
UNIT 16 DISASTERS AND DEVELOPMENT

Structure

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16.0 LEARNING OUTCOME

After studying this Unit, you should be able to:

- Understand the interconnection between disaster and development in both positive and negative senses;
- Bring out the deficiencies in development planning in this regard; and
- Look at the vision for the future.

16.1 INTRODUCTION

Disaster reduction and coping with disasters touch many areas of human life and society constituting a core task for sustainable development. Major UN Conferences on Environment and Development (Rio de Janeiro, 1992) and on the Reduction of Natural Disasters (Yokohama, 1994) have stressed that natural disasters cannot be attributed solely to natural causes; they are as much a result of incorrect *human conduct*. The IDNDR articulates the prime ones as: *irresponsible approach to the environment, the proneness of mega cities to grow out of control and population growth* (Sinha, 2003).

Over the past few years, there has been an apparent increase in the number of natural disasters, and with it, increasing losses on account of urbanisation and population growth. Clearly, the perspective on development has been one-dimensional, that is, cognisance has been taken exclusively of the growth aspect, without an eye on sustainability. As a result, the impact of natural disasters is now felt to a greater extent. According to the *United Nations*, in 2001 alone, natural disasters of medium to high range caused at least 25,000 deaths around the world, which is more than double the previous year and economic losses of around US\$ 36 billion. These figures would be much higher, if the consequences of the many small and unrecorded disasters that cause significant destruction at the local community level were to be taken into account. Some 75 per cent of the world's population lives in areas affected at least once by earthquake, tropical cyclone, flood or drought between 1980 and 2000.

However, a purely antithetical understanding of the relation between disasters and development may not give the true picture. Before we move any further with the discussion, it may be pertinent to elucidate the meaning of the two terms that will be frequently referred in this text, that is, '**Disasters**' and '**Development**'. '**Disaster**' can be defined as "*any serious disruption in the functioning of the society, caused by a hazard having wide spread human, material, environmental and other losses which exceed the ability of the affected society to cope using its own resources.*" On the other hand '**Development**' is a *comprehensive social, economical and political process that aims at the constant improvement of the well being of the population and all individuals.*

It is not development *per se*, but the character of development that is in question in regard to sustainable development; the question being: Is development welfare driven or is it spurred by purely commercial considerations? This can be understood by the damage suffered in different countries in Asia from the 2004 tsunami disaster. While Maldives, Sri Lanka, and Thailand suffered from non-ecologically sustainable *over-development* in coastal areas; India, Sumatra and North East Sri Lanka, suffered because affected pockets were inaccessible due to *underdevelopment* and impoverishment of the people, which compounded the death toll to tremendous proportions.

Development has to continue, but with due concern for environment protection. Science and technology can be fruitfully employed to control disasters, such as environmentally sustainable disposal of nuclear and radioactive waste, development of non-conventional energy sources, such as bio fuel, which reduces dependence on less sustainable options such as dams and nuclear energy. Such alternatives are generated by research and development in science and technology, which needs to be fervently promoted as a development strategy. There is much emphasis currently on science and technology, especially information communication technology for better understanding of disasters and better reach of disaster response efforts.

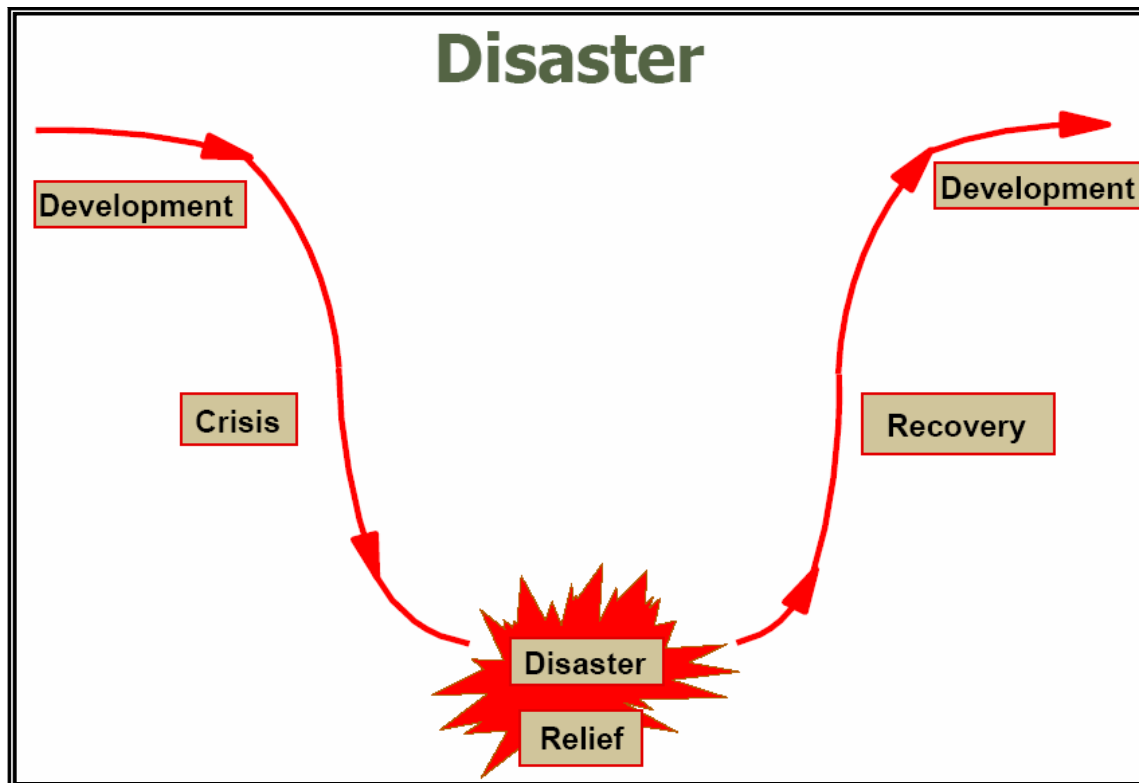
As per UNDP, there is need for proactive resource commitment on the part of Governments world-wide to understand the underlying causes behind natural calamities and inquire into the *nature* of correlation (whether positive or negative) between these causes and development which has been propelled significantly over the past few decades by globalisation. As per the World Bank and the US Geological Survey estimates, reported in White, Phillip *et al* (2004), economic losses worldwide from natural disasters during the 1990s could have been reduced by US\$280 billion worldwide if US\$ 40 billion were invested in mitigation and preparedness. In Darbhanga district in North Bihar, a cost-benefit analysis of mitigation and preparedness suggest that for every Indian rupee spent, the benefits amounted to 3.76 rupee. These researches are attributed to Twigg (2002), World Bank (2004) and Tearfund International (2004). The UNDP catalogues some of these correlations as: *rapid urbanisation* with impoverished settlements increasingly located in ravines, on steep slopes, along flood plains, on unprotected coastlines, along tectonic fault lines, or near dangerous industrial facilities; *environmental degradation* caused by harmful agricultural and industrial practices; climate change leading to rising seas, coral reef deterioration; increases in cyclones and droughts; *economic trends* that are forcing the rural poor to focus on monoculture practices and seek to cultivate marginal land; and *violent conflict* which has led to the destruction of forests and wetlands, poisoning of the environment, and dislocation of peoples. Two factors quite clearly, played major part in causing the tsunami disaster. Those two factors stem directly from

