

# CHAPTER 1: VULNERABILITY REDUCTION, A DEVELOPMENT CHALLENGE

## Introduction

Natural disasters are caused by the vulnerability of people and human settlements with regard to natural hazards. Cyclones, earthquakes, floods and droughts only lead to disasters where man puts himself in a vulnerable position. Disasters can affect entire countries, districts and communities. It is at the level of the community that the destructive and disruptive impact of disaster is seriously felt.

The vulnerability of a community at risk must be understood as both

1. the degree to which socio-economic and socio-political factors affect the community's capacity to absorb and to recover; and
2. on the personal and domestic level as "defenselessness and the inability to cope with risk, shocks and stress".

Events which may contribute to that inability may accrue over time in the economy, the loss of land or crops, ill health, or death in the family, all of which may be caused by natural disasters as well as contribute to their overall impact - in addition to causes of external factors.

Thus, vulnerability has two sides: an *external* side of risks, shocks, and stress to which an individual or household is subject; and an *internal* side which is defenselessness, meaning a lack of means to cope without damaging loss. Loss can take many forms - becoming or being physically weaker, economically impoverished, socially dependent, humiliated or psychologically harmed.



vulnerability

## SESSION 1: VULNERABILITY, DISASTER AND DEVELOPMENT

### Topic 1.1 : Vulnerability, the root cause of disasters

The vulnerable condition of populations and settlements is as much a cause of "natural" disasters as are the physical phenomena with which they are associated. What are called "earthquakes" are the natural forces; what are seen afterwards are the results of the impact of those forces on human settlements. The degree of susceptibility to damage, destruction and death is preconditioned by actions and inactions of man. There is thus no such thing as an entirely "natural" disaster.

*Vulnerability of populations is the root cause of disasters, but, because there has been an institutional and administrative separation of "disaster reduction" from "development", vulnerability has been neglected. Vulnerability itself could have been exacerbated. Although, on the one hand, there has been an assumption that development is necessary before the impact of disasters can be reduced, on the other hand, development projects themselves have automatically been divorced from natural disasters.*

Vulnerability accrues and regresses through change; thus it is the management of change that has to address vulnerability. "Risk" refers to people, the area concerned, to installations and buildings and refers to the expected number of lives lost, persons injured and material damage. To be damaged requires a vulnerable social infrastructure. During the period for which risk is assessed, change to elements at risk will result in changes of vulnerability to damage. Thus, when a damaging event occurs, the effects are different at the end of the period from what they would have been when the period began. Though reassessable from period to period, actuarial risk is static but *vulnerability is dynamic and accretive*. It is not therefore, the product of risk only which needs to be assessed and controlled, but also the process as well as the product of vulnerability.

Vulnerability is perhaps more obviously related to built structures and the damage that they sustain. It is building damage which manifests earthquake impact and the collapse of buildings which causes death and injury. The age, condition and strength of buildings is therefore an indicator of vulnerability - the design and construction of recent buildings being as significant as the age of old ones. Where older housing stock is occupied and over occupied by poorer populations, buildings and social vulnerability are closely linked, as illustrated by the 1985

Mexico City earthquake. Earlier tremors and small earthquakes may have contributed to a weakening of construction which was thus rendered more vulnerable to destruction. Social vulnerability within urban areas may be expressed by the location, as well as by the quality, of building. The Guatemala earthquake which killed 22,000 people, destroyed the squatter housing in ravines around the city and buildings in the city center were relatively undamaged. The majority of casualties and homeless were however in rural areas. Guatemala's capital was moved to its present site after the former capital was destroyed in 1773, after which it was virtually destroyed again in 1917.

Historical analysis further exposes the interrelationships of vulnerability. Recently emancipated slaves and their new but poor settlements at St. John's were observed as being the most severely affected by the Antigua earthquake of 1843. Were an investigation to be made into reasons for migration, the establishment of squatter settlements and occupation of hazardous sites, all of which in many cases have exacerbated vulnerability to natural disasters, then the role of development in reducing vulnerability becomes necessary.

