Household Food Security: Concepts, Indicators, Measurements

A Technical Review

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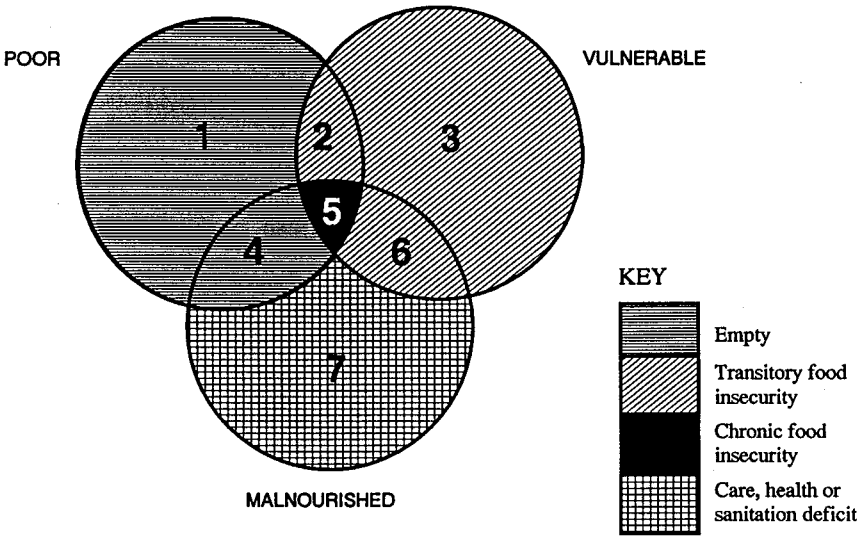
Contents

Household Food Security — Errata

The following corrections should be made to the text:

Page 18: Figure 1.6, replace with the following:



Page 25: Figure 1.7, insert '<u>Source</u>: UNICEF 1990'.

Page 34: Figure 1.10, replace key with the following:

▬▬	ENDURING HOUSEHOLDS:	Maintaining Household Food Security (HFS) on a Continuing Basis
▲▲▲▲▲	RESILIENT HOUSEHOLDS:	Experience Transitory Food Insecurity but Maintain HFS in the Long Term Perspective
. . . . .	FRAGILE HOUSEHOLDS:	Unable to Maintain HFS in the Short and Long Term Perspective

Page 35: Figure 1.11, delete '(Adapted from Watts, 1988)' and insert '<u>Source</u>: Bayliss-Smith 1991:7'.

Page 169: Item 109, line 5, delete 'andhealth', insert 'and healthy'; line 6, delete 'food available'.

Page 185: Before item 170, insert 'USAID 1992 - see item 109'.

Preface

IFAD and UNICEF share a number of fundamental principles regarding the goals of and basis for development. Particularly important to both agencies is the necessity to reach the poorest and most vulnerable population groups in ways that respond to their real needs and on their own terms. However, the two agencies operate under different mandates and procedures. IFAD is a financing institution providing loans to developing countries to address rural poverty, while UNICEF is a technical and advocacy oriented agency providing grants to improve the welfare of children and women. There is, nevertheless, great scope for complementarity and synergism in the operations of the two agencies.

To ensure such synergism requires consensus on specific development objectives and their implications for operationalization. The comparative advantage and potential contributions of each agency can then be identified. One area of clear complementarity is the reduction of hunger and malnutrition, or as expressed in the positive: the achievement of sustainable access to adequate food, better dietary intake and improved nutritional status for all. Attainment of this goal requires a common perception of the principle causes of the problems, the concepts involved, and how they can be translated into practical activities and measurable change.

These changes must also be understood and designed within the context of economic development for the affected groups; reduction of poverty is a key to achieving reduction of hunger and malnutrition. The need is thus to understand better the linkages between the processes and measures that can alleviate poverty on the one hand, and specific food access, food intake and nutrition-relevant outcomes of such development efforts on the other. Household food security is a key element in such strategies.

The present document responds to a felt need in UNICEF and IFAD for an overview of the evolution and various uses of the concept of household food security. The concept generally has at least two applications. First, it can be seen as a framework within which to understand the opportunities, practices and constraints of households in attaining access to sufficient and adequate food to satisfy the dietary needs of their members under changing conditions. Secondly, it can be utilized as an explicit objective for development efforts intended to promote the sustained availability and access to adequate food for target groups in question.

The concept of household food security (as distinct from the more generic term of food security) emerged during the 1980s as a potentially useful development objective. It has captured great interest among research institutions, international aid organizations, government agencies and NGOs involved in social and economic development. However, the increasing attention given to household food security and its consequent popularity among funding agencies has not yet resulted in an agreed

conceptual and methodological understanding of the issues involved. Nor has there been agreement on the opportunities that household food security may offer as an explicit objective in current and future development activities. As a result, different individuals and development agencies often perceive the concept and its operationalization in different ways. Confusion about the term has tended to increase, comparison has become difficult, and programmatic implications have often been unclear.

The first two sections of the present publication review the evolution of the household food security concept and its measurement. Sections III and IV present detailed annotated bibliographies on each component to facilitate additional research and reference. The combined total has been prepared to clarify the essential elements of household food security. It is hoped that this review will contribute to increased understanding of the concept as an objective in programming and project design and as a key variable in monitoring change and evaluating outcome.

We thank the two main authors commissioned for this study, Simon Maxwell of The Institute of Development Studies, Sussex, and Timothy Frankenberger, Office of Arid Lands Studies, University of Arizona, as well as their collaborators, for their preparedness to take on this task.

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Part I

Household Food Security: A Conceptual Review

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Household Food Security: A Conceptual Review

Contents

List of Figures

Summary

The purpose of the paper is to clarify concepts and definitions of household food security. The literature on food security has spiralled since the 1970s and the paper is based on a review of more than 180 items dealing with concepts and definitions.

In the 1970s, "food security" was mostly concerned with national and global food supplies. In the 1980s, the focus shifted to questions of access to food at household and individual levels. This interest has continued: 80% of the literature reviewed dates from the period 1986-91.

The paper finds that there are four core concepts, implicit in the notion of "secure access to enough food all the time." These are (a) sufficiency of food, defined mainly as the calories needed for an active, healthy life; (b) access to food, defined by entitlement to produce, purchase or exchange food or receive it as a gift; (c) security, defined by the balance between vulnerability, risk and insurance; and (d) time, where food insecurity can be chronic, transitory or cyclical.

Beyond the core concepts, the literature on household food security has developed to take account of parallel developments in other fields. First, the household itself is a problematic concept and individual members of a household will experience different food security risks and often follow different food security strategies. Secondly, food security is a necessary but not sufficient condition for adequate nutrition, the other conditions being care and health; but the two are closely related, not least because of the genetic, physiological and behavioural adaptations people make to nutritional stress. Thirdly, it is misleading to treat food security as a fundamental need, independently of wider livelihood considerations: people may go hungry to preserve assets or meet other objectives and it is important to study food security in the context of livelihood security. Fourthly, in so doing, the sensitivity, resilience and sustainability of livelihood systems are crucial: interventions should support the adaptability and flexibility of vulnerable livelihood systems. Fifthly, people's own perceptions of vulnerabilities and risk predominate in food security strategies, in order to remove the fear that there will not be enough to eat; cultural values are also important in determining the quality of food entitlement, rather than just the quantity. Sixthly, whatever people's own perceptions, efficiency and cost-effectiveness are legitimate objectives and will be pursued within the household and by the state. Finally, the right to food imposes obligations on states to respect, protect, fulfil and promote food security.

These findings suggest some general conclusions about the treatment of household food security in the 1990s. Flexibility, adaptability, diversification and resilience are key words. Perceptions matter. Intra-household issues are central. Importantly, household food security must be treated as a multi-objective phenomenon, where the

identification and weighting of objectives can only be decided by the food insecure themselves.

Policy should be directed to enlarging the scope of choice by food insecure individuals, for example by developing self-targeting interventions rather than imposing standard, centrally-administered programmes. Data collection and analysis should so far as possible favour a locally-based, learning process approach.

I. Introduction

In the second half of the 1980s, food security became an important "organising principle" in development. It generated a large academic literature; conceptual and organisational innovation by aid agencies; and many regional, national and local programmes in developing countries, especially in sub-Saharan Africa. Interest has continued to grow in the 1990s[1].

The roots of concern with food security can be traced back to the world food crisis of 1972-74; and, beyond that, at least to the Universal Declaration of Human Rights in 1948, which recognised the right to food as a core element of an adequate standard of living (UN 1948). However, the surge of interest in the 1980s can be attributed to three contemporary factors: the impact of the African famine of 1984-85; a concern with deteriorating basic needs during structural adjustment[2]; and the fruits of an intellectual progression, which stretched from multi-sectoral nutrition planning in the 1970s[3], through entitlement theory in the early 1980s[4], to household food security in the second half of the decade. Figure 1.1 lists some of the main initiatives related to food security over the last five decades.

As the topic has grown, it has also become more complex. On conceptual and definitional issues alone, Smith et al have assembled a bibliography of over 180 items, 80% deriving from the period 1986-1991. The main cause of increasing complexity is a shift in the level of analysis: from a primary concern in the 1970s with national and international food security, defined in terms of the level and reliability of aggregate food supplies; to a focus in the 1980s on individual and household food security, with the emphasis on access, vulnerability and entitlement. Here, as we shall see, the links spread widely: to nutrition planning, rural development and even environmental sustainability.

The eclectic and wide-ranging character of "food security" makes it a powerful tool of integration and synthesis — but also creates the possibility of conceptual confusion. As Smith et al show, the term is used in many different ways. These sometimes reflect a desire for product differentiation between agencies (Maxwell 1990: 2), but also stem from differences in level of analysis, geographical focus, conceptual starting point or programmatic priority.

Our purpose in this paper is to clarify the concepts and definitions at the household level, where interest is now centred and where the literature has grown fastest. This is not to deny the importance of other levels of analysis, and we make connections where appropriate. Nor is it to deny the programmatic heterogeneity of food security initiatives: we try to explicitly recognise the rich diversity of the literature.

The structure of the paper is as follows: in Section II, we establish core concepts in household food security, especially those concerned with access and risk. In Section

Figure 1.1

Initiatives Related to Food Security, 1943-90

1943	-	Hot Springs Conference on Food and Agriculture
1945	-	FAO established
1946	-	UNICEF established
1948	-	Universal Declaration of Human Rights
1963	-	World Food Programme established
1966	-	International Covenant on Economic, Social and Cultural Rights
1967	-	First Food Aid Convention
1974	-	World Food Conference: Universal Declaration on the Eradication of Hunger and Malnutrition
	-	World Food Council established
	-	FAO Committee on World Food Security established
1975	-	FAO Global Information and Early Warning System (GIEWS) established
	-	International Emergency Food Reserve (IEFR)
1976	-	Club du Sahel established in OECD
1978	-	FAO Regional Food Plan for Africa
1980	-	OAU Lagos Plan of Action
1981	-	European Community "Plan of Action to combat hunger in the world" and initiation of food strategies in four countries
	-	IMF Compensatory Financing Facility extended to cereals
1983	-	Broadened concept of food security adopted by FAO
1984	-	Lome III convention gives central place to food security
1985	-	USAID Famine Early Warning System (FEWS) established World Food Security Compact (FAO)
1987	-	Mandate of FAO Food Security Assistance Service broadened to focus more on national policy
1988	-	World Bank task force report "The Challenge of Hunger in Africa: a call to action and initiation of World Bank food security studies in Africa"
1989	-	Convention on the Rights of the Child adopted by the General Assembly of the United Nations
	-	Initiation of FAO food security planning in four African countries
	-	Bellagio Declaration: Ending half the world's hunger by the year 2000
	-	WFC Cairo Declaration and Programme of Cooperative Action
1990	-	Food Aid Charter for the countries of the Sahel
	-	World Summit for Children (UNICEF)

Source: Adapted from Phillips et al (1991)

III, we take up a series of issues connected to the core concepts: the household, nutrition, livelihood, sustainability, cultural acceptability, efficiency and human rights. Finally, in Section IV, we synthesize the main conclusions and comment on issues of measurement.

