1–100 HH) (b) Medium (101–500 HH) (c) Large (more than 500 HH)
B4	Most dominant nature of livelihood options for HH	(a) At home work (b) Travel 0–1km for work (c) Travel more than 5km for work (d) Migrate regularly to other cities/towns for work (e) Migrate seasonally to other locations for work (f) Mixed nature of work
B5	Level of Hazard Risk Exposure This assessment could be based on secondary information from past events, or project reports if available.	(a) High (b) Medium (c) Low

B6	Type of Urban form	(a) Cluster housing (b) Row Housing (c) Multi-storey Housing
B7	Levels of social infrastructure distinguished by provider	(d) Good—provided by the government (e) Good—provided by the civil society (donors, INGOs, NGOs, etc.) (f) Good—self/community created (g) Poor—with contributions from public funds (h) Poor—with contributions from the civil society (i) Poor—self provisions
B8	Strength of social networking Also comment on the nature of networking—language, caste, livelihoods, regional, etc.	(a) High (b) Medium (c) Low
B9	Most dominant form of family structures	(a) Nuclear family with male family head (b) Nuclear family with female family head (c) Joint family with male family head (d) Joint family with female family head
B10	Use given to abandoned site Also comment on who owns, plans and implements the new use—public sector, private sector, communities themselves, etc.	(a) No use planned (b) Planned housing (c) Planned commercial (d) Environmental land use
C	**New settlement-level characteristics**	
C1	Level of hazard exposure	(a) High (b) Medium (c) Low
C2	Type of land tenancy	(a) Owned (b) Right to occupy (c) No explicit/legal right
C3	Type of new Urban form	(a) Same as what it was before (b) Similar but not exactly the same (c) Absolutely different from the earlier form
C4	Level of planning and provisions (Good, medium, minimum, none)	(d) Designed housing (e) Roads (f) Public Transport (g) Water and Sanitation (h) Electricity (i) Schools (j) Hospitals or health centres (k) Marketplaces

Appendix 11:

Commentary on Economic Assessment Methodologies

Understanding outcomes in a post-intervention scenario relies broadly on qualitative and quantitative approaches—generally followed by World Bank, ADB and other multi-lateral agencies (Annez et al., 2012; PNPM-Urban, 2013; Takeuchi, Cropper, & Bento, 2006). The former principally develops an assessment framework which identifies key desirable outcomes post-intervention (useful in our context). These outcomes are useful considering that there are different situational contexts in which interventions are planned and implemented. Some of the typical indicators of interest are: land ownership, livelihood options, mobility and long-term sustainability. The assessment framework is usually backed by evidence from primary sources such as site visits and in-depth interviews.

The quantitative assessment framework primarily follows two principle techniques: Randomised and Quasi-Experimental Methodologies. While the two techniques are useful they are heavily reliant on undertaking assessment using a control and a treatment group (which is not recommended in the present context). In some cases, a locational attribute is responsible for the overall well-being of community settlements and therefore, hedonic measurement techniques are prominently used (simply understood in the context of identifying critical proxy variables and using statistical techniques) (Jimenez, 1983, 1984; Kaufmann & Quigley, 1987). We have a case for using a comprehensive risk-assessment framework, develop attributable/proxy measurable indicators and undertake an evaluation. While it is important to identify 'change' (beneficial outcome), it may be challenging to draw comparisons (to be thought through).

Some discussion points:

1. Literature underscores the need for economic, social, and environmental costs of relocation to be carefully assessed before the decision to relocate is finalised, and the consideration of other risk-mitigation options. It is also identified that relocation is often unsuccessful because of inadequacy of new sites, distance from livelihoods and social networks, socio-culturally inappropriate new settlements, lack of community participation and under-budgeting of relocation costs (some of the elements that can be specified in our multiple contexts). It is also identified that relocation requires risk mitigation through well-planned and adequately financed programmes that should include elements such as employment generation, ensured access to food, improved access to health services, transportation to jobs, restoration of common properties, and support for community and economic development (Jha, Barenstein, Phelps, Pittet, & Sena, 2010).

2. Key risks and challenges hover around underestimation by decision makers of the social consequences of post-disaster relocation despite the growing body of research that shows that it is rarely successful and that challenges persist around issues of loss of livelihoods, impoverishment, social and cultural alienation, loss of social coherence, increased morbidity, and loss of access to common property for the relocated community, as well as conflicts and competition with hosting communities (if any) over scarce resources (Jha et al., 2010).

