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# **Vulnerability and Poverty: What are the causes and how are they related?**

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## **ABSTRACT**

This paper aims to analyze how the terms ‘vulnerability’ and ‘poverty’ can be elucidated in a variety of ways, with different meanings, different implications and their interrelationship. The analysis shows poverty is generally associated with deprivation of health, education, food, knowledge, influence over one’s environment and the many other things that make the difference between truly living and merely surviving. There is another universal aspect of poverty, which makes it particularly painful and difficult to escape is: Vulnerability. The poor are more vulnerable than any other group to health hazards, economic down-turns, natural catastrophes, and even man-made violence. Shocks such as illness, injury and loss of livelihood have dreadful impacts, and are significant causes of poverty. Scholars argue that vulnerability and poverty are comprised of economic, social, cultural, political and environmental factors, thus to identify the full range of factors, this paper encompasses an interdisciplinary analysis with some case studies from developing countries.

## **ACKNOWLEDGEMENT**

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## ACRONYMS

ADB	Asian Development Bank
AIDS	Acquired Immune Deficiency Syndrome
FY	Fiscal Year
GDP	Gross Domestic Product
HIV	Human Immunodeficiency Virus
ILO	International Labor Organization
IMF	International Monetary Fund
NGO	Non Governmental Organization(s)
UK	United Kingdom
UNDP	United Nations Development Program
USD	United States Dollar
WHO	World Health Organization

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## 1. INTRODUCTION

The understanding of the concepts of poverty, vulnerability and their linkage is important in the efforts to improve the standards of living in the world. Whilst vulnerability has often been closely associated with poverty, it has also been seen as being distinct. Historically, vulnerability has been seen as a dynamic concept which recognizes and captures change, poverty has been seen as being static (Moser, 1998). However, the increasing realization that poverty itself is dynamic, “that some of the poor are not poor all of the time” (Yaqub 2000) means that the historical harmony has been established between poverty and vulnerability.

Poverty is mainly viewed as an indicator of lack of access to resources and income opportunities, but it has other aspects of social positioning such as geographical location, age, gender, class, ethnicity, community structure, community decision making processes, and political issues that determine poor people’s vulnerability (Yodmani, 2001). Poor households often identify vulnerability as a condition that takes into account both exposures to serious risks and defenselessness against deprivation. Defenselessness in turn is often seen as a function of social marginalization that ultimately results in economic marginalization. Since understanding the linkages between poverty and vulnerability calls for a clear understanding of these terms, consequently the paper is an effort to review the different meanings and cause-effect relationship of vulnerability and poverty using an interdisciplinary approach.

In this paper, we examined the causes of, link between poverty and vulnerability. In order to achieve the objectives, this paper comprises reviews of various studies on poverty and vulnerability. A few case studies of some developing countries have been presented to substantiate the various arguments raised in this paper.

The paper encompasses four main sections. The first section provides a general introduction of the concepts of vulnerability and poverty, objectives and organization of this paper. The second section possesses a review of literatures. The review is mainly based on the historical background, theoretical approach, meaning, causes,

measurements, indicators, dimensions and dynamics of poverty and vulnerability. This is followed by the third section which describes the interrelationship between poverty and vulnerability based on case studies. The last section gives summary and recommendations.

## **2. LITERATURE REVIEW: VULNERABILITY AND POVERTY CONCEPTS**

### **2.1 Historical Background of Poverty and Coping Vulnerability**

**Poverty** is blessed with a rich vocabulary, in all cultures and throughout history. Rowntree's study, published in 1901 was the first to develop a poverty standard for individual families, based on estimates of nutritional and other requirements. In the 1960s, the main focus was on the level of income, reflected in macro-economic indicators like Gross National Product per head. In the 1970s, poverty became prominent, notably as a result of MacNamara's celebrated speech to the World Bank Board of Governors in Nairobi in 1973. Other factors that played a big role include the emphasis on relative deprivation, inspired by work in the UK by Runciman and Townsend. Townsend had the opinion that poverty was not just a failure to meet minimum nutrition or subsistence levels, but rather a failure to keep up with the standards prevalent in a given society. Thus, following ILO's pioneering work in the mid-1970s, poverty came to be defined not just as lack of income, but also as lack of access to health, education and other services.