II. Core Concepts in Household Food Security

Introduction

As the literature has spiralled, many definitions and conceptual models of household food security have been presented, not all necessarily labelled as such. Smith et al review the field; here we present, in Appendix 1, some 30 definitions which have either been influential in the literature or which summarise agency views. The series begins with the report of the World Food Conference of 1974 and gathers momentum through the 1980s: the fact that over a third of the entries date from the past two years is testimony to continued interest in the topic. Some of the definitions have been especially influential: Siamwalla and Valdes (1980), FAO (1983) and World Bank (1986) (itself derived from work by Reutlinger (1982, 1985a,b)) fall into this category.

Much of this paper will be concerned with the nuances separating the various approaches to household food security. We think it important to begin, however, by stressing the similarities. The many definitions and conceptual models all agree that the key defining characteristic of household food security is secure access at all times to sufficient food. We deal in turn with (a) sufficiency, (b) access, (c) security and (d) time.

Sufficiency: What is "Enough"?

The concept of "enough food" is presented in different ways in the literature: as a "minimal level of food consumption" (Reutlinger and Knapp 1980); as a "target level" (Siamwalla and Valdes 1980); as "the basic food (needed)" (FAO 1983) or as the food "adequate to meet nutritional needs" (Barraclough and Utting 1987). In more descriptive formulations, Kracht (1981) refers to "enough (food) for life, health and growth of the young and for productive effort;" the World Bank (1986) to "enough food for an active, healthy life" and Sahn (1989) to "enough food to supply the energy needed for all family members to live healthy, active and productive lives." From these definitions, and the others listed in Appendix 1, four aspects of the question can be distinguished.

First, the unit of analysis in these definitions is the individual, not the household. Where the household is referred to, as by Phillips and Taylor (1990), it is usually as an aggregation of individuals whose food needs must be satisfied. Only rarely (Eide et al (1985, 1986), Jonsson and Toole (1991b), Frankenberger and Goldstein (1991))

is the household considered as a unit. We discuss this question in more detail in the section "*Intra-Household Issues.*"

Secondly, although the definitions mostly refer to "food," the main concern is with calories (e.g. Heald and Lipton 1984) and not with (a) protein, (b) micro-nutrients or (c), more generally, food quality and safety (though see Eide 1986, 1990). This is mainly because analysts operate on the principle that other needs are usually satisfied when calorie intake is satisfactory. We discuss these issues in more detail in the section "*Household Food Security and Nutrition.*"

Because it is difficult to estimate precise calorie needs for different groups in the population, Pacey and Payne have concluded that all estimates of nutritional requirements have to be treated as value judgements:

> Something which is specifically excluded . . . is the notion of an "optimum" state of nutritional health, achievement of which might be the criterion for a requirement level . . . Any views of "desirable" or "optimal" food intakes for human individuals or groups can only be value judgements. (Pacey and Payne ibid:70-1)[5]

We take up in the section "*Perceptions and Cultural Acceptability*" the question of whether subjective assessments of food insecurity by the food insecure themselves may be a better route to follow.

Finally, and notwithstanding the difficulty of measurement, an important aspect of assessing whether people have access to "enough" food is to ask how far they fall below the threshold. This is something not much discussed in the recent food security literature, though Heald and Lipton (1984) talk about "proportionate shortfalls" in access to calories and Maxwell et al (1990) introduce the idea of the "intensity" of food insecurity. In the earlier literature on malnutrition, however, and in the current literature on poverty, the size of the gap is an important theme.

As far as malnutrition is concerned, Reutlinger and Selowsky (1976:2) began with FAO calorie requirements and calculated what proportion of people by geographic region fell (a) up to 250 calories per day below requirement and (b) more than 250 calories per day below requirement. They calculated for 1965 that 56% of the population of developing countries had a calorie deficit of over 250 calories a day and another 19% deficits of up to 250 calories per day. The total deficit was equivalent to 4% of world cereal production in the mid-1960s (ibid:3).

In calculating the extent of poverty, the World Bank (1990:29) has distinguished between the "poor" (defined as those with an income below $370 p.a. in 1985) and the "extremely poor" (with an income below $275). Similarly, Lipton (1983) has distinguished between the poor and the "ultra-poor." Making an explicit link to nutrition, he defined the latter as those unable to procure 80% of calorie requirements

with 80% of income, the so-called "80/80 rule." Lipton argues that the ultra-poor behave differently to the poor and are at sharply greater risk due to hunger and illness.

Taking these various considerations together, we find that the concept of enough food is problematic. Nevertheless, it appears to make sense (a) to concentrate initially on calories, (b) to define needs not just for survival, but also for "an active, healthy life," (c) to assess not just the fact of a shortfall but also its gravity, and (d) to begin with individual needs and build up to the household. We return to some of these issues in later sections.

Access and Entitlements

The second of our core concepts is "access," the question of whether individuals and households (and nations) are able to acquire sufficient food. It is often argued that the focus on access is a phenomenon of the 1980s, largely resulting from the pioneering work of Amartya Sen (1981) on food "entitlements." However, the interest in whether and how people acquire food has a longer pedigree and is rooted in nutrition planning.

In 1973, for example, Joy developed the idea of a "functional classification" of malnourished people and argued that

> food and nutrition planning starts not from the measurement of nutrient and food supply "gaps" but from the identification of who it is that is poorly nourished and why. (Joy 1973:170)

Many similar analyses were incorporated in nutrition studies during the 1970s (Berg 1973, Berg, Scrimshaw and Call 1973, Levinson 1974, Kielmann et al 1977). In the light of later debates, it is interesting that Joy's functional classification included ecological, demographic and economic factors (Figure 1.2).

An access approach was also incorporated in food policy analysis. Thus, Clay (1981) argued that:

> 'food security is a problem most often conceptualised as a macro phenomenon — deviations from trend in aggregate consumption.' However, as a human problem, it is primarily one of the welfare vulnerability of distinct categories of people within the population . . . the urban poor, the rural landless and small or marginal farmers (ibid:5).

Sen's entitlement framework provides a systematic approach to the definition and assessment of vulnerability. An individual's entitlement is rooted in his/her endowment — the initial resource bundle — which is transformed via production and trade into food or commodities which can be exchanged for food. If the entitlement set does not include a commodity bundle with an adequate amount of food, the person must go

Figure 1.2

Illustrative Outline of "Functional Classification" of Undernourished Population as Basis for Food and Nutrition Planning

1. *Regional Divisions* — based on administrative structure
2. *Ecological sub-zones*
   - including, e.g. urban
     - rural accessible — irrigated; unirrigated
     - rural inaccessible — arable; grazing
   - as well as subdivisions by cropping areas
3. *Economic status fo sub-groups of population*
   - including, e.g.
     - urban — migrants, recently arrived
     - — poor, stable employment — in large firms
     - — in small firms
     - — poor; unstable employment or unemployed
     - — income above subsistence
     - rural — settled farmers — "surplus" farmers
     - — "deficit" farmers
     - — nomads
4. *Demographic categories within subgoups*
   - including, e.g.
     - mother — child (infants)
     - pre-school children
     - school-aged children
     - adults — male
     - — female
     - elderly
5. *Deficiency pattern*
   - chronic
   - seasonal
   - occasional
6. *Nutrient deficiency (or problem)*
   - protein-calorie
   - vitamin A
   - riboflavin
   - vitamin C
   - calcium
   - iron
   - iodine
   - (lathirysm)

Source: Joy 1973:173

hungry; in Sen's terminology, the individual has suffered an entitlement failure. In a private ownership market economy, the entitlement relations of individuals are determined by what they own, what they produce, what they can trade, and what they inherit or are given.

Using the entitlement framework, Sen demonstrated that a decline in food availability was neither necessary nor sufficient to create hunger. He showed that famine could

occur in the absence of any change in production, if the value of people's production and work activities declined relative to the cost of staple food.

As Sen himself agrees, and as critics (e.g. Devereux 1988) have pointed out, an approach which emphasises Food Entitlement Decline (FED) is not necessarily inconsistent with one that emphasises Food Availability Decline (FAD), since a food production crisis may lead both to reduced nominal incomes and higher food prices. Food availability remains a key issue in food security. Nevertheless, food availability decline is not a necessary condition for food entitlement decline.

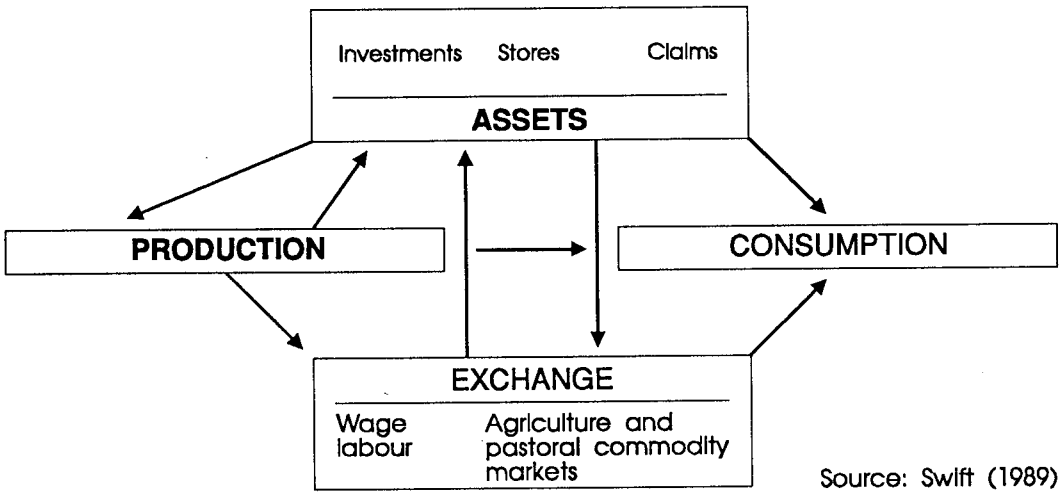
Sen's analysis has been extended in subsequent writing in at least five ways. First, the original analysis omits all nonlegal transfers of resources and hence the role of violence and social disorder leading to entitlement collapse. Secondly, the analysis is household centred. This means not only that the unequal distribution of food among household members receives no attention, but also that the non market rights and obligations of the household are neglected, because of a failure to embed the entitlement relations of the household into the social and political fabric of the wider community. Thirdly, because death is presumed to derive from inadequate food consumption, the role of disease in determining famine mortality is not addressed. Fourthly, no attention is given to the significance of cultural preferences and tastes in determining voluntary under-consumption when entitlement is adequate. Finally, and perhaps most important of all, the original entitlement framework has no temporal dimension. Consequently, the analysis is ahistorical and cannot account for changing vulnerability to entitlement failure.

An important extension to entitlement theory is provided by Swift (1989 and Figure 1.3). Swift's analysis focuses on the role of investments, stores and social claims in determining household vulnerability to famine. He assumes that when households are able to generate a surplus over and above their basic food requirements, the excess resources are diverted into assets of these three kinds which can be drawn down when households face a crisis. In this model, potential support from the community is an important asset which households can use as a buffer against entitlement failure.

Swift's analysis concludes that household vulnerability to famine can thus be understood with respect to the inadequacy, not only of immediate entitlements, but also the paucity of household assets. As the poorest households tend to have the fewest assets, they will be the most vulnerable. Clearly, successive crises deplete the scale and depth of buffers available to the household. As a consequence, the vulnerability of the household will be a function of both immediate entitlement failure and the extent to which existing buffers have been exhausted; the latter a function of the frequency, intensity, and duration of previous crisis exposure.

Figure 1.3

Causal Pathways Between Production, Exchange and Consumption



Source: Swift (1989)

Security

The third main concept is that of "security:" secure access to enough food. This builds on the idea of vulnerability to entitlement failure introduced in the previous section, focusing more clearly on risk.

The notions of risk and risk avoidance have been central to definitions of food security, since the term came into use in the 1970s. However, the scope of risk analysis has widened as the scope of food security itself has widened, to focus increasingly on individual and household level analysis.

