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## **UNIT 13 THE EXPERIENCE OF VULNERABILITY – II**

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### **13.0 LEARNING OUTCOME**

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After reading this Unit, you should be able to:

- Understand cyclone preparedness with particular reference to India;
- Understand the causes of drought and requirements of drought management in India; and
- Be informed of development initiatives towards vulnerability reduction of natural hazards in India.

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### **13.1 INTRODUCTION**

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Every year, hundreds of natural disasters shatter lives, destroy property, and dislocate and disrupt communities across the world, more so in developing countries. Large-scale natural disasters upset economic activities, increase people's economic vulnerabilities, heighten social and economic cleavages and hit the poor the hardest. These events cause sharp escalation in poverty and have highly debilitating long-term impact on the economy. In India, where the states have to deal with disasters, the impact of disasters depends on two factors: the magnitude of direct losses due to a disaster and the economic resilience of the state in the long run.

Sometimes, a post-disaster situation analysis is made to analyse the impact of a disaster. However, post-event analysis may not be the best way to assess the true impact of a disaster. In the face of weak adaptive capacity and inherited socio-economic problems, frequent natural disasters tend to increase vulnerability levels. The macro-economic impact of chronic exposure to disasters is heightened further due to unmanageable factors such as the scale and frequency of such catastrophic events. The aim of all post-disaster recovery initiatives, therefore, has to be not just recovering from losses suffered and ensuring a return to the pre-disaster state of affairs, but on steps to reduce present and future vulnerabilities through adequate risk management planning, preparedness and prevention measures for a safer future.

Although, there is growing awareness of disaster management in India, better disaster response mechanisms are still to be secured. Although India's national capacities to respond to disasters of small or moderate size with relatively little or no international assistance are generally adequate, the overall trends suggest that government of India (GOI) response mechanisms are less than optimal for responding to large-scale natural disasters. Deaths and economic losses have shown an increasing trend over the years. The reasons for this are varied, such as increasing population pressures in urban areas, increase in poor people occupying marginal lands, for example, area adjoining river beds which are susceptible to disasters, poor or ignored zoning laws and policies, lack of proper risk management in terms of insurance, credit facilities for renewing livelihood and other factors. Numerous challenges pertaining to administrative preparedness and policy formulation and coordination of scientific expertise still remain to be addressed.

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## **13.2 CONTROLLING CYCLONES**

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In case of large natural disasters, often the scale of immediate relief and restoration is high but starts to dissipate once the initial high has dissipated. The challenge is to sustain the momentum and prepare slowly but steadily over time to reduce threats.

Unlike earthquakes, the formation of cyclones can be predicted with sufficient accuracy. In the past, the inability of forecasting the exact path, coupled with lack of infrastructure in relocating people to safer areas at short notice, resulted in loss of innumerable lives. The resulting devastation was multiplied by official apathy, the inability or unwillingness of people to react to cyclone warnings, and poverty, which is the main reason for people venturing in dangerous areas for fishing despite cyclone warnings and refusal to learn from past experiences.

Events can be classified as long- term and short- term, depending on the duration of the impact. Small or medium-scale natural disasters are localised events while long- term are more extensive, both temporally (persists over a long period of time) and in the spatial sense. Their impacts are also more severe and also more abiding, in the sense that they leave behind more intense vulnerabilities to affected communities. For example, the 1999 super cyclone affected over 18 million people in Orissa, which is more than half the state's population. It also caused widespread damage to infrastructure worth billions of rupees, which included urban and rural roads, bridges, irrigation facilities, water resource related works, public buildings, schools, and other critical facilities. The cyclone flattened telecom towers and communication facilities and destroyed power transmission systems, keeping key parts of the state in the dark for weeks. It killed some 9000 people and rendered millions homeless by damaging about 2 million houses. Normal life came to a

standstill as support systems collapsed and economic activities grinded to a halt. In such a situation what appeared most urgent were the immediate restoration activities to ensure early resumption of everyday life. Such quick restoration may not always address the real issue of reconstruction. However, it does provide people as well as the government with the necessary breathing space to plan required post-disaster reconstruction measures with a relatively long-term perspective.

Disasters raise many other fundamental issues related to development. Following the super cyclone, policy makers, civil society actors, and people in Orissa realised that the dependence on monsoon crops must give way to economically viable crop diversification. It was also realised that primary health care centers were not enough to address the health needs of the rural people and that wider initiatives were required for creating a cadre of community health workers and for promoting preventive health awareness in people. Most important was the realisation that despite various rehabilitation initiatives taken by the government and civil society actors, recovery and future coping ability of people depended crucially on their pre-disaster vulnerability levels.

Linking reconstruction, preparedness and risk mitigation therefore, holds the key to a successful disaster mitigation strategy. For example, after the super cyclone, it was realised that concrete structures served as emergency shelter during the cyclone. Therefore, after the cyclone, once the immediate repair and restoration of thousands of damaged schools had been completed, steps were taken to undertake construction of newly designed school buildings in existing premises with a view to providing additional classroom space as well as making these structures double up as emergency community shelters during floods and cyclones in the coastal areas. Post disaster situations also provide opportunities for addressing many long-standing needs and demands of the people and pay attention to unfinished developmental tasks. For example, after the super cyclone, about ninety go-downs were constructed for storing food grains in areas highly vulnerable to cyclones and floods. This was long over due, but their completion after the 1999 cyclone ensured that these were put to best use during the 2001 floods. This initiative was further amplified by building small go-downs at the gram 'panchayat' level. Again, this came in very handy during the 2003 floods. Pre-positioning of food-grains at district, block and gram 'panchayat' levels ensured timely relief provisions during floods.

### **13.2.1 Foci of Disaster Management**

Social, institutional and infrastructural vulnerabilities have become a necessary part of analytical assessments mandatory for professionals concerned with evaluating risk factors. Engineers earlier applied the concept of vulnerability was applied in structural terms as the probability expressed in a percentage of a given structural element failing in response to a specific force or hazard. Vulnerabilities are now considered as prevailing conditions of social, economic or physical nature that may predispose a designate population, structures, or physical environment to severe loss or damage from the effects of a hazard or a combination of hazards. In the latter context, as they are generally dependant on human behavior, decisions or actions, (as variables) they can equally be modified by human behavior to reduce the potential risk.

During the same time, hazard research has attracted a growing number of social scientists in recognition of the human dimensions involved in risk analyses in modern societies. It is now widely accepted that social and economic conditions can either increase or diminish the risk for a specific population to particular hazards, although suitable methodologies to actually measure the costs and benefits are still debatable.

Experiencing vulnerability, whether in the social, system, institutions or infrastructure, is all inter-related. Chambers (1989) summarising case studies in vulnerability, coping and policy asserts that vulnerability is increasing in less industrialised countries because of factors such as decline in patron-client obligations (except in South India) and decline in the support of an extended family, the rising costs of social events such as weddings, and the localised scale of the means of livelihood.

Occupational health and safety is an important issue in addressing vulnerability of the poor people. The main asset of most poor people is their body, therefore health, especially of the breadwinner, is a crucial issue for all members of households. Health signifies 'wholesome soundness' of the body. It is rare to find an occupation that does not entail vulnerability to physical health. Even in office work, where the physical environment may be fully controlled, several psychosocial stress factors might exist including pressing demands, inter-personal relationships and job security.

According to Banuri et al. (1994:7), sustainable development includes social capital and equity concerns. "Sustainable human development, therefore, can be defined as the enlargement of people's choices and capabilities through the formation of social capital so as to meeting as equitably as possible the needs of current generations without compromising the needs of future ones." Such a definition has clear implications for vulnerability, in that social capital is the key to building resilience. Sustainable development projects, in this view, will be effective only if they are locally designed and controlled, open and participatory, inspirational, and catalytic. Scholars characterise sustainable development as entailing "a permanent political discussion" in which people must choose carefully what to control and how to control. Hence the official definition of vulnerability, the Bruntland definition is enlarged with the added perspective of *social capital and equity*.