Vulnerability can be created by development and change which may dislocate communities, cause planned or spontaneous relocation of settlements, expose them to more familiar or less familiar hazards, or reduce access to services. Analysis of existing vulnerability must include the identification of processes which may have caused a vulnerable condition to occur.

*Vulnerability has to be addressed not only by post-disaster response, but with all other sectors established for the management of social and economic development. Otherwise, within these activities may ferment the causative conditions for disaster which remain unrecognized until the disaster has happened. Separation of post-disaster response from pre-disaster contexts inhibits the creation of the wider strategies. Some sectors may inadvertently contribute to the causes of "natural" disasters that the relief sector may be called upon to attend and to pay for.*

Development processes occurring outside disaster management tend to be disregarded by the disaster experts. Thus migration, squatter settlements, occupation of hazardous sites, have created more vulnerability to earthquakes, landslides, storms and have placed greater

demand on relief and preparedness. Whilst there is thus more than ever the need for these services, it makes common, as well as economic sense, for the high cost of these services not to go unattended.

*Vulnerability has to be reduced by development planning; not only by ad hoc application of services that commence only after the occurrence of disaster.*

- ? a. Development management should contain the elements of disaster reduction (i.e. prevention, mitigation and preparedness) and be designed to address vulnerabilities. Explain.

key vulnerability, risk, earthquake vulnerability, disaster reduction - integration in development planning, Mexico, Guatemala.

## Topic 1.2 : Development and Disaster: Friends or Foes?

The term "development" has many interpretations and it may have different meanings to different people.

The term development is often used in its widest sense that includes economic implications of income, trade statistics and growth rates, and economic activity sectors; but also of population number and distribution, expectation of life and life expectancy; the quality of life as indicated by literacy, housing, supply of water and energy, distribution of medical services, access to education and effective political representation. Development also involves good government, efficiency, accountability, and human rights; and equal balance of resource distribution between sectors and between social groups, regions, sectors, and environmentally responsible sustainability. Development is distinct from growth; growth meaning to get bigger, development meaning to improve and for things to get better.

Many aspects of this description of development relate to natural disasters and disaster reduction eg. expectation of life, housing and medical services; but many aspects apply also to a quality of life necessary to create surplus sufficient to generate options - and therefore to reduce dependency and/or vulnerability. The reduction of vulnerability generally serves also to reduce vulnerability to natural disasters.

"Development" is a convenient term for a very large number of factors and values and is therefore an extremely complex process.

Disaster reduction is also an extremely complex process, many aspects of which are synonymous or closely compatible with the objectives of development. Understanding of the relationship between development and disasters has, as a result, been rather impeded. It is nevertheless a relationship which is crucial to understanding and practice if disaster reduction is to succeed in reality, rather than only as a catalogue of relief and preparedness projects, "spitting in the wind" of development, undertaken heedless of environmentally hazardous contexts and the process of growing vulnerability.

## 16 Planning for Structural Upgrading

Current interpretations of the relationship between development and disasters are various but can be distinguished within the following groupings:

1. all development related to a policy of vulnerability reduction.
2. disaster reduction identified as a program in its own right, alongside other development programs.
3. established development impeded or negated by relief;
4. established development interrupted or destroyed by disaster;
5. established development restructured as the result of disaster;
6. post-disaster relief related to development opportunities exposed or created by disaster;
7. post-disaster relief related to established development policies;

*Many aspects of disaster reduction are closely related to the objectives of development. A better understanding of the complex relationship between development and disasters is therefore crucial if disaster reduction is to succeed in reality.*

