**Food Security and Livelihood- A Major Concern to Save Hunger**

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**Livelihoods: origin, definition and concept**

Livelihood is defined as adequate stocks and flows of food and cash to meet basic needs. Security refers to secure ownership of, or access to, resource and income-earning activities, including reserves and assets to offset risk, ease shocks and meet contingencies. Sustainable refers to the maintenance or enhancement of resource productivity on a long term basis. A household may be enabled to gain sustainable livelihood security in many ways-through ownership of land, livestock or trees; rights to grazing, fishing, hunting or gathering; through stable employment with adequate remuneration; or through varied repertoires of activities.

According to Chamber and Conway (1992), a livelihood comprises the capabilities, assets including both material and social resources and activities required for a means of living. A sustainable livelihood is sustainable when it can cope with and recover from Stress and shock, maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base.

A person's livelihood refers to their "means of securing the basic necessities -food, water, shelter and clothing- of life". Livelihood is defined as a set of activities, involving securing water, food, fodder, medicine, shelter, clothing and the capacity to acquire above necessities working either individually or as a group by using endowments (both human and material) for meeting the requirements of the self and his/her household on a sustainable basis with dignity. The activities are usually carried out repeatedly. For instance, a fisherman's livelihood depends on the availability and accessibility of fish.

According to Stage et al. (2002) household livelihood security is often influenced by the ability of the household to diversify livelihood sources and assets. This shows that the more livelihood strategy and asset (the bigger its capacity and asset) that have in the household are having a chance more secure livelihood than a household have less livelihood assets.

Livelihood diversification refers to a household's attempt to reduce its vulnerability by having more than one livelihood activity. In a diversified household, if one productive activity does not provide enough, or fails completely, there are other sources of livelihood that the household can fall back on. They use their different capabilities and the tangible and intangible assets and entitlements to which they have access as the basis for different livelihood sources and activities.

## Livelihood context

Livelihoods are formed within social, economic and political contexts. Institutions, processes and policies, such as markets, social norms, and land ownership policies affect our ability to access and use assets for a favorable outcome. As these contexts change they create new livelihood obstacles or opportunities. These include: Social relations: The way in which gender, ethnicity, culture, history, religion and kinship affect the livelihoods of different groups within a community. Social and political organization: Decision-making processes, civic bodies, social rules and norms, democracy, leadership, power and authority, rent-seeking behavior. Governance: The form and quality of government systems including structure, power, efficiency and effectiveness, rights and representation. Service delivery: The effectiveness and responsiveness of state and private sector agencies engaged in delivery of services such as education, health, water and sanitation Resource access institutions: The social norms, customs and behaviors (or ‘rules of the game’) that define people’s access to resources Policy and policy processes: The processes by which policy and legislation is determined and implemented and their effects on people’s livelihoods.

Livelihoods are also shaped by the changing natural environment. The quality of soil, air and water; the climatic and geographic conditions; the availability of fauna and flora; and the frequency and intensity of natural hazards all influence livelihood decisions.

## Livelihood Interdependence

One final important characteristic of livelihoods is their interdependence. Very few livelihoods exist in isolation. A given livelihood may rely on other livelihoods to access and exchange assets. Traders rely on farmers to produce goods, processors to prepare them, and consumers to buy them. Livelihoods also compete with each other for access to assets and markets. Thus

positive and negative impacts on any given livelihood will, in turn, impact others. This is a particularly important consideration when planning livelihood assistance.

We consider livelihoods because more importantly, disaster affected populations have overwhelmingly identified livelihoods as their greatest recovery priority.

## Livelihood recovery

Livelihood recovery is also a building process that takes place in a very dynamic environment. Livelihood strategies must be able to adapt or change altogether as the surrounding conditions change. Disaster assistance, across all sectors, also directly and indirectly impacts livelihood recovery, either enabling or impeding it.

## A phased Approach to Livelihood Programming

**Livelihood provisioning:** Livelihood provisioning is a set of relief based interventions that involve providing food and meeting other essential needs for households to maintain nutritional

levels and save lives. Interventions of this type usually entail food and health relief for people in an emergency or people who are chronically vulnerable.

**Livelihood protection:** Livelihood protection is a set of interventions that involve protecting household livelihood systems to prevent an erosion of productive assets and replacing or rebuilding productive assets. These types of interventions entail timely food and income transfers; infrastructure repair, rehabilitation, and improvements, carried out through food- or cash-for-work or some other means; and replacement of assets such as tools, boats and seeds.

**Livelihood promotion:** Livelihood promotion is a set of development based interventions that involve improving the resilience of household livelihoods so that food and other basic needs can be met on a sustainable basis. Interventions of this type entail strategies such as diversifying livelihoods strategies; creating alternative income-generating activities; providing financial services, such as loans and insurance; and strengthening markets.

Different methods, capacities, resources and timeframes are required to achieve the different objectives of livelihood provisioning, protection, and promotion. Livelihood provisioning is a relief-based objective, which relies on swift response and the logistical capacity to deliver critical

provisions. Livelihood protection is aligned with the recovery phase and requires careful and complex assessment and benefits from local contextual knowledge. Livelihood promotion is the transition from recovery efforts to development goals and requires the long term commitment of governments and other development actors.

**Issues concerning Livlihood**

## 1: Enabling livelihood protection

* Cash grants and material assistance
* Creating temporary income-earning opportunities
* Procuring local goods and services
* Using market chain analysis to reinvigorate markets

## 2: Improving livelihood promotion

* Engaging development actors in livelihood programming
* Building and strengthening micro-finance institutions
* Intervening in markets
* Ensuring economic and environmental sustainability

Vulnerability, coping and sustainable livelihoods Vulnerability has been defined as a state of defenselessness, insecurity and exposure to risk, shocks and stress. It is different to poverty itself which refers to a lack or wants. In fact, there are two sides to vulnerability - externally, an individual or household may be subject to shocks or risk, while internally, the means to cope may be inadequate or non-existent.

## The concept of 'livelihoods' usefully integrates poverty and vulnerability.

A 'livelihood' may be defined as a level of wealth and of stocks and flows of food and cash which provide for physical and social well-being and security against becoming poorer. Poverty lines and other definitions of deprivation based only on flows (e.g. income), and not on assets or reserves which can be disposed of in emergencies e.g. sickness, drought, are less satisfactory. Assets such as land, trees, livestock etc. reduce vulnerability and act as buffers to “shocks”. As with aspects of nutrition such as the status of women and seasonality, for example, sustainable

livelihoods should not merely be dealt with as an appendage to an analysis of deprivation - these are integral threads that are better understood as pervading all aspects of the problem.