globalisation: increased global tourism, which has led to a chain of hotels coming up in vulnerable areas, particularly along the coasts and the consequent destruction of natural mangroves and forests. As has been explained in Unit 1, a hazard *turns to* disaster, when natural phenomenon interfaces with populations and settlements without adequate capacity to cope with inherent threats.

The Disaster Cycle

Disasters and Development are interrelated, both in positive and negative ways. Skewed choices in development planning result in adverse consequences for the environment and people; however, if the same choices are made ‘rationally’ on the basis of hazard evaluation and risk assessment exercises with an eye on disaster prevention, development becomes a boon, not a bane, as alleged in every case. The following model (Figure-1) of Disaster Cycle demonstrates the interconnection between disasters and development. Development could lead to crisis and disaster. Post disasters, lessons learnt and factored in subsequent decisions result in ‘sustainable development.’

The concept of a disaster management cycle has emerged which emphasises the interconnection between the three phases of response, recovery and prevention. Learners have been apprised of the concept in Unit-2 of this course. Relief, rehabilitation, reconstruction comprise the recovery phase and inspire subsequent development policy towards disaster prevention. Hence, they should be studied, not as isolated events but as integrated, along a linear continuum. The Disaster Cycle, however, has been criticised for oversimplifying the disaster situation. This is because even though it views the stages as integrally connected, it still visualises them as occurring along a linear continuum, where policy returns to the pre -disaster stage of preparedness, if the apprehended disaster does not occur, when actually, the situation carries the germ/potential of a disaster. Hence, instead of a disaster cycle, a *risk management cycle* is considered more appropriate, to tackle inherent hazards and not just manifest disaster (White, Phillip et al, 2004). The diagram, Figure-1, of disaster cycle represents disasters and development as integrally linked, in that they operate as causes and affects of/to the other variable. The concept of disaster management cycle has significant implications for developing countries like India. In India the distinction between disaster management and development was clear-cut as the latter appeared as a non-plan item of expenditure, under “calamity relief.” This was obviously a misconstruing of the problem, as was soon learnt after a spate of disasters, when the Orissa Super Cyclone of 1999, Gujarat earthquake and floods in different states in 2001 set back development a number of years. Hence, the Tenth Plan announced a paradigm shift in that disaster management would now be appreciated or perceived with/from a development perspective, and be factored into plan schemes under relevant sectors. This is in keeping with the concept of disaster management cycle.



(Source: <http://ocw.jhsph.edu/courses/RefugeeHealthCare/PDFs/Lecture17.pdf>)

Fig. 16.1: Model of a Disaster Cycle

The interconnection between disasters and development is also brought out by the fact that public policy has been deficient in many respects. This has resulted in vulnerabilities that have exacerbated disaster losses that would otherwise not have accrued. For example, as rightly pointed out by the Sustainable development Network (2005), in poor countries, planning regulations are such that residents do not have secure tenure to their properties and are therefore dissuaded from carrying out much needed repairs, which make the structures weak overtime. Instead of going in for substantial investments which would provide them safe dwellings, poor residents prefer to live in ramshackle tin huts which provide little or no resistance to strong currents or wind storms. Besides, since legal procedures are often time consuming and weak, contracts and other property rights cannot be enforced, which means financial institutions cannot provide insurance. The current planning regulations give the bureaucrats too many powers of interjection and direct interface with the public, which increases the probability of corruption. This lacuna was made evident by the recent tsunami of 2004. Many such homes were swept away, even though construction technologies have been developed that can ward off such threats from the sea to some extent.

Hence, securing property rights, ensuring freedom of contract and unflinching application of the rule of law are the three basic requirements of a liberal economy, which India is embarking upon presently. It also has significant implications for disaster management. Good governance is another eminent requirement. Corruption stalls effective implementation of poverty alleviation programmes as also disaster relief and response programmes. While good governance may be hard to define in precise terms, broadly it is conceived as a government which is transparent with regard to its working and where bureaucrats are accountable for omissions/commissions. As per the Sustainable Development Network, “poverty and corruption seem to occur jointly”. Wealthiest countries, as per the Corruptions

Perception Index (2004), such as Finland, New Zealand, Denmark and Iceland, Singapore, Sweden, Switzerland; Norway, Australia, United Kingdom, Canada, US along with Ireland and Belgium, are also the most well governed, implying more corruption free, and the poorest, Angola, Democratic Republic of Congo, Cote d'Ivoire, Georgia, Indonesia, Tajikistan and Turkmenistan, Azerbaijan, Paraguay, Chad, Myanmar, Nigeria, Bangladesh and Haiti are the poorest and also the most corruption ridden.