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### 13.3 LARGE DAMS AND VULNERABILITY

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Large dams are no more revered unthinkingly as the temples of India's progress. They are not, of course, as their destructive consequences are being increasingly recognised. All major rivers are either dammed or are in the process of being so. This indicates that in the next two or three decades, dam construction is going to be a major development issue. People are now getting aware about their vulnerability because of big dams, as there is increasing awareness of the fact that they can prove to be ecological disasters; more significantly, in context of the mega projects like Narmada or Tehri. There is a beneficiary group of contractors and employees and there is the group comprising affected populations, who will suffer displacement, besides environmentalists and human rights activists who are involved on ideological grounds. The Sardar Sarovar in Gujarat and the Narmada Sagar upstream in Madhya Pradesh are probably the biggest dams being built in the world (in 2005) and *Tehri* is among the highest dams being built. The Narmada Sagar Project comprises the Narmada Sagar, Omkareshwar and Maheswar dams, of which, Narmada Sagar is by far the largest. The dam is planned to work in cooperation with the Sardar Sarovar dam situated downstream of Narmada Sagar. Narmada Sagar, if built, is likely to have substantial negative environmental and social effects compared to the benefits expected. According to 1981 figures, more than 130 000 people are likely to be displaced by the project. Waterlogging is one of the most serious of the environmental problems the Narmada Sagar is expected to create (Paranjapye, 1990). Other problems related to the project are many; deforestation, erosion, and salinisation of agricultural lands, are but a few. Large dams are generally being constructed in areas,

which have so far not been touched by modern development. These dams will affect the natural course of rivers. Forest cover is also very vulnerable to such projects. Forests are not only being cut for the dam area but also for approach roads, offices, residential quarters, storage of the construction material, etc. Rehabilitation of the vulnerable population is also never efficiently done. Estimated number of people displaced by large dams in India range from 21 million to 40 million.

India has 4,291 large dams, counting the 695 currently under construction. Of these, 2,256 were built in the peak period between 1971-1990. About 73% of the completed dams are situated in three western agricultural states. Some of the most fertile agricultural lands in this part of India are apprehended to be submerged by the Sardar Sarovar reservoir. In addition to the area of permanent submergence, an area of unknown size is likely to be prone to annual flooding as a result of the project. The size of this area will depend on the intensity of monsoon rains and the amount of sediments disposed in the reservoir. There are no thorough studies to give reasonable predictions about the amount of land, which will be affected in this manner. However, according to the Morse commission, this problem is strongly underestimated by the project authorities (Morse, 1992).

Of the total area to be irrigated by Sardar Sarovar, only some 40 percent is classified as "suitable" and "very suitable" for irrigation. As to the remaining 60 percent, there are more or less severe problems related to high salt content in the soil or in the groundwater, or a propensity for water logging. Water logging occurs when groundwater levels reach so high that plant roots are more or less drowned, thus reducing fertility.

The increased salinity, decreased water quality and reduced amount of nutrients and sediments in the Narmada are bound to have impacts on fish and other lifeforms in the river. Both prawns and *hilsa* are sensitive to changes in their physical environment, and *hilsa* is known to have left rivers following construction of dams. Thus, there is danger of both *hilsa* and the freshwater prawns disappearing from the Narmada, or at least diminishing in numbers.

Dams can also create several hazards, which are very significant but not so well known. Scientific research conducted at several large reservoirs has revealed that there are possibilities of earthquakes being triggered due to the impounding of massive amount of water in them. Seismic tremors have been recorded at these reservoirs. Earthquakes can also occur due to the existence of active faults, or discontinuities in the underground rocks, along which movement, which might take place, or due to the existence of fissures through which water seepages into the earth. In a study entitled *Reservoirs and Earthquakes*, authors Harsh Gupta and B.K. Rastogi, cite about thirty cases "where the initiation or enhancement of seismic activity has been well evidenced following the impounding of reservoirs behind large dams." The reality of these hazards was highlighted after the devastating earthquake, which struck Koyanagar, 450 km southeast of Mumbai on December 10, 1967. This region had long been a non-seismic one, but had experienced a series of tremors after the impounding of water in the Koyna dam reservoir in 1962. In the 1967 earthquake, nearly 200 lives were lost, 1500 people were injured and thousands were rendered homeless. More than 80 percent of the houses in Koyanagar were either completely destroyed or became completely uninhabitable. The city of Mumbai and its suburbs were also rocked. The generation of electricity from the Koyna hydel works was badly affected, paralysing Mumbai's industry. There is a recognised danger of an earthquake of magnitude 7.0 on the Richter scale occurring in the Sardar

Sarovar vicinity. It is expected that at least one major earthquake will occur during the dam's life span. An earthquake would also have impacts apart from the immediate effects, even if the dam itself were not damaged. For example, an earthquake would probably cause landslides into the reservoir and upstream river, thus increasing sedimentation in the reservoir and reducing the life span of the dam (Paranjpye, 1989).

Whether a dam will collapse or not during an earthquake depends on several factors. Those include the type of foundation rock, its vibration characteristics and the presence or absence of faults or recent seismic activity. Such factors are normally taken into account in preparing the design of a dam. Even though the Koyna dam actually moved in the 1967 earthquake, the huge structure did not collapse.

A more sensible approach is to thoroughly investigate a site where a large dam is to be constructed, for potential earthquake hazards, as part of the environmental impact assessment (EIA). The need for caution is especially great in regions that are known to be geologically unstable, such as the Garhwal Himalaya. The Tehri dam, which is being constructed here, is one such example. Similarly, extremely careful evaluations will be necessary for the many reservoirs planned in the Brahmaputra river system in Northeast India. Seismologists have predicted a high probability of strong earthquake in this region in the next few years.

There are also cases of bad designing and poor quality of construction leading to dam bursts. The worst dam disaster in India was the burst of Machu dam in Gujarat in 1979. Several hundred people were killed and the town of Morui along with several villages was destroyed by the floodwaters. According to the Consumer Education and Research Center (CERC), Ahmedabad, the dam was designed using an outdated empirical formula. The Central Water and Power Commission had thrice asked the state government to use a more scientific formula. State government sources maintain that the dam failed due to extremely heavy rainfall and floods in the spillway.

There is an interesting sidelight to the Machu dam burst. In March 1981, the present government of Gujarat summarily wound up the inquiry commission appointed to look into the cause of the disaster. CERC filed an appeal against the government's decision in the Gujarat High Court on the basis that the public had a right to know the findings of the commission.

There are several cases of undesirable seepage in various dams across the country. Disbursing reports have appeared about the Barna dam near Bhopal and the Bargi dam near Jabalpur, both in Madhya Pradesh. The Somasila dam across the Pennar river in Andhra Pradesh has also developed cracks in the spillway.

The well of water that is unleashed when a dam, reservoir or a tank bursts, packs tremendous force that can wipe out everything in its path. Even a relatively small tank burst, such as the one on October 19, 1980, at Gopinatham in Karnataka, can be devastating. The two million cu m tank had been built in November 1980 at a cost of Rs. 40 lakh. Within minutes of its breach, the entire village of Gopinatham with a population of few thousands was wiped out, leaving over 40 dead and the rest homeless.

The state government was quick to call this a 'natural calamity', blaming a sudden storm that had hit the area a few hours earlier. A later investigation by the state public accounts committee concluded that corrupt officials and contractors were responsible for shoddy workmanship and that proper maintenance could have averted the tragedy.

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## 13.4 SOCIO-ECONOMIC DRIVERS OF VULNERABILITY

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Empirical results in the case of abnormal flooding, from the unprotected villages suggest that there are three levels of vulnerability; *relative invulnerability* towards the top of the socio-economic ladder; *a highly vulnerable* category of marginal and small landholders; and an effectively '*sub-vulnerable*' category of landless or near-landless households.