The strength of a given livelihood is not only measured by its productive outcomes, but equally by its resilience to shocks, seasonal changes and trends. Shocks might include natural disasters, wars, and economic downturns. Availability of resources, income-generating opportunities, and demand for certain products and services may fluctuate seasonally. More gradual and often predictable, trends in politics and governance, technology use, economics, and availability of natural resources, can pose serious obstacles to the future of many livelihoods. These changes impact the availability of assets and the opportunities to transform those assets into a “living”. Under such conditions, people must adapt existing strategies or develop new strategies in order to survive.

# Basic concepts of Food Security

Food security is defined as the availability of food and one's access to it. A household is considered food secure when its occupants do not live in hunger or fear of starvation. Stages of food insecurity range from food secure situations to full-scale famine. It is also defined as when all people at all times have access to sufficient, safe, nutritious food to maintain a healthy and active life. Food security also broadly refers to the ability of individuals to obtain sufficient food on a day-to-day basis. The USAID (1992) defined food security as When all people, at all times, have physical and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life. People who do not satisfy the conditions in this definition are considered food insecure. Food insecurity exists when people do not have adequate physical, social or economic access to food as defined above.

Within the context of this definition, food security has four primary components: ‘food availability,’ ‘food access,’ ‘food utilization’ and ‘Food stability’.

# Food Availability

# *Availability refers to the physical existence of food, whether from the household’s own farm or garden production or from domestic or international markets. It is defined by USAID (1992) as when: “Sufficient quantities of appropriate, necessary types of food from domestic production, commercial imports, commercial aid programs, or food stocks are consistently available to individuals or within their reach.”*

Food availability is a function of domestic food stocks, commercial food imports, and food aid, in addition to the underlying determinants of these factors, including macro-economic trends and events, government policies, the functioning of international and domestic markets, and the state of the physical economic infrastructure.

# Food Access

Access refers to the resources individuals have at hand to obtain appropriate foods for a nutritious diet. It is defined by USAID (1992) as when: “Individuals have adequate assets or incomes to produce, purchase, or barter to obtain levels of appropriate foods needed to maintain consumption of an adequate diet/nutrition level.”

Individuals obtain food through (1) own food production and consumption (including wild food gathering), (2) purchases in the market place, or (3) in-kind transfers or loans from relatives, members of the community, the government, or foreign donors private citizens. An individual’s ability to access food from these sources is in turn determined by their asset endowment and by the social, economic, policy, physical, and natural environments, which define the set of productive activities they can pursue in meeting their income and food security objectives. Food access is also influenced by the aggregate availability of food through the latter’s impact on supply and, therefore, prices in the market.

# Food Utilization

Utilization refers broadly to the actual food that is consumed by individuals; how it is stored, prepared, and consumed; and what nutritional benefits the individual derives from consumption. It is defined by USAID (1992) as when: “Food is properly used; proper food processing and storage techniques are used; adequate knowledge of nutrition and child care techniques exist and are applied; and adequate health and sanitation services exist.”

Food utilization has both a socio-economic and biological dimension. The socio-economic dimension refers to decisions related to what food is consumed and how the food is allocated within the household. Both decisions in turn are influenced by intra-household dynamics and social customs/taboos. Depending on these factors, individuals within households may have access to food but still suffer from food insecurity. Women and children are particularly more likely to suffer from food insecurity because of their relatively limited control over assets and relatively weak intra-household bargaining power. (This is addressed in further depth below.)

The biological dimension of food utilization refers to the ability of the human body to take food and transform it into energy for daily activities or to store it for future energy needs. Food utilization interacts in complex ways with diet, nutritional status, the functioning of the immune system, and health and hygiene practices. In this context, food utilization requires a healthy diet, a healthy body, and a healthy physical environment, including safe drinking water and hygienic sanitary conditions. It also requires a practical understanding of proper health care, food storage, food preparation, and feeding practices, along with the associated behaviors.

While important for its own sake as a determinant of human well-being, food utilization also has feedback effects through its impact on the health and nutrition on individuals and thus on their labor productivity and income-earning potential.

# Food Stability

Food stability is the fourth component of food security that cuts across the other three. Stability refers to the temporal dimension, or time-frame, of food security as implied by the wording “at all times” in the USAID definition of food security. Stability is defined as, “The ability to access and utilize appropriate levels of nutritious food over time.”

An important distinction is made between chronic food insecurity and transitory food insecurity. Chronic food insecurity is the long-term or persistent inability to meet food needs, whereas transitory food insecurity is a short-term food deficit. Transitory food security is sometimes divided into two sub-categories: cyclical food security and temporary food insecurity. Cyclical (or seasonal) food insecurity occurs on a routine or predictable basis, for example, the ‘lean season’ that occurs in the period just before the harvest. Temporary food insecurity occurs for a limited time due to unforeseen and unpredictable circumstances.Two common definitions of food security come from the United States Department of Agriculture (USDA), and the UN's Food and Agriculture Organization (FAO):

* Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life. (FAO)
* Food security for a household means access by all members at all times to enough food for an active, healthy life. Food security includes at a minimum, (USDA):
* The ready availability of nutritionally adequate and safe foods
* An assured ability to acquire acceptable foods in socially acceptable ways (that is, without resorting to emergency food supplies, scavenging, stealing, or other coping strategies).

## Livelihood and food security

The relationship between livelihoods and food security is complex and is influenced by a wide variety of factors that vary in importance across contexts and over time. Clarifying these factors, and the pathways through which they influence household livelihood and food security, would serve a number of purposes. Among them, it would help donors and development practitioners formulate research questions, identify livelihood and food security indicators, make sense of research findings and practical experience, and improve intervention designs.

In practice, livelihood security and food security are linked in a bi-direction relationship. Food production constitutes one of the most basic livelihood activities, and can be a critical source of food access, particularly for rural households. The household’s ability to purchase food in the marketplace is another critical determinant of food access, which in turn depends on the household’s ability to generate income. Research indicates, moreover, that many of the food insecure in developing countries, even among so-called subsistence farming groups, are net purchasers of food, reinforcing the critical role of income generation in determining food access.