The World Food Conference identified the risk of "acute food shortages in the event of widespread crop failure, natural or other disasters," as well as the risk of fluctuations in production or prices (UN 1975:14); and many subsequent analyses similarly concentrated on risks to national food supply and the Balance of Payments (Minhas 1976, USDA 1977, Valdes and Konandreas 1981, FAO 1983). At the same time, others began to look more closely at welfare vulnerability (Clay 1981), short term variability in entitlements (Chisholm and Tyers 1982) and the ability of household food systems to resist "crises threatening to lower the achieved level of food consumption" (Oshaug 1985). By the mid-1980s, "analysis of risk of inadequate access (had become) an important concern" (World Bank 1989) and food insecurity was more often defined in terms of risk: by Phillips and Taylor (1990) as resulting "from an unfavourable balance between risk and insurance;" by the SCN as being at

"undue risk of losing access to the food needed for a healthy life;" and by Von Braun (1991) as "the risk of an ongoing lack of access by people to the food they need."

Linking the discussion of risk to the discussion of entitlements in the previous section, it is necessary to identify the risks to food entitlements. These can originate from many sources and include variability in crop production and food supply, market and price variability, risks in employment and wages, and risks in health and morbidity. Conflict is also an increasingly common source of risk to food entitlements.

This question is explored in Figure 1.4. The rows in the table identify the different sources of entitlement to food: productive and non-productive assets; human capital; social claims; and income-earning activities which translate assets into command over food. The columns identify the different types of risk: natural; market; state; community; or other. Thus, drought, for example, mainly affects the capacity of households to turn productive assets into command over food: it therefore qualifies as an income risk. However, it may also affect productive capital, for example by lowering the water-table or causing livestock deaths. By the same token, conflict can undermine
food security in a number of ways. For example, it may disrupt markets, cause labour to be withdrawn from productive activities or, in extreme cases, bring about the disruption and displacement of entire communities.

The risk profile of individual households and communities will be determined by the channels through which their access to food is normally mediated and by the assets which are available to them as buffers. The most food insecure households will be those facing the greatest probability of an entitlement failure with the least assets. If the risks should materialise, these households will have no choice but to bear the costs of an entitlement failure in the form of reduced dietary intake, either in the current time period or in the future. Even where asset holdings are larger, households may be reluctant to dispose of productive assets to safeguard current food consumption, because of the opportunity cost in terms of future food access. However, there will come a point when it is no longer rational to protect future entitlement by under-consumption if the household will not survive the current period by so doing.

The link between risks and assets has been illustrated diagramatically by Jonsson and Toole (1991) (Figure 1.5). Here, the most food secure households are those which achieve adequate access to food while using only a small proportion of available resources; the most food insecure, those most at risk, fail to achieve adequate access even by devoting a large proportion of available resources to food.

To summarize the implications of this analysis for models of food security, we think it important to distinguish between the risks of entitlement failure and the costs borne in the event of failure. This has a number of advantages when trying to operationalise the concept of food security.

First, the distinction suggests a framework within which accepted indicators of food insecurity can be developed. For example, threshold probabilities and asset holdings could be used to classify households, with a series of probabilities being used to distinguish between the mildly, moderately, and severely insecure.

Secondly, the focus on risks highlights the critical choices facing food security planners, particularly those in resource poor countries. Public policy can concentrate on alleviating the costs of entitlement failure — what Dreze and Sen (1989) have termed "entitlement protection" — or focus on reducing the likelihood of entitlement failure — "entitlement promotion."

Thirdly, the concept of risk emphasises the time dimension of the food security problem. Households may allocate their resources over time in ways which optimise the adequacy of food access, without sacrificing stability in that access; in other words, they try to ensure current access without jeopardising future food consumption. This introduces the idea of choice into the analysis, which permits dietary inadequacy to be seen as both the cost of entitlement failure and the opportunity cost of investments in entitlement promotion.

Finally, by separating out risks and outcomes, the links between food security and nutrition can better be delineated. A food secure environment is clearly an important determinant of adequate dietary intake. Whether this translates into good nutritional status, however, will depend on a range of other issues, such as health and sanitary factors, methods of food preparation and the adequacy of general child care. Secure access to enough food to meet household food needs is a necessary but not sufficient condition for good nutritional status.

Time

Finally, we come to "time:" secure access to enough food at all times. The topic is not much discussed in the literature. However, following the lead of the World Bank (1986), it has become conventional to draw a distinction between chronic and transitory food insecurity. Chronic food insecurity means that a household runs a continually high risk of inability to meet the food needs of household members. In contrast, transitory food insecurity occurs when a household faces a temporary decline in the security of its entitlement and the risk of failure to meet food needs is of short duration. Transitory food insecurity focuses on intra- and inter-annual variations in household food access. It has been argued that this category can be further divided into cyclical and temporary food insecurity (CIDA 1989:21). Temporary food insecurity occurs for a limited time because of unforeseen and unpredictable circumstances; cyclical or seasonal food insecurity when there is a regular pattern in the periodicity of inadequate access to food. This may be due to logistical difficulties or prohibitive costs in storing food or borrowing.

Figure 1.4

Sources of Risk to Household Food Security

Sources of Entitlement	Types of Risk				
	Natural	State	Market	Community	Other
Productive capital(land, machinery, tools, animals, farm buildings, trees, wells, etc.)	Drought contamination (for example, of water supplies) Land degradation Fire Flooding	Land or other asset redistribution/ confiscation	Changes in costs of maintenance	Appropriation and loss of access to common property resources	Loss of land as a result of conflict
Non-productive capital (jewellery, dwellings, granaries,some animals, cash savings)	Pests Animal disease	Compulsory procurement Villageisation Wealth tax	Price shocks (for example, falls in value of jewellery and livestock) Rapid inflation	Breakdown of sharing mechanisms (for example, communal granaries)	Loss of assets as a result of war Theft
Human capital (labour power, education, health)	Disease epidemics (for example AIDS) Morbidity Mortality Disability	Declining public health expenditures and/or introduction of user charges Restrictions on labour migration	Unemployment Falling real wages	Breakdown of labour reciprocity	Forced labour Conscription Mobility restrictions Destruction of schools and clinics during war
Income (crops, livestock, non-farm and non-agricultural activity)	Pests Drought and other climatic events	Cessation of extension services, subsidies on inputs or price support schemes Tax increases	Commodity price falls Food price shocks		Marketing channels disrupted by war Embargoes
Claims (loans, gifts, social contracts, social security)		Reductions in nutrition programmes (for example school feeding, supplementary feeding)	Rises in interest rates Changes in borrowing capacity	Loan recall Breakdown of reciprocity	Communities disrupted/displaced by war

Figure 1.5

Resources utilized in pursuing household food security strategies

	Household food secure	Household food insecure
Uses a small proportion of available resources	Best off	Not too difficult to improve
Uses a large proportion of available resources	Food secure, but at great risk	Worst off

Source: Jonsson and Toole 1991b

In practice, chronic and transitory food insecurity are closely linked. Successive exposure to temporary, but often severe, stress may increase the vulnerability of the household to chronic food insecurity, by causing households to liquidate assets in their efforts to stabilise food consumption.

Conclusion

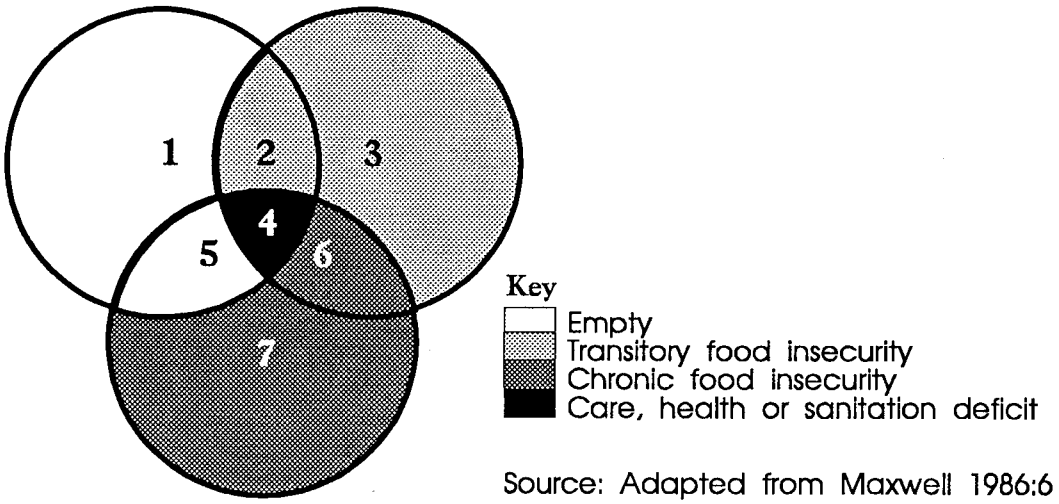
It is already clear that the notions of poverty, undernutrition and vulnerability are closely intertwined in definitions of food insecurity. The relationship between these has been explored by Maxwell, in a diagram reproduced here, in modified form, as Figure 1.6. This shows poverty, malnutrition (for which read undernutrition) and vulnerability as three overlapping circles, implying that it is possible, in principle, to experience the three conditions alone or in any combination: to be vulnerable, for example, without currently being either poor or malnourished; or poor and vulnerable, without being malnourished; or simultaneously poor, malnourished and vulnerable.

In practice, some simplification is possible. As with all Venn diagrams, some areas are likely to be empty. Thus, in the real world, it can be assumed that all people who are poor are also vulnerable, in the sense that they are susceptible to "large fluctuations in real income over relatively short periods, coupled with the absence of off-setting mechanisms to stabilise purchasing power or nutritional intake" (Maxwell 1989:24). Logically, therefore, the areas marked 1 and 4 in Figure 1.6 will be empty.

Focusing on the rest of the figure, transitory food insecurity will be found where poverty and vulnerability exist but where undernutrition, temporarily, does not (areas 2 and 3); and chronic food insecurity will be found where poverty, vulnerability and undernutrition coincide (area 5). Where undernutrition is found among populations that are not poor (areas 6 and 7), the most likely explanation is a failure of care, health or environmental sanitation (see Figure 1.7).[6]

Figure 1.6

Poverty, Vulnerability and Malnutrition: A Model of Food Insecurity



Source: Adapted from Maxwell 1986:6

The recent literature on food security has moved outside the boundaries of the four core concepts to tackle other issues. In so doing, it has been enriched by development in related literatures, particularly in nutrition, livelihood security, household models and ecological sustainability. In the section Section III, we review the implications for conceptual models of household food security.

III. Conceptual Issues in Household Food Security

Introduction

It is already clear that there are many conceptual problems with contemporary definitions of food security. Here we focus on seven sets of issues:

1) Intra-household issues;
2) Household food security and nutrition;
3) Household food security and livelihood;
4) Sustainability, resilience and sensitivity;
5) Perceptions and cultural acceptability;

6) Efficiency and cost-effectiveness; and
7) Household food security and human rights.

The main findings are summarised in the section "*Summary of Conceptual Issues*" and conclusions are drawn in Section IV.

Intra-Household Issues

A first set of issues concerns the household as a unit of analysis. Operationalising a concept of "household food security" requires making a series of assumptions about household structure and organisation in order to identify the activities, relationships and processes essential to improving food security and to maintaining adequate nutrition status. In the nutrition literature, children and pregnant and lactating women are often identified as priority vulnerable groups, implying a disaggregation of the household. However, a more systematic analysis of intra-household relations is provided by household studies.

In the theoretical literature on economic models of household behaviour, all household members are assumed jointly to maximise some household level welfare function. Essentially, as long as the household remains intact, it may be treated as if it acts as a single individual. All resources are pooled and then reallocated according to some common rule (Becker 1981).

The implications of this model of household behaviour for food security issues are: (a) household members share a common set of preferences in resource allocation; (b) household income and food resources are pooled and allocated to maximise collective welfare — income under the control of different household members has the same impact on outcomes such as child health, nutrient intake, fertility; (c) households with similar endowments respond similarly but independently to price, income and other exogenous changes — hence "average" demand/supply responses are meaningful for research and policy purposes.

