

## Anthropological Approach to the Study of Natural Disaster

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### Introduction : Concepts and Mechanisms

A basic point of environmental research in anthropology is the analysis of human-environment relationship. This analysis can contribute to the theoretical development of anthropology as an academic discipline. That knowledge is essential for contributing to the public policy on environmental issues. Natural disasters present a social scientific research opportunity for examining overall 'social structure' (Ploughman 1997:118) and social system. The basic questions of structural inquiry are how social structure is formed (social action) and how it maintained (social order). Disaster by definition, involves temporary disruption of the social action and social order.

Natural disasters can be said the disorders of the natural events and a crucial factor for human society. Human society developed through adjustment with the nature and natural events. Till now, the natural events are out of human control except their (human beings) development in technology and organization of social units. Their vulnerabilities and social reconstruction are the important factors in their coping process.

Similar to other disciplines, anthropological research on disaster studies has an implicit perspective. Virtually all research is directed to the problems of individuals, communities, and societies. There is, however, 'a corpus of literature in anthropological disaster research that addresses applied problems and methods explicitly' (Oliver-Smith 1996: 317). Natural hazards are evaluated as 'fostering theories on response, hierarchies and cost/risk assessment as well as framing and testing hypothesis about environmental change and human behavior' (Oliver-

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Smith 1996:321). Research in human ecology has been taken into closest relation to other trends of anthropological inquiry<sup>1</sup>. The result of this inquiry is closely related to the development of theory and research and a better understanding of human adaptive strategies in different ecological conditions and changes. Hazard events are related with the responses of the affected population and "each event can be constructed as a 'problem' or 'opportunity'," (Lees et.al. 1984:146). Research on human adaptation to critical environmental situation leads to understand the pattern of socio-economic institutions and choice of technology.

Kreps (1989) conceptualized disasters as 'the events in which societies or their sub-units (e.g., communities, regions) incur physically damages and losses and/or disruption of their routine functioning. Both the causes and effects of those events are related to the social structures and processes of societies or their sub-units'. The criteria of 'so-called 'significant' disasters are (Smith 1996:29):

- (i). Number of deaths per event : 100 or more
- (ii). Significant damage : 1% or more of total annual GNP
- (iii). Affected people : 1% or more of total national population

According to Turner, all disaster may be regarded as the outcomes of misplaced or misdirected energy, so general principle is (Turner 1978:189):

Disaster equals energy plus misinformation  
i.e., (disaster = energy + misinformation).

Shook (1997) differed with Turner. To him, disaster is the product of one or more hazards and some affected vulnerable elements or elements (Shook 1997:79):

Disaster = Hazard + Vulnerability

Drabek (1970) proposed a three-dimensional methodology for disaster studies. The dimensions are system complexity, level of obstruction and time after event. Time after event starts from zero time at the moment of impact. This figure shown by Turner (1978:39) as follows:

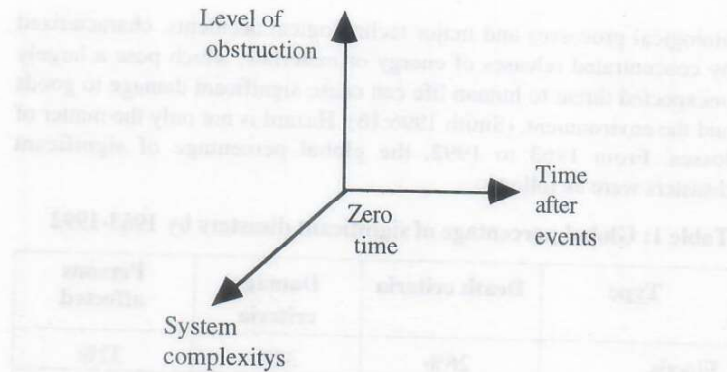


Figure 1: The three dimensional methodology by Drabek (1970)  
(Source: Turner1978: 39)

Three approaches developed in anthropology on hazard research (Oliver-Smith 1996:305). Those are behavioral response approach, social change approach and political economic/environmental approach. Behavioral approach ignored sociopolitical and historical structural features but those are related to decision-making, argued by Hoque and Zaman (1989). Moran (1984) emphasized on the studying of responses of the individual to clarify the responds, changes of population structures, cultural patterns, perception of the severity of the stress, process of adjust to termination of stress which can differentiate changing pattern from stable one. In terms of decreasing severity, Smith (1996:6) recognized the threats of a hazard in three ways;

- (i). Hazards to people : death, injury, disease and stress
- (ii). Hazards to goods : property damage, economic loss
- (iii). Hazards to environment : loss of flora and fauna, pollution, loss of amenity.