This can be illustrated by an examination of material flood damage to a household. The material possessions of the households are so scant, often consisting of no more than a few items of clothing and domestic utensils, that they are easily carried to safety in times of severe flooding (provided, of course, that those affected are able to secure their own safety). Wealthier households have sturdier and more elevated houses, which are both more resistant to flood damage and afford better protection to other possessions, even if this means storing them in the rafters or on rooftops. Between these two extremes are those households who have enough possessions so as to have 'something to lose', yet do not have the superior dwellings and structures to provide protection from flood damage.

The same categories of vulnerability hold for the agricultural damage. Larger landholders may suffer more crop damage in absolute terms owing to their larger landholdings but they are able to recover from their crop losses, perhaps by shifting in a replacement crop as soon as the floodwater recedes. Those marginal and small landholders with an established occupation in addition to farming may have an interim source of income, until such time as they are able to re-establish their agricultural practices. Landless households are by definition exempt from crop damage, other than through its impact on labour demand (which may in some instance even be positive). It is only for the farmers in the small and the marginal landholding categories and without any additional occupation that 100 percent crop damage automatically means 100 percent loss of their livelihood.

A household with large landholdings might simply need to draw on savings to rebuild their home, purchase food and re-establish crops. For a household already landless or near landless and dependent on employment as agricultural labour, flood damage might mean intense but short-term hardship, with their livelihood restored as soon as their prospective employers begin replanting. Most vulnerable, surely, are again the small and marginal farmers, who are forced to adopt a range of often-drastic measures in their attempts to recover from flood damage. These might include incurring debt, often adding to existing indebtedness, sending all household members into the labour market, perhaps for no payment other than food, selling productive assets such as livestock and agricultural implements, and, mortgaging or even selling land. Such measures are likely to involve substantial and often irreversible decline in the household's economic fortune.

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## 13.5 SYSTEM VULNERABILITY

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Recently, there has been an increasing urban focus on environmental problems. Many environmental problems are sourced in the urban environment and are felt at their most intense level in urban areas. The feeling is epitomised in the oft repeated argument that village life is far more preferable to urban life suggesting the disdain with which urban environment is perceived. Hence an urban scale of analysis is being adopted. The goal is a 'green city. However the implication of the term 'green' has widened considerably. As Leff quoted in Houghton (1994) argues,

"Greening the city in the context of the urban explosion of Third World cities implies a

reconstruction process that goes beyond anti pollution measures, conservation of green areas, and reforestation of the surrounding environment of the city. As well, it goes beyond better transportation systems, public services, and waste recycling technologies to rationalise the use of resources and energy with the urban eco system.”

In fact it is necessary to look beyond the urban ecosystem to broader eco systems (Houghton and Hunter, 1994). Leff (1990) goes on to argue and develop this point,

“Greening the city implies the articulation of urban functions in an overall sustainable development process. It implies new functions for the city and its reintegration into the overall productive process through a more balanced spatial distribution of agri-ecological, industrial and urban activities.”

Others have attempted to explore the possibility of changing fundamentally the inherent characteristics of the city to make it more in consonance with sustainable development if there is marked divergence from sustainability stipulates. Sustainable development is consequently being understood in the context of urban development. It has become increasingly common to link urban environmental processes with requirements of environmental protection. For Elkin McLaren and Hillman, (1991) the requirements are that cities be “user friendly” and “resourceful” in terms of energy efficiency, accessibility of basic services, regulatory and developmental activities etc.

It is also notable that urban environmental policies are being appreciated in the wider socio- economic context of development. The World Health Organisation (1992) states that, “sustainable urban development should have as its goal that cities (or urban systems) continue to support more productive, stable and innovative economies yet do so with much lower levels of resource use.”

Poverty is by far the biggest obstacle in the entire developmental process. Lack of safe drinking water, lack of adequate shelter increases vulnerability to natural hazards. Vulnerability to hazards to human and ecological health posed by various kinds of pollutions, whether chemical, radioactive, and thermal or any other reason is another important factor in increasing social vulnerability. Also, pollution caused by improper sanitary conditions, malnutrition, and improper disposal of wastes reflects the system vulnerability of the country. Although urban centers present real opportunities for poor people, they also create and feed the conditions within which poverty spreads. Slum is an area of poverty, transition, and decadence, a catch for all criminals, and the down and out. It is the utmost form of human degradation. Inhabitants are vulnerable to starvation, malnutrition, unemployment, underemployment, exploitation, torture, depression, alcoholism, diseases and heinous crimes. The government has adopted the policy of slum clearance, which is odiously anti poor. Allocation to the Integrated Development of Small and Medium Towns (IDSMT) and ‘Environmental Improvement or Urban Slums’ (EIUS) have fallen drastically in real terms. A massive programme of slum clearance was launched during the emergency even while the Urban Land Ceiling Act was enacted to check inequity in land distribution and secure land for low medium housing schemes. The trend seems to have continued. Gross violation of the Master Plans and the land utilisation law by the elite have been brought to the notice of the courts, though the courts have confined themselves to passing interim or stay orders. Meanwhile commercial complexes and big businesses houses continue to be built on slum ruins. In the liberalised regime, following neo liberal agenda, any radical change in the ‘anti poor stance’ is not realistically expected. (Thomas, 2004-05).



The tenth plan had in the context of urban development laid stress on improving the functional and financial autonomy of urban local bodies (ULBs), strengthening of their financial position through smooth implementation of the awards of the State Finance Commissions (SFCs), rationalisation of the property taxation system and the levy of user charges. The plan advocated broad based urban sector reform measures and emphasised that public private (PP) partnerships be earnestly followed to improve the efficiency and delivery of services. The mid- term review of the tenth plan has revealed shortfalls in the achievement of stated objectives. Meaningful decentralisation has not been attempted in most states. PP partnerships have also been lackadaisical though some initiatives are notable, as in Tamil Nadu, Karnataka, Andhra Pradesh, and Gujarat where PP projects have covered conservancy, sanitation garbage disposal, /collection, compost, plant, street lighting, water supply, collection of local taxes, development and maintenance of gardens, and parks, bus terminus, land development, and market development etc. Bu lack of institutional arrangements for regulating and overseeing pp initiatives has hampered utilisation of this administrative measure. Other measures emphasised are e-governance and right to information.

Besides:

- The systems at the city level are not financially viable;
- Existing schemes are patchy and the allocated resources are inadequate to the magnitude of the problems;
- Issues are not addressed in a holistic manner; and
- There are many schemes with similar /overlapping objectives.

The following two-track strategy is recommended with the focus on urban reforms and e- governance:

- Convergence of urban development schemes into an integrated scheme; and
- National Urban Renewal Mission.

Financial assistance under the proposed scheme is proposed to be in the ratio, 80:10:10 (Centre: State: financial institutions/own resources). Eligibility for assistance would be made conditional to the following reforms:

- 1) Implementation of decentralisation measures as envisaged by the Constitution 74th constitutional amendment.
- 2) Accounting Reforms; adoption of modern accrual based double entry system of accounting in Urban Local Bodies
- 3) Ensuring peoples' participation and right to information
- 4) Bringing all civic agencies engaged in service delivery in urban areas under the rubric of local institutions and creating accounting mechanisms for each.
- 5) Carry out O&M efforts where necessary, and apply reasonable user charges to generate required resources
- 6) Revamping of property tax system through revision and updating of data with the help of GIS.
- 7) Fillip to e-governance

National Urban Renewal Mission would be an effort to launch an inner city area improvement drives whereby reforms would be implemented within a marked zone, as multi pronged strategy for urban renewal. All land transaction and building activity within an area is stopped and the land is requisitioned by the government, and placed under requisite authority, which oversees the development plan. Occupants can be moved out if need be. The menu would include both mandatory and optional provisions.

Urban development and rural development are not divorced but integrated processes in that one does not proceed without the other. Lack of employment opportunities in rural areas increases the possibility and extent of migration, which jeopardises urban development.

