# *A reconceptualization of the linkages between disasters and development*

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## INTRODUCTION

The victims of disasters in the Third World are also, too often, victims of relief, rehabilitation, reconstruction and development programs. These programs that purport to addesss the economic and social conditions that leave people vulnerable to famine, earthquakes, floods, or human-caused disasters seldom succeed entirely. Even as a development project reduces vulnerability in one area for some segment of a population, it may increase it in others. Are people, then, locked into a cycle of vulnerability? Is it possible to restructure both disaster emergency aid and long term development aid so that vulnerability is genuinely reduced? In this paper, we shall explore the relationships between disasters and development and propose a reconceptualization of these relationships which may prove useful in realizing the opportunities that exist for addressing vulnerability. We shall also discuss the implications of this new approach for the policies and programs of the international relief and development agencies.

## NEW DEFINITIONS

Those who work in emergency disaster relief in the Third World have, for the most part, viewed disasters as "interruptions" of development. They have calculated that the provision of material and organizational resources to disaster victims represents a "diversion" of these resources from the real work of basic development. Therefore, they have seen their task as getting things back to normal just as soon as possible so that effort can again be focused on basic and long term development. They have responded with short term and immediate material and technical aid, often provided through special arrangements that lie outside ongoing social and political organizations.

Increasingly, however, journalists and observers who cover disasters in the Third World are asking questions about "root causes" of poverty and vulnerability. Aid and relief agency personnel point to complex economic and political forces that precede any disaster and call for attention to those conditions that, if altered, could prevent disasters. Many feel that disasters simply do not have to happen.

Here one must distinguish between crisis events (whether natural or political) and disasters. Natural crisis events occur indiscriminately though predictably more frequently in certain areas than in others. Political crisis events often arise from manipulation by certain interest groups. Nevertheless, in both situations not all crises become disasters and all people in crisis areas do not suffer equally. The disastrous impact of crises falls disproportionately on the poor and vulnerable. An UNDRO study in 1976 estimated that 95% of disaster-related deaths occur among the 66% of the world's population that lives in the developing countries. The Earthscan Briefing Document tells us that between the 1960's and the 1970's, while the number of natural disasters increased by 50%, the number of deaths from these disasters increased by 600%! Similarly, while the average annual death toll from natural disasters in Japan is 63, in Peru it is 2,900. A gas explosion in Miami, Florida in the summer of 1984 killed no one; a similar explosion a month later in Mexico City became a disaster with terrible loss of life and property. It is true that some years bring greater crises than others and some areas of the world experience crises with greater frequency than others. However, even with differences in impact that arise from these variations, the incidence of suffering from crises has been documented as higher among the poorer societies and among the poorer within societies.

At the Institute, discussed throughout this issue, on Education for Development in the Context of Disasters, a group of scholars and practitioners involved in disaster-response efforts developed a set of definitions to point up the relationships between disasters and development. The group accepted the notion, put forth by Frederick Krimgold, Frederick Cuny and others (1976), that crises become disasters only when they outstrip the capacity of a society to cope with them. Given the relationships contained in this notion between suffering and coping ability, the Institute participants defined disasters and development by the following corollaries:

- Disasters are indicators of the failure of development.
- Development is the process of reducing vulnerability to disasters.

A society or group that faces a crisis but is able to cope with it so that long-term loss is minimal may be said to have experienced development. Where a crisis becomes a disaster because a group does not have the capacity to cope, a basic failure of development is indicated.

## THREE AREAS OF VULNERABILITY

Individuals and societies may be vulnerable in three areas: the material, the organizational and the socio-psychological. Reduced vulnerability in these areas, or in the mix of these three together, supports the ability to cope with crises so that they do not become disasters.