There is a positive correlation between wealth and resilience to disasters. While the rich can secure lives and property by accessing insurance, and retrofitting structures, the poor cannot access such means. More the economic inequality, greater is the vulnerability of large masses of people to disasters. Given the negative correlation between economic development and disaster damage, governments in developing countries could not be excused for inadequate effort in this regard. Every week, 120,000 people, especially children would die from preventable diseases, like Malaria, indoor air pollution, malnutrition, lack of clean water and poor sanitation. These happen exclusively in poor countries due to lack of economic development and access to technology.

Desideratum of the discussion /arguments stated above, is, that “ only through institutions of a free society can poor people move from the vicious cycle of poverty and oppression to a virtuous cycle of empowerment and development” (Ibid).

Public Policy for development of telecommunications and broadcasting infrastructure at the local level is a critical requirement in disaster response. The same was realised during the 2004 Tsunami, when information about sea surges from affected areas did not reach the Centre even after 48 hours with the result that aid could not reach these areas in time. Another factor, which again concerns ‘mainstream’ development, is communication infrastructure, which was found weak at the field level during the recent tsunami. Since the information network was highly centralised, information from many affected areas did not reach the centre in time, which resulted in avoidable catastrophe. The National Disaster Management Policy enunciated after the Gujarat earthquake in India focused on early warning and information sharing between agencies that are timely and accurate. As per Sinha (2003), emphasis areas were: Increase of networking, Resource and knowledge sharing, Blending science and technology with the ongoing development process, efficient linkages with other Disaster Management Systems, Adoption of multi-hazard approach within the paradigm of prevention, mitigation and reduction.

The United Nations has been advocating proactive policy, especially for developing countries, to preempt/prevent disasters and/or towards mitigating their impact(s) if/when they strike. Accordingly, the decade of 1990 was declared the International Decade for Natural Disasters Reduction. The plan of action chalked out in pursuit of the objective was outlined in the Yokohama Conference of 1994. The strategy is to urge nations to share technology and expertise between them; the onus clearly is on the developed world, which has to generate awareness in this regard among poor nations where disasters risk reduction is still not a priority agenda. Since resource is the prime constraint, United Nations and other international agencies such as the UNDP, UNIDO, and World Wide Fund for Nature *et al* have committed fund assistance for projects to developing countries. At the same time, developing countries are being prompted to invest more in disaster prevention and mitigation activities, than relying on foreign aid, which is not the panacea as has been brought out in experience with recent calamitous events. The United Nations has declared a five point agenda in their *Draft Programme Document* in this regard:

- Ensure that disaster reduction is a national and local priority, with a strong institutional basis for implementation

- Identify, assess and monitor disaster risks and enhance early warning
- Use knowledge, innovation and education to build a culture of safety and resilience
- Reduce the underlying risk factors
- Strengthen disaster preparedness for early response

16.2 DISASTERS AND DEVELOPMENT PROCESSES

There is an old saying, ‘*an ounce of prevention is worth a pound of cure*’. Prevention is possible only when mitigation aspects are incorporated in the development planning process. Disasters resulting from natural hazards, such as flood, cyclone, drought, earthquake, fire and many more impact development in several ways. Disasters damage infrastructures, lifeline and critical facilities resulting in human, financial and environmental losses. Thus, natural disaster risk is intimately connected to the processes of development (see box ‘a’).

The following are some of the notable success stories of disasters prevention, as read from different sources:

- In China investment of US\$3.15 billion in flood control measures over 40 years is believed to have averted potential losses of US\$12 billion.
- In Vietnam, 12,000 hectares of land of mangroves planted by the Red Cross protect 110 km of sea dykes. While planting and protection cost US\$ 1.1 million, the cost of dyke maintenance was brought down by US \$ 7.3 million per year and the mangroves have protected 7, 750 families living behind the dyke.
- According to Oxfam, the value of cattle saved on a flood shelter of 4 acres in Bangladesh during the 1998 floods was as much as \$150,000 against a construction cost of only \$8.650.

The Evolution of Natural Disaster as a Development Concern

Both researchers and practitioners have been providing compelling evidences for many years that natural disasters are something more than just acts of God. While this is a broad generalisation of a very complex and heterogeneous process, one can say that until the 1970s a dominant view prevailed that natural disasters were synonymous with natural events such as earthquakes, volcanic eruption etc. From the 1970's onwards, technical professionals such as engineers, architects, began to focus on the fact that the same natural hazards had a varying impact on different kind of structures. The characteristics of a disaster became more associated with its physical impact than with the natural hazard. Interest grew in the design and implementation of ways to mitigate losses through physical and structural measures to reduce hazard or to increase the resistance of structures. Unfortunately, the cost of physical mitigation meant that in many of the countries efforts to reduce risk by these means have been minimal.

Also since 1970s, but with the increased emphasis in the 1980s and 1990s, research from social sciences and humanities have argued that the impact of a natural hazard depends not only on the physical resistance of a structure, but on the capacity of the people to absorb the impact and recover from loss or damage. The focus of attention shifted to social and economic vulnerability. The casual factors of disasters thus shifted from the natural event towards the development process that generated different levels of vulnerability. Vulnerability reduction began to be advanced as a key strategy for reducing disaster impact.