3. Key aspects emerging from routine economic analysis of resettlement operations in developing country projects emphasise the need to engage in full cost assessment, where full cost refers to the sum of economic, social, and environmental costs.

4. Literature has also laid heavy emphasis on diverting specific attention towards relocation/resettlement impacts on income-generating activities. Literature underscores that social and economic rehabilitation programmes are the backbone of sustainable urban resettlement. Multi-lateral agencies also, in their standard protocols, have laid special emphasis on understanding how resettlement choices shape income-generation activities of the affected population.

Some other factors that also need careful consideration are:

1. Assessing the degree to which families and their economic activities are linked to a specific area.

2. Negative effects on the low-cost survival patterns developed by poor families living in areas of urban expansion, especially activities that complement family income such as raising animals and garbage recycling.

3. Family income erosion due to new financial burdens, such as additional transportation costs or having to pay for services that were previously free or subsidised.

4. Additional expenditures due to the rupture of community ties and interdependence that previously guaranteed services, such as child care and neighbourhood security (Cernea, 1999).

5. Cost and Benefit analysis - CBA (Romijn & Renes, 2013). Cost and benefit analysis is a conventional approach used in assessing the beneficial/cost

outcomes of an intervention. While useful, it has its own challenges:

- The valuation of effects must make as much use as possible of (observed) market prices. For non-priced effects, this is clearly not possible and other methods such as revealed or stated preference must be used. Costs or benefits should be calculated at market prices at the price level of a chosen fixed base year.
- There are questions about the time frame of analysis, including use of discount rate (for net present value calculations).
- The costs of a measure are made up of the costs of the resources required to implement and sustain it.
- In a CBA, the costs are defined in welfare economic terms. This means that the cost of a measure is expressed in terms of relevant opportunity costs, or the value of the best alternative use the goods or services could be put to.

A standard protocol for assessing resettlement costs is reproduced below. The same indicative elements can be used to quantify the quantum of benefits that accrue to communities/individuals. We can create such a typology for site-specific assessment and proceed to understand how we can quantify the elements.

Table 17: Standard Protocol for Risk Assessment

Compensation and resettlement costs: marketable assets	Lost land: new land where possible. Lost housing: replacement housing. Crops: new land compensates but not for the adjustment period when food and cash will be required. Lost employment: new employment. Small business: new building.
Public assets	Infrastructure: expanded assets in the community.
Environmental services	Grazing lands, common resource rights: expanded assets in host community. Water: cost of new boreholes. Cash payments appropriate if water has to be purchased. Fuelwood, fodder, poles; cost of tree-planting schemes in host community. Cash payments appropriate if wood and fodder have to be bought, such as in transition period.
Compensation and resettlement costs: Non-market assets	Cultural assets. Costs of recreation Social cohesion Psychological stability Environmental services
Rehabilitation costs	Investment costs of rehabilitation projects. Costs of extension, new works, retraining, credit, marketing.

Loss and Damage Approach (L&D[1])

Loss and damage[2] is an emerging area of policy and practice. L& D has its origin in COP16 where a work programme for enhanced understanding of L&D was launched and COP19 (where the Warsaw International Mechanism was announced). However, there is little understanding of the meaning or application of 'Loss and Damage' in urban areas. The approach follows two aspects:

1. Understanding, under a climate-induced impact, what is lost or damaged.

2. Measuring the quantum of loss and damage, with due consideration to understanding measurable and non-measurable dimensions (basically elements of risk).

Key considerations for urban L&D research and practice:

Things that can be damaged in urban areas: infrastructure systems (water and energy supply; sanitation and drainage; transport and communication); services (health care; emergency services); built environment; ecosystem services.

Factors shaping loss and damage at city scale: city profiles (hazard exposure, risk reducing infrastructure and services, institutions, investment capacity). Intersection between climatic and non-climatic drivers.

Loss and damage that affects individuals and households: loss of life; damage to health/ well-being; direct financial loss (small amounts, high importance); loss of productivity (time spent responding to impacts); erosion of assets.

Factors shaping loss and damage of individuals and communities: quality of shelter, quality of service provision (external factors); age, gender, health, (dis) ability (internal factors).

Focus Issues

- To understand the form, nature and structure of differential access and vulnerabilities of certain locations/groups of people (relatively more vulnerable), across dimensions of basic services, rights, and situational circumstances.

- To understand the multiple dimensions of Quality of life and Well-being (particularly, perception based and in the context of short-to-long-term).

- To understand the scale of immediate and long-term loss and damage, with appropriate understanding of urban connectedness.