### 1. Material vulnerability

Most development strategies and most emergency relief programs concentrate on vulnerability (identified as poverty) in the economic/physical/material realm. Strong houses withstand earth tremors better than weak ones; healthy babies survive diminished food supplies and illness longer than unhealthy ones; access to quality health care and medical services means that an injury may be treated quickly and effectively reducing the probability of disability and/or death; a well insured house or farm can be rebuilt or replanted with minimal losses to families and to society; access to early-warning systems, transportation and resources for escape all allow evacuation before natural hazards occur. Poor people have few of these resources. They suffer disproportionately from crisis events, and for them, such events often become disasters. Thus any strategy for development, as any strategy for disaster prevention, must focus on material resources as one of its concerns.

Material vulnerability is reduced when resources for meeting basic human physical needs are sufficient both for present consumption and for sustaining a community through a non-productive period which might be caused by a crisis event. Beyond this, however, material vulnerability is high when individuals, groups and societies have few options for attaining these resources other than those immediately at hand.* Peasants throughout the ages have diversified crops in order not to risk catastrophe in the event of the failure of one crop. The vulnerability of entire nations has increased as subsistence agriculture has given way to a concentration on a single cash crop which is subject to demand (and price) fluctuations determined by the world market. Similarly, basic education, literacy and skills training are valued because these prepare students to "solve problems" or undertake a broad range of productive activity. Specialized training in certain skills can, on the other hand, become obsolete when industry-wide developments change production patterns or the bottom drops out of certain markets. Thus, access to a range of options contributes to relative invulnerability in the material realm.

Even though the examples above are based on the identification of material vulnerability with poverty, there is another, often ignored, aspect of vulnerability in this realm that arises from the possession of too many or too complex material goods. Mohandas Gandhi wrote early in the twentieth century that those who hold "too much" wealth are vulnerable to theft, to reliance on others for the maintenance and care of their goods, and to potential "rot" of the goods through disuse. Ownership and stockpiling on too grand a scale, he claimed, result in as great a material vulnerability as does poverty.

This same point is made by contemporary, modern-day social commentators who note that the complexity and interdependence of industrialized societies have brought increasing areas of vulnerability. Societies which rely for warmth, light, food and other essentials on goods and inputs (scarce minerals, fuel, etc.) controlled by others may be liable to disasters that occur when these supplies are cut off either wilfully or through accidents. Whole segments of industrialized countries may be shut down when access to essential inputs is lost. Sometimes the methods contrived for insuring against such losses, such as reliance on nuclear power rather than oil for example, bring their own potential vulnerabilities. Many societies do, however, develop options for providing these essentials that depend on outside supplies precisely to counter these modern day vulnerabilities.

In the developing nations, there are numerous examples of vulnerability derived from reliance on equipment or technologies too complex for the other available resources in those societies. Expertise in maintaining and repairing imported equipment is in short supply in many cases. Increasingly, technology transfer programs are addressing the necessity of training for maintenance at the same time as equipment is supplied. Sometimes, a problem arises when parts for an imported piece of equipment are not available and cannot be produced locally. Reliance on technologies and/or equipment which are beyond the maintenance and supply capacities of the local society creates new vulnerabilities.

The point of the above examples is that vulnerability in the material realm is based on more than the simple quantity of goods. The options for attaining access to necessities are important, as are the quality of the material base, its integration with locally available technique and capacity and its relation to other aspects of the environment. An increase in material wealth may result in increasing material vulnerability. An improvement in the quality of material goods may, in some instances, increase vulnerabilities. For example, when people have shifted from housing made of thatch to building with concrete blocks (an indication of increasing material wealth) they have become more vulnerable to earthquakes. To reduce vulnerability in the material realm, then, requires an analysis of the complex of factors that affect sufficiency, security and safety.

### 2. Organizational vulnerability

The organizational capacity to cope with crisis is of equal importance to the material/resource-based capacity. A poor community which is closely knit and neighborly may withstand or recover from a natural hazard more effectively than a wealthier community where social and political suspicions and divisions exist. Even people with material resources and seeming options may, when organizational systems break down, become highly vulnerable. This occurs, for example, in times of political crises when even the highly educated who held positions of responsibility and power in their societies, find it necessary to move into refugee camps. On the other hand, wealthier people with greater material options frequently suffer less than those with fewer options in political/social/organizational crises. There are two

*The importance of choice, or of having adequate options, was raised in conversations with Frances D'Souza, who deserves credit for this idea.

points to be made here. First, organizational strength may mitigate the impact of a physical event that disrupts material production. Organizational vulnerability will exacerbate a society's failure to cope with material vulnerability. Second, however, organizational vulnerability revealed in a society's political disruption (revolution or war) will increase material vulnerability but may, also, in some instances be offset by material strength. Neither material nor organizational strength, alone, ensures the capacity to cope with a crisis. Both are integral aspects of development.