By the end of the 1990s, it was clear that development processes were not only gathering different patterns of vulnerability, but were also altering and magnifying patterns of hazard – an augment that has gained increasing currency as evidence mounts regarding the impact of global climate change. Risk management and reduction has been advanced as an integral paradigm that builds on and incorporates all the previous strategies from the perspective that all development activities have the potential to increase or reduce risk.

Source: A Global Report: Reducing Disaster Risk- A Challenge for Development.

box ‘a’

In order to clarify the ways in which disasters and development interact, it is helpful to distinguish between economic and social elements of development. These social and economic development work directly or indirectly to decrease or increase disaster risk. The table below outlines the relation between social and economical development with disasters.

Disaster-Development		
	<i>Economic Development</i>	<i>Social Development</i>
<i>Disaster limits development</i>	Destruction of fixed assets. Damage to transport, communication, infrastructure. Erosion of livelihood.	Destruction of health or education infrastructure and personnel. Death, migration of key social actors leading to an erosion of social capital.
<i>Development causes disaster risk</i>	Unstable development practices that create wealth for some at the expense of unsafe working or living conditions for others or degrade the environment.	Development path generating cultural norms that promote social isolation or political exclusion.
<i>Development reduces disaster risk</i>	Access to adequate drinking water, food, waste management and a secure dwelling increases people's resilience. Trade and technology can reduce poverty. Investing in financial mechanisms and social security can cushion against vulnerability.	Building community cohesion, recognising excluded individuals or social groups, and providing opportunities for greater involvement in decision-making, enhanced educational and health capacity increases resilience.

Looking at the relationship between disasters and development one can identify 'four' different dimensions to this relation:

- 1) Disasters can set back development
- 2) Disasters can provide development opportunities
- 3) Development can increase vulnerability and
- 4) Development can reduce vulnerability

The whole relationship between disaster and development depends on the development choice made by the individual, community and the nation who implement the development programmes. Let us now try to understand these 'four' different dimensions mentioned above with suitable examples for a better understanding.

- 1) ***Disasters can set back Development:*** Disasters wipe out decades of *economic* and *social* development, which has taken place over a period of time. In 1982, hurricane Isaac destroyed 22 per cent of the housing stock in the Togan archipelago. Reconstruction cost to improve damage to water and sanitation, energy, telecommunications, roads and railway infrastructure, from flooding in Mozambique in 2000, cost US\$ 165.3 million.

- 2) These accounts are dramatic, but the constant drain of resources because of frequent disasters limits development potential of million of people around the world. In

The 2001 earthquakes in El Salvador and in Seattle in the United States resulted in losses of around US\$ 2 billion each. While this scale of loss was easily absorbed by the U.S economy, it represented 15 per cent of El Salvador's GDP for that year.

Vietnam, in "normal" years, flooding destroys on an average of 300,000 tonnes of food. In addition, unplanned budgetary allocation to disaster recovery can hamper development interventions and lead to unmet development targets. Thus, disasters can significantly impede the effectiveness of development resource allocation. The damage due to disasters is done in many ways and the impacts can be as complex as the economy itself.

Countries that are normally affected by disasters have also to face the brunt of reduced human capital, as a large number of populace is affected and are not able to carry out the routine work. Disasters also reduce availability of new investment, further constricting the growth of the region. Besides, additional pressure may be imposed on the finances of the government through investments in relief and rehabilitation work. The increase in the cost and the frequency of disaster is the direct result of human action. Not only will the size of a nation's economy, but also the proportion of its land area exposed to the hazard determine disaster risk. Almost three quarter of the island of Montserrat was uninhabitable by the volcanic eruption in 2001. Today 36 per cent of the pre-disaster population remains and is supported by the United Kingdom.

Disasters can also limit social development. A population that has been weakened and depleted by natural disaster, particularly when this coincides with losses from HIV/AIDS, malnutrition or armed conflict, will be less likely to have the organisational capacity to maintain irrigation works, bunds in the field for water harvesting etc. Without these social assets, communities become more vulnerable. Women suffer additional stresses in disaster situations and also bear a disproportionate burden of the additional domestic and income generating work necessary for survival after a disaster event. When women are exposed to these additional stresses, the level of social development is reduced. However, over the long run, it is possible that there is an increase in their economic and political participation, generating an increase in social development. The exclusion of women from local decision-making circles in Bangladesh led to women and girls being unwilling to use cyclone shelters. Currently, inclusions in the decision-making process have improved the social position of women and encouraging greater use among women has reformed the management of cyclone shelters there. Disasters are thwarting attempts on the part of governments to achieve the Millennium Development Goals (MDGs), particularly, eradication of extreme poverty and hunger. In Ecuador, the Climate effects of El Nino, in 1997-98, in combination with an oil shock, increased the headcount poverty rate from 34percent in 1995, to 46 per cent in 1998. In Honduras, where there was widespread loss in agricultural output following Hurricane Mitch in 1998, the poverty rate increased from 43 per cent to 46 per cent but more so for rural households. In the Dominican Republic, headcount poverty increased from 36 to 40 per cent after a combination of drought and terms of trade shocks in 1990. In larger developing countries, however, such impacts on MDGs may not be wholly visible since overall national performance may obfuscate pockets of high impact, where the MDGs were intensely affected. There is therefore need to develop decentralised arrangements for impact assessments regarding MDGs following a disaster. Besides, time factor is important since effects of floods or droughts can be

assessed over a longer time frame, while that of earthquakes or hurricanes require shorter time frame. More reliable indices are expected to emerge with regard to progress in achievement of MDGs by 2015.

