Landuse Planning and Urban Risk Reduction

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Abstract

Prevailing urban planning practices follow the traditional techniques of land use zoning classifying disaster – prone areas as unsuitable for development. Invariably, however, it is precisely along such tracts of zoned land that informal settlements mushroom. Inhabitants on these settlements are the most vulnerable sections of urban societies, poor, with no land rights, maneuvered by local politicians, with no dependable source of income, living in temporary and unsafe structures with little or no facilities for sanitation, drinking water, electricity and solid waste disposal. Even a hazard of low intensity attains disastrous proportions when it strikes communities living in such risky conditions. This scenario typifies the limitations of conventional planning techniques to control disasters in urban communities, especially in developing nations. This paper proposes an alternative means of addressing this problem of managing urban land prone to disasters through a process encompassing different scales, a multitude of activities and involving many concerned agencies. The aim here is to evolve an enduring and holistic development mechanism for informal settlements in disaster prone lands, involving upgradation pertaining not only physical development but also related to social and economic development.

Disasters in Urban Areas: What makes informal settlements especially vulnerable?

Most prominent amongst the disasters striking urban settlements frequently are those of floods and fire, with lower incidences of earthquakes, landslides and cyclones. Of these, floods are more devastating due to their widespread and periodic effect. Fires have more localised effects but are very frequent in urban areas leading to heavy losses of life and property. Earthquakes do not occur often, but when they do, they wreak havoc, often completely damaging infrastructure lifelines.

Hutments inside the Yamuna River embankments - living with annual flooding

Studies indicate that the loss of life and property due to floods has been increasing over the past decades. The prime reason for this is unplanned urban growth on the banks of the rivers and in other low-lying areas in the vicinity.

Informal settlements represent a vast human population is living in temporary and unsafe structures with little or no facilities for sanitation, drinking water, electricity and solid waste disposal. Densities in such settlements often exceed 2500 persons per hectare. Areas with such high population concentrations face greater risk of damage to life and property in the event of disasters

Even a hazard of low intensity attains disastrous proportions when it strikes communities living in such risky conditions, because of their limited capacity to withstand disasters. For example, the annual rise in the level of the river Yamuna in Delhi, India is caused by the release of water from some reservoirs upstream. It causes the river to flood its banks to a certain degree. The population living in the "planned areas" of the city hardly ever notices the change. But for the community living in the riverbed, every such instance means they have to shift temporarily, bag and baggage, to another location and only hope and pray their home still stands when the water recedes. When they do return to their homes, they have to battle with epidemics of water-borne diseases. Recovery from this annual ritual takes a long time in the absence of economic means, community support structures and facilities that aid recovery.

Conventional Planning Tools and the Real Picture

The conventional City Master Plan is patterned on the following themes:

1. Demographic projection and decision on the levels at which the population will be contained;
2. Allocation of population to various zones depending on existing density level, infrastructure capacity and future density levels,
3. Land-use zoning to achieve the desired allocation of population and activities in various zones as projected; and
4. Large-scale acquisition of land with a view to ensuring planned development.

The reasons why most Plans to reduce risk fail may be attributed to three main issues:

1. The considerable investments required for protection works: usually out of reach of most local Governments, or low down in their priorities
2. Monitoring/regulation systems to check processes of land occupation. It is much easier to prevent than to cure
3. Effective implementation: all the paraphernalia of plans, investments, legislation etc. can come nothing not implemented.

The poor and unemployed from the rural hinterland, attracted by the economic opportunities cities offer, arrive in large numbers and squat (occupy illegally) on any available piece of land. They live in temporary structures often made of materials discarded by the better-off section of the city's population. In such a scenario, lands designated as vacant for future expansion or as environmentally sensitive zones under the Master Plan become soft targets.

