Urban Eco System

Every city is marked by informal settlements. In some cities like Mumbai, for instance, 49 percent of the population, according to Census 2001 lives in slums. They live in dangerous and inhuman conditions, such that any untoward natural event is likely to become a disaster. Vulnerability to Climate Change sits on top of, and is exacerbated by these vulnerabilities.

Following heavy precipitation events, increased cyclonic activity, and predicted global warming; there is an increased risk of floods and landslides, damage to homes and business, loss of income and property. Low lying areas are susceptible to water borne diseases, increased breeding of vectors, water related diseases. The cities along the coast, and there are many of them, suffer loss of property, damage to shelters, salination of water, coastal flooding etc due the projected sea level rise. Drought in the hinterland creates food shortages, where poorer people are unable to cope with increased prices of food. Further vulnerable urban spaces are subject to increase distress migration from rural areas.

Vulnerability of Urban Marginal Communities

(Extracts from the Vulnerability study conducted in three slums in Bangalore in Centre for Education & Documentation)

Bangalore provides a classic example of the impacts of city growth, where urban landscapes have shown unprecedented growth rates, and how a predominantly rural population converts to an urban one10. The rapid expansion of the city has also taken place at the expense of natural ecosystems.

In Bangalore the number of slum dwellers in a decade has risen from 23% in 2001 to nearly 30-40% of the city's current population. According to a project report prepared for the Karnataka Slum Clearance Board by the Center for Symbiosis of Technology, Environment and Management (STEM), 1/3rd of slums in the city are located in environmentally sensitive and filthy areas, where water stagnation breeds mosquitoes and other health hazards. Almost 90% of all slum houses are kutcha and semi pucca shabby dwellings. Further, the Corporation limits have recently been expanded to incorporate fringe areas of the city. 85 such zones with area characteristics of a village have already been considered as slums.

The vulnerability study was conducted in three slums of Bangalore:
a) KS Garden: Old slum in the core of the city; vulnerability to climate changes marked by the cramped houses and their proximity to the open drains, large number of homes.
b) EWS Quarters: Typical example of relocation settlement and its attendant issues, the ability of the area to convey the vulnerability of its community due to forces beyond their control and institutional in nature, Kutcha homes that provide an insight into the exposure of its residents to climatic extremes and how the community adapts to these issues.
c) Parappana Agrahara: Fringe habitat in the periphery of Bangalore, recently incorporated into the city's limits, represents an ideal example of rural to urban transition, the community's evolution to a more urban mindset, degradation of the nearby lake and possibilities of future disasters in the area because of this.

The Specific impacts of climate change in the area were:

a) Rise in temperatures
b) Climate Extremes: Flash Floods
c) Impact on vector borne diseases

The predominant vulnerability of people living in the slums under study is water logging and flooding. This has direct impacts on the general health particularly of children who are prone to allergies resulting in colds, asthma etc. The other impact is on vector borne diseases, particularly Chikungunya. In all the areas surveyed, the incidence of such diseases particularly during epidemics is far far higher than for the general population.

Beyond vulnerability relating to elevation and natural drainage of the slum, the exact extent of vulnerability correlates primarily to the specific history of intervention by political events or NGO intervention on issues of tenure, and specific problems like water, amenities like toilets etc. The other important indicator is the nature of housing. While it is generally true that income and status has a lot to do with the kind of houses people possess and the kind of drainage they use, the more significant operand has been the development programme, and interaction with the slum development/regulating authority.

Though people generally build their own dwellings, their vulnerability stems from the fact that they cannot choose a good location, and have to make do with what is there to be occupied. The newer entrants would go by the rent or unofficial payments they can afford. Once settled, the incremental nature of improvement of habitat and housing is a creative function, where people use whatever resources they can muster in their environment. The extensive use of plastic sheets, gunny sacks, used flex, or buckets, plates to ward off the water, and then resorting to physically bailing out water, raising barricades of one to two feet height etc is testament to the resilience, or more correctly struggle of people against the elements. That this is likely to get worse in climate change is not in their radar, but they have perceived a change in the pattern of rains.