Disasters exacerbate poverty manifold through a range of macroeconomic mechanisms in that following short-term losses like loss of assets, the more intense long-term impacts follow from cuts in social spending and post disaster inflation, especially in food prices following flood or drought. In Zimbabwe, the 1991/92 droughts led to a jump in inflation to 46 per cent and food price inflation to 72 per cent by the end of 1992. Besides, disasters cause reallocation of funds and also donor assistance from development to relief and rehabilitation which usually mean cuts on capital expenditure. This sets up a vicious cycle of retardation in development and consequent income erosion, which affects the poor, disproportionately more. Repeat events successively erode the coping capacity of the poor, initially, selling jewellery or taking loans, to selling productive assets (livestock, land, housing rights) to survive, and finally, to destitution and distress migration. HIV AIDS or protracted conflicts as a result of dislocation and loss of social capital owing to competition for scarce means and loss of social solidarity are known to take over at this stage. These have set in motion a pernicious cycle in Africa, where destitution combines with poor governance and disaster risk to create misery that is never ending since the wherewithal to cope have been nearly annihilated (White, Phillip *et al*, 2004).

2) ***Disasters can provide development opportunities***: Disaster events often give a fillip to development, especially in the period immediately following a disaster. They provide a spur to development policy in the aftermath period. Stephenson and DuFrane (2002) opine that disasters can elevate the *development potential* of a society 'at-risk' for damage from a hazard. The political impact of damage and disruption can actually be a catalyst for change. A lot of reconstruction and social development schemes are taken up which would otherwise have not been paid attention to. Examples include, housing improvements, land reform, social forestry, restructuring of the economic base due to resource transfer from other areas, infrastructure development as contingent requirements etc.

There could be enhanced investments in upgrading administrative capability and training of personnel involved, which serves long term development goals. Development is also imparted 'direction' in that pockets of underdevelopment, where damage is disproportionate to the impact of the disaster, get highlighted during such events, which provides guidelines for future policy in this regard. The *Recovery* phase gives important indications for development planning. Reforestation programmes usually follow landslides and flash floods to check soil erosion, which have spin off effects on other sectors, such as improved air quality, better flora and fauna, health and longevity for people, etc., which improve outcomes from 'mainstream' development programmes in the form of more sources of income for the poor, enhanced employment opportunities, better animal husbandry, and better forest produce for people living in the adjoining areas. Changes in cropping patterns ameliorate erosion problems, and also losses due to floods and droughts. Programmes for soil conservation, water harvesting and on farm storage mitigate the effects of droughts. Hence, development is a variable in both the *input* and the *output* aspects of the disaster management cycle. In fact, it is central to disaster management.

At the request of the Government of India (GoI), The Asian Development Bank (ADB), the United Nations and the World Bank put together a Joint Assessment Mission (JAM) comprising experts from different disciplines and relevant vocations to assess the damage from the Tsunami in Andhra Pradesh, Tamil Nadu, Kerala and Pondicherry and make

suitable recommendations regarding Recovery, based on field surveys. The JAM recommended that national and state authorities treat the tsunami as a “wake up call to better evaluate vulnerability and improve risk management”. The Tsunami destroyed fisheries and to a lesser extent, agriculture which affected communities beyond the physical impact of the tsunami. The JAM recommended that, considering the crosscutting nature of the disaster’s impact, administrative approach in reconstruction should be participatory, flexible, decentralised, equitable and transparent, and cover concerns beyond livelihood restoration to better coastal management and risk management as continuous policy through realistic, short- term and medium -term goals. Effective hazard risk management in the future should be less dependent on relief and assistance, which draws valuable resources from other development goals. Instead there is a need to promote increased participation of the community in risk transfer insurance, community level risk management and disaster prevention while giving assistance to those affected. Before the tsunami, the government had chalked out a coastal regulation zone notification of 1991, which could not be implemented due to lack of an integrated approach and also understanding of the provisions of the act, which led to different interpretations by different departments. The notification required the coastal zone (500 mts. off the High Tide Line) to be classified into one of four categories and then regulate the type of activities and land uses permitted in each as per the vulnerability quotient. After a period of lackadaisical activity, the 2004 Tsunami created an opportunity to implement the act with more sense of purpose, since it has given impetus to studies and analyses into specific requirements in each demarcation and also the significance of integrated coastal zone management.

Forestry Project in Nepal Combines Development and Mitigation Strategies

The deforestation of Nepal has occurred at an alarming rate, with 50,000 hectares of forest cover (or 2 per cent of the total forest land) lost each year. This loss of soil protection has resulted in serious erosion in the mountainous region. There, population density has increased to more than 500 people per square kilometer of cultivated land. As estimated 80 per cent of Nepal’s energy used comes from fuel wood, and forests contribute more than 33 percent of the fodder needs. In addition, increasing numbers of livestock have led to overgrazing, which significantly contributes to environmental degradation.

During the 1980s, the Government of Nepal began the implementation of a community forestry programme to counteract these trends. This ongoing project is intended to stimulate increased production of such forest product as fuel wood, fodder and timber to simultaneously improve rural welfare and forest conditions. The strategy involves the decentralization of the existing Forestry Department’s control, and a transformation of its community Forestry and Afforestation Division from a custodial to a collaborative role, with communities assuming responsibility for planning and implementing their own forestry projects.

With deforestation, the dangers of environmental degradation, flooding and drought are increased. The Ministry of Forest and Soil Conservation, together with funding from United Nations Development Programme, is pursuing a project to increase community involvement in the conservation and disaster mitigation practices. Activities being promoted include fodder tree planting, land use management, training, inclusion of people at the local and district levels in the planning process, and coordination of forestry activities of all community projects.

By giving the rural farmers the commercial rights to forest products and providing them with information concerning forest conservation it is hoped that they will have more of an economic interest protecting forestland and increase its productivity. Special emphasis is placed on training and extension activities for women who perform most of the work related to forest products in Nepal.