The UNDRO (1994) defined disaster as 'an event, concentrated in time and space, in which, a community undergoes severe danger and incurs such losses to its members and physical appearances that the social structure is disrupted and the fulfillment of all or some of the essential functions of the society is prevented' (quoted from Smith 1996:20). Smith defined environmental hazards as 'extreme geophysical events,



biological processes and major technological accidents, characterized by concentrated releases of energy or materials, which pose a largely unexpected threat to human life can cause significant damage to goods and the environment, (Smith 1996:16). Hazard is not only the matter of losses. From 1963 to 1992, the global percentage of significant disasters were as follows:

**Table 1: Global percentage of significant disasters by 1963-1992**

Type	Death criteria	Damage criteria	Persons affected
Floods	26%	32%	32%
Tropical cyclone	19%	30%	20%
Drought	3%	22%	33%
Earthquakes	13%	10%	4%
Others	39%	6%	11%
Total	100%	100%	100%

(Source : K. Smith 1996:32)

The intensity of a disaster is related to the damage and destruction of the social system. Intensity increases the damages and damages increases stress over the population. For this people tend to increase function that forms new organizations and patterns of behavior. The interaction between victims and donor communities change the society. Conflict and cooperation takes place among groups. The management of the outside resources is the important factor for reconstruction phases. Beside panic, some gains also arise in various forms of aid and grants. This assistance may be related to the creation of new stratification in the society. The aid distribution reconstruction principles are controlled by the stratification system of the society.

Anthropological concern on society and culture, and the disaster studies are inquiring similar target. Changes in environmental condition 'affect the subsistence economies of the traditional societies' (Colson 1979, Dirks 1980, de Garine and Harrison 1988). In coping with the hazard of natural events, human beings become more vulnerable to the consequences of the great extreme (Slovic et.al. 1974). Human

ineffectiveness can turn the 'identities of natural hazards' (Croll and Parkin 1992:28), as the result of sins, process of punishment, which means one type of interaction between human and non-human agencies. Shaw (1992) argued that the geographical approach of hazard research 'eclipse the social and cultural nature of hazards by 'natural' nature of hazards. In such research, investigation of human involvement has usually limited to such question as how accurately people appraise risk, how they cope and adopt the hazard (Shaw 1992:201). In the early anthropological writing, natural hazards were considered as a systematic dimensions of the environment to which people developed strategies for successful/effective adaptations.

The way that how human beings cope with their surroundings and how they affected by the environment are important. The target of human adaptability studies is to find out the applicable and systematic properties and to understand the patterns of human behavior. The crisis situation in natural disaster creates unusual and relatively extreme disruption of normal socio-associational patterns. It is important to identify that how human activators constitute (or reconstitute/reconstruct) the social organization with the division of labor. In the study of environmental disaster issues and change of human behavior strategies, it is important to examine the effects of the environmental events subsistence activities, resources and micro-environmental niche areas. Human beings, their culture, physical and biotic environment are not isolated. Moreover, each affects the other. The implication of this concept is clear than the interpretation of human behavior. Baker (1964) narrated in proper way – 'it may be convenient to study the temple form in a culture, but a better understanding will be gained by rememing that the topography of the land, its climate, the genetics of the people, etc. are all involved in the same temple form' (Baker 1964:21).

When a society forms through the participation of it's members then a smooth social dynamism is their expectation. Beyond the internal problems, some external matters appear as the obstacle or influential factor to restructure that formation. Natural disasters are such types of factor from the external side. Human life, plans and intentions may be thwarted by natural hazards and disasters. Even, the safest position,

which is never counted with the possibility of some unforeseen and destructive events, may subject to danger or disrupt. That can break down the orderly everyday affairs. Those events might be regarded as Turner (1978:1) said 'resulting from some external and unfathomable force which could not be controlled directly but only accepted'.