It is noted that the primary cause of food insecurity is the continued lack of economic opportunity to produce adequate amounts of food or to obtain sufficient income to purchase adequate amounts of food. As incomes rise, poor households spend more on food (although proportionately less than the increase in income), purchase a more diverse variety of foods, and shift to higher quality foods with greater nutritional value. A household’s livelihood activities, moreover, enable it to manage risks, cope with stresses and shocks, and build or replenish assets, all important determinants of household food security.

The household’s livelihood security in turn is affected by its food security. Households with poor food access and/or poor food utilization tend to suffer more from illness or other physical debilitations thereby impairing their labor productivity and/or their ability to engage in livelihood activities.

## Climate Change and Food Security Agriculture, climate and food security

Agriculture is important for food security in two ways: it produces the food people eat; and (perhaps even more important) it provides the primary source of livelihood for 36 percent of the world’s total workforce. In the heavily populated countries of Asia and the Pacific, this share ranges from 40 to 50 percent, and in sub-Saharan Africa, two-thirds of the working population still make their living from agriculture (ILO, 2007). If agricultural production in the low-income developing countries of Asia and Africa is adversely affected by climate change, the livelihoods of large numbers of the rural poor will be put at risk and their vulnerability to food insecurity increased.

Agriculture, forestry and fisheries are all sensitive to climate. Their production processes are therefore likely to be affected by climate change. In general, impacts are expected to be positive in temperate regions and negative in tropical ones, but there is still uncertainly about how projected changes will play out at the local level, and potential impacts may be altered by the adoption of risk management measures and adaptation strategies that strengthen preparedness and resilience.

The food security implications of changes in agricultural production patterns and performance are of two kinds:

* Impacts on the production of food will affect food supply at the global and local levels. Globally, higher yields in temperate regions could offset lower yields in tropical regions. However, in many low-income countries with limited financial capacity to trade and high dependence on their own production to cover food requirements, it may not be possible to offset declines in local supply without increasing reliance on food aid.
* Impacts on all forms of agricultural production will affect livelihoods and access to food. Producer groups that are less able to deal with climate change, such as the rural poor in developing countries, risk having their safety and welfare compromised.

Other food system processes, such as food processing, distribution, acquisition, preparation and consumption, are as important for food security as food and agricultural production are. Technological advances and the development of long-distance marketing chains that move produce and packaged foods throughout the world at high speed and relatively low cost have made overall food system performance far less dependent on climate than it was 200 years ago.

However, as the frequency and intensity of severe weather increase, there is a growing risk of storm damage to transport and distribution infrastructure, with consequent disruption of food supply chains. The rising cost of energy and the need to reduce fossil fuel usage along the food chain have led to a new calculus – “food miles”, which should be kept as low as possible to reduce emissions. These factors could result in more local responsibility for food security, which needs to be considered in the formulation of adaptation strategies for people who are currently vulnerable or who could become so within the foreseeable future.

Food systems exist in the biosphere, along with all other manifestations of human activity. some of the significant changes in the biosphere that are expected to result from global warming will occur in the more distant future, as a consequence of changes in average weather conditions. the most likely scenarios of climate change indicate that increases in weather variability and the incidence of extreme weather events will be particularly significant now and in the immediate future.

Evidence indicates that more frequent and more intense extreme weather events (droughts, heat and cold waves, heavy storms, floods), rising sea levels and increasing irregularities in seasonal rainfall patterns (including flooding) are already having immediate impacts on not only food production, but also food distribution infrastructure, incidence of food emergencies, livelihood assets and human health in both rural and urban areas.

**The Sustainable livelihoods framework and strategies**

The sustainable livelihoods framework is a way to improve understanding of the livelihoods of poor people. It draws on the main factors that affect poor people's livelihoods and the typical relationships between these factors. It can be used in planning new development activities and in assessing the contribution that existing activities have made to sustaining livelihoods. The two key components of a sustainable livelihoods framework are that it helps in understanding the complexities of poverty and a set of principles to guide action to address and overcome poverty.

The sustainable livelihoods framework places people, particularly rural poor people, at the centre of a web of inter related influences that affect how these people create a livelihood for themselves and their households. Closest to the people at the centre of the framework are the resources and livelihood assets that they have access to and use. These can include natural resources, technologies, their skills, knowledge and capacity, their health, access to education, sources of credit, or their networks of social support. The extent of their access to these assets is strongly influenced by their vulnerability context, which takes account of trends (for example, economic, political, and technological), shocks (for example, epidemics, natural disasters, civil strife) and seasonality (for example, prices, production, and employment opportunities). Access is also influenced by the prevailing social, institutional and political environment, which affects the ways in which people combine and use their assets to achieve their goals. These are their livelihood strategies.

People are the main concern, rather than the resources they use or their governments. SLA is used to identify the main constraints and opportunities faced by poor people, as expressed by them. It builds on these definitions, and then supports poor people as they address the constraints, or take advantage of opportunities. The framework is neither a model that aims to incorporate all the key elements of people's livelihoods, nor a universal solution. Rather, it is a means of stimulating thought and analysis, and it needs to be adapted and elaborated depending on the situation.

## Sustainable livelihood framework

A livelihood framework is a tool to improve our understanding of livelihoods, particularly the livelihoods of the poor. It was developed over a period of several years by different organizations and researchers. This section of the book provides an introduction to the framework itself. The individual components of the framework are described in detail in this section.

Sustainable livelihoods framework has seven guiding principles. They do not prescribe solutions or dictate methods. Instead, they are flexible and adaptable to diverse local conditions.

The guiding principles are:

* + - **Be people-centered.** Sustainable livelihoods framework/approach (SLA) begins by analyzing people's livelihoods and how they change over time. The people themselves actively participate throughout the project cycle.
		- **Be holistic.** SLA acknowledges that people adopt many strategies to secure their livelihoods, and that many actors are involved; for example the private sector, ministries, community-based organizations and international organizations.
		- **Be dynamic.** SLA seeks to understand the dynamic nature of livelihoods and what influences them.
		- **Build on strengths.** SLA builds on people's perceived strengths and opportunities rather than focusing on their problems and needs. It supports existing livelihood strategies.
		- **Promote micro-macro links.** SLA examines the influence of policies and institutions on livelihood options and highlights the need for policies to be informed by insights from the local level and by the priorities of the poor.
		- **Encourage broad partnerships.** SLA counts on broad partnerships drawing on both the public and private sectors.
		- **Aim for sustainability.** Sustainability is important if poverty reduction is to be lasting.