Working at the grass roots level, Nepal’s community forestry programme is an innovative attempt to improve the productivity of the land and reduce potential disasters by linking increased production with protection of forest resources.

Source: Adapted from UNDP Project document # NEP/85/017/b/01/12- Project of Government of Nepal)

Development opportunities often are compromised because of excessive focus on relief assistance, which smothers independence and entrepreneurial effort on the part of people. Most of it is misdirected or channeled through weak local structures as a result of which funds get siphoned off. It has been noted that a lot of what is procured as relief could be locally purchased which endorses the rationale of extending assistance for long/medium term development (based on resources) through short-term relief instead of conceiving the latter as being sufficient in itself. Reconstruction management involving vulnerability reduction of particularly high-risk areas is a development challenge where hazard potential of repeat events could be substantially minimised. Information regarding physical and socio-economic vulnerability that is attained during disaster events can be factored into development strategy for the future. Here, the private corporate sector and the voluntary sector have significant contribution to make along with the government, especially in the context of the changing paradigm of public administration, where the government functions as a catalyst and promoter, and the civil society and private corporate sectors are engaged in actual service delivery. Since resources flow in from many sources, national and international, during emergencies, it is an opportune time to reinforce the financial sector by strengthening the banking structure, housing associations and cooperative credit societies by extending needed technical assistance and information. It is also time for in-house organisational reforms within the governmental system, concerning O&M (Organisation and Methods), involving financial procedures, reporting, monitoring systems, auditing and evaluation procedures (Stephenson, DuFrane, 2002).

Disasters can also be a major vehicle for carrying out major development programmes. Changes may occur in new land reforms, Acts and policies being developed, training of professionals, inducing disaster resilient technologies in the new constructions etc. On the other hand, development opportunities are missed or compromised because of lack of awareness and also resistance to accept and introduce new techniques while a new initiative is being taken up. This takes place because of lack of awareness of detailed risk factors among decision makers and planners at the national and community level and the related tendency for development options to be foreclosed when decisions are made quickly without having full information. A case study of forestry project in Nepal (see box 'b' above) reflects how development and mitigation strategies to reduce vulnerability can be related.

Information management is thus absolutely crucial for rational decision making in this regard. The significance of decentralised information communication network has already been highlighted earlier in the text. This leads us to research and development and use of science and technology *integrally* in development planning. Thus, there is a great need to guide and support the Government in developing strategic recovery programmes that mesh with national development goals and leads to substantial reduction in vulnerability. Interventions are effective especially when they focus on areas of particularly high risk, for example, low cost earthquake resistant houses being constructed in areas prone to earthquakes.

3) ***Development can increase vulnerability***: Social and economic development can increase the vulnerability of the community to disaster risks. There are many examples, which show that economic development increases disaster risk. The clearing of protective mangrove stands for shrimp farming in Bangladesh and Vietnam has increased damage due to storms and pollution. Widespread deforestation of hill slopes has increased vulnerability to landslides (White and Phillip, 2004). The massive forest fires in Indonesia in 1997 that

caused air pollution in neighboring Malaysia were partly caused by the uncontrolled use of fire by the farmers wishing to expand production of a major export crop for manufacturing palm oil. Another example that can be cited is tourism development that benefited Barbados, but which may inadvertently be adding to their own risk as waste water and recreational sports which contribute to the denudation of coral reefs, which act as a first line of sea defence against storm surges. Many urban disasters have been known to result, not from initial shock of the hazard, but from secondary releases from industrial units that store/use hazardous material. Metropolitan Calcutta and Vadodara are susceptible to such risks.

It is hard to imagine that increase in social development can increase the risk of disasters. The only possible situation that would actually place social development as a causal factor in disaster risk is one where people are forced to expose themselves or others to risk in order to fulfill their needs and desires. *Rapid urbanisation* has increased the vulnerability of the community. The growth of informal settlements and inner city slums normally inhabited by migrants have often led to development of settlements in vulnerable pockets like the low lying areas; on steep slopes; along flood plains or close to dangerous industrial sites. Over 600 million urban dwellers in Africa, Asia, Latin America and the Caribbean live in life and health threatening homes and neighborhoods as a result of poor quality housing and inadequate provision of basic needs. These developments impact the frequency and severity of disasters, exposing a growing proportion of the world's population to hazards. As reported in International Federation of Red Cross and Red Crescent Societies' (IFRCRCS's) World Disasters Report, 2004, "while the growth of mega-cities and mega-risks like earthquakes capture headlines, far more lives in urban areas are lost to everyday disasters caused by dirty drinking water and sanitation." In the last half century, human development has been characterised by rapid and unplanned urbanisation in the developing world like India. Between 1950 and 2000, the urban population in the developing countries increased from less than 18 per cent to more than 40 per cent. Nearly half the world lives in urban areas, and numbers are accelerating. Over the next two decades, 90 per cent of population growth in developing countries will be urban. Municipalities can't keep up. In Mumbai, 60 per cent of the city's 23 million inhabitants occupy 6 per cent of its total area; an average density of 2,000 people per hectare. In some slums, 50 families share a single toilet. The land where slum dwellers settle is often dangerously steep slopes, flood plains, near railway lines, industrial zones. As building activity spreads, rainwater cannot soak away. Monsoon floodwaters that remain a few days in well-serviced districts can stay for a month in slums. Since sewage cannot be controlled the municipalities leave it in the open, which leads to disease and death, especially reported among infants in Mumbai. Urban livelihoods are also less secure than their rural counterparts (World Disasters Report, 2004). Unplanned and ill-planned urbanisation has been the cause for environmental degradation (for example, deforestation), over exploitation of natural resources (for example, water), ecological disturbance (for example, pollution) and social destitution (for example, increase in poverty). These factors turn hazards into disasters. *Increased population* concentrations and *sub-standard construction* increase the vulnerability of the built environment and the fragility of socio-economic systems. Land use and urban development practices often do not take into account the susceptibility of natural hazards. United Nations statistics indicate that in the 1990s, close to 70 per cent of construction in the developing countries was built illegally. Hence, year after year, exposure to natural hazards increases as a result of unsustainable development.