The concept of basic needs inspired policies like integrated rural development. New layers of complexity were added in the 1980s. The principal innovations were: (a) The incorporation of non-monetary aspects, particularly as a result of Robert Chambers' work on powerlessness and isolation. (b) A new interest in **vulnerability**, and its counterpart, security, associated with better understanding of seasonality and of the impact of shocks, notably drought. This pointed to the importance of assets as buffers, and also to social relations (the moral economy, social capital). It led to new work on coping strategies. (c) A broadening of the concept of poverty to a wider construct, livelihood. (d) Theoretical work by Amartya Sen (1981), who had earlier contributed the notion of food entitlement,

or access, emphasized that income was only valuable in so far as it increased the capabilities of individuals and thereby permitted functionings in society. (e) A rapid increase in the study of gender. Policies followed to empower women and find ways to underpin autonomy, or agency. In 1990s UNDP developed the idea of human development: ‘the denial of opportunities and choices to lead a long, healthy, creative life and to enjoy a decent standard of living, freedom, dignity and self-esteem’.<sup>1</sup>

## 2.2 Theoretical Approaches to Vulnerability Analysis

The conception of vulnerability has been amended and adapted in various approaches. For example: *The biophysical approach* mainly focuses on the vulnerability or degradation of biophysical conditions. The approach extrapolates the biophysical estimates to the impact on the human occupants of a landscape (Liverman, 1990). This approach is widely used in studies of vulnerability to natural hazards and climate change (Hewitt, 1995; Clark *et al.*, 2000). Key articles from a development and sectoral perspective include Bohle and Watts (1993). Studies on climate change explorations include Adger and Kelly (1999), Bohle *et al.* (1994), Downing *et al.* (2001), Handmer *et al.* (1999), Kasperson *et al.* (2002), Leichenko and O’Brien (2002), and Bogardi (2004). *The human ecological approach* essentially embeds human systems within ecological processes (e.g., Moran, 1990). *The Political Economic Approach* is based on the theory of marginalization (Susman *et al.*, 1983) and food entitlements (Sen, 1981). It emphasizes the central role that differential economic and political power play in determining differential vulnerability of individuals and groups (Greenberg *et al.*, 1994). The approach has been criticized for neglecting historical diversity of response, underemphasizing the role of human agency, and diminishing the role of the environment as an independent factor that affects social relations (Bryant, 1992). *Political ecological approach to vulnerability* uses a political ecological view in vulnerability analysis. An example of a research project that employed this methodology is a project aimed at understanding vulnerability in Southern Honduras (Stonich, 1993).

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<sup>1</sup> Depicted from ‘The Meaning and Measurement of Poverty’ by Simon Maxwell (1999)

### 2.3 Theoretical Approaches to Poverty Analysis

The main objective of all approaches of poverty analysis is primarily to determine who are the poor households, individuals, or groups of individuals? There are two main approaches for estimating welfare for the purposes of analyzing poverty: Those that are based on an indicator of welfare, hence the name of the *welfare approach* which refers to the microeconomic concept of utility. The second approach is known as the *non-welfare approach* which is basically regarded as being more social in character than the welfare approach (Boccanfuso, 2004).

*The welfare approach* refers to the numerous microeconomic precepts that postulate that economic actors are rational and that they behave in ways to maximize their benefit (welfare). Since economic welfare is not observable, the welfarist school has fallen back on real income and consumption expenditures as indicators of economic welfare. This is the approach advocated by the World Bank, the IMF, and the main development partners (Boccanfuso, 2004).