The difficult question here for development planners and agencies is at which level or combination of levels — local, regional, national or international — is organizational capacity important for effective coping with different probable crises. Self-reliance theory (Anderson, 1978) suggests the imagery of concentric circles in which the smallest, innermost circle is completely self-reliant, surrounded by successively larger circles, the sufficiency of which is derived from the smaller ones they contain. But, we also know the importance of planning, co-ordination and interaction in crisis management as well as in development management. Smaller units must also be able to derive resources from higher tiers of organization. An individual community's response to a flood along a river basin may be adequate in the immediate crisis if it is well organized locally and has sufficient resources to carry it past the crisis event. However, to prevent future crises of flooding, it will of necessity have to join with other communities along the river's bank to devise a plan for flood control and water storage. The ability of a society at all levels to respond flexibly to a physical crisis or new social challenges is organizational strength. Organizational vulnerability may result in political uncertainty, disruption, revolution or war.

While both development and emergency relief programs may directly address material vulnerability and help in disaster prevention by helping ensure adequate material resources, it is much more difficult for such programs to help a society reduce organizational vulnerability. Many efforts have been made to devise effective models for participatory and community development strategies. Development projects have frequently focused on the establishment of viable co-operatives also to address the need for organizational resilience. The degree to which external aid providers may or should attempt to devise models for indigenous social/political capacity is, however, a question because of their basic position as non-participants and non-residents. However, while the creation of organizational strength may be difficult for external aid agencies, they may promote the climates, or encourage processes that, at least, do not undermine or weaken existing organizational capacity if they intend to address the issue of reduction in organizational vulnerability.

### 3. Socio-psychological vulnerability

Finally, socio-psychological invulnerability must be of equal importance to material and organizational invulnerability, though we know much less about it. Studies of the psychological effects of disasters have tended to focus on individual trauma and coping mechanisms and, in particular, to focus on the United States and Europe.* Though many people involved in development and disaster response in the Third World have noted the defeatism of vulnerability, dependence and victimization, little has been done to understand the role of socio-psychological strength (we use the term to include both individual and societal attitudes and strengths of mind) in development.

In another publication, I have suggested that, in addition to the three traditional neo-classical factors of production of land, labor and capital, there is an equally important fourth productive factor: ideology (Anderson, 1978). Ideology, when joined with the other three factors of production, may greatly increase productivity in certain situations, as in times of newly won independence. It may also decrease productivity as when union organizing efforts entail work slow-downs. While not the same an entreprenuership or achievement motivation (which have also been named as important factors in productivity), ideology shares some common characteristics with them. It involves a sense of competence in managing an outcome like entreprenuership, and it involves a sense of purpose for action like achievement motivation. Ideology differs from entreprenuership and achievement motivation, however, in that it is more often collective than individual. It is shared by a group or society.† The experience of many independence movements of the 1950's and 1960's alerts us to the interaction of socio-psychological strength with purpose, and a sense of competence with invulnerability to crises.

In their programs, development and relief agencies have tended to ignore the potential of the socio-psychological realm in reducing vulnerability. Though there is acknowledgement that programmatic disincentives undermine psychological strength and lead to inactivity, there is much room for additional consideration of the interplay among the socio-psychological, material, and organizational realms in programs and projects designed to address vulnerability to crisis and disaster prevention.

*There are a number of studies of the impact of World War II on children and adults in Europe. U.S. psychiatrists also study "psychic numbing" which arises from people's inability to confront and cope with the prospect of nuclear disaster (Robert Lifton). The National Institute of Mental Health in the U.S. established, in May 1983, a Center for Mental Health Studies of Emergencies to fund research and provide crisis counseling grants in areas declared disaster areas.