For renewed emphasis on rural development, the approach paper to the mid term review of the tenth five year plan has recommended the following important strategies for renewed emphasis on employment generation for tackling poverty:

- Special emphasis to promote public investment in rural areas for absorbing unemployed rural labour force for asset creation;
- Identification of reforms in the financial sector to achieve investment targets in the small and medium enterprises sector;
- Large- scale employment creation in the construction sector, especially for the unskilled and the semi-skilled;
- Necessary support to services sectors to fulfill their true growth and employment potentials and greater focus on agro processing and rural services.

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## **13.6 INSTITUTIONAL AND INFRASTRUCTURE VULNERABILITY**

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### **13.6.1 Institutional vulnerability**

Institutions can be considered as social tools for the management of vulnerability. Institutions also minimise vulnerability and conflicts and enhance sustainable management of resources. The level of institutions contributes to mitigate the vulnerability. The more assets people control, the less vulnerable they are and the greater is their capacity to successfully cope with risks and stresses.

Despite the rapid growth of India's industrial and service sectors over the past decade, agriculture continues to be the dominant factor in the GDP (Gross Domestic Product). With respect to infrastructure provision, India's regional disparities in agriculture productivity and growth can be partially traced to differences in the levels of public investment in infrastructure for agriculture, particularly investments in irrigation technologies and rural credit. In such areas like Punjab, Haryana and Maharashtra, farmers and people are more easily coping with disasters. However, poor regions like Orissa and Bihar in respect to infrastructure are prone to disasters.

Regional disparities in terms of infrastructure development have persisted in India over a long period of time. It could be analysed with reference to the *pre-reform* and the *post-reform* periods. In the pre- reform period, balanced regional development was identified as a development objective and the same was provided for in the five-year plans. The

instrumentality of achieving such balance was the public sector, which functioned with the specific instruction of diversifying operations so as to provide for balanced regional development. For example banks were required to encourage rural credit and promote development in backward areas by providing concessional credit facilities to farmers and investing in public infrastructure. The Institutional Finance Infrastructure was set up for the express purpose of stimulating growth in backward areas through branch expansion and availability of cheap credit. Liberalisation has effected a complete change of stance on the part of the government in that the objective has been neutralised almost in effect. Privatisation of banks and operation of banks on the profit criteria would mean different criteria for mergers and acquisition, investment decisions and location of banks.

Industries were accordingly distributed across states, for equity in regional development though not always in compliance with commercial norms. The licensing regimes regulated capacity creation in states by governing norms for setting up enterprises in states, which are the engines of growth. There was a shortfall in efficiency but some amount of loss was to be borne for the wider objective of balanced regional development. This objective has been forsaken in the post-reform period (Kumar, 2004). The ninth plan did allude to it but did not follow it up in any substantial measure as became evident in the mid term review. The mechanism has almost been dismantled as the tenth plan has refrained from announcing any specific policy in this regard though 'consideration' is to be given to sectoral growth needs. As is evident the objective has subsequently been seriously compromised with most states showing retarding indices. Multi-dimensional institutional mechanism that existed prior to the reform period for effective intervention in various policy areas for the objective has almost been dismantled. Central intervention has been limited to peripheral investment in central public infrastructure and centrally sponsored schemes for agriculture and rural development. The two areas are primarily state subjects in which central intervention is not so meaningful. There is need for planned institutional framework, which cannot be arranged without a paradigm shift in economic policies for development.

Determining vulnerability of local institutions and regions are access to natural resources like energy, food and water, access to productive resources for income generation, access to social infrastructures like education and health and the availability of adequate institutional arrangements in the form of *panchayats* (local government) and good governance on the part of the state machinery. Thus there is need to focus on vulnerabilities from an economic, social, ecological and institutional perspective in an integrated way. On the basis of theoretical and empirical studies, it is argued that for the larger purpose of reducing poverty redistributive policy is imperative. The argument differs with the World Bank position that redistributive policy induces political instability (White, 2001).

Vulnerability not only depends on the exposure to hazard but also on the coping capacity of the people. Building both the social and financial capital for the poor could be the best way to increase the coping capacity of the nation and reduce overall vulnerability of people. This could happen because social, economic and political aspects vary from one region to another. Issues such as property rights, access to resources, technology and credit, create social vulnerability to disasters, causing individuals and societies to cope and adapt differently to these changes. It would be pertinent to discuss the role of the civil society here. The non-government organisations have stepped in the space left vacant by state institutions for development purposes. There is robust activity on their part in relief

and rehabilitation, post disaster, and development tasks like poverty alleviation, gender justice, child labour etc. Their role needs to be appreciated in the context of globalisation in that the operation of non-government organisations has acquired an international dimension. Non-government organisations are operating as a network of international agencies. Consequently, understanding vulnerability is being attempted on an international scale in that agencies like the International Red Cross and Red Crescent Societies and other United Nations organisations are involved in study and analysis of vulnerabilities across the globe on the basis of the Human Development Index (HDI). On the basis of HDI, countries have been classified as High, Medium and Low human development.

Disaster impacts very enormously, according to the level of human development achieved in the country when disaster strikes. Levels of development for each country are taken from the United National Development programme's (UNDP) Human Development Index (HDI). One simple way of analysing disaster impacts is to compare reported deaths and costs against the number of disasters reported. Calculations according to the criteria reveal that over the natural and technology disasters in countries of high human development (HHD), disasters in LHD countries killed an average of 300 people. Though damage in physical terms in LHD countries is higher the damage estimated in terms of economic cost and benefit shows a much different picture. Disasters in HHD countries inflicted an average of US\$ 318 million worth of damage per event, over 11 times higher than the US\$ 28 million recorded per disaster in LHD countries. These figures convey reveal the economic cost of capital-intensive infrastructure as compared to developing countries.

In countries of medium human development (MHD), transport accidents proved most common from 1994 to 2003, driven by a more mobile population and accelerating economic development in countries such as India and China. However, a combination of earthquakes, floods and windstorms accounted for nearly three quarters of all disasters in MHD countries over the decade. Of all those reported affected by disaster in MHD countries, 58 per cent suffered from floods, which caused at least US\$ 107 billion of damage over the period.

Transport accidents also accounted for the highest number of disasters reported in LHD countries. However, drought and famine proved by far the most devastating disaster in these countries, accounting for 84 per cent of the decade's death toll and three-quarters of all those affected. Floods, meanwhile, cost LHD countries that most accounting for three-quarters of all reported economic damage each (World Disasters Report, 2004).

LHD countries were commonly afflicted by windstorms (mainly in the United States), which accounted for nearly half of all those affected by disasters while, extreme temperatures (particularly 2003's heat wave in Europe) caused more than half of reported deaths in highly development countries (HHD) countries as per figures computed since 1994. Meanwhile earthquakes (particularly Japan's Kobe quake) inflicted at least US\$ 206 billion of damage over the ten-year period, double the cost of windstorms that was the next most expensive disaster.

What this report conveys has significant implications for disaster management policy for the future. Transport accidents and heat waves are not commonly recognised as disasters though they account for major losses in both less developed and highly developed countries. Climate Change is not a rhetoric anymore, which can be discussed in seminars and never followed up with any concrete action. It is a real problem now, which is affecting people, crops and livestock around the world. There is another significant fact

that emerges out of this. Vulnerability factors rendering communities to climate change and security of aircrafts have not been studied in depth. Risk assessment figures do not reveal the hidden factors, which have caused the disaster. Some of these are; large scale deforestation, especially around industrial cultures, a failing public health infrastructure, political failure to support the elderly who are the most vulnerable group and falling social capital in communities. Heat waves and intensifying cold waves in continental counties is a major challenge for disaster management professionals and academics. Risk perception of these threats is quite low in counties, in that, these threats are not treated as disasters in the first place, and there is no mitigation policy based on an analysis of vulnerability factors contributing to losses from the impacts of climate change (*ibid*). Another significant factor is classifying vulnerability as urban and rural. For example, heat waves are specifically an urban problem where social capital is low in that social networks are not strong and the poor are often left homeless or shelter less, for example, rickshaw pullers in India or the aged in Europe.