The SLA framework is presented in schematic form below and shows the main components of SLA and how they are linked. It does not work in a linear manner and does not attempt to provide an exact representation of reality. Rather, it seeks to provide a way of thinking about the livelihoods of poor people that will stimulate debate and reflection about the many factors that affect livelihoods, the way they interact and their relative importance within a particular setting. This should help in identifying more effective ways to support livelihoods and reduce poverty. The picture given below represents one of the SLA approaches/frameworks.



The sustainable livelihoods framework presents the main factors that affect people’s livelihoods, and typical relationships between these. It can be used in both planning new development activities and assessing the contribution to livelihood sustainability made by existing activities.

In particular, the framework provides a checklist of important issues and sketches out the way these link to each other

* + - draws attention to core influences and processes; and
		- Emphasizes the multiple interactions between the various factors which affect livelihoods.

The framework is centered on people. It does not work in a linear manner and does not try to present a model of reality. Its aim is to help stakeholders with different perspectives to engage in structured and coherent debate about the many factors that affect livelihoods, their relative importance and the way in which they interact. This, in turn, should help in the identification of appropriate entry points for support of livelihoods.

The form of the framework is not intended to suggest that the starting point for all livelihoods (or livelihood analysis) is the *Vulnerability Context* which through a series of permutations yields *Livelihoods Outcomes.* Livelihoods are shaped by a multitude of different forces and factors that are themselves constantly shifting. People-centered analysis is most likely to begin with simultaneous investigation of people’s assets, their objectives (the Livelihood Outcomes which they are seeking) and the *Livelihood Strategies* which they adopt to achieve these objectives.

Important feedback is likely between:

1. Transforming Structures and Process and the Vulnerability Context; and
2. Livelihood Outcomes and Livelihood Assets.

There are other feedback relationships that affect livelihoods which are not shown. For example, it has been shown that if people feel less vulnerable (Livelihood Outcome) they frequently choose to have fewer children. This has implications for population trends which might be an important part of the *Vulnerability Context.*

The framework is intended to be a versatile tool for use in planning and management. It offers a way of thinking about livelihoods that helps order complexity and makes clear the many factors that affect livelihoods. A more important task than perfecting the framework itself is putting the ideas that it represents into practice. If that calls for adaptation of certain boxes or revision of certain definitions to make the framework more useful, the entire better; the framework becomes a living tool. Use of the framework is intended to make a distinct contribution to improving organizations’ ability to eliminate poverty. It is not simply a required step in project/program preparation, nor does it provide a magic solution to the problems of poverty elimination. In order to get the most from the framework:

1. The core ideas that underlie it should not be compromised during the process of adaptation. One of these core ideas is that (most) analysis should be conducted in a participatory manner.
2. Use of the framework should be underpinned by a serious commitment to poverty elimination. This should extend to developing a meaningful dialogue with partners about how to address the underlying political and economic factors that perpetuate poverty.
3. Those using the framework must have the ability to recognize deprivation in the field even when elites and others may want to disguise this and skew benefits towards themselves (this will require skill and rigor in social analysis).

Despite differences in emphasis by different practitioners, the livelihoods framework helps us to:

* + identify (and value) what people are already doing to cope with risk and uncertainty
	+ make the connections between factors that constrain or enhance their livelihoods on the one hand, and policies and institutions in the wider environment
	+ identify measures that can strengthen assets, enhance capabilities and reduce vulnerability

**VULNERABILITY TO LIVELIHOODS/FOOD INSECURITY**

Vulnerability is a characteristic of an individual and/or groups of people who habit a given natural, social and economic space, within which they are differentiated according to their varying position in society into more or less vulnerable individuals and groups. It is a complex characteristic produced by a combination of factors derived especially (but not entirely) from class, gender, and ethnicity. Vulnerability concerns the complex of social, economic and political considerations in which peoples’ everyday lives are embedded and that structure the choices and options they have in the face of environmental hazards. The most vulnerable are typically those with the fewest choices, those whose lives are constrained, for example, by discrimination, political powerlessness, physical disability, lack of education and employment, illness, the absence of legal rights, and other historically grounded practices of domination and marginalization.

# The concept of vulnerability and resilience

Vulnerability refers to the extent an individual or a community or a country is exposed to certain risks like food insecurity, famine, or any natural or manmade hazards. Resilience, on the other hand, refers to the rate at which an individual, community or a country recovers such setbacks. Both vulnerability and resilience are the function of varied interconnected factors like asset position, access to information, level of development, social capital and the level of the risks faced.

More specifically, vulnerability refers to the inability to withstand the effects of a hostile environment. In relation to hazards and disasters, vulnerability is a concept that links the relationship that people have with their environment to social forces and institutions and the cultural values that sustain and contest them. The concept of vulnerability expresses the multi dimensionality of disasters by focusing attention on the totality of relationships in a given social situation which constitute a condition that, in combination with environmental forces, produces a disaster. It's also the extent to which changes could harm a system, or to which the community can be affected by the impact of a hazard.

The Vulnerability Context frames the external environment in which people exist. People’s livelihoods and the wider availability of assets are fundamentally affected by critical trends as well as by shocks and seasonality-over which they have limited or no control. The box below provides examples (this is not a complete list):

The factors that make up the Vulnerability Context are important because they have a direct impact upon people’s asset status and the options that are open to them in pursuit of beneficial livelihood outcomes.

* **Shocks** can destroy assets directly (in the case of floods, storms, civil conflict, etc.). They can also force people to abandon their home areas and dispose of assets (such as land) prematurely as part of coping strategies. Recent events have highlighted the impact that international economic shocks, including rapid changes in exchange rates and terms of trade, can have on the very poor.
* **Trends** may (or may not) be more benign, though they are more predictable. They have a particularly important influence on rates of return (economic or otherwise) to chosen livelihood strategies.
* **Seasonal shifts** in prices, employment opportunities and food availability are one of the greatest and most enduring sources of hardship for poor people in developing countries.