†While in some cultures the term "spirituality" would express this idea well, it too is usually seen as a condition of individuals, or at least groups, rather than societies or nations. Nonetheless, there is a theme among Third World leaders that, while materially wealthy and probably dominant, the U.S. and U.S.S.R. are "spiritually" lost or weak and, hence, vulnerable to moral challenge from the rest of the world.

## BRIEF HISTORICAL CONTEXT AND THE REDUCED VULNERABILITY NOTION

The understanding of development as a reduction in the degree of vulnerability reflects and incorporates elements of past development definitions. It also differs from other widely accepted development definitions and measures in several significant ways. These differences, in turn, suggest new approaches to the design and implementation of development projects and programs, whether undertaken as a part of national development strategies by the governments of the Third World or as a part of the aid programs of international agencies. The connections of this approach to previous accepted approaches and the areas of substansive difference deserve exploration.

W.W. Rostow, launching the development approach of the decade of the 1960's with his *Stages of Economic Growth* (1960), focused on the economic/material base of development. His prescription for achieving "take off" and sustained development relies on measures of investment rates, growth rates and changes in GNP. He was soon challenged by others who, concerned with the maldistribution of economic growth, stressed the "social indicators" of development. Raymond A. Baur *et al.* (1966), shifted away from the sole focus of development on "how much" to include considerations of "how good" and "for whom." Also concerned with distributional issues, the "growth with equity" school of thought (led, in part, by the World Bank under Robert McNamara's presidency in the 1970's) merged their concerns with equity and Rostow's focus on economic determinants. They noted that well-fed, clothed, housed and educated populations with access to health care and social services could be expected to be more productive and, thus, contribute to increases in output and surpluses for investment. The "basic needs" approaches to development also stressed the material aspects of development over non-material indicators, but some among them included political participation and social opportunities among their lists of needs essential for a good life. Self-reliance theorists (see Galtung *et al.*, 1975) made a more profound attempt to integrate economic processes of development with socio-political processes, claiming that these were fundamentally linked through the process of work by which both productivity goals and societal purpose were served.

The reduction of vulnerability definition of development goes one step further in integrating the material and non-material components of development. By emphasizing equally material, organizational and psychological invulnerability, it poses an equation of development that, while variable among societies and over time, ensures through the mixture of these three components, the ability to cope with crisis. No one of the three is predominant in all circumstances; nor can any of the three, alone, ensure development. Development programming which concentrates on only one of the elements to the conscious or unconscious exclusion of the other two has been seen to fail to achieve its goals.

The second area of difference between the reduced vulnerability definition of development and others is even more critical, though it also has roots in previous approaches. This difference centers around the understanding that the various approaches have of the way in which the process of development brings about a differential impact on different segments of societies. Albert Hirschman in his *The Strategy of Economic Development* (1958) noted the unevenness of development that he termed "polarization." Polarization involved a process by which development in one area of a country siphoned off resources from other areas, causing some to advance while others either stagnated or fell farther behind. Hirschman at that time saw this "unbalanced growth" of development as a potential force for spurring effort, policies and programs to overcome the differential and lead to further growth. Gunnar Myrdal (1957), writing at the same time noted a similar phenomenon but applied the term "backwash effects" to describe the process by which areas are robbed of their resources by growth elsewhere. He saw no sufficient automatic corrective for this process within the price system and thought that government planning was required for overcoming backwash effects. Dependency theorists such as Cockcroft *et al.* (1973) also point to the connection between the process of development in certain areas with the process of "underdevelopment" in others, showing that the European and North American nations used the colonization of the southern hemisphere to supply and support their industrial and technological development. As each of these approaches analyzes the differential impacts of development on populations and locations, they identify those for whom vulnerability has increased as, somehow, "left out" of the development process.