Since 1991, two-third of the victims of natural disasters, were from developing countries, while just two per cent were from highly developed nations. Those living in developing countries and especially those with limited resources tend to be more adversely affected.

With the alarming rise in the natural disasters and vulnerability *per se*, the world community is strengthening its efforts to cope with it. Lack of access to education and information often has wider implications for vulnerability, since people may simply be unaware of the options open to them for vulnerability reduction. Poor people have far fewer assets to invest in resources, which may reduce their vulnerability. Poor people are less likely to be in a position to organise collectively to reduce risks, partially because poorer people have a high proportion of women, young children, the sick and the disabled. Furthermore, after a disaster, the effects of malnutrition and chronic illness put people at additional risk. Thus, natural disaster risk is intimately connected to the processes of human development.

Although in aggregate terms, development will usually contribute to a reduction in vulnerability to natural disasters; development activities within an area, might increase certain types of vulnerability, for example:

- Urban development often leads to an influx of relatively low income groups, with large scale settlement of marginal land or in high density, poor quality housing.
 - Marine and coastal zone development leads to population concentrations, exposed to possible storm surge, high wind, flash flood and landslide risks. Tsunami and tropical cyclones can destroy all the development gains.
 - Mechanisation of agriculture could be fraught with adverse environmental consequences. There have been numerous examples to endorse the argument. The rationale of the argument is that the change being introduced is 'exogenous', not based on indigenous adaptations, which makes it doubtful with regard to suitability/veracity. Endogenous practices are in consonance with the ecology of the area and the requirements of the people. Reportedly, long-standing agro-forestry systems in Pacific Islands are threatened by agricultural modernisation.
- 4) ***Development can reduce vulnerability:*** If development can act as an agent for increasing the vulnerability of the community; it can also sometimes reduce the vulnerability of the people. For economic development to proceed without increasing disaster risk, development planning needs to reconcile some potentially conflicting drivers for development. *First* the generation of wealth, that can raise the basic level of human development and *second* the distribution of wealth, which can enable the poorest to overcome human vulnerability. The mainstreaming of disaster risk assessment into the existing development instruments is critical in achieving economic development without generating new risk. This includes incorporating disaster resistant technologies in buildings that are being newly constructed. The Klang River Basin Flood Mitigation and Environment Management Project in Malaysia is a good example of development oriented towards risk reduction. The Klang River Basin is rapidly urbanising and its population is more than 3.6 million, with major proportions of urban land being converted for urban use. Frequent flooding and degradation of the environment has also been escalating as urbanisation continues. An Environmental Master Plan is planned to direct environmental management. The planning aims to improve river water quality and provide flood warning and protection.

Apart from economic development, social development too plays a key role in shaping governance regimes for disaster risk management set within a development agenda. To reduce disaster risk, governance must be sensitive to the needs of those who are at risk and able to facilitate timely assistance with appropriate measures. Social development would include awareness/education, and more importantly, health. Improved health and education status help reduce vulnerability and can limit human losses in a disaster. Following the direct impact of a disaster event, a better nourished healthier population, in which children have also been vaccinated will do much better in homes, shelter and camps set up for those displaced by disaster.

A literate and better-educated population, including women and girls, is better able to cope up effectively to any disaster. An educated community will also be in a position to respond immediately to early warning and other warnings of any disaster.

Impact of Globalisation

Development has progressed at a rapid pace in many developing countries, though dictated by globalisation, since tourism has grown considerably, and, as a result infrastructure has come up especially in coastal areas. This has increased considerably the damage potential of hazards if/when they strike. The developed world is equally at risk since development has meant more exposure of people and physical infrastructure. Also, many people have large disposable incomes travel for recreation is high on their agenda, which makes them vulnerable to unforeseen catastrophes. This has also induced more construction activity in attractive tourist destinations. Ironically, the most attractive tourist hotspots are also the most vulnerable to hazards such as floods, cyclones, storm surges, and volcanoes that mean disasters are almost inevitable. Globalisation undoubtedly has exposed more people and infrastructure to risks from hazards, besides disturbing the ecological balance of fragile ecosystems, such as small island states and regions around volcanoes. However, it would not be practicable to hope any of this would stop. Globalisation is an economic and political imperative, since the neo-liberal ideology dominates theory and practice in economics and political science. Rising prosperity in developing countries is providing newer fillip to the trend towards global integration.

It could be argued however, that increased travel and free trade between countries has led to economic gains to developing countries where employment opportunities have grown commensurate to growth in business in the economy. While that is accepted, it remains an incontestable fact that globalisation also has also widened income disparities within national boundaries. Opportunities have been availed by the educated elite, while the poor farmer has also been exposed to precocious competition in that while he is unable to access European markets, cheaper alternatives from other countries have pushed his goods out of the market. Reduced subsidies, dearer credit, and improper market access has put him at a clear disadvantage (Alternate Economic Survey, 2004-05). Globalisation places too much faith in unregulated markets, reduced state action, to create condition for human development. However, the balance is unfairly tilted in the favour of the rich developed nations. *Corporate Social Responsibility* hasn't made up for reduced state action as far as the welfare of the workers is concerned. Unchecked business also exacerbates environmental degradation and disaster risk through land alienations, unregulated extraction of primary products and rapid growth of urban slums. In post-cold war, there has been an increase in trade in arms, etc., which fuel conflicts. Armed conflicts and disasters are a deadly combination, which have destroyed communities such as in the Horn of Africa. Globalisation created a new class of deprived in Guyana, where people

lost jobs in the public sector. In the following floods they fell prey to diseases since they did not have the means to replace lost resources (White, Phillip et al, 2004).