The Vulnerability Context is the part of the framework that lies furthest outside people’s control. In the short to medium term and on an individual or small group basis there is little that can be done to alter it directly (though there are exceptions: for example, direct intervention to diffuse conflict). Most externally-driven change in the Vulnerability Context is a product of activity at the level of Transforming Structures and Processes (e.g. changes in policy). Another way of managing the Vulnerability Context is to help people to become more resilient and better able to capitalize on its positive aspects. This is a core aim of the sustainable livelihoods approach. It can be achieved through supporting poor people to build up their assets. For example, increasing people’s access to appropriate financial services- including insurance-is one way of reducing vulnerability. Another approach is to help ensure that critical institutions and organizations are responsive to the needs of the poor.

Livelihoods analysis does not have to be exhaustive to be effective. Rather than trying to develop a full understanding of all dimensions of the Vulnerability Context, the aim is to identify those trends, shocks and aspects of seasonality that are of particular importance to livelihoods. Effort can then be concentrated on understanding the impact of these factors and how negative aspects can be minimized. This requires a prior understanding of the nature of local livelihoods-what types of livelihood strategies are employed by local people and what factors constrain them from achieving their objectives. Such understanding cannot be gained without social analysis so that particular social groups and their relationship with factors within the Vulnerability Context can be identified. While it is important to narrow down the extent of analysis, it is also important to think broadly about factors within the VulnerabilityContext that might affect local people, so that less-obvious issues are not neglected. For example, when thinking about seasonality, it is important to consider both immediate and more distant effects.

In a rural setting, it may be necessary to find answers to the following types of question:

* Which groups produce which crops?
* How important is each crop to the livelihoods of the groups that produce it?
* Is the revenue from a given crop used for a particular purpose? E.g. if it is controlled by women is it particularly important to child health or nutrition?
* What proportion of output is marketed?
* How do prices for different crops vary through the year?
* How predictable is seasonal price fluctuation?
* Are the price cycles of all crops correlated?
* What proportion of household food needs is met by own consumption and what portion is purchased?

At what time of year is cash income most important (e.g. school fees might be collected one or more times during the year)? Does this coincide with the time at which cash is most available?

* Do people have access to appropriate financial service institutions to enable them to save for the future? Does access to these vary by social group?
* How long and intense is the ‘hungry period’?
* What effect do the ‘hungry period’ and other seasonal natural events (e.g. the advent of the rainy season) have on human health and the ability to labor?
* Has the length of the ‘hungry period’ been increasing or decreasing?
* How do income-earning opportunities vary throughout the year? Are they agricultural or non-farm?
* How does remittance income vary throughout the year (e.g. falling off at times when it is most needed because of food price rises)?

# Factors exerting influence on livelihoods

Discussions about causes of poor livelihoods (such as famine, food insecurity, etc) have always been controversial. Some groups of the academia argue that poverty is basically attributed to ecological degradation and adverse bioclimatic incidences. This is associated with views of Malthusian school of thought which strictly argues the natural resources depletion play critical roles in determining the food security status of a community. On the other side, there are people who argue that unfair distribution of resources is the critical cause of poor livelihoods in the world. It is the fervent belief of the compiler of this teaching material that the cause of poor livelihoods in the world is the combination of the adverse impacts of ecological degradation and bioclimatic factors (population pressure, soil loss, deforestation, erratic rainfall, and pest and disease infestation, etc) as well as human-induced attributes (poor policy framework, nepotism, inappropriate land tenure, rights to means of production, etc). The proponents of the second category argue that poverty is a preventable socio-economic crisis.

 **DETERMINANTS OF LIVELIHOODS AND FOOD INSECURITY**

**Introduction**

The status of livelihoods and food security is determined various interlocked biophysical, socio-economic and policy-induced factors. Climatic profiles, topography, soil fertility, population size and growth rates, availability of natural resources, etc determine the livelihoods and food security status of the people. Natural hazards like earthquakes, tsunami, cyclone, landslide and volcanic eruptions also cause poor livelihoods and food insecurity. Similarly, air pollution, soil loss, soil contamination/pollution, deforestation and water pollution causes poor livelihoods and food insecurity. Social unrest and political instability can also result in deteriorated livelihoods. Hence, this chapter is devoted to present these determinants of livelihoods and food security in detail.

## Ecological/Agro-climatic determinants of livelihoods & food insecurity

For the 60% of poor populations who are found in fragile ecosystems and mainly remote and ecologically vulnerable rural areas, the challenge of environmentally sustainable poverty alleviation is immense. It has been estimated that 80% of poor people in Latin America live in such areas, 60% in Africa and 50% in Asia. Reliance on the currently prevailing patterns of growth will postpone the resolution of poverty in marginal areas, with severe implications not only for the people affected but also for the environment. The immediate-to-medium-term prospects for the rural poor to abandon these areas for other sectors of the economy, as was thecase in Europe in the last century, are not promising. As a result, fragile ecosystems are rapidly becoming ghettos of poverty and environmental degradation.

The need for urgent action can be recognized in relation to the following characteristics of these regions:

1. They constitute a significant part of the world's land resources. Forty percent of the earth's land surface is considered dryland, of which approximately 70% is already degraded or subject to heavy degradation. On the other hand, hilly and mountainous regions cover about 21% of the earth land mass and, although not so extensive as dry lands, they exert a far-reaching influence on other areas, primarily through watershed functions.
2. The role of both ecosystems in terms of human habitat is also significant: approximately 900 million of the world's population is subsisting in dry zones. Although only about 10% of the world population lives in mountain areas, a much larger percentage (about 40%) occupies the watersheds below. It is safe to assume that the future of mountain ecosystems affects the life of half of the world's population. From the Andes to the Himalayas and from South East Asia to East and Central Africa a serious ecological deterioration caused by overgrazing, deforestation and excessive cultivation threatens the livelihood of these populations.
3. Mountains are important sources of water, energy, minerals, agricultural products and a major reserve for the world's biodiversity. Similarly, dry zones are rich in biodiversity, hosting many endangered species. Moreover, crops, grasses, trees, and livestock species, that form the core of survival in drought prone regions, exist in these regions only.
4. A high proportion of the absolute poor in ecologically fragile areas are indigenous peoples, estimated at some 300 million worldwide. They depend on renewable resources to maintain their well-being. This has led to the development of livelihood systems which are well-adapted to the harsh conditions in which they lived. Their holistic, traditional knowledge of their natural resources and environment constitutes a rich human heritage.