### 13.6.2 International Efforts to Assess Vulnerabilities

International agencies like the UNDP are involved in reducing disaster vulnerability in poor developing countries. One area of work for the UNDP has been to develop a "vulnerability index" alongside those relating to poverty eradication and livelihood protection of people, environment and women. With more investment in disaster reduction, there is a greater need for better decision-making tools. Developing a *vulnerability index* for the country would be an important step in this direction. This requires good, highly disaggregated, time-series data on the occurrence of disasters and losses associated with them. Vulnerability reduction and environmental sustainability is one of the four thematic areas of the Government of the India and UNDP Country Cooperation Framework for 2003-2007. This theme area has two programme components; one, dealing with sudden disasters such as earthquakes, cyclones and floods and the other with slow disasters like drought. Both components of the programme will emphasise a community-based approach to address disasters through an integrated approach for reducing socio-economic and environmental (including natural hazards) vulnerabilities. They intend to demonstrate a sustainable model for combining disaster risk management at all levels, focusing on district and community level activities. At the national level, this programme seeks to provide support to the Ministry of Home Affairs to set up an institutional framework for disaster preparedness, prevention and mitigation.

Affected communities always remain the first responder to disasters. That is why great emphasis is being put on community-based disaster preparedness, like in Orissa. After the super cyclone, NGOs involved in rehabilitation work initiated steps to strengthen community level preparedness as a necessary component of their humanitarian intervention. UNDP and OSDMA have jointly undertaken CBDP programmes in 144 vulnerable blocks in Orissa under the Disaster Risk Management Programme being coordinated by the Union Home Ministry. DRM involves preparation of contingency plans based on local resource and hazard mapping, risk and vulnerability assessment, formation of disaster task forces at village, gram panchayat, and block levels involving key stakeholders, and training these task forces in search and rescue operations, relief and emergency shelter management, etc, regular mock drills, etc. Women self-help groups, farmers, fishermen, schoolteachers, *aanganwadi* workers, etc. actively participate in this process.

The above model is known as vulnerability and capacity analysis or VCA which features quite often in disaster management literature, which is an assessment of resilience of

communities, putting capacities against vulnerabilities and observing which way the balance tilts. The orientation of the approach is changing in that the accent is now on capacities and ways to build them rather than vulnerabilities which are analysed which is conducted by 'outside' professionals who are not expected to understand the intricacies of local problems. Hence instead of VCA it is now being referred as CVA or capacity and vulnerability analysis (World Disasters Report, 2004).

Examples of successful CVA abound. Following the Gujarat earthquake in 2001, a local NGO, Self-employed Women's Association (SEWA) helped poor craftswomen access to credit to buy raw materials for embroidery and tarpaulin work. About 9000 slum dwelling families were helped to set up small businesses and also invest in post disaster recovery. As per a survey, 9000 slum dwellers had invested nearly US\$ 300,000 of their money in improving their homes and livelihoods in the two years following the disaster. During the 1990s, the people of Samiapalli with the help of a local NGO built disaster resilience by learning to construct disaster proof homes. When the super cyclone of 1999 struck, the village was saved from the scale of devastation that would otherwise have been incident. As revealed by another study, farmers in the drought stricken semi arid region of Zaheerabad, in Andhra Pradesh with the help of a local NGO learnt about drought resistant and pest resistant seed varieties, which solved a recurrent problem to considerable extent. As per another study, quoted in the World Disasters Report, (2004), following the devastating earthquake, of 2001, villagers rebuilt stronger homes with the help of local and international aid agencies. Traditional engineering knowledge like stone masonry was combined with modern engineering, to create earthquake proof homes.

This brings to light the significance of peoples' participation in decisions that affect them and also later during the implementation stages. Building up the resilience of communities is a more desirable course to adopt than aid which is a short-term measure and not very effective in building up inherent capacity as against vulnerabilities of communities.

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## **13.7 THE EXPERIENCE OF DROUGHTS IN INDIA**

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A drought is an example of unattended vulnerabilities that concretise overtime as large-scale disasters. In common terms, a drought implies shortage of water for human population, agriculture, livestock and industry. It can be caused by a shortfall in precipitation, by disruptions in conveyance and storage of water or abnormal demand in a season, which leads to over exploitation of resources. Mostly, it is a consequence of the failure of rains while urbanisation, overgrazing, deforestation and even farming can reduce the water retention property of soil. Droughts cause severe reduction in water-availability and soil moisture to levels much below the minimum necessary for sustaining plant, animal and human life. Their effects depend on the severity, duration and extent of the area affected. Their impacts depend on the level of socio-economic development and administrative, financial and technical capacity of the country/ state to respond. Drought is manifested as loss of food and water. Crop failures set in motion a chain reaction of human suffering and economic distress. Sometimes, population shifts occur. The normal hydrological balance is broken, the topsoil erodes and the water table is lowered, making recovery difficult.

The table below illustrates damage caused by droughts in India in separate states in 2001-02.

Sl No.	State	Districts (Total)	Districts (affected)	No. of people affected (lakhs)	No. of cattle affected (lakhs)
1	Chattisgarh	25	16	94	NA
2	Gujarat	25	22	291	107
3	M.P.	45	32	127	87.7
4	Orissa	30	28	119	399
5	Rajasthan	32	31	330	399
6	Himachal Pradesh	12	12	46	NA
7.	Maharashtra	35	26	455	2.5
8.	J&K	Severe drought; 72% less rainfall			
9.	Andhra Pradesh*	24	22	NA	NA
10.	Karnataka*	27	25	55.01	28.71

\*these figures are for 2001-02 drought in Andhra Pradesh and Karnataka

*Source: Government of India, Ministry of Agriculture*

Above information can be complemented with reference to the periodicity of drought in different meteorological subdivisions as represented below in a tabular form.

Meteorological subdivision	Recurrence deficient rainfall
Assam	Once in 15 y
West Bengal, Madhya Pradesh, Coastal Andhra Pradesh, Kerela, Bihar, Orissa,	Once in 4 ye
North Karnataka, Esatern U.P, Vidarbha, Gujarat,	Once in 3 ye
Eastern Rajasthan, Western U.P. TN, Kashmir Rayalaseema, Telengana, Western Rajasthan	Once in 2.5 y

*Source: National Committee on Development of Backward Areas, 1998, Report on the Development of Drought Prone Areas.*

### 13.7.1 Man Made Causes of Droughts

In the Himalayan foothills, three decades of limestone quarrying has destroyed the forests and desiccated the perennial mountain streams. In Saurashtra, man made causes such as the mining of the natural aquifers of meiolitic limestone for the burgeoning cement industries have resulted in the ingress of saline desertification into the fertile ecosystem. In the Western Ghats, watershed of the Tungabhadra, iron ore mining has created drought by reducing waste flows and increasing the silt load on rivers. In Cherrapunji, once the wettest spot on Earth, the mixed natural forests in the upper catchments have been destroyed. Most of the 12000 mm of annual rainfall runs off causing floods in Bangladesh. After the monsoon the springs and rivers dry up leading to drought.

Critical changes in agricultural practices, promoted by the Green Revolution have ushered in intensive irrigation practices and promoted water hungry crops. This has phased out traditional crop mixes with inherent drought proofing mechanisms to survive fluctuations in rainfall. Traditional power structures effectively block any aid filtering down to the lower strata of society. Marginalisation of vulnerable sections of society also has a major role to play in drought.

### 13.7.2 Drought Prone Regions in India

For better understanding of droughts in India, reference may be made to the following map, which below shows the drought prone regions in India.