Every society perceives the natural events with its capacity to cope with those events. If that society successfully overcomes the situations that case it will be a simple natural event. If the society fails to adjust with the event then it seems a disaster for that society. People's interaction with their surrounding is important for their living in a particular area. This interaction changes the physical environment and develops the human society. Every social system responses in the crisis situation and that temporary adaptive process may transfer to the permanent pattern for that society if the occurrence takes place again and again. In the social system the great differentiation could be found in socioeconomic level. As an impact of the hazardous condition, new groups, institution come to the scene and creates new forms of contact, cooperation and conflict between existing groups and institutions. Thus the temporary changes occur which leads to the permanent changes in the unit of that social structure. Any type of destroys in the infrastructure of a society by the hazard events influence the total structure of that society to move towards recovery. In this process, the scope of interaction among different groups and agents occur in the reconstruction phase. Those interactions of affected groups and outsider group create new form of behavior. Conflicts often occur in the post-disaster phase over the distribution of resources and over the equity, utility, rehabilitation and reconstruction principles. Those conflicts (or forms of conflicts) may have serious socio-political implication. It changes the relationship between the local groups and outside, regional organizations.

Vayda and McCay (1975) proposed to focus on life threatening hazard such as drought, frost and disease as a crucial factor to understand the adaptive strategies. The root of environmental studies lies into the studies of natural uncertainties. Nature is found interesting and study matter because its effects on human life.<sup>2</sup> The climatic knowledge was one of the factors of progress of human society throughout the time. This can be found in Egaleman's writings: 'a fundamental



understanding of severe and unusual weather should be an important part of everyone's basic storehouse of knowledge. Anyone who travels to the ocean beach for any length of time should be aware of the nature of hurricanes and warning system' (Egaleman 1983:v)<sup>3</sup>. Human beings cannot manipulate the disasters and hazards weather to our will. They can arrange the community life through proper knowledge of severe problems and the use of the best information on safety. The both process includes the knowledge on environment as well as pattern of human social system.

Taking into account of normal social arrangements, the natural hazard affects its usual settings. The new setting may contain most of the previous patterns but changes occur through disaster vulnerability. The striking of disaster such as hurricanes (cyclones), floods and earthquakes, periodically in a particular area, influence to develop 'a disaster culture' (Bates *et.al* 1987:310) or 'disaster subculture' (Hussain 1999:1). When the usual pattern of a system disrupts or fails and a disaster occur, new but sometimes temporary patterns emerge or are introduced into that system. It is fact that the pattern created during an extreme and emergency situation when the normal system was overwhelmed has definite impact. But it cannot be considered 'social change' unless the new forms to be incorporated into the social system in post-disaster normalized<sup>4</sup> situation.

When a hazard takes place, break down occurs in the existing social system due to the damages. Then the people of that society reorganize themselves and reconstruct their system through facing and solving the problems. If the same place attacked by hazards every year and frequently then their coping behavior and vulnerabilities come to continuum process. In coastal Bangladesh, where cyclone hazard continues one after another, damages lives and properties, there, people's survival strategies and coping behavior are also a matter of continuum. The damages caused by the hazards is as easy to a developed country not that for the poor country like Bangladesh. Bangladesh is one of the top countries following Ethiopia and followed by Cambodia and Somalia, who lost annually more than 20000 people by disasters from 1963 to 1992. Thirty years average of this top five country was as follows (Smith 1996:35):

**Table 2: Average disaster loss from 1963 - 1992**

Country	Average death (person/year)
Ethiopia	48465
Bangladesh	40536
Combodia	40011
Somalia	21697
Sudan	16197

(Source : K. Smith 1996:35)

Oliver-Smith's (1996) comment on disaster research in anthropological perspective is, 'a disaster damages or destroys a society's ability to provide, however differentially, for the needs of its members, new adjustment or arrangements may have to be formulated for it to continue functioning. Therefore, disaster research inevitably addresses the issue, or at least the potential, of change. Despite the focus on social change in the earliest social scientific discussion of disasters, the issue of long-term social change has received significantly less attention than more immediate behavioral and organizational issues. Through its tradition of lengthy field research and emphasis on social and cultural process from a development perspective, anthropology has perhaps devoted more attention to the implications of disaster for long-term social change than other social sciences' (Oliver-Smith 1996:312). According to Baksh and Johnson (1990), there are four levels of risk with which the traditional societies have to cope - subsistence risk, environmental risk, risk of social conflict and risk of cultural loss. But people always 'held on believing that they could cope with disaster' (Gregory et. al. 1997:47).