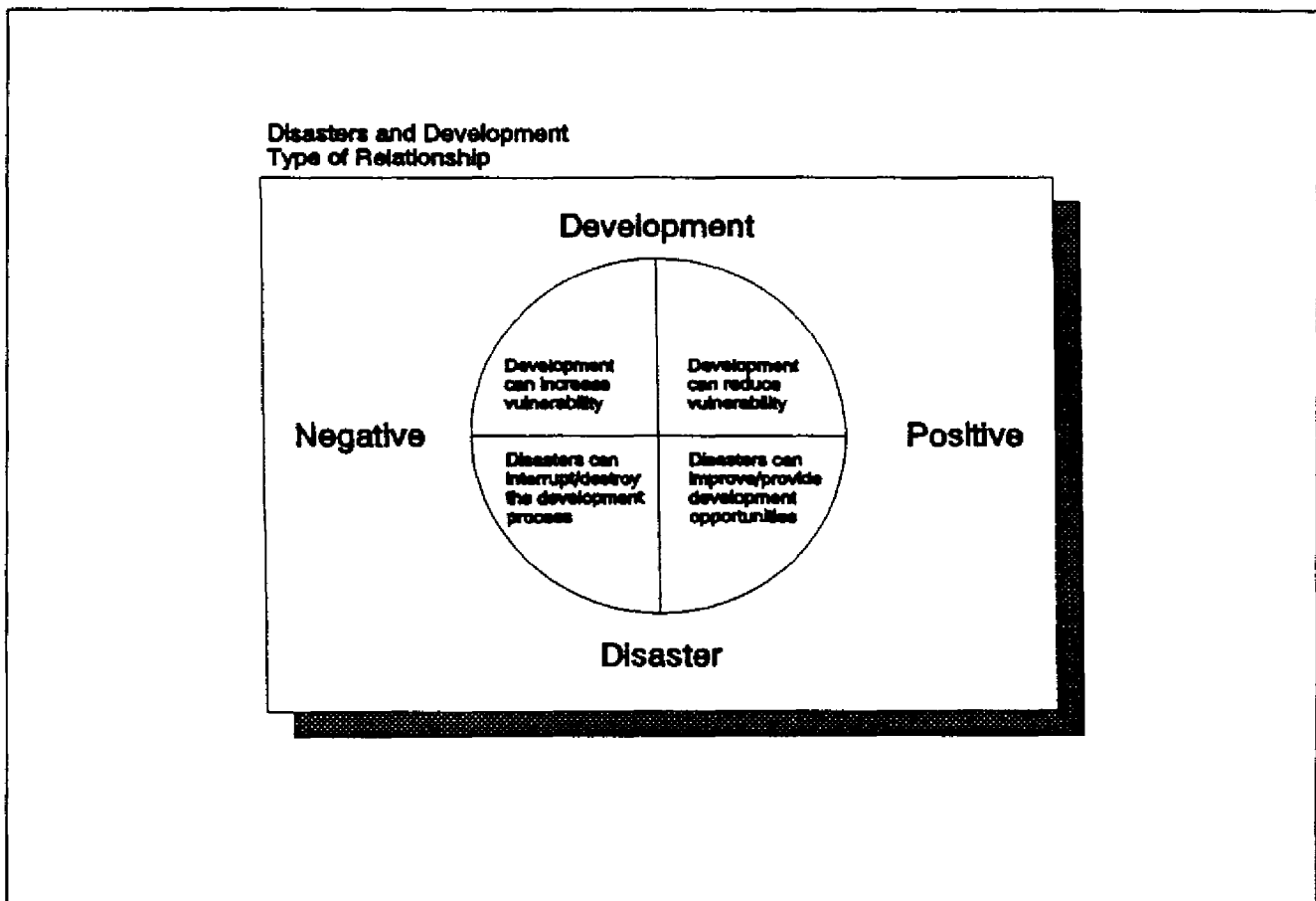


Figure 1.2-1 Disasters and development

- ? a. Development is often defined as growth in GDP and per capita income. Can you give a definition of development that has a bearing on disaster?

key development - definition, development - relationship with disaster

### Topic 1.3 : All development is related to vulnerability reduction

There is a close relationship between natural disasters and development. Not only do natural disasters have recurrent impacts upon development; development determines vulnerability and therefore the severity of natural disasters.