*Source: Compare Infobase, Pvt. Ltd.*

As illustrated in the map, in India, the states of Rajasthan and Gujarat are severely affected by drought while Madhya Pradesh, Orissa and Andhra Pradesh are moderately affected. Starvation deaths and stories of abject poverty regularly emanate from these states, particularly from Orissa and Andhra Pradesh. Nineteen percent of India's total area, with 12% of its population is drought prone. Attempt can be made to investigate the phenomenon of droughts with particular reference to major drought-hit states. For illustrative purposes the condition in two states could be studied as two *case studies*.

#### A) Case of Madhya Pradesh

Madhya Pradesh is home to some of the poorest tribes in India. Literacy levels are far below acceptable standards. Comprehensive perspective is vital and not just a one-dimensional view. Holistic analysis of poverty of these regions is needed for comprehensive preparedness to drought. Poverty is both a social and an economic phenomenon in that social inequalities are a major determinant of economic deprivation.



As per first hand account given by Jean Dreze (2003), the Chambal area of Madhya Pradesh has islands of irrigated land, owned mainly by Thakurs, Sikhs, Jats and other powerful communities; “elsewhere, there are only vast stretches of rocky land, degraded forest and desiccated ravines. Marooned in this inhospitable terrain are hundreds of thousands of Sahariyas, who eke out a living from survival activities like selling wood, making baskets and seasonal migration...Gwalior to Shivpuri and then on to Pohri and finally Chharch is like descending deeper and deeper into a dark well of poverty and hunger. People in this area suffer from horrendous levels of hunger and under-nutrition, and that many recent deaths are (in one way or another) hunger-related. The real issue is not just a few deaths, but the appalling living conditions in the whole area...from Chharch lies a trail of chilling under nourishment. Yet, health facilities are virtually invisible in the area.”

## B) Case of Orissa

Kalahandi-Bolangir-Koraput (kbc) region in Orissa displays dismal pace of development in the region (Ghate, 2005). “Extreme poverty persists side by side with bad infrastructure and poor health. Orissa is one of the slowest growing Indian states today. Poverty rates, which have a high spatial concentration in the state, have hardly budged since the mid-1990s and are amongst the highest in India. The percentage of population living below the poverty line is 47 percent compared to the nation-wide average of 26 percent.”

As brought out in the Economic Survey, 2003-04, there are some special features of poverty in Orissa:

- 1) Poverty is *spatially concentrated* in Orissa. Some regions such as southern Orissa are very poor.
- 2) A large proportion of scheduled tribes (ST) and scheduled castes (SC) population in western and southern Orissa are *highly vulnerable*. They live rather precariously from one day to the next. Women and children generally suffer more. The districts of Bargarh, Bolangir and Nuapada in Western Orissa, covering an area of 23,988 sq km falls in the Eastern Ghats was once covered with dense forests of sal, teak, and bamboo. Village forests and agricultural land abounded in timber trees and in mahua, neem, mango, and other fruits. The original inhabitants of this area were the *Kondh, Binjhal, Saora* and *Gond* Tribes. Today these people are the poorest in the region and the regions’ prosperous agricultural communities are the *Kultha, Agharia*, and *Kurmi* castes and the Brahmins. They thrived under British tutelage in colonial India and even fought against the natives in local uprisings. Replacements of traditional drought resistant crop varieties were gradually replaced by wetland rice and ‘outsiders’ gradually replaced the tribals (Sengupta, 2000). Such marginalisation has proceeded historically and can be thwarted by government intervention and activation of the civil society provided the political will for the same is articulate.
- 3) A large number of rural communities, particularly in hilly terrains of western and southern Orissa are physically excluded for want of connectivity and other infra-structural support (that is, markets, urban areas. As a result, the poor in general and ST & SC people in particular lack access to growth centers and service centers (that is, schools, hospitals, etc.)
- 4) Rural poverty is the highest in Orissa. Rural people depend mostly on agriculture and forest resources to eke out their subsistence. However, agricultural growth in Orissa

is virtually stagnant. Agricultural productivity is roughly half that of the national average. Use of improved inputs (for example, better seeds and fertilizers) is also far below the national average.

- 5) Employment opportunities are limited.
- 6) Though extensive forest resources are an important source of sustenance to a majority of rural poor, they are highly degraded and lack desired financial and managerial inputs. Large forest areas are devoid of regeneration and therefore cannot provide livelihood support on a sustained basis unless substantial investments are made in them.
- 7) Want of adequate irrigation facilities (except in certain pockets) is another limiting factor that keeps agriculture underdeveloped. Orissa is also deficient in infrastructure (e.g., railways, paved roads, ports and telecommunication). Optimal exploitation of its vast natural resources demands heavy investments in infra-structural development. However, the state government's capacity to develop infrastructure is very weak and limited. On the other hand, poor infrastructure inhibits adequate private investment in key sectors of the state economy, which continues to languish.
- 8) Administrative connivance in perpetuating the grim scenario of poverty is a rather strong factor. Block officials reportedly siphon off development funds and drought presents an occasion for manipulation of funds and bargaining between the center and the states. The age old colonial generalist dominated bureaucratic structure of administration also thwarts initiative on the part of specialists whose services are needed to address specialist technical aspects of administration like rural development and disaster management. With advanced mapping techniques policy formulation and implementation have been greatly facilitated. In Maharashtra, drought prone blocks came under a central scheme known as the drought prone areas programme (DPAP). Bringing blocks within DPAP is profitable since funds under various related schemes flow in such as the Employment Assurance Scheme, Anti desertification Projects, Drinking Water missions and a host of other benefits (Sainath, 2000).
- 9) There is no articulation of needs of the tribals for policy input and increasing 'casualisation' of the labour force, especially in the rural areas. The bright side however is the reported success of self-help initiatives at mobilising the savings of the poor which is still not being imaginatively carried forward by the government. Orissa is rich in minerals and if "the political leadership had the desire to do so, it could wipe out poverty in the state within five years" (Ghate, 2005).

Reports of globalisation related severe distress emanate primarily from Andhra Pradesh, Kerela, Maharashtra and Tamil Nadu. Price volatility and a general trend of declining prices has created demand crunch for agriculture commodities in the international market. That has affected rural population adversely since majority of them are dependant on agricultural produce. The prices of imported commodities tend to be lower which increases competition at home. As per a survey, "coping strategies mentioned by women included migration, trying other works, taking on casual work where possible, mortgaging land; sale of assets, (for example, utensils) withdrawal of children from school; discontinuation of medicines to save on health related expenditure; being forced into prostitution; and the ultimate strategy, suicide." Suicides by cotton farmers in Andhra Pradesh have been because low yields could not compete in the International open market. Withdrawal of government protection on high cost investments inputs like hybrid seeds and pesticides

and administered prices have exposed them unprotected to the international market (Mehta, Gosh, Elwadi, 2004-05). Moreover the shift from traditional food crops to cash crops without expert guidance proved ruinous. Besides, high cost debts, droughts, pest attacks and lack of proper investment in agriculture has been persistent cause of farmer distress.

### 13.7.3 Drought Management in India

Drought management is undertaken in various policies and programmes by the government of India, comprehensively as mitigation, preparedness and response policies. Some of the policies and programmes are discussed below.

#### Government Policy and Programmes

*The National Water Policy* (NWP) adopted in September 1987 envisages strategies covering ground water development, water allocation priorities, drinking water, irrigation, water quality, water zoning, water conservation, flood control and management. The state governments in India make their water policy within the framework established by the national Water Policy. The National Water Resources Council under the chairmanship of the Prime Minister lays down the NWP.

*The Agriculture Development Strategy of 1999* focuses on sustainable development through adoption of area specific strategies, taking into account agro climatic differences of different regions. Hence policies on crops, fertilizer use, and other primary activities like fisheries, horticulture and animal husbandry take account of regional differences for developing appropriate strategies and deriving optimum benefit out of the application of agriculture technology.