Those who advocate the reduction in vulnerability approach note that even within the processes that we have in the past called development, vulnerabilities are often increased. The examples of this are familiar ones. Urbanization causes people to move onto marginal lands vulnerable to flooding, mud slides, earthquakes, etc. Population increases from improved health and nutrition put pressures on land, water, forests and other natural resources resulting in environmental degradation. Industrialization increases water and air pollution and raises the possibility of chemical crises or disasters. Formerly self-sufficient subsistence agricultural societies which are drawn into international markets where they supply cash crops, are vulnerable to international market shifts and price fluctuations over which they have little control. Nations which have borrowed capital to finance development are vulnerable to interest rate changes that saddle their economies with unpayable debts. That is, even in the very processes we have identified as "development" in the locations and among the populations which we have called "developed," some vulnerabilities increase. This constitutes, in fact, negative development if we accept reduced vulnerability as the measure of development.

The third difference between the reduced vulnerability definition of development and other widely accepted definitions is in the breadth of their applicability. Previously-used definitions reflect the historical experience of the industrialized nations, but the notion that genuine

development constitutes reduced vulnerability to crisis means that this definition applies equally to nations at all stages of development. By this definition, no nation is yet fully developed (i.e. invulnerable at all points). At a fundamental level, the reduced vulnerability definition challenges much of the so-called development achieved to date by the northern tier insofar as it has produced new threats to the ecosystem on which all societies depend. This new definition introduces a critical new criterion for assessing the state of development of all countries and it provides a useful new element for designing development programs, policies projects and strategies.

## IMPLICATIONS FOR DEVELOPMENT POLICIES AND PROGRAMS

If one accepts the fact that crises only become disasters for the vulnerable and that real development is the process by which vulnerability to crisis is reduced, then the thrust and design of both emergency relief efforts and development programming changes. The intent of emergency relief is no longer to "get things back to normal as soon as possible" because normalcy is the condition of vulnerability that allowed the crisis to become a disaster. The effort will be, instead, to use relief assistance to move the group which has suffered to a new material/organizational/socio-psychological condition in which they are less vulnerable.

Similarly, vulnerabilities that result from the so-called development process can be controlled. Any project or program aimed at development, noting the centrality of reducing vulnerabilities, would (1) assess areas of vulnerability and target development programs to reduce it; (2) assess and identify areas and populations where development programs might increase vulnerability; and (3) take measures to prevent, control and manage any crisis event that might affect the vulnerable area and population so that a crisis will not become a disaster.

In both emergency relief and development programming, the most effective efforts would be those which increase the capacity of the people to cope with potential crises — materially, organizationally and socio-psychologically. When we talk of increasing peoples' capacities to cope, we are clearly shifting attention from aid that is generated and supplied from outside to abilities and resources that exist (or can be made to exist) in the local setting. Any strategy for aid or development, on these terms, would then focus on the ways in which people acquire the knowledge and skills they need to generate necessary material resources, create strong organizational forms, and develop socio-psychological assurance. Such a focus on the acquisition of knowledge and skills would, in turn, focus programming efforts in the area of education and training as those with greatest potential for reducing long-term vulnerabilities. If we ask how external aid might help people acquire the knowledge and skills they need to be able to cope with potential crises, then we answer by devising systems for transferring the knowledge and skills that are appropriate for this goal. Relief assistance and long term development programming will, with the reduction of vulnerability in mind, always incorporate as a central and necessary element programs for generating, transferring and aiding the acquisition of knowledge and skills.