In fact, the underlying model of the household is open to serious question and the implications are also doubtful. There is now an emerging consensus that:

(i)conventional economic analysis of household behaviour inadequately accounts for the heterogeneous preferences of different household members, the constraints faced by different decision-makers and actors within the household in guiding resource allocation and the contribution they make to individual and household food security (Thomas 1991, Behrman et al 1990, Evans 1991, Kabeer 1991, Folbre 1986a, 1986b, Berry 1984); and

(ii)the assumption that households are discrete entities, adjusting to changes in economic and environmental variables independently of other households and wider social/political institutions (kin, lineage, "community," "state") is seriously at variance

with reality, at least in most agrarian contexts (Hart 1986,1989, Guyer 1981, Friedmann 1979).

If this new consensus is correct, an operational concept of the "household" for food security purposes must go beyond standard economic analysis to accommodate what Friedmann (1979) has termed, a "dual specification" of households, as internally diverse organisations, embedded within and shaped by wider structures. There are three important implications for food security analysis.

First, economists have in recent years turned to questions of intra-household resource allocation and its impact on economic behaviour. The extent of "latitude" household members face in allocating labour and non-labour resources differs, depending on the "caste/class" position of households (Bardhan 1984). In very poor, landless households, women and men may be less circumscribed in allocating their labour to all kinds of (low-income, low productivity) activities regarded by less poor households as "demeaning" or "unsuitable." In less poor households there may be more intense pressure to emulate cultural/ideological norms regarding work befitting class/caste/gender status; and risk-diversification takes on different forms — early marriage of sons, male migration etc ... to diversify risk.

Diversity of food and income sources (cash and kind, farm and non-farm) is considered to be one of the main "buffers" households can develop against risk in agrarian environments. It is vital, therefore, to any understanding of household coping and survival strategies and ultimately to the effective design of food security strategies, that the relative importance of different income sources, the characteristics of these income sources in terms of seasonal fluctuations, sustainability etc. and the responses of individuals and households to these characteristics, be well understood. Von Braun notes that in Africa:

> .. diversification may entail a fair amount of specialisation within the household according to gender or age. In the Gambia, for instance, most subsistence crops are produced by males, and most income from craft-work and services is generated by specialised individuals in the extended household system ... women cultivate around 30 percent of the cash-crop fields (groundnuts). In Rwanda, subsistence crops are produced mostly by women, whereas wages are generated mostly by men. Service and trading incomes are substantially generated by women. (Von Braun 1989:12).

Secondly, there are important questions about the allocation and control of household income. Thomas (1991), working on urban Brazilian data, has shown that the effect of unearned income on child health depends largely on who controls that income. Maternal income effects on family health are generally 4 to 8 times bigger than paternal income effects; for child survival probabilities the effect is almost 20 times bigger.

Similarly, Behrman & Deolalikar, working in rural South India, find that intra-household allocation of food means that the implications of price and income changes for particular types of individuals may differ substantially from those for household averages. For example, there was significant evidence of differential adjustment in male and female food intake to changes in food prices:

> The more negative food price elasticities that we observe for females imply that the nutritional burden of a rise in food prices, which typically occurs in the lean agricultural season or during a drought year, falls disproportionately on female members within households. By the same token, however, women and girls enjoy a disproportionate share of the nutritional reward or bonus from falling food prices .... to the extent that the general risk of malnutrition or starvation is greatest during times of food shortage (when food prices are likely to increase) the relatively great vulnerability of female members at these times could be characterised as gender discrimination. (Behrman and Deolalikar 1990:693).

This finding suggests that periods of food insecurity precipitated by sudden food price rises may have differential outcomes for male and female household members. Such outcomes may be the result of female members "compensating" for the price shock by adjusting-down their own food consumption (to a greater extent than men) in order that male intakes (adults and children) remain somewhere closer to the household "average." These compensations may be involuntary and are very likely to have negative welfare consequences (Sen 1984, Sen and Sengupta 1983).

Thirdly, and despite the importance of disaggregation, cross-cultural diversity in household forms does yield some important regional regularities. For example, there would appear to be a higher incidence of corporate forms of householding, organised around the conjugal[7] bond in North Africa, South Asia and the Middle East, than in parts of the Caribbean, Latin America and sub-Saharan Africa, where the conjugal unit appears to be less cohesive and less of a focal point in household organisation. Kabeer (1991) argues that patterns such as these suggest that the conjugally organised nuclear family is a useful unit for empirical analysis in much of the Indian sub-Continent, but in sub-Saharan Africa is inappropriate given the widespread prevalence of units of production, reproduction, consumption and residence which do not overlap[8]. Tracing the composition, activities and relationships between various units and identifying where key activities — for example food production and processing — are located[9] is therefore central to understanding the institutions and processes through which scarce resources are allocated (Kabeer 1991).

The impact of these conceptual advances can be illustrated by considering the differential impact on household members of shocks associated with food insecurity. Gittinger et al identify the main causes of household food insecurity in terms of:

> variations in the amount of food provided by the work and wealth of the household. The level of food consumption can vary because of shocks in

work, in production or in assets. The shock can change the quantity available or change in the price (Gittinger et al 1990:13).

(a) **Work shocks:** these occur when the quantity/availability of work changes abruptly, for example because of illness or the effect of drought on wage employment. Work shocks will affect household members differently depending on their status as self-employed, unpaid-family or waged (causal/permanent/migrant) labour. Women and men in casual agricultural wage employment may be more vulnerable to abrupt changes in labour demand than men (rarely women) engaged in permanent farm jobs. Women may find it difficult to hire-in additional labour to compensate for a drop in family labour supply (perhaps due to illness or migration), because of limited capital or restricted access to local labour markets. A drop in the casual wage rate may be a much more serious event for a female head of household reliant on her sole income, than a male head of household who has the subsistence income of his wife or wives to fall back on. A drop in male farm or off-farm employment may have serious implications for women reliant on remittances for purchasing vital food resources and/or health care. Loss of waged work may also entail direct loss of food resources, if food is provided by employers as part payment for work.

(b) **Output shocks:** the quantity of output produced may fall or the price of output may suddenly drop. Effects will vary depending on the composition of household output (food/non-food crops, non-farm products), who contributes the most labour and who controls the proceeds of the sale of output. Depending on the portfolio of economic activities of household members, the effect of output shocks can be mediated by different household members adjusting their profile of activities accordingly. The capacity of individual members to do this will depend on their "allocative flexibility," access to new or existing resources and decision-making control. For example, women and men may be able to switch their labour time to more profitable or less insecure activities more-or-less easily, because of rigidities in the division of labour (women's domestic overhead) or asymmetrical access to land, water resources and other inputs.

(c) **Food shocks:** lack of availability of food in markets, sudden price rises. The food entitlement of household members may be based on own-production, their capacity to exchange labour for a wage or a payment in kind, or their ability to call on familial and kin food-sharing arrangements. These entitlements are not fixed, they are subject to negotiation and bargaining, even over-ruling by "powerful" household/kin members. So, in periods of increased insecurity, food entitlement may be compromised for some members more so than others. Women may find their entitlement to food sharing arrangements dries up during periods of food stress, or that their "separate" access to land is denied by male household members seeking to "hedge" against further food stress by maximising the sale of cash-crops. Meanwhile, male household members may experience a drop in entitlement as rising food prices devalue the "real" wage in the casual labour

market and possibly reduce the nutritional value of the portion of the wage paid directly in food (meals during the day).

(d) **Asset shocks:** unanticipated drop in the quantity of assets e.g.: death of livestock, theft, debt seizure or a fall in the value of liquid assets due to rapid inflation or due to excessive selling-off during times of stress. Women and men hold assets in different forms and during periods of stress they may each attempt different strategies for protecting their assets or be forced to relinquish them at different times and in different ways. The effect of disinvestment or "asset stripping" on food and nutritional outcomes in the short-run may be different, depending on the convertibility of different assets into food and food-related products. Whereas women may be inclined to convert assets directly into food products for short-term consumption purposes, the "lumpier" assets owned by men may be more difficult to convert into food resources (less liquid) or they may be sold off only when conditions worsen in the medium term. The extent to which these strategies complement or conflict with one another and the costs incurred for individual members need to be examined.

There is a further shock which is likely to be of major importance in African households for the foreseeable future and that is the effect of AIDS. In many ways it cuts across the shocks listed above. Nonetheless its effect will be highly interactive with other shocks that might occur.

(e) **AIDS shocks:** AIDS is likely to generate some very significant shocks on productive capacity, purchasing power and per capita food availability. Disruption and even dissolution of family structures because of AIDS is likely to increase food insecurity and malnutrition. Extended families that take in orphans could find their food resources spread more thinly. The evidence from Africa increasingly shows that women are more likely to be infected than men and at an earlier age. This suggests that the links between AIDS, household food security and individual nutritional status may be significant.

To conclude, this framework is clearly advantageous for pulling together household level and intra-household information, but it remains rather imprecise. Kabeer (1990) suggests operationalising the idea of the "food cycle." The food cycle refers to the sequence of events by which food enters households (purchased or produced) and is transformed, first into consumable form and then into nutritional intake but itself at some nutritional cost. By locating food cycle activities in the wider context of activities and processes that reproduce labour resources on a daily and generational basis (including health-care/sanitation activities), it is possible to identify the cost and benefits to individuals. Kabeer emphasises the importance of tracing household labour inputs to food cycle activities, because the imbalance between production and use of human energy is one major contributing factor in individual nutrition shortfalls, especially for women.

Household Food Security and Nutrition

A second set of issues concerns household food security and nutrition. We have already argued that many of the core issues in food security are derived from the earlier concerns of nutrition planning; and to the extent that food is central to both, there is clear overlap. However, recent work has helped to clarify the relationship between food security processes and nutrition outcomes. There have also been important contributions on diet quality, especially with respect to micro-nutrients, and on nutrition adaptation: these also have considerable implications for food security.

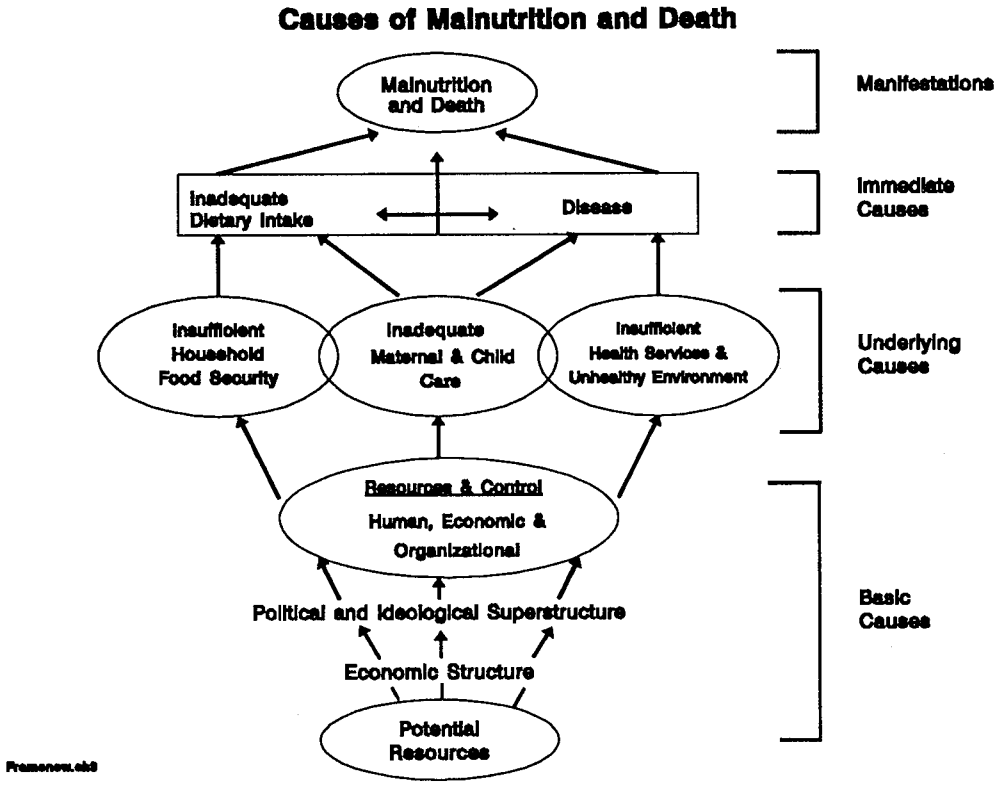
The debate about food security and nutrition is concerned with the question of whether under-nutrition, usually measured by growth faltering in children or possibly by reduced body-mass in adults (Martorell et al forthcoming), is an adequate proxy or indicator of food insecurity. At one extreme, it can be argued that under-nutrition is synonymous with food insecurity; at the other, that undernutrition can be, for practical purposes, independent of food insecurity. The debate has important consequences for food security monitoring and famine early warning, not least because anthropometric data is so frequently used as a key indicator.