*Drought Warning and Monitoring* is undertaken in India by the India Meteorological Department, (IMD), National Remote Sensing Agency (NRSA), Central Water Commission (CWC) and the Ministry of Agriculture.

*Two Programmes of note* as part of the area development approach are the Drought Prone Area Programme, initiated in 1973 and the Desert Development programme initiated in 1977-78. The objective of the former is to promote dry land agriculture in arid and semi regions in India by promoting activities such as water harvesting, soil and water conservation, livestock development to provide livelihood options to people etc. The DPAP covers 615 blocks, in 91 districts in 13 states. This is a centrally sponsored scheme where allocations are made on a 50:50 basis. The latter covers both hot desert (Gujarat, Rajasthan and Haryana) and the cold desert regions (J&K and Himachal Pradesh) in 131 blocks in 21 districts, in 5 states. The focus of this programme is on preventing desertification and improving the productivity of land and income of people in affected regions. The expenses are shared between Union and State governments on a 50:50 basis. Two significant strategies in the two programmes are (1) Cultivation of surface spreading crops, for example, groundnut, soyabean, mung and urad which helps check soil erosion and (2) three tier system of plantation (grasses, bushes, and trees) which provides adequate biomass to meet the fodder, fuel and timber needs of the local population (Sahni, 2003).

Pardeep Sahni, (2003) lists the commonly adopted drought mitigation strategies in India as follows:

- Construction of check dams
- Watershed Management
- Water Rationing
- Cattle Management
- Proper Selection of crop for drought affected areas
- Leveling, soil conservation techniques
- Reducing deforestation and firewood cutting in the affected area
- Checking of migration and providing alternate employment for people in government sponsored relief schemes or village cooperatives and non government programmes
- Education and training to the people
- Participation in community programmes, for example, 'Pani' Panchayat, in Maharashtra, Sukhomajri experiment in Punjab, and Anna Hazare 's work in Ralegaon Siddhi Village in district Ahmednagar of Maharashtra.

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## 13.8 MIGRATION AND VULNERABILITY

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Vulnerability due to poverty leads to vulnerability due to migration. The question arises, why do poor people migrate? How are migration and vulnerability correlated? Does migration lead to greater vulnerability or vice versa? There may not be a single answer to these questions. Seasonal migration for manual work in the countryside means different things to different workers. There are differences between migrant workers in the same stream and between streams of migrants coming to the same destination workplace. A case study regarding seasonal migration, taking a stream of workers who travel to southern West Bengal in India to transplant and then to harvest rice, explores the relationship between vulnerability and seasonal migration. The study finds that the recent growth in migration from Murshidabad district in the north of West Bengal to the rice fields of Bardhaman district, in the south, came about during a period of agricultural intensification and rapid population growth. However, people from the same place migrate for very different reasons. Landless workers are more likely than those with even a very small amount of cultivable land to migrate to meet food and other daily expenses in the off season. 56% of landless households included at least one seasonally migrant worker, as against 17% of landed households. Slightly better off households are also vulnerable, but less so as migration may be undertaken in order to save or invest for a particular purpose. Age may also account for differences, as was identified in one case, where seasonal migration was partly due to youthful rebellion. Migrants from Murshidabad are very vulnerable when they travel to other areas. It takes time to find work, which may not be available even in the busiest agricultural seasons. Women and children stay behind so there is a greater anxiety about their sustenance during a migrant's absence, as there are lower average earnings per household.

Migration often results in deepening of existing poverty as the probability of finding viable work may be low. Migration also results in over populous slums where living conditions could be miserable. There is evidence of positive correlation between inequality in income distribution and inducement to migrate. According to Kamal Narain Kabra, (2004-05),

India's New Economic Policy fundamentally failed to achieve the objective of equity in income distribution and growth with social justice and the pragmatism was evident in the first five year plan itself. The plan unrealistically *underestimated* the power of the entrenched powers; the big businesses and bureaucrats to control the market forces and *overestimated* the state's power to control their subversive power. In the words of Kabra, "it considered the institution of complex regulations, detailed controls and high marginal rates of direct taxes on the rich to be sufficient condition for their substantive implementation." Consequently, the state embarked on the path of licensing and control, which played in the hands of the 'haves.' Achievement of equality in a basically iniquitous society requires definite redistributive agenda on the part of the government, articulated through policy, as pointed out earlier. In the absence of such a commitment, inequality has been perpetuated. To endorse, agrarian reforms could not be implemented because of the inability of those in government to stand up to pressure to the contrary from rich landowners. Continuously rising prices and inflation worsened the condition brought on partly due to an over reliance on indirect taxes, deficit financing and shortages of critical commodities. The 'haves' have cornered all the gains and the poor have become poorer. Evidence of reinforcement of inequality comes from rising corporate assets, consolidation of land holdings, rise in the number of small and marginal farmers, rising import costs for (inputs required by) industry, widening fiscal deficit, proliferation of black economy, and falling foreign exchange reserves. States' expenditure has risen disproportionately against tax collections, partly due to nefarious maneuvers of the rich and partly because the large 'regulatory state' has been an expensive proposition to maintain. Demand of high cost inputs from the industry have dominated imports which has led to negative foreign exchange reserves. The neo liberal agenda further reinforces the inequality position since it advocates an open free market economy, which would make the market friendly and disposed towards the rich and the famous. The poor are left out of the growing alliance between capitalists and the state. The result as feared by most observers and commentators would not be benign as is claimed by most neo- liberal theorists/advocates but sadly, 'amnesic' of poverty. Absence of an honest commitment to alleviating poverty has led to exacerbation of inequalities and pressure on the uprooted rural poor to migrate to urban areas. A significant undesirable consequence of migration has been increase of population pressure in urban areas and proliferation of shanty settlements to accommodate such increase. In the words of Dheri (2001), "the dynamics of change in urban settlements because of large scale migration has led to the evolution of high rise structures, mixed land use, high population density, growth of cottage tank farms, and thermal power stations" which have added another dimension to loss pattern during disasters and that is the risk of fires and large scale infrastructure loss. Lives are lost in urban areas not so much because of the natural disaster but due to collapse of large buildings, which leads to large-scale loss of lives. Theft of power in illegal settlements also adds to the threat of fire because the infrastructure is never properly maintained and it buckles under strain."

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### **13.9 REDUCING VULNERABILITY THROUGH TACKLING POVERTY**

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It is therefore clear from the preceding discussion that a long term and lasting solution to the problem of drought lies in tackling the problem of poverty. The *World Development Report 1990* has presented the following guidelines for poverty reduction in the Third World countries:

- Labor-intensive growth;

- Broad provision of social services, especially education and health to build up human capital.

World Development Report 2000-01 has stressed on:

*Promoting opportunity:* understood as expanding economic opportunity for poor people by stimulating overall growth and by building up their assets and increasing the returns on these assets, through a combination of market and non-market initiatives.

*Facilitating empowerment:* understood as making state institutions more accountable and responsive to poor people, strengthening the participation of the poor in political processes and local decision-making, and removing the social barriers that result from distinctions of gender, ethnicity, race, and social status.

*Enhancing security:* implying reducing poor people's vulnerability to ill- health, economic shocks, policy-induced dislocations, natural disasters, and violence, as well as helping them, cope with the adverse shocks whenever they occur.