## CUNY-BEAUMONT MOBIUS STRIP

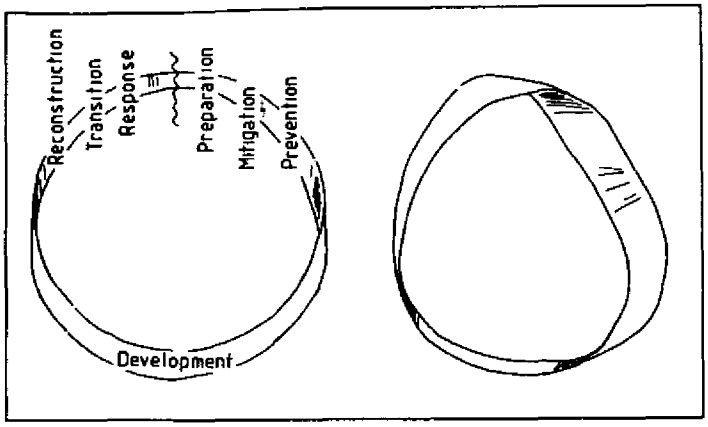
The fundamental relationship between disaster vulnerability and the failures of development — or, to put it positively, between disaster invulnerability and development — may be visualized and conceptualized through the "Cuny-Beaumont Mobius Strip." A Mobius Strip, named after its German Mathematician inventor August Mobius (1790—1868), is a one-sided surface formed from a rectangular strip by rotating one end 180° and attaching it to the other end. During the Institute held at Harvard University referred to earlier in this paper, two participants, Frederick Cuny and Jacques Beaumont, developed the Mobius Strip's applicability to the disaster/development analysis. Frederick Cuny with a simple, two sided loop (Fig. 1(a)) noted the continuum represented by linking the phases of disaster prevention to the phases of disaster response and showing that those phases at the extremes (prevention and preparedness on the one hand and reconstruction on the other) have much in common with development *per se.* Jacques Beaumont took Cuny's looped continuum, with the disaster phases on the inside and development on the outside, and cut it, reattached the ends at Mobius' 180 rotation, giving us the one-sided continuum (Fig. 1(b)) in which all phases of disaster interventions (prevention, preparedness, the event, response, relief, rehabilitation and reconstruction) and the process of development flow into each other.

This tool illustrates superbly the continuity of the notion of vulnerability among all phases of development, from the highly vulnerable to the highly invulnerable. It illustrates, also, from a programmatic perspective that to work on reducing vulnerability at any point along the strip is to affect it at all other points. Rather than seeing an immediate post disaster moment as one in which it is impossible to address fundamental issues; rather than waiting for normalcy to prevail before undertaking systematic programming, it is possible *at any point* to address issues of vulnerability and to begin the process of vulnerability reduction through projects aimed at aiding people in the generation and acquisition of knowledge and skills. Identification and assessment of points of vulnerability become the guiding indicators for project design, and shape any activity undertaken by relief and development agents.

## A CHALLENGE

The world has no historical experience with massive, national development undertaken on these terms. The Industrial Revolution which shaped the productive arrangements of Europe and North America increased the vulnerability of great numbers of people. Colonization took advantage of and exacerbated the vulnerability of whole groups.

However, in the late twentieth century, governments and international aid agencies are constrained from policies and




Figs. 1(a) and (b). The Cuny-Beaumont Mobius strip.

programming approaches which, too obviously, make certain groups increasingly vulnerable. Many of the social service aspects of Third World governments' development strategies can be seen as attempts to provide organizational invulnerability (on a national level) to counter instances of increasing material vulnerability that result from the development strategy being pursued.

The challenge before us is to face and acknowledge the role that vulnerability plays and to devise essentially new approaches to disaster relief and development that anticipate vulnerabilities *before* crises become disasters. Development programs and relief programs, alike, must address immediate vulnerabilities and long-term ones (the essential prerequisite for this is both a timely and appropriate emergency response). They must address the mix of material/organizational and psychological elements that support and promote competence, security and invulnerability.

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Galtung Johann, O'Brien and Preiswerk (Editors), *Self-Reliance: A Strategy for Development*. Institute for Development Studies, Geneva (1980).

Hirschman Albert, *The Strategy of Economic Development*, Yale University Press, New Haven (1958).

Krimgold Frederick, in: *Overview of the Priority Area Natural Disaster*. United Nations, New York (15th October 1976).

Myrdal Gunnar, *Economic Theory and Underdeveloped Regions*. Harper Torchbooks, New York (1957).

Office of the United Nations Disaster Relief Co-ordinator, *The Protection of Human Settlements from Natural Disasters*, Geneva (24th February 1976).

Rostow W.W., *Stages of Economic Growth: A Non-Communist Manifesto*. Cambridge University Press (1960).