*The non-welfare approach* is more sociological in nature. In contrast to the previous approach, this has to date been a *multidimensional* approach. There are two schools under this approach: The first is the *basic needs* school and the second is the *capabilities*. *The basic needs approach* appeared in its operational guise in the 1970s in response to the policies for the fight against poverty proposed by the *welfarists*, and particularly to the policies of growth trumpeted as a tool for reducing poverty. It views poverty as a problem of unacceptable social inequality (Kanbur, 2002). *Sen's(1981) school of capabilities approach* was also developed in opposition to the welfare approach. The aim in this approach is for an individual or household to have the capacity to function well in society and not solely on the basis of its own functions. In this context, this agent cannot be considered poor, even if she/he decides not to achieve certain functions, provided that he has the possibility to select them from the total range of functions.

## 2.4 Vulnerability and Poverty: What do they mean?

### 2.4.1 The Meaning of Vulnerability

Generally the term vulnerability refers to exposure to contingencies and stress, and difficulty in coping with them. We have seen how increased attention is currently being paid to the concept of vulnerability, this section provides a review of the views of various authors regarding the meaning of vulnerability.

#### *Chambers and Ellis - internal and external*

The starting point in disaggregating vulnerability is the internal/external distinction proposed by Chambers (1989): “Vulnerability thus has two sides: an external side of risks, shocks, and stress to which an individual is subject to; and an internal side which is defenseless, 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”.

#### *Moser – sensitivity and resilience*

Moser (1998) also utilizes a two-step model of vulnerability but uses the concepts of sensitivity and resilience to significantly change the focus and emphasis of Chamber’s internal/external distinction. “Analyzing vulnerability involves identifying not only the threat but also the resilience or responsiveness in exploiting opportunities, and in resisting or recovering from the negative effects of a changing environment. The means of resistance are the assets and entitlements that individuals, households, or communities can mobilize and manage in the face of hardship. Vulnerability is therefore closely linked to asset ownership. The more assets people have the less vulnerable they are, and the greater the erosion of people’s assets, the greater their insecurity”.

#### *Watts and Bohle - exposure, capacity and potentiality*

The Watts and Bohle’s (1993) definition of the ‘space of vulnerability’ shows *exposure* (risk of exposure to hazards) as the external side of vulnerability, whilst *capacity* (risk of inadequate capacity to mobilize resources to deal with hazards) and *potentiality* (the risk

of severe consequences) form a more complex understanding of the internal side of vulnerability.

### *Sinha and Lipton - exposure, vulnerability and aversion*

Sinha and Lipton (1999) describe *exposure* to Damaging Fluctuations (DF) (this is increased with size, frequency, earliness and bunching and correlates to what Watts and Bohle also describe as exposure), the *vulnerability to exposure* (this increases with unpredictability, co-variance with other DFs and exposure relatively to the portfolio of assets and activities, this correlates roughly to capacity), and *aversion* (this increases with exposure, vulnerability and experience, and correlates to potentiality).

Furthermore, Clark *et al.* (2000) define vulnerability "as the risk of adverse outcomes to receptors or exposure units (human groups, ecosystems, and communities) in the face of relevant changes in climate, other environmental variables, and social conditions." Vulnerability has also been defined as "a human condition or process resulting from physical, social, economic and environmental factors, which determine the likelihood and scale of damage from the impact of a given hazard" (UNDP, 2004).

### *Vulnerability as Risk*

Chronic exposure to risks is a crucially important source of vulnerability. Risks are varied in nature and can range from macroeconomic shock, natural disaster, health hazard, personal insecurity, and socially compulsive expenses such as dowry. Each of these categories contains rich subset of varieties. Macroeconomic shocks can be caused by changes in the external trading environment and/or as a consequence of domestic policies (Kamanou, 2002). Natural disasters involve crop damage, housing and similar damages caused by cyclone, flood, river erosion as well as drought and rising salinity. Health hazards include both expenditures on member illness and livestock death through diseases. Personal insecurity includes theft, eviction from land, money cheating, land litigation, physical assault, physical threats, police harassment, court/police expenses, rape and abandonment of women. Dowry includes expenses incurred on daughter's marriage. Others include death of the main earner.