However, their traditional ways of life are now being threatened, disturbing the delicate balance of natural resource use. Nevertheless, viable technology and institutional arrangements for resource conservation in these areas could be built upon indigenous knowledge; and similarly effective disaster prevention policies can benefit from coping strategies developed by the local population.

1. Rural women play a key role in on- and off-farm activities in the developing countries. This is particularly true in the case of the ecologically fragile areas. With the growing male out- migration from marginal areas, the number of women headed households in these areas is increasing. Women are becoming more and more responsible for the day to day survival of the family. Women tend to be more vulnerable than men to the effects of environmental degradation because they are often involved in harvesting common property resources such as wood and water. Since women usually make a greater contribution to household food security than men, a decline in women's access to resources may have a significant impact on household consumption. Environmental degradation implies further burdens and responsibilities which are not compensated for by increased decision-making power.
2. Degradation of land and loss of its vegetative cover also have consequences at the global level, primarily because of its influence on carbon exchange, but also in terms of loss of biodiversity. The large amount of carbon stored in the vegetation of the dry zones, for example, averaging about 30 tons per hectare, decreases when the vegetation is depleted or disappears. Carbon-rich soils, frequently found in dry zones, store a substantial amount of this element (nearly half the total quantity of carbon is stored in the organic matter in the soil, much more than is found in the world's vegetation). The destruction of these soils has a very powerful effect on the carbon cycle and boosts the greenhouse effect as a result of the release of carbon.

Over the past two decades, environmental degradation, including land degradation has continued to worsen exacerbating further poverty and food insecurity. Conversely, awareness of the importance of the environment and its conservation has increased. There has been a transformation in people's perception of the poverty problem in developing countries. If one accepts that hard core rural poverty is increasingly a phenomenon associated with marginal lands, then new strategies are required that integrate poverty alleviation and environmental management. Until recently, the international community and national governments have tended not to appreciate the need for integrated rural poverty alleviation and environmental managementprograms in marginal areas. There were a number of promising initiatives in this field, usually undertaken by NGOs and community-based organizations, but they were usually small and much localized. At the same time, in many regions, rural people's perceptions of their environment and the priority they give to a better relationship with it have changed. Increasingly, rural people are realizing that:

1. the fragile environment on which they depend for their survival is being neglected or over- exploited, and it is now necessary to rehabilitate it and manage it sustainably; and
2. the environment belongs primarily to them, and they must take the responsibility for the land and organize themselves in groups, cooperatives, village development associations and other local association to defend it.

## Environmental degradation vs livelihoods and food security

Environmental degradation is the deterioration of the environment through depletion of resources such as air, vegetation, water and soil; the destruction of ecosystems and the extinction of wildlife. It is defined as any change or disturbance to the environment perceived to be deleterious or undesirable. Environmental degradation is one of the Ten Threats officially cautioned by the High Level Threat Panel of the United Nations. The United Nations International Strategy forDisaster Reduction defines environmental degradation as ‘The reduction of the capacity of the environment to meet social and ecological objectives, and needs’. Environmental degradation is of many types. When natural habitats are destroyed or natural resources are depleted, environment is degraded.

Environmental Change and Human Health, a special section of World Resources 1998-99 in this report describes how preventable illnesses and premature deaths are still occurring in very large numbers. If vast improvements are made in human health, millions of people will be living longer, healthier lives than ever before. In these poorest regions of the world an estimated 11 million children, or about one in five, will not live to see their fifth birthday, primarily because of environment-related diseases. Child mortality is larger than the combined populations of Norway and Switzerland, and mostly due to malaria, acute respiratory infections or diarrhea- illnesses that are largely preventable.

## Water deterioration

One major component of environmental degradation is the depletion of the resource of fresh water on Earth. Approximately only 2.5% of all of the water on Earth is fresh water, with the rest being salt water. 69% of the fresh water is frozen in ice caps located on Antarctica and Greenland, so only 30% of the 2.5% of fresh water is available for consumption. Fresh water is an exceptionally important resource, since life on Earth is ultimately dependent on it. Water transports nutrients and chemicals within the biosphere to all forms of life, sustain both plants and animals, and molds the surface of the Earth with transportation and deposition of materials.

It is estimated that one in three people over the entire globe are already facing water shortages, almost one-fifth of the world’s population live in areas of physical water scarcity, and almost one quarter of the world’s population live in a developing country that lacks the necessary infrastructure to use water from available rivers and aquifers. Water scarcity is an increasing problem due to many foreseen issues in the future, including population growth, increased urbanization, higher standards of living, and climate change.

## Climate change and atmospheric temperature

Climate change affects the Earth’s water supply in a large number of ways. It is predicted that the mean global temperature will rise in the coming years due to a number of forces affecting the climate, the amount of atmospheric CO2 will rise, and both of these will influence water resources; evaporation depends strongly on temperature and moisture availability, which can ultimately affect the amount of water available to replenish groundwater supplies.

Transpiration from plants can be affected by a rise in atmospheric CO2, which can decrease their use of water, but can also raise their use of water from possible increases of leaf area. Temperature increase can decrease the length of the snow season in the winter and increase the intensity of snowmelt in warmer seasons, leading to peak runoff of snowmelt earlier in the season, affecting soil moisture, flood and drought risks, and storage capacities depending on the area.

Warmer winter temperatures cause a decrease in snowpack, which can result in diminished water resources during the summer. This is especially important at mid-latitudes and in mountain regions that depend on glacial runoff to replenish their river systems and groundwater supplies,

making these areas increasingly vulnerable to water shortages over time; an increase in temperature will initially result in a rapid rise in water melting from glaciers in the summer, followed by a retreat in glaciers and a decrease in the melt and consequently the water supply every year as the size of these glaciers get smaller and smaller.

Thermal expansion of water and increased melting of oceanic glaciers from an increase in temperature gives way to a rise in sea level, which can affect the fresh water supply of coastal areas as well; as river mouths and deltas with higher salinity get pushed further inland, an intrusion of saltwater results in an increase of salinity in reservoirs and aquifers. Sea-level rise may also consequently be caused by a depletion of groundwater, as climate change can affect the hydrologic cycle in a number of ways. Uneven distributions of increased temperatures and increased precipitation around the globe results in water surpluses and deficits, but a global decrease in groundwater suggests a rise in sea level, even after meltwater and thermal expansion were accounted for, which can provide a positive feedback to the problems sea-level rise causes to fresh-water supply.