Wilbur Charles E. (Editor), *The Political Economy of Development and Underdevelopment*. Random House, New York (1973).

# SUGGESTED READING

Cuny, Frederick C., *Disasters and Development*. Oxford University Press, New York (1983).

Central to this book is the notion that disaster mitigation and preparedness should replace the current emphasis on emergency relief. Careful scrutiny is given to the process of program planning and design within assistance agencies. A case study of a reconstruction program provides a concrete example of the successes and failures within an attempt to tie relief to development. The interaction between poverty and disasters is a critical issue raised in this book.

Dudasik, Stephen, Unanticipated repercussions of international disaster relief, *Disasters* 6(1), 31—37 (1982).

This interesting case study examines the massive disaster relief given to the Peruvian town of Huarez after the earthquake of May 1970. The author presents a detailed examination of the disruption of the social, economic, political, and cultural functioning of the community. One result was a "disaster boom economy" which caused rapid economic growth and serious negative effects in the long term.

Fagerlind, Ingemar and Saha, Lawrence J., *Education and National Development: A Comparative Perspective*. Pergamon Press, Oxford (1983).

The book begins with a thorough yet succinct review of the major theories of development and then examines the pivotal question of how one conceptualizes societal growth. The authors study several dimensions of development all of which are tied to education. The final section presents a typology for education and development under both capitalism and socialism.

Fernandez, Aloysius, The relationship between disaster assistance and long-term development, *Disasters* 3(1), 32—36 (1979).

Based on the premise that vulnerability can be decreased by taking advantage of opportunities which arise in disasters, the author examines constraints to that process. First there is a useful description of general features of disaster-prone areas. This is followed with suggestions of possibility which occur both during and after disasters.

Freire, Paulo, *Pedagogy of the Oppressed*. The Seabury Press, New York (1970).

This book is perhaps the most widely read and best known work on education published in the last several decades. Freire describes the underpinnings of his successful literacy work in Brazil. His approach is a dialogical one which assists the participants to no longer respond as an object of his/her environment but, instead, to take an active part in critically analyzing then restructuring the conditions of that society.

Hewitt, Kenneth (Editor), *Interpretations of Calamity*. Allen and Unwin, Inc., Boston (1983).

As the first volume in the Risks and Hazards series, this book sets the stage for an examination of natural hazards research. This collection of essays offers a critique of the dominant view in this field. The response to crises is described through economic development and social change and set within a context of a skewed and unjust international economic system. Cases are offered from industrialized and developing countries and describe both contemporary and historical situations. The book ends with several alternative frameworks.

Jeffery, Susan, The creation of vulnerability to natural: case studies from the Dominican Republic, *Disasters* 6(1), 38—43 (1982).

Jeffery begins with the premise that social and economic processes can be considered as causes of disasters as well as the more obvious physical phenomena. She shows how vulnerability for certain groups has increased due to large scale commercialized agricultural production in the Dominican Republic.

Kates, Robert W., Disaster reduction: links between disaster and development, in: *Making the Most with the Least: Alternative Ways to Development* (Edited by Berry and Kates) pp. 135—169. Holmes and Meier, New York (1980).

Kates begins his chapter stating that "to be poor is to be vulnerable." He reviews hazard types and frequency along with describing several cases. His central thesis is that disasters impact unevenly on the developing world.

Shah, Bindi V., Is the environment becoming more hazardous? — a global survey 1947—1980, *Disasters* 7(3), 202—209 (1983).

In this important article Shah presents disaster statistics, describes hazards as cultural phenomena, and takes issue with the arbitrary classification criteria for disasters. In the case of Bangladesh he points to structural problems which exacerbate risk and vulnerability.

Wijkman, Anders and Timberlake, Lloyd, *Natural Disasters: Acts of God or Acts of Man?* Earthscan, Washington (1984).

Wijkman and Timberlake take a long and careful look at disaster statistics compiled from several sources and point to dangerous trends. They also raise the issue of vulnerability and call for a more appropriate response than emergency relief — instead, a kind of development which reduces vulnerability to disasters.

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