## 2.4.2 The Meaning of Poverty

Poverty - just like its conceptual and social structural opposite pole, wealth - has many dimensions and manifestations. It always means a reduced (or complete lack of) access to material, economic, social, political or cultural resources needed to satisfy basic needs. As a multidimensional phenomenon, poverty is defined and measured in a multitude of ways. This section describes the various meanings of poverty.

### *Absolute and relative poverty*

Poverty can be viewed in absolute and relative terms. Absolute poverty refers to subsistence below minimum, socially acceptable living conditions, usually established based on nutritional requirements and other essential goods (e.g. per capita income under a certain arbitrarily fixed poverty line in USD per unit of time, a daily intake of less than 2,150 calories/person/day, or Human Development Index). Relative poverty compares the lowest segments of a population with upper segments, usually measured in income quintiles or deciles, may be quantified by concentrating on a small number of key indicators such as the share, in national wealth or income, possessed by 20% of the poorest inhabitants of a country.

### *Objective and subjective perspectives*

Poverty can be approached from objective or subjective perspectives. The objective perspective (sometimes referred to as the welfare approach) involves normative judgments as to what constitutes poverty and what is required to move people out of their impoverished state. The subjective approach places a premium on people's preferences, on how much they value goods and services (hence the emphasis on individual utility).

### *Physiological and sociological deprivations*

Poverty concepts can be divided into two types of deprivations—physiological and sociological. Regarding the former, the line of thinking is as follows: people are poor because they lack income, food, clothing and shelter. Both the income and basic needs concepts of poverty stem from physiological deprivations. The concepts of poverty emerging from the perspective of sociological deprivations are rooted in the underlying structural inequities and inherent disadvantages. They are based on observations that even

when resources are flowing into sectors dominated by the poor, they may not be able to take full advantage because of social structural impediments.

### *Poverty, equity, human rights and health: the links*

The links between the concepts of poverty, equity, and human rights in relation to health are many and profound. Both equity and human rights principles dictate striving for equal opportunity for health for groups of people who have historically suffered discrimination or social marginalization. Achieving equal opportunity for health entails not only buffering the health-damaging effects of poverty and marginalization: it requires reducing disparities between populations in the underlying conditions — such as education, living standards, and environmental exposures — necessary to be healthy. Thus, both human rights and equity perspectives require that health institutions deal with poverty and health not only by providing care to improve the health of the poor but also by helping to alter the conditions that create, exacerbate, and perpetuate poverty and marginalization.

## **2.5 Underlying Causes for Poverty and Vulnerability**

### **2.5.1 Causes of Vulnerability**

Many factors contribute to vulnerability. These factors act to undermine capacity for self-protection, blocks or diminish access to social protection, delays or complicate recovery, or expose some groups to greater or more frequent hazards than other groups. They include rapid population growth, poverty and hunger, poor health, low levels of education, gender inequality, fragile and hazardous location, and lack of access to resources and services, including knowledge and technological means, disintegration of social patterns (*social vulnerability*). Other causes includes; lack of access to information and knowledge, lack of public awareness, limited access to political power and representation (*political vulnerability*), (Aysan,1993). When people are socially disadvantaged or lack political voice, their vulnerability is exacerbated further. The *economic vulnerability* is related to a number of interacting elements, including its importance in the overall national economy, trade and foreign-exchange earnings, aid and investments, international prices of commodities and inputs, and production and

consumption patterns. *Environmental vulnerability* concerns land degradation, earthquake, flood, hurricane, drought, storms (Monsoon rain, El Niño), water scarcity, deforestation, and the other threats to biodiversity.

### **2.5.2 Causes of Poverty**

The causes of poverty can be attributed to different processes and multifaceted forces. This section tries to highlight some causes of the wide prevalence of poverty.

*Warfare:* The material and human destruction caused by warfare is a major development problem. For example, from 1990 to 1993, the period encompassing Desert Storm<sup>2</sup>, per capita GDP in Iraq fell from \$3500 to \$761 (Dercon, 2001). The drop in average income, while a striking representation of the drop in the well-being of the average Iraqi citizen in the aftermath of the war, fails to capture the broader affects of damages to the infrastructure and social services, such as health care and access to clean water. However, there is no doubt that the persistent civil wars, like in the case of Angola, Mozambique and Liberia have contributed significantly in impoverishing those countries.