Most vulnerable are those who have mud flooring, this combined with poor drainage of grey water in the neighbourhood, makes any kind of perturbation extremely intolerable. They are the poorest and cannot afford to fall ill.

Women are most affected by and the burden of recovering from water logging – namely swabbing, bailing out water, dealing with overflowing *moris* mainly falls on them. They also affected by contamination of water. Overall most women we interviewed said that the situation with the water has been improving. This is mainly due to the fact that they do not have to fetch water from the distances that they used to, or that arrangements have been made, sometimes locally, to bring the water points closer home. To that extent, the BWSSB has been making changes, bringing piped river water, or digging more borewells with local storage tanks. The maintenance of these are very precarious, and the women complain of foul smelling water, and even worms in supply.

In the newer slums, namely in the peri-urban fringes, women perceive a loss of traditional livelihood options like goat tending, agriculture, kitchen gardening, as their habitat gets increasingly urbanized and polluted. Extremes of climate events would perhaps make this worse.

A similar learning arises from the paucity of firewood. While subsidised kerosene is provided at ration shops, but these are not sufficient, and its supply entails a lot of leakages. In our study we found that people make up that shortfall by using firewood stoves, where they use all kinds of waste from the environment, many of the substances quite toxic, when burnt. Most people do not use LPG as their spaces/huts are not designed to house a stove attached to a cylinder. Perhaps the one-piece stoves, distributed free would take care of their special and safety concerns.

Identification of some key policy elements:
Most issues like toilets, good drainage are best sorted out at the community level, at least for maintenance. The example of KS Garden where the three persons required to maintain the facility are paid by the contributions, and supervised by representatives of the community, rather than as is the case of EWS where the staff of the community toilets are seen as employees of the corporation.

Water and Electricity become the indicators of progress, small amounts of which are greeted gratefully. Almost all would use electricity for basic lighting. Though there are a few CFL bulbs, CDMs giving free CFLs would be ideally welcome.

Almost every home will have a TV, and would take pride in owning one. The Fan and Mixie are a necessity, but both of which have come into prominence as hand me downs or poor second hand purchases.

Most of these appliances are energy inefficient, but they are well worth it as they provide immense value to a beleaguered life. Electrical wiring also is temporary. Electrical efficiencies given the low rate of consumption, is not an economic option for the household point of view. Many people make do with connections from neighbours and loose wiring, and inefficient appliances. Perhaps the total electricity saved by proper regulated supply, good wirings and more efficient appliances would go a long way to pay for the material itself. Perhaps a potential pro-poor CDM!

The other issue is transport: wherever public transport is not convenient, people tend to use old two wheelers or hired auto rickshaws for medium distances especially. Since it is used for essential travel only, the higher per-trip costs, far out-weigh the disadvantage of not being able to put the upfront money required to have a good efficient vehicle.

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In the area of health impacts, we looked at practices. While people do tend to make offerings and prayers to recover from illnesses, these actions seem to be more out of "abundant caution", as they go in for different forms of treatment. First preference would be different types of home remedies like kashayams. The doctor is not the preferred course of action, as they are not proximate and involve travel and medical costs. Most helpful adaptation would therefore be more information on oncoming epidemics, increasing instances of viral attacks, so that people can appreciate the nature of the symptoms. And of course, a low cost, friendly Primary Health Centre would be most welcome and effective.

Health Care: clearly there is need for free public health care at the basic level. But people would rather opt for self care as even public health care tends to be expensive in terms of time, and sometimes the drugs prescribed are beyond the means of the poor. It is therefore prudent o support self-care, using public education of alternatives, and preventive especially during emergencies and disasters like floods.

Location and utilities are the main parameters which affect vulnerability. The absolute poor would have no means to do even the bare minimum. And what the little better off can do would hardly be

sufficient to adapt even to preclimate change situations. Thus climate change would call for more concerted and overarching integrated action, by a range of actors, particularly state, and NGOs.