A way into the debate is to examine the causes of under-nutrition. Several causative models illustrating the aetiology of malnutrition have been developed (Mason et al 1984; Pacey and Payne 1985; Beghin et al. 1988; UNICEF 1990). The most recent of these, by UNICEF, is reproduced in Figure 1.7. It shows that malnutrition and death are caused by a combination and interaction (Tomkins and Watson 1989) of (a) inadequate dietary intake and (b) disease. These, in turn, are seen to be caused by a combination of three inter-related factors: insufficient household food security, inadequate maternal and child care and insufficient health services and unhealthy environment. These three factors, food security, health and care, are each necessary but none sufficient on its own for adequate nutritional status to be achieved.

The model summarised in Figure 1.7 has gained wide acceptance (Gillespie and Mason 1991, ACC/SCN 1991). It implies that household food security is necessary but not sufficient for adequate nutrition; and, in turn, that growth faltering cannot necessarily be ascribed to a failure of household food security. From this, it is said to follow that a deterioration in anthropometric indicators cannot be interpreted on its own as identifying a decline in food intake, let alone in food security. Even if it can, poor anthropometric results, especially stunting, may well reflect a history of past under-nutrition rather than any current problem (Beaton 1989, Payne 1990). By the same token, acceptable anthropometric results do not necessarily demonstrate adequate food security: risk levels, for example, may be high.

There is certainly empirical evidence to support the notion that failures in caring capacity or environmental sanitation are associated with growth failure among children (Gillespie and Mason ibid, ACC/SCN ibid). Indeed, a "health crisis" model has been proposed as the main cause of death in famines (de Waal 1989). Nevertheless, others have argued that the relative importance of health and care may be less important than

Figure 1.7



suggested in Figure 1.7, especially for adults and in non-famine situations. If, for example, environmental conditions remain stable over time, then there may well be a direct relation between changes in food security status and nutritional outcomes (Young and Jaspars, forthcoming). The implication for food security would seem to be that anthropometry is not a universally reliable indicator of (changing) food security status, but that it may, in certain circumstances and with information on the other factors, be possible to interpret anthropometric data with respect to food security.

A second issue has to do with diet quality. As noted in the section "*Sufficiency: What is 'Enough'*," the food security literature has concentrated principally on calories, reflecting a movement away from concerns with protein quantity and quality in the 1970s (Joy 1973:165ff). However, a number of definitions of food security stress food quality as an objective (Commission of European Community 1988, Mudimu 1988, Bryceson 1990) and this is consistent with a renewed emphasis in the 1990s on the composition of the diet, especially with respect to micro-nutrients.

The new emphasis on micro-nutrients is said to stem from two factors:

> first, the increasing understanding of the extent and far-reaching consequences of micro-nutrient deficiencies, especially iron, iodine and vitamin A . . . (and secondly) the existence of proven and low cost methods for preventing these deficiencies (ACC/SCN 1991:16ff).

The extent and consequences of micro-nutrient deficiency are reviewed elsewhere (Chen 1990, Millman 1991, ACC/SCN forthcoming). The implication for food security is that more attention needs to be paid to the potential quality of diet than has recently been the case.

The third issue is concerned with adaptation to nutritional stress and connects closely with later discussions on the management of livelihood strategies and sustainability and resilience. There are many common themes.

Households facing regular episodes of food insecurity have developed complex strategies for coping with these events. Although coping strategies vary with local conditions, there is a common pattern in the sequence of responses (Corbett 1988). As the severity of food insecurity increases, the household responses become progressively more serious and threatening to livelihoods. One of the first responses is to reduce food intake, in order to preserve essential assets.

There are three types of nutritional adaptations to reduced food intake or energy stress; genetic, physiological and behavioural (Waterlow 1985; Payne and Lipton 1990). Payne and Lipton (1990) use the term "adaptive response" in its evolutionary sense; it increases the probability of survival and subsequent reproduction. Whether this adaptation is acceptable is another question and is essentially a value judgement, based on the costs incurred or risks involved.

First, the genetic make-up of the individual determines the extent to which physiological adaptations are possible. The capacity for physiological adaptations will influence the social adaptations that are necessary (Waterlow 1985).

Secondly, with regard to physiological adaptation, the most common single adjustment to energy stress is reduction in body size and growth. Other examples of physiological adjustments include metabolic adaptations, such as reductions in basal metabolic rate, and reduced fertility (Payne and Lipton 1990). Mild early growth retardation in children is adaptive, as it results in significant cumulative energy savings, which may be crucial to the household's overall survival. The state of being small may not put the child at any current or future risk in terms of health, but the process of becoming small is unacceptable, because it leads, for example, to smaller mothers, increased episodes of disease and possible mental impairment (Beaton 1989).

Growth failure carries significant health risks. Most studies which relate growth failure to risk of mortality have suggested that there is a range of growth status over which the risk of dying changes only slightly, with a lower threshold below which mortality rises steeply (Kielman and McCord 1978; Chen 1980; Heywood 1982; Katz 1989).

However, recent analysis (Pelletier 1991) suggests that a sharp threshold does not exist and that even mild to moderate undernutrition is associated with increased risk of mortality. Severe malnutrition also increases the incidence, duration and severity of infectious disease (Tomkins and Watson 1989). The pattern of morbidity and mortality is a result of environmental factors that influence transmission of disease, such as crowding, water supply, sanitation, and climatic factors.

Food insecurity may prompt responses that increase risks to health and even health crises. For example, distress migration and the formation of camps are associated with higher than normal mortality rates (Toole and Waldman 1990). The risks associated with growth failure are likely to vary depending on whether people are home based or have migrated and settled among other destitutes. Therefore, what may be considered a successful adaptation amongst a home-based population, may be unsuccessful in different circumstances, such as camps, because of the additional health risks.

Thirdly, behavioural responses to energy stress are probably much more important than physiological responses. The main behavioural responses are reductions in energy expenditure, ergonomic adaptation, which is substituting uncomfortable for energetic work by adults, and reduced play and work by children (Payne and Lipton 1990). The very poor will be less able to reduce their energy expenditure at times of energy stress as they must spend most of their time and effort securing sufficient food or income. During famine, it is not only the poor who must increase their efforts, and hence reducing energy expenditure may not be an option even for the less poor.

In balancing these various options, people's choice of response will involve trade-offs depending on their priorities and perceptions of the costs or risks involved. This relates to both current and future food security. For example, children may go hungry in drought or may be denied schooling, so that they may earn or preserve energy, long before the household is prepared to sell assets (Jodha 1975). In such a case, acceptance of some degree of hunger or under-nutrition is in order to preserve future food security (Corbett 1988). Thus, pursuing the goal of future household food security may have a markedly negative impact on nutrition and may be mis-interpreted as a lack of household care or as ignorance of the nutritional needs of different household members.

This discussion has important implications for food security. Following Gillespie and Mason 1991 and ACC/SCN 1991, the food intake of the household is more closely related to household food security than is growth failure as measured by anthropometry of children under five. Food intake is not only an outcome of current and past household food security, but is also part of the process of ensuring future household food security: the fear of not having enough food in the future may lead to reductions in current food consumption. However, in practical terms, and given the scope for adaptation, it is extremely difficult to establish a reliable minimum energy requirement below which a household may be considered food insecure. There are also additional problems of measuring food intake not considered in this review.

Household Food Security and Livelihood

As already made clear, the analysis of access and entitlement is central to food security, identifying the risks facing particular social groups and mapping their vulnerabilities. In so doing, it has been a common assumption that the food sub-sector can be treated independently of others and usually as the first priority of the food insecure.

Conventionally, food is supposed to be one of the most basic human needs within a hierarchy of concerns (Maslow, cited in Handy 1985: 30)[10]. Within this hierarchy,

> lower-order needs (physiological and safety) are dominant until satisfied, whereupon the higher order needs come into operation ... If you are starving, your needs for esteem or status will be unimportant; only food matters. (Handy 1985: 30).

Much food security literature has assumed this logic and the urgency to satisfy food needs which it implies, such that these needs are met by poor households before and in preference to all others. Hopkins, for example, argues that

> food security stands as a fundamental need, basic to all human needs and the organisation of social life. Access to necessary nutrients is fundamental, not only to life per se, but also to stable and enduring social order (Hopkins 1986:4).

In recent years, these assumptions have been questioned. Food security has been seen as only one dimension of the broader concept of livelihood security; the food security strategies of poor people have been interpreted in the context of their complex and dynamic livelihood strategies; and, in the process, the preeminence of food security has had to be reevaluated.

A starting point for the discussion is Chambers' (1988:1)[11] definition of sustainable livelihood securities in which:

> 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, resources 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.

In this framework, the achievement of food security is but one sub-set of objectives and food one of a whole range of factors which determine why the poor take decisions and spread risk, and how they finely balance competing interests in order to subsist both in the short and longer term.

There is empirical evidence to support a focus on livelihood security. De Waal (1989) found in the 1984/85 famine in Darfur, Sudan, that people chose to go hungry in order to preserve their assets and future livelihoods. He argued that "people are quite prepared to put up with considerable degrees of hunger, in order to preserve seed for planting, cultivate their own fields, or avoid having to sell an animal" (de Waal 1991:68). Furthermore, "avoiding hunger is not a policy priority for rural people faced with famine" (ibid). Similar findings are cited from Ethiopia (Turton 1977).

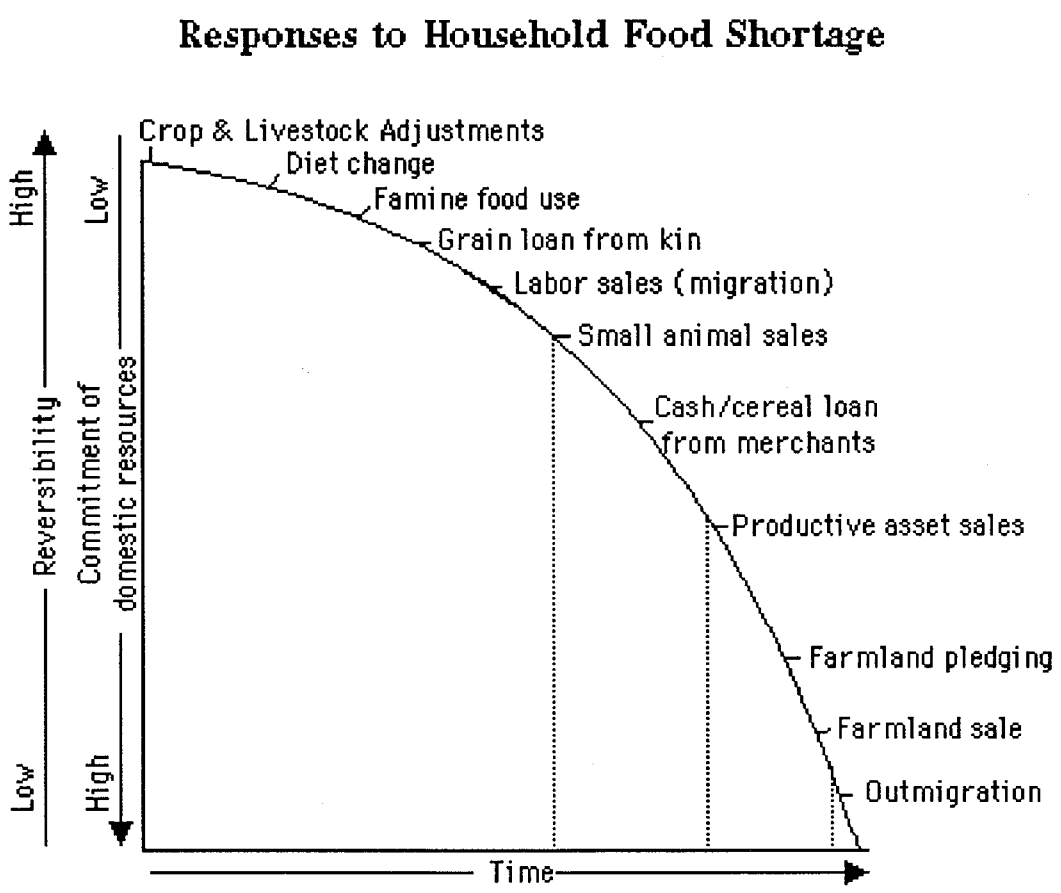
Equally, in comparing the sequential use of coping strategies employed in periods of food stress in a number of African and Asian cases, Corbett (1988) found that preservation of assets takes priority over meeting immediate food needs until the point of destitution, when all options have been exhausted.