*Agricultural Cycles and Natural Disasters:* Many families that rely on subsistence production for survival, the period immediately prior to harvest is a 'hungry period.' During these periods of scarcity, many families lack sufficient resources to meet their minimal nutritional needs. Moreover, natural disasters such as hurricanes, droughts, flooding and earthquakes have devastated communities throughout the world. Developing countries often suffer much more extensive and acute crises at the hands of natural disasters, because limited resources inhibit the construction of adequate housing, infrastructure, and mechanisms for responding to crises.

*Corruption and Social Inequality:* Corruption often accompanies centralization of power, when leaders are not accountable to those they serve. Most directly, corruption inhibits development when leaders help themselves with money that would otherwise be used for development projects. There is another source of poverty throughout the world is social inequality that stems from cultural ideas about the relative worth of different genders,

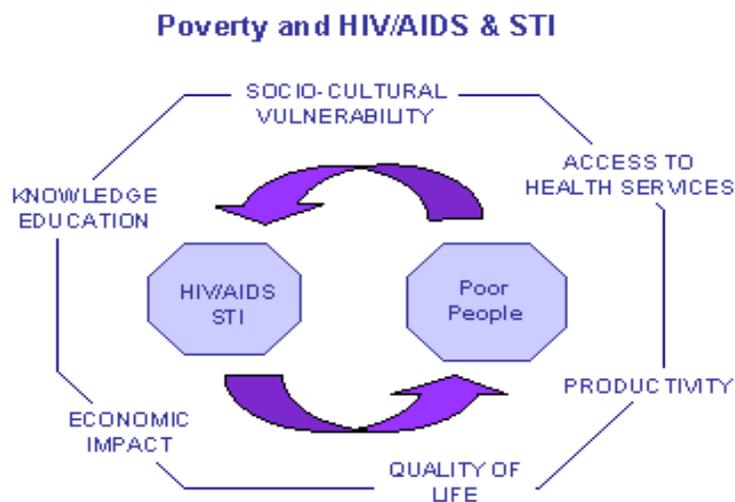
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<sup>2</sup> The name of mission to liberate Kuwait in 1991

racess, ethnic groups, and social classes. Ascribed inequality works by placing individuals in different social categories at birth, often based on religious, ethnic, or racial characteristics. For example in South African history, apartheid laws defined a binary caste system that assigned different rights (or lack thereof) and social spaces to Whites and Blacks, using skin color to automatically determine the opportunities available to individuals in each group.

*Pervasive Illiteracy and Wide Spread Diseases:* In least developed countries there is a high level of illiteracy. This is a very big problem in improving the livelihoods of people. The poor, who are also illiterate, have a limited chance of making use of improved production technologies and preventive health services. That is why diseases such as HIV and Malaria have exacerbated the already precarious conditions of the poor. Diseases increase expenditure on health, at the same time reduces effective working time thus plummeting labor productivity and availability in the households. The association between diseases and poverty can be easily depicted using the case of HIV-AIDS.

**Figure 1: Poverty-HIV/AIDS-Association**



Source: Kelk (2003)

## **2.6 Measuring Poverty and Vulnerability**

### **2.6.1 Measuring Vulnerability**

Vulnerability to poverty can be measured as the risk a household or community will fall into poverty at least once in the next few years. This means that vulnerability is measured as a probability. Since the future is uncertain, the magnitude of vulnerability rises with the time horizon. Reviewing articles we tried to merge some important indicators for measuring the multiple dimensions of vulnerability in Appendix 1.

### **2.6.2 Measuring Poverty**

The complexity of poverty has led to the development of various forms of measurements. Economists have given a great deal of attention to the functional form of a poverty measure, such as how the measure should respond to changes in distribution below the poverty line. A *poverty line* is defined as the monetary cost to a given person, at a given place and time, of a reference level of welfare. People who do not attain that level of welfare are deemed poor, and those who do are not (Ravallion, 1998). The poverty line can be established by using the *equivalent expenditure method* or the *food energy intake method*. Reviewing literatures we found some important indicators of poverty showed in Appendix 2.