The impact of disaster is governed by the conditions that prevailed before disaster happened. Relief is a short-term remedy-without-cure for *the manifestation* of this condition in disaster; it cannot change the long term prevailing condition itself out of which disaster ensued. Disasters are the manifestation of environmental hazards; hazards must be taken into account as an aspect of environmentally responsive development.

*Development impact upon disaster* may be due to:

1. physical exposure of development projects to hazards - inadequate - physical resistance to hazards
2. the destruction of natural protective features (dunes; trees; mangroves; reefs; etc)
3. migration or resettlement;
4. non-availability or inaccessibility of resources;
5. disablement of self reliance for survival
6. inaccessibility of warning information
7. inaccessibility of information on response
8. lack of options for response.
9. failures of development planning contributing to vulnerability.

*Natural disaster impact upon development* may be:

1. direct physical destruction of infrastructure: roads; bridges; telecommunications; buildings; industrial and commercial installations; etc.
2. loss of cash and subsistence crops; loss of animal stock; etc.
3. destruction or incapacitation of social infrastructure: transport; schools; clinics; post offices; shops; etc.
4. indirect "knock-on" debilitation of economic production as the result of shortages of materials or equipment.
5. shortage of labor; etc by the diversion of goods and people to higher priority activities in emergency.
6. depletion of development projects by diversion of resources allocated to relief and rehabilitation programs following disasters.

Natural disasters do not respect boundaries, all economic and social sectors and activities may be affected. Likewise, sectors and activities have their effect upon and relate to one another. Thus management for disaster reduction should be a spread throughout this boundary-less activity - rather than being a self contained function

separate from it. It is more for reasons of administrative convenience that we make the separation, rather than any other.

*Disasters and development mutually influence each other. To be really effective disaster reduction should therefore cut across all boundaries of economic and social sectors.*

- ?
- a. The relationship between natural disaster and development is not one-way. Identify disaster impact on development and vice versa.

key development - relationship with disaster.

### Topic 1.4 : Disaster reduction as a program in its own right

Reconstruction after disasters can involve development inputs for improvement of what previously existed and so reduce vulnerability to disasters.

Whether in physical reconstruction of buildings, infrastructure, communications or irrigation, development projects with the ultimate objective of disaster reduction, take place alongside other developments perceived as unrelated to disasters. Some of this development may cause increased vulnerability to disasters. In other words, some development may reduce disasters whilst other simultaneous development (out of the same pocket) may aggravate them.

A second major reason why disaster reduction remains separated from development is that "development" is interpreted as largely physical; land-use, reconstruction, repair of dams, retrofitting, infrastructure, unsafe structures, building ordinances, etc. Emphasis of the physical must be balanced by emphasis on less visible but no less crucial aspects of development. Development influences the choice of economic activities and the relevance of those activities to sectors of the community. Development also influences access to and availability of activities not only economic, but those which have a major role to play in "the normal function of settlements" as well as in post-disaster situations eg. schools and health centers. The real question is, how much does the normal function of settlements respond to the needs expressed by local known incidence and variety of hazards - or does normality (once again) mean that which is separate from hazards - and that it is resulting disasters which bring about a therefore abnormal situation?

Here, the main impediment to disaster reduction is suspected to be the preservation of separate institutional identity. Institutional identity could otherwise be lost amongst other developmental agencies.

*While some development may strive for vulnerability reduction, other development may, at the same time, enhance the likelihood of disasters. Institutional separation and an overemphasis on physical aspects are important impediments to the adoption of a more developmental viewpoint for disaster reduction.*

- ?
- What is the relationship between disaster and development?
  - The cause and effect relationship between disaster and development has been ignored. Discuss.

key reconstruction, disaster reduction - integration in development planning.

### Topic 1.5 : Post-disaster relief and established development policies

Much disaster relief is unrelated to development policy; where the relationship is not understood it cannot be practiced. Established development policies must be assessed for their capacity to reduce vulnerability. Some do not. Development may have contributed to the causes of disaster.