Disaster creates new contexts of power relation, transform political consciousness, shape individual action and strength or dissolves institutional power arrangements. 'Two related themes characterize much anthropological research on political factors in disasters: a) disaster as both opportunity and cause for local political socialization and mobilization and b) disaster caused alternation in relation with the



state' (Oliver-Smith 1996:309). Violating aid distribution creates severe and long-lasting conflict in a society with highly stratified than a society where stratification so not so strict (Oliver-Smith 1977). Spillius (1957) studied cyclone affected Polynesian society and emphasized of political crisis, disturbance over unfair ration distribution and role of the chiefs.

Quarantelli (1997) differentiated disasters (everyday emergencies) from catastrophes (social crises). He showed that in a community crisis situation, four groups can be appear on the basis of organization tasks and internal social relationship. The same typology introduced by Dynes (1987) based on structure and tasks. Type one: established organizations those are carrying out regular tasks (regular and old), type two: expanding organizations (regular and new) such as Red Crescent Society, type three: expanding organization (non-regular and old) and type four is emergent group (non-regular and new) such as rescue group (Dynes 1987:73, Quarantelli 1997:44-45). Faupel (1988) followed this. He argued that 'ad hoc' group (emergent group type organization) emerges due to lack of planning and preparedness, emerging leadership and communication problem in disaster condition.

#### **Post-disaster Recovery Process**

The post-disaster recovery process includes the community integration, formation of new relationship among the victims and aid agencies -'we they dichotomy', mobilization of community resources for reconstruction, community problems and changes in housing pattern through introducing by the aid agencies (Oliver-Smith (1977, 1979, 1990, and 1991), corruption of aid goods (Bollini et.al 1994, Zmolék 1988)), dominant economic and political forces, political clientism, labor market monopolies appears soon due to misuse of relief and reconstruction funds (Littlewood 1985). With Sjoberg' (1962) stated that disasters have minor affect on the dominant structural arrangement of the society. Firth (1959) from his study Tikopia society after devastating hurricane of 1952, focused on the process of power exercise of chiefs and control over the situations, their gaining, people's household strategies, social hierarchy and economic behavior. He showed that social structure sustained for privatized life. Islam (1974) concluded his study on cyclone hazard on basic three points: cyclone

hazard studies requires the understandings of area's land ownership patterns, decision making in hazards has no relation to past experiences, and relief reduces people's concern on hazards. Shaw (1992) argued that in Bangladesh, in terms of religion, ecological hazards come to moral hazards for women in the cases of *pardah*.

Two links between the developed and developing countries have been argued by Whyne-Hammond -'trade: the buying and selling of goods and services between countries and aid: the transfer of goods, finance and services from advantaged countries to disadvantaged countries' (Whyne-Hammond 1985:255)<sup>5</sup>. In the recovery process, key elements were leadership, act ability and knowledge of recovery (Rubin 1985), social networks (Kates 1978), bureaucratic structure and decision-making process (Torry 1978), media as a unit of social structure (Ploughman 1997), etc. Rossi (1993) found that pre-disaster behavior is the best indicator of post-disaster behavior. He divided structural characteristics into cultural, social and economic resources and action characteristics into leadership and grass-root initiatives and argued that reconstruction related to both structure and action potentials of the community rather than damage level. Snarr and Brown (1978) showed that difference created between aid recipient and non-recipients from a study on disaster assistance in Honduras after hurricane in 1974. The causes he found for unsuccessfulness of the relief were greater needs, inability of the agencies and corruption in distribution system.

Anthony Oliver-Smith (1996) reviewed some papers on hazard research. Key findings of that review were: explanation and meaning of loss and change and religious aspects - belief, sin and punishment, nature of divine, sacred and secular etc. and shifting religious values (Bode and Maida), post-disaster socio-psychological stress (Palinkas), emergent group becomes threat of established power politicians, create new social hierarchy, effect on local political process, recognizes new power relations, new economic and political process, (Doughty, Robinson Bode, Johnston), reconstruction process affects post-disaster power structure and relation (Johnston, Oliver-Smith) and religio-structural inequality justifies inequitable relief distribution (Torry) shifting attitudes and values of marriages (Loizos).

The main concepts and issues were emphasized on social and institutional responses, people's lack of faith on warnings systems, emphasizing of improvement of warning systems and prediction of flood level accompanying cyclone. Few papers discussed on causes of death - poor housing, poor sheltering, avoiding warnings, infrastructure problem women's conditions and gender differential in the vulnerability. These all factors are related with the socioeconomic conditions, training and education, social values etc., which were absent in their analysis. Housing is directly related with economic capacity of the household, infrastructural conditions are related to the national economic policy and development, women conditions related to social values. About policy implications - making new shelters with sufficient facilities and protective infrastructure, training to survive, including rural leaders in every ecological and environment developmental program, introducing environmental problems in academic curriculum, were discussed in some papers. But most of above ignored the usual features of the social structure. The people are facing the poverty and different socioeconomic differentiation, sociopolitical conditions. Policy ignoring the people's view is unable to provide proper meaning.