## **3. INTERRELATIONSHIP BETWEEN POVERTY AND VULNERABILITY: CASE STUDIES AND ANALYSIS**

Some researchers claimed that there are two differing perspectives on vulnerability. The first perspective may be called the ‘risks-centric view’ whereby vulnerability is typically defined as *variability in the living standard* caused by consumption or income shocks. The second perspective may be called the ‘rights-centric view’ whereby vulnerability is caused by the *lack of social and political rights*. Both the views are important in understanding how poverty and vulnerability are interlocked. These views attach importance to differing dimensions of poverty. The risks-centric view tends to highlight

transient poverty while the rights-centric view focuses on chronic poverty, though; admittedly, there is a considerable gray area between the two.

Poorer nations and disadvantaged groups within nations are more vulnerable to disasters than the rich nations. It is usually the poor who are among the most vulnerable to famine, malnutrition, and hunger. At a local level the highest levels of household vulnerability are characterized by low household incomes. Adder and Kelly (1999) also demonstrated the influence of poverty on a region's coping capacity; poor regions tend to have less diverse and more restricted entitlements and a lack of empowerment to adapt.

### **3.1 Ecological Vulnerability Affecting Economic Sustainability**

**Case study 1: Bangladesh** is a prime example of a country that is particularly vulnerable to today's climate. With a low-lying coastline, high population density, and an economy highly dependent on agriculture, the lives and livelihoods of people are threatened by frequent floods, cyclones and the associated effects, such as saltwater intrusion, that render agricultural lands unproductive. Between 1974 and 2004, In 1998, about 68 percent of the country's geographical area was flooded, affecting more than 30 million people. Economic losses were estimated at US\$3.3 billion, equivalent to 8 percent of the country's GDP (Choudhury 1998). The 2004 floods are likely to be as devastating as the 1998 floods in many ways. The joint mission's preliminary estimates<sup>3</sup> show that total damage to assets and output losses are approximately Tk127 billion (about \$2.2 billion) or 3.9% of GDP (\$56.9 billion in FY2004), most of which correspond to lost assets. Residential housing, roads, bridges, crops, fisheries, and livestock have suffered the most damage. The largest assets and output loss occurred in the agriculture (including livestock and fisheries) sector, which was estimated at Tk34 billion (\$580 million) or 27% of the overall loss.

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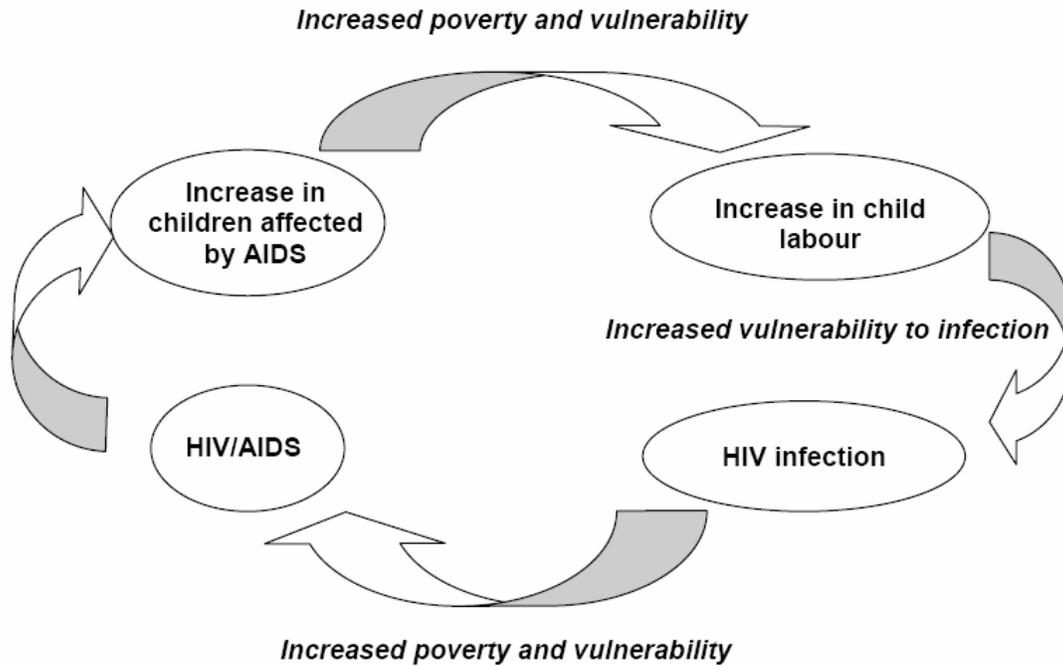
<sup>3</sup> A joint ADB and World Bank (WB) damage and needs assessment mission was fielded from 12 to 27 September 2004. The mission held discussions with a multitude of agencies, including all concerned government agencies, UN agencies, development partners, NGOs, public and private institutions, and academics.