Vulnerability reduction "will have little impact unless it is conducted in concert with normal development activities". What is done in disaster aftermath can either impede or assist development objectives. It is those objectives which, in the first place, must take integral account of hazards and disaster probability. By ignoring hazard potential or by the assumption that development *per se* will make disasters go away, disasters may be worse or more numerous. There are countless cases where "development" has made matters worse - not better.

The greatest contribution of the current environmental movement may be the realization that there is something bigger than development to which development is to subscribe and contribute. Gradually, all development will be constrained by environmental considerations and the first national examples may well be the smallest - the island states as a macrocosm for the world and its larger countries. Natural disasters arise out of environmental hazards, a component of environment and environmental management. Where development becomes environmentally responsive, it subscribes to disaster reduction; where development contributes to disaster reduction - it is environmentally responsive.

*Disaster reduction must be made inclusive of ecological adjustments of vulnerable people to maintain self-reliance to counter the effects of disaster, rather than only as technological resistance to the forces of environmental extremes themselves.*



relief, development - disaster relationship, disaster and environment.

## SESSION 2 : PLANNING FOR SUSTAINABLE DEVELOPMENT

### Topic 2.1 : Development Planning for disaster reduction

At present there is little development planning for disaster reduction. Instead there exists a wide range of measures to assist disaster reduction - for the greater part through applications of technology and improved physical protection, and in preparedness management.

Some of these are directed towards the source of risk itself, such as flood barriers; some towards mitigation, such as improved building construction; and some are directed towards the desired response and behavior of people facing disaster or living in hazardous environments. Some of these measures are structural and some are non-structural; and all are related to periods of time about disaster events for their most effective or appropriate implementation; eg. relief immediately after disaster, preparedness in the short term and prevention in the long term before the next disaster occurs - and some of these lending themselves to interpretations of development on behalf of disaster reduction.

Another classification relates measures simply to their effect: those measures that redistribute losses, such as relief and insurance; those that modify the susceptibility to loss, such as warnings and land-use planning; and those that attempt to limit losses, such as in building construction and engineering works. Many of these measures however, are rarely applicable to poor people who are the most vulnerable.

Disasters are nationally and internationally financially accounted as separate, abnormal and infrequent events, thus discouraging a system that might more usefully relate one disaster with the next in normally hazardous contexts. Action in one disaster could be accounted as serving to reduce disaster next time - and the time after that. The costs of such action could therefore be accounted over longer periods and be more acceptable in the contexts of allocation of development resources.

Disaster reduction has to be envisaged not only in terms of damage to buildings and loss of life, but in terms of quality of life of survivors, their access to resources and their ability to continue to survive. The prevailing quality of life preconditions vulnerability to disasters - and disasters, contribute to vulnerability and degradation in a truly vicious cycle. Conversely however, measures for the enablement of survival contribute to the everyday quality of life and to reduced vulnerability.

*Social and economic "eligibility" therefore has a significant part to play in reducing disaster losses. There is little point in knowledge, skills, technology, and financial and management system being designed for a theory of disaster reduction, if these measures are not accessible to, those in greatest need - the poorest, the elderly, the sick, and the very young; the rural, the remote and peripheral - squatters and shanty town dwellers, and all of these in physically and socially exposed and insecure conditions.*

*Development planning for disaster reduction has the following prerequisites:*

1. the psychological and policy acceptance that disasters can happen;
2. informed perceptions of environmental hazards and disasters; causes, incidence and effects;
3. integration of accurate perceptions into development policy for all sectors; and the preparation of "development guidelines for disaster reduction";
4. evaluation of all development proposals from whatever source against "development guidelines for disaster reduction".

*There is the need therefore for planning - identification, coordination, implementation and evaluation - of development and change for disaster reduction. However, over all development sectors are not separated. Rarely can one measure on its own be wholly effective; any measure is only one of many crucial to the essentially multisectoral task of reducing vulnerability to disaster.*

*It is also evident that disaster reduction will not automatically come about from a rag-bag of assorted projects, and that understanding of the vulnerability process is necessary before there can be integrated planning for disaster reduction.*

? a. Which are the main prerequisites of development planning for disaster reduction?

key disaster reduction - integration in development planning, disaster reduction - classification of measures, vulnerability.