16.3 NEED FOR A NEW PARADIGM

The frequency with which some countries experience natural disasters should certainly place disaster risk at the forefront of the development planners' agenda. Measures need to be taken to integrate disaster mitigation efforts at the local level with the general exercise of planning. Development programmes and projects need to be reviewed for their potential to reduce or aggravate vulnerability and hazard. Bringing disaster risk reduction and development concerns closer together requires three measures:

- a) The collection of basic data on disaster risk and the development of planning tools to track the relationship between development policy and disaster risk;
- b) The collection and dissemination of best practices in development planning and policy that reduce disaster risk; and
- c) The galvanising of political will to re-orient both the development and disaster management sector.

A future 'blue-print' for disaster management in India rests on the premise that in today's society, while hazards are inevitable, the disasters that follow need not be so and the society can be prepared to cope with them effectively whenever they occur. The need of the hour is to chalk out a multi-pronged strategy for total risk management, comprising prevention, preparedness, response and recovery on the one hand and initiate development efforts aimed at risk reduction and mitigation, on the other. Only then can we look forward to "sustainable development".

Changes in governance style can bring about the desired synergy between development and attainment of human development objectives. As highlighted in the tenth plan, the government would henceforth function more as a catalyst and a promoter, while the civil society and the private corporate sector would be engaged in actual service delivery. However, there are certain areas where government's role would actually expand. Infrastructure provision for rural development especially would demand increased public investment. The 73rd and the 74th amendments to the Constitution of India have provided for decentralised governance in India, where local democratic institutions would be engaged in development planning, enlisting peoples' participation in interest articulation and later, at the implementation stage. Certain indications emerge. Henceforth, the requirement of local infrastructure would be adequately met. Strengthening administration at the local level would mean ready response on the part of administration to disaster calls, better warning and information dissemination and better understanding of vulnerabilities since in a decentralised arrangement, people turn from passive beneficiaries to active participants in administration. Since the government would be providing most of the infrastructure, lessons learnt from past experiences would get duly incorporated in development planning.

16.4 CONCLUSION

Disaster management henceforth would be an integral aspect of public policy for development, which means, physical infrastructure has to be hazard resistant. Resettlement and rehabilitation of affected populations as a result of development, such as building

dams has to ensure that displaced poor are not exposed to newer vulnerabilities. Since disasters adversely affect progress in achieving the Millennium Development Goals, targeted risk reduction needs to be attempted, as per the specific vulnerability identified, such as, training teachers and students in emergency preparedness and building safer structures for schools in hazard prone areas, instituting health infrastructure and arranging for awareness and training in hazard prone areas and also promoting better maintenance of such infrastructure, promoting awareness of gender concerns and health issues like HIV, involving communities in such activities in a proactive way (White Phillip et al, 2004).

The aim in all such similar cases should be to minimise the adverse side effects of development projects if any/apprehended. In this context, siting decisions regarding projects have to be taken after due consideration, technically, risk assessment, of the hazard vulnerability of the area. Besides people vulnerability, adverse impact of the environment if any has to be duly accounted for. To that end, Environment Impact Assessments or EIA norms/stipulations should be duly complied with. All of these measures contribute greatly to minimising losses when eventually disasters strike. Development that proceeds without factoring sustainability concerns leads in time to crisis, and thence, disaster on encountering unavoidable hazards. Post disaster, after recovery gets underway, development is embarked upon again, hopefully, factoring vulnerability concerns. For instance, abiding by building codes and zoning regulations can mitigate future losses from similar events, such as earthquakes, floods and cyclones. Besides saving lives, such measures protect high value economic property, such as educational, medical hospitality, entertainment and industrial facilities.

While natural disasters could not be completely averted, damages accruing resultantly could be significantly minimised, if policy planners in the course of 'mainstream' development planning make the right choices. The onus is on the government, the international community and the people alike, since public policy towards disaster mitigation/preventive policy is an integral concern and depends on the Risk Perception among policy makers, and also the public for effective interest articulation on their part for public policy regarding sustainable development

16.5 KEY CONCEPTS

Sustainable Development : Development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts: the concept of "needs", in particular the essential needs of the world's poor, to which overriding priority should be given; and the idea of limitations imposed by the state of technology and social organisation on the environment's ability to meet present and the future needs. (Brundtland Commission, 1987)

Sustainable development is based on socio-cultural development, political stability and decorum, economic growth and ecosystem protection, which all relate to disaster risk reduction.

EIA : Environment Impact Assessment means assessing proposed project on the basis of likely impact on the

environment and people in nearby areas. In India an Environment Information Center (EIC) has been set up as clearinghouse of information since such assessments require data, which is presently a constraint in India. The Ministry of Environment and Forests conducts EIAs in India. The EIC stores data in GIS format.

Social Development

: Social development implies the level of coherence achieved in a society by institutional means. The more the social capital, and the more it is institutionalised/organised as committees/organisations the more is the level of social development.

O&M

: O&M or Organisation and Methods, is a technique of procedural reform that is closely related to scientific management precepts. It entails the study of procedures with a view to simplifying them, such as rationalising office work, which contributes economy and efficiency at work; the intent, is to find the “one best way” of “doing things.”

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16.7 ACTIVITIES

- 1) Explain with examples how development activities increase the vulnerability of the community towards natural hazards.
- 2) Do you think disaster resistant features need to be added in all the development activities carried out by the Government? Discuss.
- 3) Explain how urbanisation and population growth have accounted for a greater impact in case of a disaster.
- 4) How have disasters set back decades of development? Explain this with suitable examples.