**Case study 2:** El Niño is associated with floods and droughts in Latin America, Asia, and Africa. El Niño has caused loss of life, destroyed livelihoods, and affected national economies. For **Ecuador**, the overall costs of direct damages to agriculture, livestock and fishing associated with the 1997–98 El Niño constituted 4.7 % of its agricultural GDP. Loss of harvest and rising unemployment of agricultural workers led to an increase in the incidence of poverty by 10 percentage points in the affected municipalities (Vos et al. 1999). In **Tanzania**, high rainfall due to the 1998 El Niño was followed by a two-year period of erratic rainfall. This climatic shock caused some of the poorer farmers to give up maize farming and opt instead to sell their labor at farms in other, more productive areas. The resulting dependence on physical working capacity as their sole endowment increased vulnerability, since malnutrition and disease can reduce their capacities for manual labor.

### **3.2 Socio-economic and Cultural Vulnerability towards the Poor**

**Case study 3:** At the root of the global socio-economic and cultural problems related to HIV/AIDS are the unjust distribution and accumulation of wealth, land and power. This leads to various forms of malaise in human communities. Some of the problems that are associated with poverty are huge external and internal debts, critical health problems, illicit drug and sex trades, including an increase in child prostitution, fragmentation and marginalization of communities — all these factors form a web of inter-related global problems which intensify the vulnerability of human communities to HIV/AIDS. To substantiate the above descriptions we use a review study on the HIV and Labor Interface by Le Bretonis and Brusati (2001). It reviewed studies conducted in **Malawi, Zambia, Kenya, Uganda, Tanzania and Zimbabwe**. The study came up with a schematic presentation (Fig.2) on how poverty and vulnerability are related. The key findings of the reviewed studies were: HIV/AIDS in parents increases child labor; HIV/AIDS leads to increased poverty, which leads to increased child labor; Children affected by AIDS have an increased risk of engaging in risky livelihood strategies, such as living and working on the streets and informal sex work; Working children are exposed to increased risk of contracting HIV through the lack of a supportive, protective working environment, sexual abuse at work.

**Figure 2: Poverty-Vulnerability-HIV/AIDS-Linkage via child labor**



Source: Le Breton and Brusati (2001)

### **3.3 Global Environmental Problems and Local Poverty**

An important aspect of local adaptability to environmental change is the interaction between various environmental problems at a local level. To an impoverished farmer, the degradation of several natural resources that together form his or her subsistence base is considered a single problem, even though the causes of the degradation are considered to be separate phenomena at a global level.

Biodiversity in the form of local tree and plant species distributed throughout the farms represents an alternative income source for poor farmers when crops fail. For example, local wood is used to make stools, kitchen equipment, chicken coops, and so on. These products are sold on the local markets. Lumber is also used to burn charcoal, which is

sold to urban areas and cities. Leaves and seeds from certain trees are used as feed for goats and cattle. Drought resistant indigenous fruits are an important source of nutrition for both children and adults when there is little food. Thus preservation of local knowledge and biodiversity in cultivated areas helps enhance adaptability and reduce vulnerability to extreme climate events such as drought and flooding (Eriksen 2000).