### **13.9.1 Reducing Vulnerability through State Protection**

As has been pointed out in the preceding discussion, the fast changing socio-economic scenario in the country and its impact on urbanisation, industrialisation and modernisation of the economy has resulted in increasing trends of rural-urban drift in search of livelihood. This, in fact, has tended to put a strain on the already limited urban facilities, resulting in serious problems of over-crowding, emergence/increase in slum/pavement dwellers, unemployment, poverty, destitution etc. All these factors have exposed the vulnerable and the disadvantaged to the increasing incidence of social deviance and maladjustment. The traditional social structures like the joint family system, and their accompanying support services, and societal checks and balances, which hitherto regulated social behaviour, and extended care and protection to these groups are no longer forthcoming. Consequently, the welfare and development needs of these groups have now become the major responsibility of the state. Thus, these other special groups requiring care and protection of the state include persons with disabilities, viz., loco-motor, visual, hearing, speech and mental disabilities; the social deviants who come in conflict with law viz., juvenile delinquents/vagrants, drug addicts, alcoholics, sex workers, beggars etc; and the other disadvantaged, the aged, children in distress such as street children, orphaned and abandoned children etc. As highlighted in the Economic Survey, 2003-04, the State's commitment towards the well being of the disadvantaged/deprived sections of society is evident from the specific constitutional provisions made in favour of these groups. Recognising the relative backwardness of these weaker sections of the society, the constitution of India guarantees equality before the law (Article 14) and enjoins the State to make special provisions for the advancement of any socially and educationally backward classes or for SCs (Article 15(4)). It also empowers the State to make provisions for reservation in appointments or posts in favour of any backward class of citizens (Article (16(4)). The constitution of India also states categorically that untouchability is abolished and its practice in any form is forbidden (Article 17).

Further, it enjoins the State to promote, with special care, the educational and economic interests of the weaker sections of the people and, in particular, of SCs, and promises to protect them from social injustice and all forms of exploitation (Article 46). Reservation of seats for SCs in the democratic institutions (Article 330) and in services (Article 335) is another measure of positive discrimination in favour of these groups. It empowers the State to appoint a Commission to investigate into the conditions of socially and educationally

backward classes (Article 340) and to specify the castes to be deemed as SCs (Article 341). In the case of minorities, the constitution adopts certain safeguards to recognise their rights in conserving their culture and establish and administer educational institutions of their choice under the Articles 29 and 30. While the Article 350(A) advocates instructions in the mother tongue at the primary stage of education to children belonging to linguistic minorities, Article 350(B) provides for a Special Officer to safeguard the interests of the linguistic minorities. Besides these specific Articles, there are also a number of constitutional provisions enabling protection and promotion of the interests of these socially disadvantaged groups.

The State is directed to offer relief and help to the disabled and the unemployable, vide Entry 9 in the List II of the seventh schedule. Article 41 states that the State shall, within the limits of its economic capacity and development, make effective provisions for securing the right to work, to education and to public assistance in cases of unemployment, old age, sickness and disablement. In order to control the harmful effects of addictive substances, Article 47 enjoins the State to prohibit the consumption of intoxicating drinks and drugs injurious to health and raise the level of nutrition and standard of living to improve public health. Deriving strength and support from the constitutional commitments, the State brought into effect many policies and programmes to improve the lot of the welfare groups, right from the First Plan (1951-56). The first step in this direction was setting up of a national level apex body, the CSWB in 1953 to look after the welfare interests of the disabled. In the Second and Third Plans (1956-61 and 1961-66), welfare activities for the disabled were further expanded through extension of basic services like education and rehabilitation facilities. The State's intervention in the social defence sector was initiated through enacting important legislations for the care and protection of women, girls and children in distress and in social and moral danger. A Central Bureau of Correctional Services (CBCS) was set up in New Delhi in 1961 for conducting research and training besides helping the Government to formulate need-based policies and programmes for the social defence groups. The Fourth and Fifth Plans (1969-74 and 1974-78) saw further expansion of welfare activities for the disadvantaged groups. Apart from strengthening the CSWB, the three National Institutes – one each for the Blind (later changed to Visually Handicapped), Deaf and the Orthopaedically Handicapped were also set up to take care of specialised research, training and designing exclusive aids, appliances and programmes for each individual category. As the three-pronged strategy of 'Empowering the Disabled', 'Reforming the Social Deviants' and 'Caring for the Other Disadvantaged' adopted during the Ninth Plan has proved to be effective in achieving the goals set, the tenth Plan has, therefore, chosen to continue with these very same processes as its approach. To strengthen these on-going processes, the tenth plan will endeavour to collate the existing services in all the welfare-related sectors, so that the required services of preventive, curative, rehabilitative, welfare and development can be extended to each of these other special groups. In other words, the major efforts in the tenth plan will be to develop a multi-sectored approach to attend to the needs and problems of these groups.

### **13.9.2 Reducing Vulnerability through Local Self-Governance**

The traditional role of municipal bodies had been one of providing basic amenities of civic life. Services such as water supply and sanitation, roads and drains, street-lights, collection and disposal of solid waste, maintenance of public places, burial grounds and crematoria, cattle pounds, registration of births and deaths, maintenance of markets have long been seen as the function of municipal bodies. In addition, they performed certain regulatory

functions relating to construction of buildings, public health areas such as eating-places, slaughterhouses and tanneries, etc. The 74th constitutional amendment has substantially broadened the range of functions to be performed by the elected urban local bodies (ULBs). The Twelfth Schedule brings into the municipal domain, among others, such areas as urban and town planning, regulation of land-use, planning for economic and social development, ‘safeguarding the interests of weaker sections of society including the handicapped and mentally retarded,’ slum improvement and up-gradation, urban poverty alleviation, and ‘promotion of cultural, educational and aesthetic aspects’. The subject of ‘cattle pounds’ has been extended in the Twelfth Schedule to include ‘prevention of cruelty to animals’. The constitution thus envisages urban local bodies as being totally responsible for all aspects of development, civic services, and environment in the cities, going far beyond the traditional role. (Economic Survey, 2003-04)

Provision of basic amenities will continue to be among the core activities of the ULBs. The efficient performance of these responsibilities requires proper institutional structure, unambiguous decentralisation of powers, adequacy of resources, support of the state governments and their entities, and a concerted effort to build up capabilities in the various sections of the ULB machinery. During the Tenth Plan, some key areas of water supply and sanitation, urban transport, alleviation of urban poverty, the housing needs of slum-dwellers, and reforms in the urban sector with a view to strengthening the institutional and resource base of ULBs will have to be taken up for special attention.

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## 13.10 CONCLUSION

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The crux of the discussion has been that vulnerability to specific event has underlying socio-economic causes, which can be addressed only through planned development. In a poor developing country like India, the real challenge remains tackling the root causes of underdevelopment, viz. poverty, unemployment, low savings, low rate of capital formation, low investment and poor supply and demand situations in the economy. Disaster Vulnerability is an outcome of these deep-seated causes of vulnerability. Hence a systemic perspective to understanding vulnerability is more apt to get to the real concerns and diagnose the root problem rather than tackle only the symptoms in a superficial manner. Income and employment generation through public expenditure programmes would be required to maintain the momentum of development.

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## 13.11 KEY CONCEPTS

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- Deforestation and Catchments Area Treatment** : A dam submerges forested area. The loss of forest implies reduced wildlife stretches, loss of biodiversity and substantially increased pressure on the remaining forest resources. Accelerated soil erosion is also caused due to deforestation. Catchment area is the area surrounding the riverbed. Catchment area treatment is necessary to reduce erosion. The higher erosion rates in the catchment area, the quicker the dam is filled with silt, shortening the life span of the project. Common methods of reducing erosion are afforestation and terracing.
- Tropical Cyclones** : Tropical cyclones move generally to the west-northwest initially and northeastward later. Being of oceanic



origin they generally hit the east coast of the continents. Soon after crossing the coast, they begin to dissipate, deenergised by friction with land and the lack of moisture. Sometimes, rebuffed by a cool sea or land surface instead of a warm one, cyclones reverse, return to sea to 'breathe deep', and come ashore at unpredictable locations.

**Water-logging** : Dams slow down the downstream flow of a river causing water logging in the delta area. Natural delta formation is impeded which makes the catchments area (area surrounding the river bed) waterlogged.

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## 13.12 REFERENCES AND FURTHER READING

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### 13.13 ACTIVITIES

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- 1) What are the causes of drought of India? How can they be managed?
- 2) What are the reasons for institutional and infrastructural vulnerability?
- 3) On a map of India show the drought-affected regions.