## Topic 2.2 : Disaster management: the integration of all sectors

Conceptual separation has led to the creation of special "desks" for disaster management, compartmented away from the management of development. Thus, the separation of disasters from development has become institutionalized; the effect of which has been to remove responsibility for disasters from development activities. Nothing could be more dangerous.

There are situations where on the one hand initiatives are being implemented to improve disaster preparedness but where on the other hand, vulnerability is being unknowingly increased. Within organizations of the same government and within the same country, what is done on the one hand is contradicted by what is done on the other. This is not only ridiculous; it is expensive, dangerous and costs lives. But it ensures that the relief "machine" will have more and more work to do!

Institutionalization of international bilateral disaster response is demonstrated by the departments, offices and units for "disasters" (UK/ODA), "humanitarian assistance" (Canada), "disaster assistance" (USA), "disaster preparedness" (Jamaica), "protection civile" (Algeria), and humanitarian affairs (United Nations) for example. These are centers focused on disaster effects and subsequent short-term rehabilitation. Being *post facto* disaster specific, this conventional focus excludes a necessarily wider view to take account of crucial political, institutional, social, cultural, economic and physical factors that are the root causes of vulnerability to "natural" disasters.

Institutional separation has taken "disasters" away from everything else, and has implied the absolution of all other sectors from their responsibilities in that respect. As a result of popular interchange of terms and of common misunderstanding, "disaster relief" is often assumed to be the totality of necessary action and not to involve any but the department of that designation. This is a long way from the reality of how vulnerability comes about. What is in need of management are the ways in which people and communities become vulnerable; otherwise, *post-disaster efforts are likely to be overwhelmed by the effects of pre-disaster ignorance.*

It has to be recognized and acknowledged of course, that the separation of disaster management from other aspects of government may not be arranged simply for ill-informed convenience - but because it is politically convenient to do so. Governments would rather disasters be "acts of God" and separate from other aspects of administration, than for administration to accept responsibility for disasters brought about in conditions of

vulnerability that have ensued from government policies - or the lack of them.

Nevertheless, strategic planning for the identification and reduction of vulnerability (and thus the reduction of disasters) must be understood as requiring the integration of all sectors and levels of national and local development effort. Disaster management must therefore be shared by all sectors and activities to do with development and change, and at all levels from policy makers through to community groups, in an understanding of the processes that have a bearing upon vulnerability.

*In order to bring about the understanding of these processes and to achieve appropriate management systems for disaster reduction, all those sectors, levels and activities must be included as target groups for training programs in disaster reduction. Programs that address themselves only to - disaster desks - are a perpetration of the very institutional separation that is at fault.*

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- a. How are disasters assessed and managed in your country? Is institutional separation a problem? Are there institutional mechanisms to integrate disasters into development planning so as to ensure inter-sectoral coordination?

key disaster reduction - integration in development planning, relief.

### Topic 2.3 : The relief syndrome

Government bilateral relief is of donor-national political significance and non-governmental relief organizations have energetically and publicly promoted themselves to achieve increased income and turnover. As a result, the popular profile of disaster relief has also increased - as well as its budgets.

Disaster relief has become a powerful and popular lobby; it is able to command the public imagination with the tension of emergency and catastrophe as well as its humanitarian concern; it is tangible, visible, reportable, photographable and filmable; and it is internationally credible and respectable.

Disaster relief has become so popularly powerful that it tends to rule out the need for better understanding of the contexts in which lie the socio-economic causes of disasters. The need for inputs of a kind that could reduce recurrent disaster impact and render them survivable is not only insufficiently understood, it is a need ignored and rejected because such an approach would pre-empt and reduce the need for relief and diminish its profile, popularity and power. Each time a major disaster occurs, public appeals are announced and relief supplies transported and delivered at enormous cost. But these respond to only the smaller proportion of the total need. Less is done to reduce disaster next time, even where it is known that disasters of the same kind have happened before and thus are likely to do so again. In these terms, relief has displaced development !