While proactive adaptation responses must attend to the needs of the poorest, any real resilience to impacts of climate change can only take place with development of employment, livelihood and habitat. Poor urban people highlight employment, assets and savings, and income as the key determinants of their well being. This is heavily related to the security and predictability of income, as well as to the security of assets (e.g. tenure as opposed to ownership).

In terms of livelihood, the most buoyant careers in these three slums is service work ranging from municipal or public goods services, transports, plumbing, masonry, carpentry etc. For Destitute women and single women parents too, domestic work and that too part time, is a lifeline. Being unorganised, and dispersed, services is not evenly accessed, or given. The example of Shramik organizing a cooperative of such workers, and ending up being a pro-active habitat player, indicates the benefits of a cooperative approach. In places like EWS, an unofficial extension of water lines close to the homes of the women have been enabled by such cooperative action.

Way Forward for us

With increasing impacts of climate change, in the hinterland we can expect increased migrations. We need to study the issues of the new migrants especially those who would have katcha and temporary dwellings.

In the old areas, each NGO and local organizations would do well to have a map of the vulnerable people at different levels of extremes like flooding. It is therefore essential to create a template for mapping the disaster prone houses, families. In this connection homeless people also need special ongoing mapping.

A climate disaster resilience index was developed by experts at the Tata Institute of Social Sciences (TISS) after mapping five of the city's worst-hit slum pockets. Human and social dimensions, mainly community involvement, contributed most to people's resilience, notching scores of 0.60 and 0.47 on the index of 1.0. Worryingly, the slum settlements scored a poor 0.36 on most other factors owing to the absence of disaster warning systems, poor infrastructure and inaccessibility of areas to rescue services such as fire brigades and ambulances.- Spirit of Mumbai triumphs over disaster, dearth of infrastructure by Madhavi Rajadhyaksha. Times News Network. May 19, 2011. http://m.timesofindia.com/city/mumbai/Spirit-of-Mumbai-triumphs-over-disaster-dearth-of-infrastructure/articleshow/8425842.cms

Analysis result for Mumbai

Overall climate-disaster resilience is relatively low for Mumbai City. It was also the case of social dimension of resilience characterized by a dwindling social capital. Despite being renowned for its status of commercial, financial and entertainment capital of India, Mumbai city appears to lack of financial services, budget and subsidy as well as savings and insurance. Concerning physical dimension, early warning system and evacuation, internal road network, solid waste disposal and water supply demonstrate the low extreme values which will have tremendous effect on the city’s resilience. Similarly, aside from external institutions and networks, the city represents a fragile institutional dimension of resilience.

Policy recommendations for Mumbai

Overall climate-disaster resilience of Mumbai is relatively low and calls for an urgent attention of stakeholders from and beyond the city. Sustained efforts are specifically needed to strengthen physical, social and institutional dimensions of resilience.

• Dismal picture of city-wide basic services is a major stumbling block on the road to physical resilience and solid waste management, water supply, internal roads, sanitation and warning mechanism requires immediate interventions for improvement.

• Recurring floods have already helped create awareness among common people. By capitalizing on this, civic societies and local government should focus on building social resilience.

• The city needs to leverage on existing reasonable level of income and employment opportunities for crafting savings and insurance mechanism for the urban poor the augment their economic resilience.

• Local institutions responsible for city development have good external network, but need to effectively address climate-disaster issues by wider and broader cooperation with other institutions and also by mainstreaming disaster risk reduction in the development agenda.

Overall recommendations are converging to one goal: the enhancement of community resilience in the face of climate related disasters.

This climate and disaster resilience initiative is in its development stage. Through the data collection and questionnaire analysis, city resilience mapping is conducted, which has different components of physical, social, economic, institutional and natural aspects.

See full report: http://www.unescap.org/idd/events/2009_EGM-DRR/Japan-Rajib-Shaw-CLIMATE-DISASTER-RESILIENCE.pdf

Further readings:

Climate Change and the Urban Poor: Risk and resilience in 15 of the worlds most vulnerable cities by The International Institute for Environment and Development (IIED), London.22 pp. 2009. [R.E31d.76]

The City Calling: A Discussion trigger film. Nov 2009. [L.E31d.V200/VC50]