Frankenberger and Goldstein (1990) have taken the role of coping strategies one step further, distinguishing between various types of risk management and patterns of coping behaviour (e.g. asset depletion, breakdown of community reciprocity, non-farm coping strategies), as well as different types of household assets which will play different roles in the process of coping (Figure 1.8). On this basis they argue that "the dilemma facing small-farm households ... involves a trade-off between immediate subsistence and long-term sustainability" (ibid, 22). But, as yet, there is little evidence to show how this trade-off works in the long-term, or to what extent coping strategies are successful in striking a balance between meeting immediate food needs and longer-term livelihood sustainability. To find out about this, coping strategies, the reasons for and timing of their use, and their success or failure, need to be tracked over much longer periods than a single cycle of famine and rehabilitation.

Riely adds an important qualification to this conclusion. Examining the coping strategies of food insecure communities in Kordofan, Sudan, he finds that the experience of drought itself changes the scope for coping with the next food crisis, for example because of asset redistribution or changes in markets. He concludes that it may be very difficult to predict from studying coping strategies during one cycle what will happen during the next — and hence very difficult indeed to interpret early warning data on livelihood changes (Riely 1991). In many such cases, "coping" may be a misleadingly positive word, implying that food insecure households survive periods of high risk unscathed: in fact, households may survive only at the cost of significant impoverishment.

Pursuing the dynamics of coping strategies, Davies (forthcoming) argues that there is conceptual confusion between the use of the term "coping strategies" to describe fall-back mechanisms during periods when habitual food entitlements are disrupted, and its use to describe long-term, irreversible changes in local food security systems. She suggests a distinction between "coping" and "adapting:" the former is a short-term response to an immediate and inhabitual decline in access to food; the latter, in contrast, involves a permanent change in the mix of ways in which food is acquired, irrespective of the year in question.

Figure 1.8



Source: Adapted from Watts (1983) by Frankenberger & Goldstein, Office of Arid Lands Studies, The University of Arizona.

Work on food security and the environment also supports the importance of a livelihood approach. It is often argued that food security is achieved at the expense of environmental degradation, but Davies et al (1991b) find that poor people do not distinguish so clearly between food entitlements and "environmental entitlements" (Leach and Mearns 1991). They have a vested interest in conserving their natural resource base, for food security and livelihood reasons, and will do so if given the opportunity (Chambers 1988).

In terms of definitions of food security, livelihood has largely been an implicit theme, expressed in terms of the close relationship between food insecurity and the "secular problems of poverty" (Chisholm and Tyers 1982), the "real family income of

vulnerable groups" (Muhammed 1987) or "household strategies for exploiting available food resources" (Eide 1990b). Maxwell, however, has made the link to livelihood explicit, arguing that

> food security will be achieved when equitable growth ensures that the poor and vulnerable have sustainable livelihoods (Maxwell 1988 and 1991:22).

He also argues, citing de Waal (1988 in Maxwell 1989, 1991,), that "poor people will modify their attitudes to food in order, for example, to preserve their asset base or in other ways protect their livelihoods." (Maxwell 1990:4).

Davies (forthcoming) has taken the argument one step further. Locating food security within the broader context of livelihood security, she begins by asking not how people fail to feed themselves and become food insecure, but rather about the positive strategies they follow to feed themselves. This leads her to ask what people do (e.g. what production systems they are part of and on what terms they participate), where people fit into local resource management systems, and what kind of flexibility their overall livelihoods provide them with (e.g. can they migrate into neighbouring production systems, do they have reciprocal links with kin in neighbouring production systems, do they have reciprocal links with kin in urban or more productive agro-ecological zones?). She argues that this livelihood approach mirrors some of the preoccupations of farming systems research with classification (Maxwell 1986:66), but with a greater emphasis on cultural variables. Davies' livelihood security approach to food security is contrasted with a "Food First" approach in Figure 1.9.

This kind of analysis has three important implications for food security. First, it reinforces the point that food cannot be seen as a unique and objectively defined need at a particular point in time, independently of people's other priorities at that point in time and their inter-temporal decision framework. There is thus an additional incentive to establish food security norms on a participative basis, rather than imposing them externally.

The second implication is that information systems need to be concerned not just with food flows, but also with wider issues of livelihood, in particular with coping strategies and long-term adaptation to food stress. Since the livelihood and coping strategies of different groups are continually evolving, not least in response to episodes of food insecurity, the implication is that the evaluation framework also needs to change so that data can be used in a meaningful way.

Finally, it is apparent that addressing food security in the context of livelihood security opens a Pandora's Box of data and interpretation. Data requirements multiply rapidly. It may be more appropriate to recognise complexity and diversity in such a way as to maximise the choice and freedom of manoeuvre of the food insecure themselves, rather than trying to impose a small number of indicators from outside. This is a theme to which we return in Section IV.

Figure 1.9

Differences Between a Narrow "Food First" Approach and a Wider "Sustainable Livelihood" Approach to Household Food Security

Livelihood	"Food First" Approach	"Sustainable Livelihood" Approach
Objective	access to food	secure and sustainable livelihood
Point of departure	failure to subsist	success in feeding, living
Priorities	food at the top of a hierarchy of needs	food one part of a jigsaw of livelihood needs
Time preferences	food needs met before and in preference to all others	food needs met to the extent possible given immediate and future livelihood needs
Entitlements	narrow entitlement base (current and past consumption)	broad entitlement base (includes future claims, access to CPRs etc.)
Vulnerability	lack or want of food	defencelessness, insecurity, exposure to risk, shocks and stress
Security	opposite of vulnerability is enough food, irrespective of the terms and conditions on which it is acquired	opposite of vulnerability is security
Vulnerable groups	based on social, medical criteria	also based on economic, cultural criteria
Coping strategies	designed to maximise immediate consumption	designed to preserve livelihoods
Measuring and monitoring	present and past consumption	livelihood intensity
Relationship to food security and the environment	degrade environment to meet immediate food needs	preserve environment to secure future

Source: Adapted from Davies 1992 (forthcoming)

Sustainability, Resilience and Sensitivity

The food security literature is sometimes accused of being more concerned with the current state of food insecurity than with changes over time and underlying processes. However, resilience, sensitivity and sustainability have played an important part in the literature on household food security, developing from the key notion of risk discussed in the section "*Security.*" There are also many connections to the discussion of livelihood security.

In 1985, for example, Oshaug argued that

> a society which can be said to enjoy food security is not only one which has reached the Food Norm . . . but which has also developed the internal structures that will enable it to sustain the Norm in the face of crises threatening to lower the achieved level of food consumption. The internal structures form the basis of the capacity to endure . . . . (and endurance can be defined as) the capacity of a given social system/unit to undergo a perturbation without a decline in the degree of progress made towards the Food Norm. (ibid:5-13)

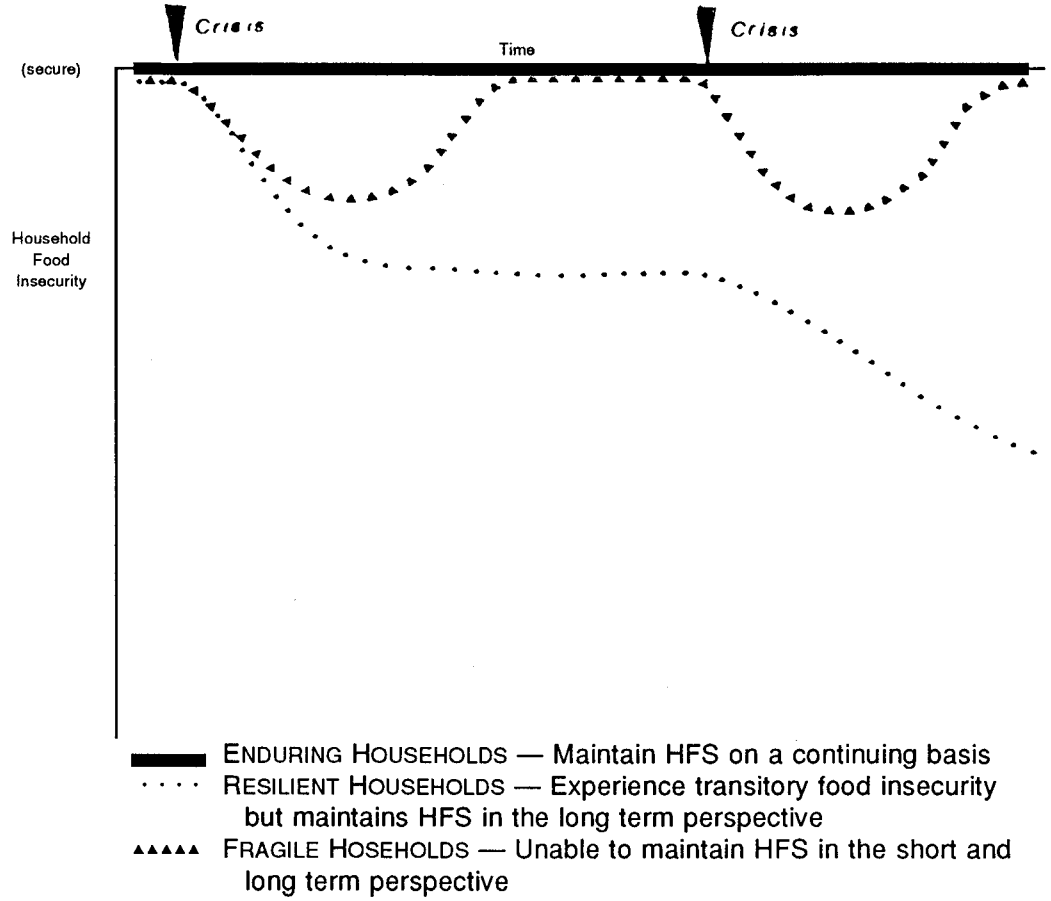
Oshaug identified three kinds of households, "enduring households," which maintain household food security on a continuous basis, "resilient households," which suffer shocks but recover quickly, and "fragile households," which become increasingly insecure in response to shocks (Figure 1.10).

Similar approaches are found elsewhere. Benson, Clay and Green (1986) analyse household food security in terms of three main elements: average household incomes, the magnitude and probability of seasonal and annual fluctuations around the average, and the value and form of stocks a household can maintain to protect itself against income shortfalls. Barraclough and Utting (1987) suggest that long-term sustainability is one of five key characteristics of food security, achieved by preserving and improving the ecosystem within which food is produced; reliability is another characteristic, meaning that seasonal and cyclical variations in access to food are minimized. Maxwell (1988) identifies sustainable livelihoods as a necessary condition of food security. And Phillips and Taylor (1990a,b) focus specifically on the balance between food security risks and current insurance. These ideas can be combined and modified in the light of recent work on resilience, sensitivity and sustainability in ecological systems and studies of livelihood security.