Referring Boyce and Hartmann's (1978) work on the 1970's cyclone and 1971's war recovery phase, Torry described 'large portion of food provided by donor agencies are expropriated by public officials and end up in black market to be sold at 'exorbitant prices' (Torry 1978:304)<sup>6</sup>. O'Riordan (1997) prescribed for the mix response (local and governmental). That will be feasible, acceptable and accommodative. The frequent cyclone, flood, etc are hazardous for the poor and powerless but beneficial for the power holders and the rich. They 'can use their resources and influence to circumvent government regulations' (Vayda and McCay 1975:302).

#### **Bangladesh Perspectives**

Alam (1994) reviewed a significant number of disaster related papers. His review shows that most of the studies were based on GO/NGO projects. In many cases, a short version of their project reports were published as the article format in the academic/institutional journals/bulletins. He found (1994:3) that disaster analysis and relevant



issues did not get interest among the social scientists in Bangladesh because of ignorance of people's perception and trying to solve in structural engineering way. The social science practitioners were working in traditional way. Most of them were motivated towards NGO projects oriented research - especially on poverty alleviation and income oriented project formulation and research and not in theoretical or academic research which are the causes of absence of disaster research literature. Secondly, most of the researchers were geographers, economists, sociologist, field visitor etc. and were working as the consultant of the NGOs and Government projects. That is why their concepts seemed action oriented, not theory oriented and from superficial-observer's point of view, not from participant's point of view. And finally, after the devastating flood of 1988 and cyclone of 1991, some researchers moved to this field (Alam 1994:3).

Now a day, Bangladesh is known to the outside world in two ways. Firstly, it is a country of disasters such as - flood, cyclone and tidal surges and secondly, a country of poverty. Unfortunately, poverty of this country is related to the disaster havoc of every year and all over the country. The geographic location of this country is favorable for the occurrence of natural disasters again and again. The delta situated at the lower plate of the Himalayan basin that is the cause of water overflow throughout the country and creation of flood. Moreover the country faces to the sea in the south. The long coast is unprotected from the sea borne disaster threat. The cyclone and the tidal surges can easily hit the wide coastal area of Bangladesh getting no trouble on its ways.

Cyclone is sea origin severe hazard. It destroys the coastal areas rapidly. The cyclones that come from a long distance with sufficient energy, wind speed, tidal surges and heavy rain, are really dangerous. Cyclone is termed 'tropical cyclone' in the Indian Ocean, the Bay of Bengal and Australia, 'hurricane' in the Caribbean, Gulf of Mexico and the Atlantic Ocean and 'typhoon' in Philippines and Japan. In global perspective, the tropical cyclone makes remarkable losses. The cyclones form in the Indian Ocean and hit the coast after crossing more than thousand kilometers. The Bay of Bengal, which is the adjunct part of the Indian Ocean, is only the media between the country and the ocean. So the oceanic storms can easily attack the coast of the country and victimize coastal people. This is the past history of the coastal areas and definitely will continue in future. There is no way to protect the

coastal area and people from the disaster trouble. The country, Bangladesh is the poorest one in the world. But from the population point of view, it has the high density of population (near about 900 people per sq. km). Though the country is a plain land area except some small hills in the eastern side, the total land is not enough for population. The per capita land area is unable to serve one's necessity. This poverty situation closes all the doors to take any necessary step for protecting people from disaster havoc like floods, cyclones and tidal surges.

The coastal zone of Bangladesh is known as the 'death trap' and 'High Risk Area' because of frequent cyclone and tidal surges. The massive loss of life from cyclone occurred many times throughout the history. Poverty, poor construction of houses, hazardous transporting system, poor warning system are obvious facts for the coastal people. 'About 10 percent of all tropical cyclones (of the world) form in the Bay of Bengal and this area average over five storms per year with about three reaching hurricane intensity' (Smith 1996:211). Higher waves are generated in the coast of the Bay of Bengal. Some of the tropical cyclones have produced the increase in ocean level 10-12 meter or more in the Bay of Bengal. Moreover the coastal area is less than 6 meter above sea level and situated at the lower part of the Ganges Delta. The geographic location of the country is at the northern side of the Equator. The  $23\frac{1}{2}^{\circ}$  Latitude has crossed over the middle of the country. The tropical cyclone creates within the  $5^{\circ}$  Latitude due to the temperature rise (warmer than  $27^{\circ}\text{C}$ ). Recent changes in global warming are the factors to be considered for frequent cyclone in this region in near future too. People get basic necessities in coastal area easily than the mainland, which attract them to live in such risky, and danger area and ignoring hazards. The rural population of the country wholly dependent upon land holdings, operation and managing of the land based production. Thus the climatic change affects the resources.