A rise in air temperature results in a rise in water temperature, which is also very significant in water degradation, as the water would become more susceptible to bacterial growth. An increase in water temperature can also affect ecosystems greatly because of a species’ sensitivity to temperature, and also by inducing changes in a body of water’s self-purification system from decreased amounts of dissolved oxygen in the water due to rises in temperature.

## Climate change and precipitation

A rise in global temperatures is also predicted to correlate with an increase in global precipitation, but because of increased runoff, floods, increased rates of soil erosion, and mass movement of land, a decline in water quality is probable, while water will carry more nutrients, it will also carry more contaminants. While most of the attention about climate change is directed towards global warming and greenhouse effect, some of the most severe effects of climate change are likely to be from changes in precipitation, evapotranspiration, runoff, and soilmoisture. It is generally expected that, on average, global precipitation will increase, with some areas receiving increases and some decreases.

Climate models show that while some regions should expect an increase in precipitation, such as in the tropics and higher latitudes, other areas are expected to see a decrease, such as in the subtropics; this will ultimately cause a latitudinal variation in water distribution. The areas receiving more precipitation are also expected to receive this increase during their winter and actually become drier during their summer, creating even more of a variation of precipitation distribution. Naturally, the distribution of precipitation across the planet is very uneven, causing constant variations in water availability in respective locations.

Changes in precipitation affect the timing and magnitude of floods and droughts, shift runoff processes, and alter groundwater recharge rates. Vegetation patterns and growth rates will be directly affected by shifts in precipitation amount and distribution, which will in turn affect agriculture as well as natural ecosystems. Decreased precipitation will deprive areas of water, causing water tables to fall and reservoirs and wetlands, rivers, and lakes to empty, and possibly an increase in evaporation and evapotranspiration, depending on the accompanied rise in temperature. Groundwater reserves will be depleted, and the remaining water has a greater chance of being of poor quality from saline or contaminants on the land surface.

## Agriculture and environmental degradation

Agriculture is dependent on available soil moisture, which is directly affected by climate dynamics, with precipitation being the input in this system and various processes being the output, such as evapotranspiration, surface runoff, drainage, and percolation into groundwater.

Changes in climate, especially the changes in precipitation and evapotranspiration predicted by climate models, will directly affect soil moisture, surface runoff, and groundwater recharge.

In areas with decreasing precipitation as predicted by the climate models, soil moisture may be substantially reduced. With this in mind, agriculture in most areas needs irrigation already, which depletes fresh water supplies both by the physical use of the water and the degradation agriculture causes to the water. Irrigation increases salt and nutrient content in areas that wouldn’t normally be affected, and damages streams and rivers from damming and removal of water. Fertilizer enters both human and livestock waste streams that eventually enter groundwater, while nitrogen, phosphorus, and other chemicals from fertilizer can acidify both soils and water. Certain agricultural demands may increase more than others with an increasingly wealthier global population, and meat is one commodity expected to double global food demand by 2050, which directly affects the global supply of fresh water. Cows need water to drink, more if the temperature is high and humidity is low, and more if the production system the cow is in is extensive, since finding food takes more effort. Water is needed in processing of the meat, and also in the production of feed for the livestock. Manure can contaminate bodies of freshwater, and slaughterhouses, depending on how well they are managed, contribute waste such as blood, fat, hair, and other bodily contents to supplies of fresh water.

The transfer of water from agricultural to urban and suburban use raises concerns about agricultural sustainability, rural socioeconomic decline, food insecurity, an increased carbon footprint from imported food, and decreased foreign trade balance. The depletion of fresh water, as applied to more specific and populated areas, increases fresh water scarcity among the population and also makes populations susceptible to economic, social, and political conflict in a number of ways; rising sea levels forces migration from coastal areas to other areas farther inland, pushing populations closer together breaching borders and other geographical patterns, and agricultural surpluses and deficits from the availability of water induce trade problems and economies of certain areas. Climate change is an important cause of involuntary migration and forced displacement worldwide.

## Disaster risks and livelihoods/food security

## *A disaster is a natural or man-made (or technological) hazard resulting in an event of substantial extent causing significant physical damage or destruction, loss of livelihoods, loss of life, or drastic change to the environment. A disaster can be defined as any tragic event stemming from events such as earthquakes, floods, catastrophic accidents, fires, or explosions. It is a phenomenon that can cause damage to life and property and destroy the economic, social and cultural life of people.*

In contemporary academia, disasters are seen as the consequence of inappropriately managed risk. These risks are the product of a combination of both hazard/s and vulnerability. Hazards that strike in areas with low vulnerability will never become disasters, as is the case in uninhabited regions.

Developing countries suffer the greatest costs when a disaster hits- more than 95 percent of all deaths caused by disasters occur in developing countries, and losses due to natural disasters are

20 times greater (as a percentage of GDP) in developing countries than in industrialized countries.

Researchers have been studying disasters for more than a century, and for more than forty years disaster research. The studies reflect a common opinion when they argue that all disasters can be seen as being human-made, their reasoning being that human actions before the strike of the hazard can prevent it developing into a disaster. All disasters are hence the result of human failure to introduce appropriate disaster management measures. Hazards are routinely divided into natural or human-made, although complex disasters, where there is no single root cause, are more common in developing countries. A specific disaster may spawn a secondary disaster that increases the impact. A classic example is an earthquake that causes a tsunami, resulting in coastal flooding.

## Natural disasters

A natural disaster is a consequence when a natural hazard affects humans and/or the built environment. Human vulnerability and lack of appropriate emergency management leads to financial, environmental, or human impact. The resulting loss depends on the capacity of the population to support or resist the disaster: their resilience. This understanding is concentrated in the formulation: ‘disasters occur when hazards meet vulnerability’. A natural hazard will hence never result in a natural disaster in areas without vulnerability.