Besides being the cause for 'unplanned' growth of city, such settlements reflect poor physical, social and economic characteristics.

since squatters do not own the land they live on, they have little or no incentive to make improvements in the dwelling structures on land that might be taken from them any time. Physical structures are temporary in nature made with cheap building material that offers little or no protection against disasters. As it is, housing in most informal settlements consists of temporary structures that are damaged easily; they collapse or washout during heavy rains, floods and earthquakes, burn in fires, etc Many a time these settlements also have additional incompatible uses, as they accommodate storehouses of materials for recycling / refuse, and at times, chemicals. In case of fires in these settlements, it truly becomes a case of "throwing the fat into the fire" as these aid the rapid spread of fire.

As it is, many are migrants, poor and unemployed, with no permanent source of income. Frequent disasters in their area disrupt their livelihoods.

The heterogeneity of their ethnic background coupled with competition for limited economic opportunities are a cause for social tensions Coherent social structures are seldom found to be in place, leading to easy manipulation by local politicians seeking to establish 'vote banks'. These are also the areas that have the lowest literacy levels in any city and where family sizes are the highest. These two factors invariably translate into poor awareness levels, haphazard development, and unsanitary living conditions, all adding up to a recipe for disaster.

The genesis and the ensuing germination of the informal settlements thus completely defy the original themes under which the city master plans were set. Obviously, the objectives of the conventional planning system were completely detached from the socio-economic realities the informal sectors represent.

The Approach: Planning for the Vulnerable

Policies and programmes commonly adopted for planned urban development have not really benefited the economically underprivileged; thus they have resorted to options such as popular settlements beyond the periphery of official action plan areas, settlements in hazardous or unsafe locations, settlements on Government land, etc. In most cases, when viewed against the statutory norms for building and land development activities in urban areas, they are considered illegal.

Those who can afford it, stay away from ravines, flood plains, municipal drains and similar hazard-prone areas. They can afford to give safety from natural disasters a high priority and live in the cocoon of landuse and zoning regulations, building codes etc. But these "standard" measures are effective only if they are enforced strictly; when the land is illegally occupied (as in the case of most informal settlements), enforcement and regulation become uphill tasks. The local governments fear that extending services such as water supply and electricity to informal settlements might be construed as a sign of tacit approval or approbation, encouraging such settlements even more It is then not to be wondered that planning measures, as we understand them, have had such limited success in reducing the vulnerability of informal settlements.

However, there is another dimension to the issue of reducing vulnerability in urban informal settlements. Being part of the urban poor, they also have to face the reality that conventional solutions for urban disaster mitigation in developed countries or even among the economically well-off sections of their cities are neither easily accessible to them, nor can they afford it.

The challenge facing urban planning today is that increasingly large numbers lead a precarious existence in informal settlements and yet authorities are unable to control and guide them. Certain issues need to be addressed before we move towards an alternative and viable solution to this issue: first, are informal settlements indeed a liability for cities and hence undesirable? Do they actually help the economically weaker sections to sustain themselves and over time consolidate their means of living in the city? Is it not possible to control and guide such processes in a manner that ensures a minimal quality of living environment in them?

A detailed deliberation of the first two questions is beyond the scope of this paper, but the answer to the last is positive. The authors would like to suggest, how.

Strategy for Action

Improvement in Quality of life

- Reducing vulnerability at the level of the city:
  Recognizing informal settlements in landuse planning

  Experiences all over the world have indicated that any sustainable, effective redress to the issue of reducing vulnerability in urban informal settlements has to understand and incorporate informal settlements as an integral part of the urban landscape. The interventions and policies required will definitely have to encompass several scales and activities (in both time and space[1]). One of the approaches is to *aim towards an overall improvement in the quality of life*, with improvement in not only the physical environment, but also social and economic development and upliftment. This is usually achieved by providing a variety of services at low cost, at locations with high demand for these services.