Relief can be no more than a short-term remedy-without-cure for disasters; it cannot change the long-term context - the role of development. Relief is given where disaster has struck; whereas it would be appropriate development that was responsible for relief being less necessary in the first place! Appropriate development also has the capacity to reduce vulnerability to everyday local emergencies and disasters that national relief organizations may not be aware of - and the international relief machine not concerned about. We might sometimes ask, how much are the victims of disasters also the victims of development and, how much are we, as well as they, the victims of relief propaganda? If there are manifestations of donor fatigue syndrome, and relief capacity is overwhelmed by the number and enormity of disasters it cannot meet, then appropriate development is the only alternative.

Further, assumptions that post-disaster relief will be internationally forthcoming, serves to remove the requirement for local identification of vulnerable groups and locations and the provision and enablement of basic needs for survival in disaster-prone areas as part of the development process.

It is surely significant that because buildings are tangible and physical and their frequent destruction visible, campaigns for improved construction are automatic - before the next disaster and as an activity of development. In less visible matters of food supply, water supply, caring for children and the elderly, keeping warm, avoiding disease, education etc, we see the need for immediate relief but not so much (on account of disaster reduction) for development strategy to ensure these things are available all the time to everyone - before, during and after disaster as may be.

*In the conventional sequence, relief is the operation first in line after disaster. Publicity accorded to the relief machine does give the impression that there is nothing else to be done!*



Figure 2.3-1 Relief, a short-term remedy

- ? a. Most relief efforts are based on emergency needs but they often ignore development issues. Discuss.
- b. What suggestions, if any, do you have for improving the positive long-term impacts of relief programs on development?

key relief.

## Topic 2.4 : Development, vulnerability and sustainability

Natural disasters must be considered as an integral part of the process of environmental change and therefore as an environmental issue because they arise out of natural phenomena, because they have impacts upon environment of which man and communities are a part; and because the precondition of that environment has a bearing on vulnerability to natural disasters and survival in their aftermath. *The disaster response sequence does not have to wait for disaster itself to start it off.*

As it is, countless development proposals, projects, programs and reports continue to ignore disaster potential and disaster recurrence. Even some of the most disaster prone countries do not include disaster preparedness or hazard management in their development plans; *least of all do they express an understanding of vulnerability.* When reference to natural disasters is made at all, it is to regret the losses sustained by development which chose to ignore the risk of disasters in the first place - least of all to divert some of its resources to the reduction of vulnerability.

Bearing in mind the often colossal impact upon development of natural disasters, development must itself respond by being made more environmentally conscious - inclusive of environmental hazards - and to integrate measures for survival, rehabilitation and reconstruction in an understanding of the recurrence of hazards and of the dynamics of vulnerability accretion. *Every action taken on account of one disaster must be designed and managed to also reduce vulnerability to disasters of the future.*

In this way, disaster reduction itself will be made to become "sustainable" and sustainable development will be the more secure having taken into account environmental hazards and the risks of natural disasters upon its sustainability.

So many activities for disaster preparedness, mitigation, and reduction require the support of, or subscribe to, "development" that development itself must now seize the obvious next step and make itself the paramount disaster reduction priority. Development is not a sacred cow, it has to be molded to adapt to requirements. Vulnerability is a product of human ecology which renders populations more or less susceptible to damage and loss.

*The degree by which populations and their activities can reduce, or change their vulnerability and thereby accommodate risk, is an expression of prevailing political, social, cultural and economic conditions - that are the objectives of development. Only by the reduction of vulnerability will natural disaster reduction be feasible, effective and real.*

- ? a. What types of disaster are most likely to affect your country in the coming 15 years? and why?
- Key disaster and environment, vulnerability, disaster reduction - integration in development planning.