Various phenomena like earthquakes, landslides, volcanic eruptions, floods and cyclones are all natural hazards that kill thousands of people and destroy billions of dollars of habitat and property each year. However, natural hazards can strike in unpopulated areas and never develop into disasters. However, the rapid growth of the world's population and its increased concentration often in hazardous environments has escalated both the frequency and severity of natural disasters. With the tropical climate and unstable land forms, coupled with deforestation, unplanned growth proliferation, non-engineered constructions which make the disaster-prone areas more vulnerable, tardy communication, poor or no budgetary allocation for disaster prevention, developing countries suffer more or less chronically by natural disasters. Asia tops the list of casualties due to natural disasters.

## Man-made disasters

Man-made disasters are the consequence of technological or human hazards. Examples include stampedes, fires, transport accidents, industrial accidents, oil spills and nuclear explosions/radiation. War and deliberate attacks may also be put in this category. As with natural hazards, man-made hazards are events that have not happened, for instance terrorism. Man-made disasters are examples of specific cases where man-made hazards have become reality in an event.

The impacts of natural hazards continue to increase around the world; the frequency of recorded disasters affecting communities has risen significantly over the past century. Hundreds of thousands of people are killed and millions injured, affected or displaced each year because of disasters, and the amount of property damage has been doubling every seven years on average over the past 40 years. Although earthquakes and tsunamis can have horrific impacts, most disaster losses stem from climate-related hazards such as hurricanes, cyclones, other major storms, floods, landslides, wildfires, heat waves and droughts. Current evidence demonstrates that changes in the global climate will continue to affect the frequency and severity of climate related hazards. These disasters, no doubt, damage the livelihoods of the people.

Unfortunately, there is a great shortfall in current research on how science is used to shape social and political decision-making in the context of hazards and disasters. Addressing this problem requires an approach that integrates research and policy-making across all hazards, disciplines and geographic regions.

At this juncture, one may ask a question: ‘What is the difference and similarity b/n disaster & hazard? How they caused livelihoods & food insecurity? A hazard is a situation that poses a level of threat to life, health, property, or environment. Most hazards are dormant or potential, with only a theoretical risk of harm; however, once a hazard becomes active, it can create an emergency situation. A hazard does not exist when it is not happening. A hazardous situation that has come to pass is called an incident. Hazard and vulnerability interact together to create risk. For hazards in the context of risk assessment, see Hazard (risk)

## Hazards are sometimes classified into three modes:

**Dormant:** The situation has the potential to be hazardous, but no people, property, or environment is currently affected by this. For instance, a hillside may be unstable, with the potential for a landslide, but there is nothing below or on the hillside that could be affected.

**Armed:** People, property, or environment is in potential harm's way

**Active:** A harmful incident involving the hazard has actually occurred. Often this is referred to not as an ‘active hazard’ but as an accident, emergency, incident, or disaster. Hazards are generally of four types, physical hazards, chemical hazards, biological hazards and allergenic hazard.

By its nature, a hazard involves something that could potentially be harmful to a person's life, health, property, or the environment. One key concept in identifying a hazard is the presence of stored energy that, when released, can cause damage. Stored energy can occur in many forms: chemical, mechanical, thermal, radioactive, electrical, etc. Another class of hazard does not involve release of stored energy; rather it involves the presence of hazardous situations. Examples include confined or limited egress spaces, oxygen-depleted atmospheres, awkward positions, repetitive motions, low-hanging or protruding objects, etc.

There are several methods of classifying a hazard, but most systems use some variation on the factors of likelihood of the hazard turning into an incident and the "seriousness" of the incident if it were to occur. (This discussion moved away from hazard to a discussion of risk.)

A common method is to score both likelihood and seriousness on a numerical scale (with the most likely and most serious scoring highest) and multiplying one by the other in order to reach a comparative score.

## Risk = Hazard x Vulnerability (-) Capacity

This score can then be used to identify which hazards may need to be mitigated. A low score on likelihood of occurrence may mean that the hazard is dormant, whereas a high score would indicate that it may be an ‘active’ hazard.

An important component of ‘seriousness if incident occurred’ is ‘serious to whom?’ Different populations may be affected differently by accidents. For example, an explosion will have widely differing effects on different populations depending on the distance from the explosion. These effects can range from death from overpressure or shrapnel to inhalation of noxious gases (for people downwind) to being exposed to a loud noise.

There are many causes, but they can broadly be classified as below. See the linked articles for comprehensive lists of each type of hazard.

* Natural hazards include anything that is caused by a natural process, and can include obvious hazards such as volcanoes to smaller scale hazards such as loose rocks on a hillside.
* Man-made hazards are created by humans, whether long-term (such as global warming) or immediate (like the hazards present at a construction site). These include activity related hazards (such as flying) where cessation of the activity will negate the risk.
* Deadly force or retribution is that hazard involving any protective and responsive-ready threat of harm or punishment that becomes active in the event of a breach of security or violation of a boundary or barrier (physical, legal, moral) intended to prevent unauthorized or unsafe access or entry or exposure to a situation, to something, or to someone. This includes the consequences that follow trespass, breach of covenant, outrage or moral panic.

Generally, the areas of highest weather-related risk correspond to areas where high concentrations of vulnerable people are exposed to severe and frequent hazards. The risk model highlights that flood mortality risk is highest in rural areas with a dense and rapidly growing population in countries with weak governance; cyclone mortality risk is highest in isolated rural areas with low GDP per capita; and landslide risk is highest in areas with low GDP per capita. For all weather-related hazards, countries with low GDP and weak governance tend to have drastically higher mortality risks than wealthier countries with stronger governance.

Between 1970 and 2010, the world’s population increased by 87 percent (from 3.7 billion to 6.9 billion). In the same period, the average numbers exposed to flooding every year increased by 114 percent (from 32.5 to 69.4 million annually). Relatively speaking, ever more people are living in flood plains, suggesting that the economic advantages of living in such an environment must outweigh the perceived risks of flooding. Populations in cyclone-prone areas are also growing, highlighting the attractiveness of tropical coastlines for tourism as well as for economic and urban development in general. Global physical exposure to tropical cyclones almost tripled (increasing by 192 percent) between 1970 and 2010.

Low- and lower-middle-income countries not only have the largest proportion of their population exposed to floods, but their exposure is also growing faster than in middle-income countries. More than 90 percent of the global population exposed to floods live in South Asia, East Asiaand the Pacific, but exposure is growing most rapidly in sub-Saharan Africa. In contrast, whereas in eastern and south-eastern Europe and Central Asia it is stable, reflecting a broader trend of demographic changes.