The ecological literature originates from just those marginal and sensitive environments where food insecurity is greatest. Ecosystems and livelihoods are seen as sustainable if they persist over time despite shocks and long-term adverse trends, but persistence does not necessarily mean either lack of change or the successful maintenance at all times of a particular type or form of system. In ecosystem science, based on original work by Holling (1978) and extended to agricultural ecosystems by Blaikie and Brookfield (1987), sustainability is analysed in terms of sensitivity and

Figure 1.10

Characteristics of Households' Ability to Withstand Crisis to Preserve Household Food Security on a Sustainable Basis



Source: Oshaug, 1988 (personal communication, cited in Eide (1990))

resilience. Sensitivity is defined as

> the degree to which a given land system undergoes changes due to natural forces, following human interference.

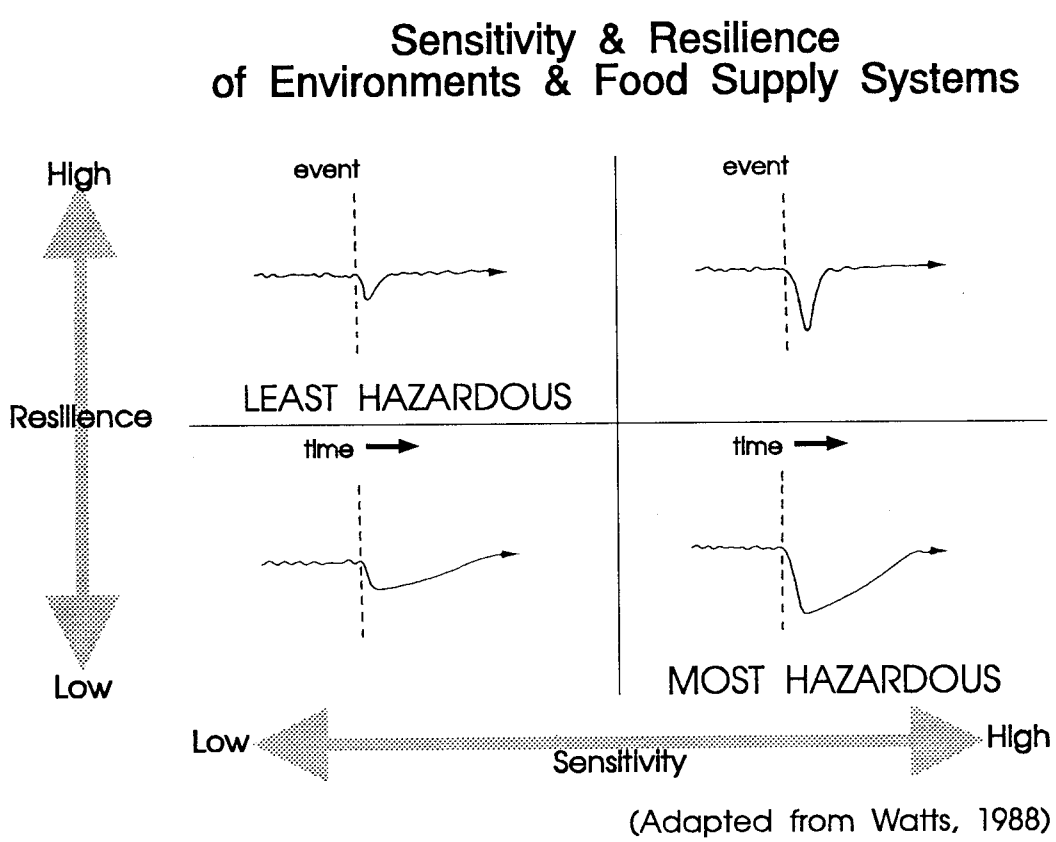
Resilience on the other hand refers to the capacity of land to absorb change; it is defined as

> the ability of land to reproduce its capability after interference ... where resilience is high, it requires a major disturbance to overcome the limits to qualitative change in a system and allow it to be transformed rapidly into another condition.

(both definitions from Blaikie and Brookfield (1987: 10-11).

A simple 2x2 matrix (high/low sensitivity, high/low resilience) gives four broad categories of ecological system, each with different sustainability characteristics: (i) systems of low sensitivity but high resilience, which are generally of low productivity but which are easily sustainable and only degrade under persistent abuse; (ii) systems of high sensitivity and high resilience, which respond well to productivity-enhancing inputs degrade easily, but also react well to land management designed to restore capability; (iii) systems of low sensitivity and low resilience, which are initially resistant to degradation but once thresholds are passed are also resistant to restoration of capability; and (iv) systems of high sensitivity but low resilience, the least sustainable, which degrade easily and do not respond to efforts at restoration (Blaikie and Brookfield 1987: 11). These different categories are presented diagrammatically by Bayliss-Smith (1991 and Figure 1.11).

Figure 1.11



A further, important, dimension of ecological resilience and sustainability is furnished by recent work on non-equilibrium ecological systems. In such environments, events like droughts or fire may trigger changes not simply to a lower point in a fixed

vegetation succession, which is then simply pushed back towards the previous climax, but to a very different but also stable vegetation association (Ellis and Swift 1988, Behnke and Scoones 1991). Such non-equilibrium ecosystems seem to be characteristic of the dry areas associated with high food insecurity.

All this suggests a different way of looking at sustainability in household food and livelihood security. Swift (1989) classified the proximate factors in food insecurity (that is, the actual potential triggers of acute episodes of famine risk) into three categories: those relating to production, to exchange and to the system of assets and claims households are able to mobilise. Variability and risk can arise in any or all of these, and historically the greatest food insecurity results from failure of all three mechanisms simultaneously.

The conventional view is that this variability, and the resulting risk of future food consumption shortfalls, must be dampened and insured against. In this view, sustainability means maintaining constant levels of consumption, and comes from stabilising and making more reliable each of the proximate factors. This is achieved, for example, by investment in agricultural capital, such as irrigation or soil conservation, by economic diversification, through stabilising staple food grain markets by the use of intervention stocks, or through insurance mechanisms. Stability means minimising variability around the mean values of production levels, terms of trade, or assets and claims. Such interventions are often very costly, and may be of doubtful efficiency. It is worth asking, in the light of the discussion about sustainability in ecological systems, whether there are alternatives.

By analogy with the ecosystem characteristics discussed earlier, livelihood systems also show varying degrees of sensitivity and resilience, and the outcome of the interaction between these determines the sustainability of the livelihood system. Livelihood systems are sensitive if they respond rapidly to interventions, whether endogenous or exogenous, positive or negative, and whether those changes become self-fuelling. High sensitivity is an important part of many agricultural ecosystems, and the aim of development innovations is often to enhance their sensitivity, for example by creating conditions under which crops can use irrigation water and fertiliser more effectively. But high sensitivity also means a capacity for rapid degradation, triggered by a small initial change. In food security terms, high productivity livelihood systems can be vulnerable, because of their susceptibility to rapid change. However, because of their ability to respond positively to innovation they can often generate rapid economic surpluses, which can be channelled into food security mechanisms, including stores of food or wealth, and insurance.

Resilient systems, on the other hand, tend to absorb change without serious modification; they revert easily to their previous state, and are not easily shifted, for example to new levels of productivity. However, resilient systems are not easily destroyed, maintaining themselves by a range of strategies; they adapt to threats, often not by attempting to maintain a population *in situ* at previous levels of consumption, but by movement, migration. In resilient livelihood systems, human populations adapt

to variable resources with great flexibility, exploiting a wide range of environments and economic possibilities.

Paradoxically, fragility and vulnerability in human livelihood systems, are often associated with resilience, a quality which ensures persistence and sustainability. Mortimore (1989) describes "uncertainty-as-norm" as the normal state of the dry areas of west Africa, contrasting it with "uncertainty-as-aberration." Farmers and herders sustain themselves in these difficult environments through resilience in their ecological, economic, social and political systems. This is not achieved by a well-protected stability in production or exchange of the sort that is achieved elsewhere by secure irrigation systems or interventionist markets, but by what Mortimore calls "resilient instability:" an ability to adapt rapidly to very adverse conditions, such as droughts, by mobility, population movement, changing economic strategies, and social and political networks. In the driest areas, the desert edge, where variability and risk were greatest, geographical and occupational mobility were also greatest. When a major drought struck, local livelihood systems responded with great flexibility, the economy tracking the downturn in the ecology by contraction, sloughing off people to other production systems and other places where the drought was less severe, activating wide geographic and political networks of support; when the environment improved again, these changes were reversed. The livelihood system was not stable or in equilibrium; on the contrary its great resilience depended on the possibility of large and sometimes sudden changes in economic activities, behaviours and expectations.

This suggests that in pursuing food security, households have to strike a balance between two types of strategy. The first is the defence of the *status quo*, and consists of all those behaviours which seek to maintain current consumption and current economic and social norms. Efforts to make production more secure against environmental variations such as drought, the many types of food storage, food sharing, insurance, risk-spreading, the networks of social and political ties — friendship, kinship, political alliances or dependence — all contribute to this end. But the cost of such strategies is often high, and rises very rapidly indeed in certain circumstances, to the point at which they become exhausted.

At such moments, a second type of strategy may be engaged. Efforts to defend existing consumption patterns in the familiar ways are abandoned, and rapid changes take place. The goal becomes one of more nearly adapting the livelihood system to the extremely reduced circumstances of the moment, of "battening down the hatches," in ways which preserve its ability to recover rapidly when the crisis has ended. A key component of such a strategy is for example to preserve productive assets such as livestock for the recovery, as de Waal (1989) recorded in Darfur in 1984, even at the cost of food consumption levels reduced to the point of greatly increased risk of mortality. Occupational mobility is another key response, with people leaving farming or herding for other occupations. Households may break up at this point, and new groupings emerge as women, children and old people move to refugee camps or settlements where there is a hope of neighbourly charity or relief, while young men

migrate long distances in search of work; a few young men may stay behind to look after the remaining assets, especially livestock, of a village or kinship group, grouped into a single unit.

Although this may often seem to be less a rational strategy than the break up of a livelihood system, in fact such types of behaviour may allow the survival of most household members and the rapid reconstitution of a livelihood system when the worst of the crisis has passed.

Sustainability of livelihood systems, and of the food security of their members, is in practice most often achieved by a combination of such defence strategies as food storage and sharing, and resilience in the economic and social system, which allows the system itself to contract and expand in response to variations in resource availability and external shocks. Interventions to reinforce food security should seek to strengthen both types of strategy, although rather different types of intervention are needed. Most contemporary intervention policies are aimed at supporting the defence strategies of food insecure households, and more thought is needed about ways to bolster resilience.

Three general points may be made about supporting resilience. First, the geographic scale and livelihood system scope of plans to reinforce resilience may have to be unusually large: as risks increase, the size of the geographic area or the economic networks needed to offer livelihood flexibility also increases. Interventions in favour of food security should make it easier for people to move and to activate such networks.

Second, a resilience strategy draws attention to the importance of the recovery phase after a crisis. Resilience is usually achieved by surviving the crisis with enough resources to take rapid advantage of post-crisis ecological and economic potentials. Governments and donors can assist in this process by packages of measures to support rural people's own resilience strategies, notably guaranteeing secure access rights to resources, and to productive capital such as livestock and farm inputs such as seed and equipment.

Last, household livelihood security depends in large part on strategies, networks and collective action at levels above that of the household. The household food security literature is curiously silent about this, its analysis usually jumping straight from the household to the nation, or at best to some large sub-national geographic region. However the most useful livelihood strategies, whether for defence or resilience in the way these terms have been used in this section, depend crucially on the way household actions are coordinated within wider social and economic frameworks. This is especially true of resilience strategies, where units of social organisation above the household often play a crucial role. Policies to improve food or livelihood security at household level should recognise this role of community organisation, and seek to strengthen it.

Perceptions and Cultural Acceptability

In a previous section, we have argued that the core concepts of access, entitlement and risk have to be modified to take account of individual and household livelihood strategies: because food is only one of many priorities people pursue, their attitude to food and the relative priority they accord it become important factors. We need now to expand on that idea. This can be done in four steps.