  "The "Slum Networking" concept adopted a similar holistic approach in community-based sanitation and environmental improvement Programmes in slums in various cities in India and in which wisely made landuse planning decisions could provide for improved quality of life in the city's overall environment. The city-level process involved upgradation of the entire city using slums as an urban net, and exploiting the inter-linkages between slums and the city fabrics. Taking advantage of the close correlation between location of slums and the natural water paths, the functional and aesthetic potentials of the natural drainage system were realised with the installation of low cost service trunks. This in turn paved the way for extensive environment improvements such as cleaning of rivers, restoration of water front bodies, development of green pedestrian spines etc. Concepts such as topography management, earth regradation, and constructive landscaping were introduced, and involved intense participation of the public. Individual services were offered to families at low costs, which also lead to the maintenance burden being shifted from the local government to individual families." (Parikh, 1996)

- Reducing vulnerability at the level of the settlements within a city: Monitoring local landuse changes

  Another process aiming at mitigation, i.e. reducing vulnerability of *existing* settlements through participatory approaches in risk reduction and monitoring is currently being tested at Ahmedabad and Delhi in India. The core issue addressed here is that of reducing vulnerability through poverty alleviation The poor are vulnerable since they lack means to withstand disasters, but disasters in turn disrupt their livelihoods, further increasing their vulnerability The attempt here is to break this vicious cycle by a series of "Action plans" consisting of tasks that the community can perform itself in order to

reduce vulnerability in their particular settlement, be it a slum or squatter. The net result is an upgradation of these settlements, both physical and social.

The Reducing Urban Risk project being carried out in New Delhi and Ahmedabad has highlighted the problems faced by the dwellers of risk-prone urban areas and the multitude of complex parameters involved in finding a sustainable solution to their problems. It has also revealed to a great degree the inadequacy of traditional planning techniques in both preventing and containing the scale of this issue. Through a series of participatory risk appraisal and action planning exercises, significant results have been achieved wherein land in the neighbourhood is put to use that benefits the community and contributes in reducing risks at local level. The process has also provided for better local monitoring of compatible and non-compatible land use activities. The approach has been to modify the community's current behavioural pattern in times of emergencies. Instead of expecting the Government to find all solutions, the community itself is adopting a more pro-active approach.

Community Action Planning Workshop in progress

- Prevention pays

  In tandem with measures that aim at reducing vulnerability of informal settlements existing in "risky" conditions, effort has to be directed to prevent mushrooming of *new* settlements in environmentally sensitive lands through putting available land to suitable alternate use. Land left as vacant, undeveloped, or "not fit for development" is the first to attract the attention of would-be squatters. The pressures of space in this world of rapid urbanisation makes it tempting to use land that "might" one day be flooded, or face landslides/earthquake/cyclones. However, by designating a use that will suffer minimal damage in the event of a natural disaster, for example, recreational use.

- Link landuse planning to socio-economic realities

  As in the case of Delhi, most Master Plans aim to provide an Environment conducive to leading a 'safe life' and to bring about an improvement in the quality of life of the residents. The link between these objectives needs to be strengthened, one way would be to incorporate 'safe living' as a precursor to all strategies aimed at improving quality of life. This can be brought about by a realisation that solutions involve multi-sectoral and multi-level issues. Pure 'physical development' which is the domain of landuse planning is affected by a range of economic, demographic and social issues that are often not taken into account in plan preparation. It holds true the other way round as well: for example, the process of economic policy formulation has to take into account the spatial ramifications of a policy under consideration. If vulnerability arises out of location, then it helps to realise that economics more often than not determines location.

Conclusion

In our cities the informal settlements form a substantial proportion of the urban population, while conventional planning tools continue to ignore their presence thus encouraging greater proliferation. The effect is on the overall environment of the city as they increasingly face risks of hazards both natural and manmade.

Experience reveals that the currents trends can potentially be reversed provided a conscious strategy is adopted wherein informal settlements are incorporated as an essential component of the urban fabric. Landuse decisions at local level need to recognize their presence and elicit their participation in monitoring. Further proliferation may be curbed through putting land to alternate uses that are unaffected by disasters.

The overall goal of the Landuse planning process in urban areas should be the reduction of socio-economic inequities in the population and provide for healthy and safe living. In doing so, as suggested herein, a more proactive approach needs to be adopted which incorporates the aspirations of a majority of the city's communities without compromising on the main function of cities as engines of national economy.

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adapted from presentation made at Conference on 'Natural Disaster Prevention Land-Use Planning and Sustainable Development', Paris, June 1999