- To understand the various dimensions of religious, cultural and production values of resources, activities and systems.

- To understand the various non-quantifiable dimensions of asset erosion.

- To understand the dimensions of disruption in education systems and the incidence of malnutrition (owing to the lack of food provisioning, an outcome of damaging the food supply chains or scarcity).

The guiding questions could be as follows:

- What are the key sectoral entry points for the assessment?

- Within the sectoral aspects; what are the key issues that require adequate attention & focus?

- What are the typical methodological tools that could be used for making loss & damage assessment?

Sectors, for example:

- Migration (from rural to urban areas) is used as a coping strategy in many contexts. However, climate-induced loss & damage in cities could potentially lead to damaging the economic activities and therefore might indicate a case of lost opportunity for subsistence work. In certain cases, renewed economic reconstruction (post-disaster event) might create new opportunities but such opportunities might be shortlived. The opportunities lost and damaged could potentially be a mixture of established networks/channels of city immersion and sustenance thereafter.

- Specific ecosystem sites that demonstrate complex & myriad relationships with the surrounding human, physical and natural systems would require an assessment of loss & damage. These ecosystems might not provide an economic service but may possibly be an important connection in the overall city dynamics. Since certain ecosystems such as coastal areas, wetlands, natural lakes, mangroves and creeks are interconnected with the city systems in many ways; these interconnections might require an assessment, which may be beyond the use of conventional economic valuation tools. For e.g., assessing the loss and damage to local biodiversity,

1 For more details, see http://lossanddamageforum.org/ and http://www.loss-and-damage.net/

2 Definition of loss and damage: 'negative effects of climate variability and climate change that people have not been able to cope with or adapt to'.

including species, flora and fauna (which help in maintaining an appropriate balance between human and natural systems); sub-systems within larger systems at the city level need to be assessed for managing waste water; various mechanisms need to be in place to slow down the loss of ecosystem services. It should also be recognised that some of the impacts (due to climate change) on ecosystems might be irreversible (loss).

- Urban systems, particularly from the perspective of informal economy and settlements, go relatively unrecognized in the context of cities. However, such systems support an important aspect of economic and non-economic activities in cities. There is a need to understand such informal systems, activities and settlements and therefore, a need to assess such dimensions of loss and damage. Institutional architecture, particularly informal grouping of people, informal processes, rules, norms and conventions (that supports the existence of the urban poor), needs to be understood and assessed with regards to loss and damage.

- Social capital (including community cohesion and social fabric); whether it gets disturbed post-disaster or whether it gets strengthened and contributes to building resilient communities/individuals is an important area for assessing loss and damages. Certain direct impacts (of varying kinds) on the people, loss of lives (if any) and the impact on the extant cultural heritage also needs to be assessed.

- Degradation of resources and land, and thereby creating unsustainable futures and their multiple and complex interactions with city-based economic and non-economic structures would require appropriate understanding and assessment. There could be potential resource-based linkages with poor communities and these resources (like water) might get completely destroyed or disturbed.

- Other non-quantifiable risks, both intensive and extensive, either emerging or originating from the wider economic or non-economic city systems would need unpacking and adequate understanding, thus leading to a need for assessing loss and damage.

The processes of urbanisation (particularly in the developing south) has unleashed an outcome that is riding on the incidence of huge development deficits within groups that are most exposed to physical risks or climate-induced extreme events. These risks get exacerbated through inadequate provision of services, lack of institutional support mechanisms and (state) non-recognition of informality. The most vulnerable are therefore underwritten through informal support structures (service and institutions), which go unreported and get unrecognized when a climate-induced risk manifests as an intensive event. Extensive risks, in interaction with climatic changes, intensify vulnerabilities and exposure and therefore, propel the poor and vulnerable groups to co-create safety nets. The scale and intensity of support systems are however inadequate. Nevertheless they enable survival with dignity. It is in this context of the myriad definitions of the urban and urbanisation that certain new approaches towards assessing loss and damage need to be developed and recognised. It is useful to quantify typical loss & damage (if possible) but this should not restrict/ guide implementation of an assessment mechanism. These approaches should be viewed in the context of the emerging dynamics of the importance of cities in a nation's economy. A typical risk asset profile that has led to relocation/resettlement would help us in unpacking the elements of risk (directly quantifiable and non-quantifiable).

Conclusion

The identified elements of risk in a relocated/resettled site should yield welfare gains and if they still exist in some form, we may safely argue that the process of relocation/ resettlement has not yielded beneficial outcomes.

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