With the two lion disaster- cyclone and flood, Bangladesh is going to face many unwarranted disasters. Firstly; the pollution of underground water by the heavy metal- Arsenic, which is the cause of diseases among the drinkers. Approximately half of the total population of the country are under its threat. Secondly; the rise of sea level as a result of

global warming will affect the country. A large number of coastal people will be affected certainly. Besides, the country is facing some imbalanced air pollution in the major cities, which is expanding to the semi-urban areas too. It is forecasted that 80 to 90 percent of the inhabitants of Dhaka city will be affected by cough and other lung diseases within 10-15 years.

### Conclusion

A huge amount of the annual budget of this poorest nation in the world expenses for disaster mitigation, rehabilitation and reconstruction process but the outcome is not so far. There are some incidences, which are responsible for this. Such as planning with ignoring native's perception, corruption in rehabilitation process etc. It is important to identify the gap between the current situation and the realities -which demands to indicate the changes and process of changes in the social system and institutional formation.

The studies of disaster events can serve the points to build up anthropological theory in evolutionary process and on changes of societies. The study of natural hazard can help to understand the social system, strength and weakness and survival strategies of a particular society.

The question how anthropological knowledge can be applied to environmental issues leads to a consideration of advocacy and globalization. Anthropologists can contribute to the environmental issues without violating the theoretical principles of the discipline. Anthropological knowledge can contribute to the environmental issues in three ways. Firstly; human or cultural ecology viewpoint where environmental problems are defined as ecological problems. Secondly; socio-cultural viewpoint where the environmental problems are considered as trans-cultural operations, and interpretation across cultural, social, political, etc boundaries is recognized. Thirdly; interdisciplinary (or multidisciplinary), where importance are given to the analysis of environmentalism with other social sciences.



### Notes

- 1 Such as Orlove (1980) argued the particularly areas related to history, political organization and economics.
- 2 Kay Milton (1993:3) argues 'environmentalism is found in both in the institutionalized practices of non-industrial people' and 'in their responses to external threats and human interaction with the environment is widely perceived both in the source of environmental problem and as the key to their solution' (Milton 1993:5). According to Torry (1979, quoted from Oliver-Smith 1996:304), 'social change and evolution are similar to totalizing nature of disasters'.
- 3 Moreover, Egaleman added 'we live in a world that is at least occasionally dominated by severe and unusual weather. However, there is hardly a place in the whole world that does not have some peculiar aspect of weather that require some degree of understanding and preparedness in order to avoid loss of property and perhaps even life itself. Fortunately, no particular location has all the different kind of unusual weather' (Egaleman 1983:3)
- 4 Bates argued that the 'social change' could be said in case of incorporation into the 'latent social structure of the community' (Bates et.al 1987:311).
- 5 Whyne-Hammond defined the international aid (1985:58) as 'poor people in rich countries giving money to the rich people of poor countries'. His explanation is correct and realistic: 'On the one hand the finance for aid is usually provided by the general taxation in donor countries. On the other hand the money, capital, equipment or food sent to less develop countries frequently falls into the hands of middlemen and administrative officials. Corruption is not uncommon in much of the third world and those responsible for the distribution of supplies may, if dishonest, grew rich on illegal interception. Elsewhere, inefficiency may exist. Ineffective government employees, poor transport facilities, insufficient finance and restrictive social and cultural divisions, may all result in much-needed provision never reaching their intended destinations' (Whyne-Hammond 1985: 258-9).
- 6 From Boyce and Hartmann, he quoted 'aid programs that promise much on paper may in fact bolster an elite that clings to power by monopolizing resources and suppressing dissent' and 'far from "trickling down" to the poorer majority, such aid actually made them poorer. Made richer by his well the landlord readily buys out small farmers when hard times befall them' (Boyce and Hartmann 1978:239-240, Torry 1978:304).

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