A similar case study was conducted by Nguyen Hoang Tri and colleagues (1998) in the northern coast of **Vietnam**. Preservation of the natural mangrove forest with its species diversity is important for local sources of income, for example, wood and honey production. The mangrove forest is equally important for protection from cyclones and typhoons. The coast is hit by between one and twelve typhoons per year, and there is great uncertainty about how the frequency and magnitude of these will be changed in connection with global warming. The mangrove forest protects agriculture against flood damage from cyclones and reduces the maintenance costs of the dikes. Preservation of this forest represents a type of climate adaptation.

These examples illustrate that the interaction between various global environmental problems can result in different impacts in different places. To reduce the vulnerability of the poorest populations, policy measures should be adapted to local conditions and address several different environmental problems at the same time.

#### **4. CONCLUSIONS AND RECOMMENDATIONS**

The main observation of this paper is that poverty and vulnerability are complex and multifaceted concepts. They are interlinked in such a way that each causes the other. That is to say, while poverty makes people vulnerable to various shocks, such as drought, diseases and other natural disasters like earthquakes and volcanic eruptions; their vulnerability to such shocks exacerbate their poverty and hence their vulnerability to future shocks. The severe socio-economic problems caused by HIV/AIDS, and Floods caused by the *El Niño* in Africa and by monsoon rains in South Asia are largely due to the low coping capacities of those countries caused by the wide prevalence of poverty

Having observed the tricky linkage between vulnerability and poverty, the paper recommends that all efforts of poverty alleviation should take into account those factors which exacerbate the vulnerability of the poor. The complexity of poverty and vulnerability means that no solution can be valid in all situations and/or locations. Thus it is important to have a clear knowledge of the location in the process of designing poverty and vulnerability alleviation programs. It means that any successful program must use a multidisciplinary solution designing approach to tackle these multifaceted problems. The programs should address problems of health and illiteracy which have been found to be among the major causes of perpetuated poverty and vulnerability. Since income poverty is one of the most notable aspects of poverty, there should be efforts to improve infrastructure and other production support services in order to increase the incomes of the poor. Good governance and rule of law are important in alleviating non-income forms of poverty. The programs should also seek to reduce the vulnerability of the poor to natural disasters by educating them on basic precautionary measures and making sure that they have access important forecast information.

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## APPENDIX

### Appendix 1: Indicators for measuring the multiple dimensions of vulnerability

Indicator/Indices	Proxy variables/Indicators
Ecological security	Proportion of geographical area under forest
	Per capita utilizable ground water potential
	Population density per square kilometer
	Proportion of arable land
	Source of irrigation
	Fertilizer consumption
	Environmental sustainability index
	Percentage of population living in coastal area and river bank
Economic efficiency	Land productivity
	Labor productivity
	Per capita income
	Percentage of population dependent on labor income
Social equity	People below poverty line
	Life expectancy
	Female literacy
	Percentage of scheduled caste and scheduled tribe population in rural areas
Empowerment	Sex ratio
	Female literacy
	Fertility level
	Ratio of agricultural labor to cultivators
Poverty	Percentage of households below poverty line
	Infant mortality rate
	Percentage of landless population
	Land tenure status
Food absorption	Percentage of population with chronic energy deficiency
	Percentage of severely malnourished children under five (rural)
	Health insurance index

## Appendix 2: UNDP measures of poverty

Measure	Components
Human Development Index	Life Expectancy at birth, adult literacy, educational enrolment, GDP per capita
Gender related development index	As above, adjusted for gender differences
Gender empowerment measure	Seats in parliament held by women, female professional and technical workers, women's share of earned income
Human Poverty Index (developing countries) (HPI-1)	People not expected to survive to 40, illiteracy, access to safe water, access to health services, underweight children
Human Poverty Index (developing countries) (HPI-2)	People not expected to survive to 60, functional illiteracy, population below mean income, long term unemployment

*Source: UNDP Human Development Report 1998*