The first step is to reiterate the spurious precision of most definitions of food security in terms of levels of food, or, more usually, calorie intake. Estimates of calorie requirements for average adults and children with average activity patterns in average years are subject to constant revision (Payne 1990). But, in addition, the calorie requirements of individuals vary with season, year, activity pattern and adaptation strategy (Payne and Lipton 1990). Some writers on food security avoid reference to specific calorie levels by referring boldly but ambiguously to "target levels of (food) consumption" (Siamwalla and Valdes 1980, Roumasset 1982, Malambo 1988) or "food supply at an acceptable level" (McIntire 1981).

The second step extends the conventional concern with technical food quality (EC 1988, Mudimu 1988, Bryceson 1990) into a broader emphasis on consistency with local food habits (Oomen 1988) and "cultural acceptability" (Oshaug 1985, Eide et al 1985, 1986, Teller et al 1991). Oshaug, in particular, explores the cultural importance of food as vehicle for self-realisation, communication and the maintenance of social relations. He argues that

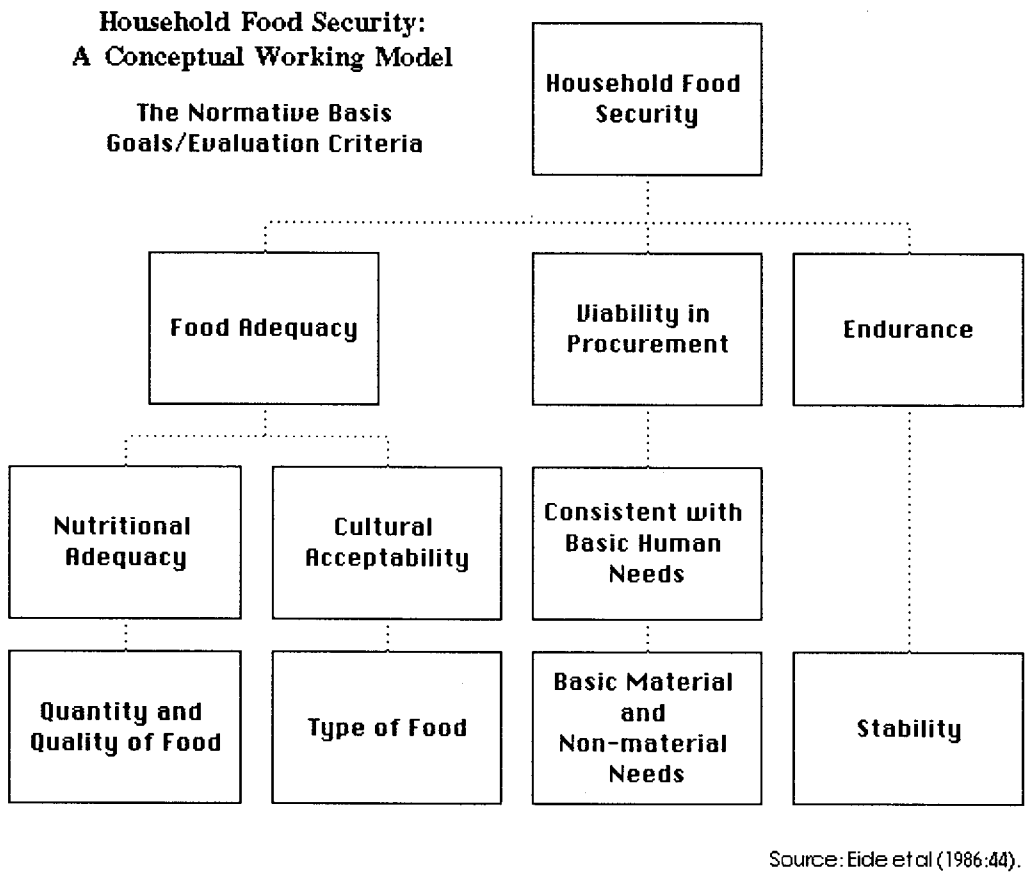
> efforts to direct changes in food patterns for optimal nutritional conditions should always take the indigenous food culture and food production pattern of a society as a starting point. The aim should be to involve people and their traditions rather than debase them through forcing them to eat food that is culturally unacceptable (ibid:5-9,10).

The implication of these arguments is that nutritional adequacy is a necessary but not sufficient condition for food security: cultural acceptability is also required (Eide et al 1985:9-2).

A third step in the argument is also introduced by Oshaug. He presents the dimension of "human dignity" as a further condition of food security, suggesting that it depends on (a) self-respect, (b) freedom of choice and action and (c) mutually beneficial exchange (Oshaug 1985: 5-10). This led Eide et al (1986) to conclude that viable procurement of food must be consistent with the satisfaction of other basic material and non-material needs (Tilakaratna 1986). They link food adequacy with viable food procurement and sustainable supply in a "normative" model of household food security, reproduced in Figure 1.12.

Similar ideas are used by others with a greater interest in national level food security, but have relevance also to the household level. Thus, Barraclough uses a different

Figure 1.12



Source: Eide et al (1986:44).

terminology to capture some of the same ideas, arguing that food systems offering food security should, inter alia, offer maximum "autonomy and self-determination," reducing vulnerability to international market fluctuations and external political pressures (Barraclough and Utting ibid:2, see also Barraclough and Scott 1988, Barraclough 1991). Similarly, Africa Leadership Forum (1989) refer to reduced dependence (in their case on imports and food aid) as a component of food security.

The final step in the argument develops these ideas to focus more directly on the perceptions and actions of the food insecure themselves. Leslie and Rankine (1987:1) refer to "wise food choices and desirable nutrition practices" as a component of household food security; and Scott (1987:355) writes that "food security for the majority implies broad popular participation by the majority . . .." Pinstrup-Andersen (1983) distinguishes between the availability of food, the ability of the household to obtain food, the desire of the household to obtain food and the intra-household distribution of food.

These ideas are developed by Maxwell (1988, 1989, 1991) who makes them central to a definition of food security:

> A country and people are food secure when their food system operates in such a way as to remove the fear that there will not be enough to eat. In particular, food security will be achieved when the poor and vulnerable, particularly women and children and those living in marginal areas, have secure access to the food they want (Maxwell 1988:10, emphasis added).

People's own perceptions of food needs is here the defining characteristic of food security.

Taken together, these ideas suggest two important modifications to the core concepts discussed in Section II. The first is that it is not just the quantity of food entitlement that matters, but also the "quality of entitlement." Thus, the highest state of food security requires not just secure and stable access to a sufficient quantity of food, but also access to food that is nutritionally of adequate quality, culturally acceptable, procured without any loss of dignity and self-determination, and consistent with the realisation of other basic needs. This transforms food security from a uni-dimensional to a multi-dimensional objective and immediately raises problems of measurement. How are these different objectives to be measured and weighted? And are there trade-offs between them? For example, how is an increase in the quantity of entitlement for people at different levels of existing access to food, to be traded-off against loss of quality? Presumably, loss of quality becomes a progressively more important consideration as quantity increases above bare subsistence.

The balance between quantity and quality cannot be decided without reference to food insecure people themselves, and the second modification is precisely to give greater weight in definitions of household food security to the perceptions of the food insecure. In this view, food insecurity is not an objectively defined level of access to food or quality thereof, but rather the level or quality that people perceive to be inadequate. Again, there are obvious implications for measurement. In India, for example, subjective questions have been included in the National Sample Survey to ask whether respondents consider their food intake adequate (Minhas 1990, reported in Gillespie and Mason 1991:31).

It is perhaps worth noting that this tension between quantitative and qualitative models is found also in current discussions about poverty. On the one hand, "poverty" is defined and measured as the shortfall from an objectively determined level of income or consumption (Lipton 1983, World Bank 1990, 1991). On the other, it is conceptualised as a multi-faceted mix of economic and social factors (Chambers 1988). Chambers, in particular, warns against a "bias to the measurable" and argues that "poverty-line thinking, with its single-scale numerical definition of poverty according to reported levels of income or consumption, misses much and can mislead" (ibid:29).

Efficiency and Cost-Effectiveness

The issues of efficiency and cost-effectiveness are absent from most of the literature on household food security, implicit in part and explicit in only a small proportion. However, they deserve greater prominence, because of the implications for resource allocation by households and external agencies.

The implicit discussion is found in the many references in the literature to "sustainability," reviewed in the section "*Sustainability, Resilience and Sensitivity.*" Sustainability can be technical, financial, political or environmental and implies some attention to efficiency and cost-effectiveness.

Explicitly, efficiency issues are most often raised in connection with national food security. Thus Balaam (1986) discusses the "food security-efficiency dilemma" largely in terms of the debate about national self-sufficiency versus import dependence; and Davies and Witter (1986:1) suggest that food security implies "an efficient distribution system for both imports and domestic production." FAO (1991:1) makes a similar point: "it is necessary to have an efficient distribution system, including processing, storage, transportation and marketing."

More generally, Badiane (1988) argues that food security can exist in the form of excessive costs incurred by the economy to ensure food availability; and Kennes (1990:67) argues that a necessary condition for achieving food security is that resources be "used well."

The strongest statement on this subject is by Maxwell (1988), who argues that "food security requires the efficient and equitable operation of the food system." He defines a food system as "the combination of agro-ecological and socio-economic processes which determine the production, marketing and consumption of food" and goes on to define "efficient" and "equitable:"

> "Efficient" means that all stages in the food chain, from production to final consumption, should be efficient in a social welfare sense. Production policies should take account of dynamic comparative advantage; marketing margins should provide no more than normal profits in the long term; and consumer prices should reflect real scarcity values. "Equitable" means that the benefits of production should be equally distributed and that food should be available to all (Maxwell 1988)[12].

This formulation begs a number of questions: about possible trade-offs between efficiency and equity; about the efficiency of marketing systems; and about how to manage consumer subsidies without distorting prices. However, it raises two important questions for household food security. Should efficiency issues form part of a conceptual model? And, if so, what are the implications for household decision-taking?

On the first question, it is clearly possible to argue that efficiency is no more than a second-order objective, so that it is desirable to be efficiently food secure but possible to be inefficiently food secure, that is food secure only at unreasonably high cost. In a conceptual model focusing on vulnerability, risk and insurance, inefficiency would arise if the risk premium paid for "food security" (for example in the form of non-productive assets easily translatable into cash to buy food) exceeded the "expected benefit." The expected benefit, in turn, would depend on the likelihood of food insecurity occurring and the expected cost: for example the likelihood of not being able to produce sufficient food.

On the other hand, the case for making efficiency central to food security is that it (a) increases the chances of sustainability and (b) focuses on questions of resource allocation. Since food security planning is principally concerned with this latter question, it seems sensible to include it.

In dealing with national food security, efficiency issues arise in connection with the debates about: growth versus equity trade offs in national development strategies; food self-sufficiency versus trade; liberalisation of cereal markets; the design of targeted consumer subsidies; and many others.[13]

The essential elements of national food security are availability of food supplies, stability in those supplies, and access to supplies on the part of all members of society. Efficient economic growth will help to ensure the supply of food, either from domestic agricultural production or through external trade and imports. Growth, however, may by-pass households whose incomes are already insufficient for meeting food needs, for example, those households, often female-headed, with an absolute labour shortage. Here, a package of food and nutrition interventions will be required, preferably targeted or self-targeted on the poor and financed by taxing the non-poor (Pinstrup-Andersen 1988).

At the household level, efficiency issues arise in production and in distribution. As far as production is concerned, risk is central. Households may incur additional costs for two reasons. First, missing savings and loan markets may induce households to invest in unproductive liquid assets, storage, and other activities for smoothing consumption, which are costly. Secondly, the absence of insurance markets for spreading risks means households must bear the full brunt of production variability. This leads them to attach a higher priority to reducing variability in household income rather than maximising expected income; in other words, they accept lower average incomes in exchange for stability. As a consequence, all production decisions are, in principle, assessed partly in terms of the extent to which they increase/reduce the risk faced by the household thereby, leading to underinvestment in risk-prone activities at the expense of higher long-run incomes. Thus a situation may arise in which inefficient production ensures secure access to food.

When it comes to distribution, the issue is more complicated. In household economics, the question of intra-household distribution and the inadequacy of an undifferentiated

utility function has generated a large literature (see the section *Intra-Household Issues*). Distribution is now seen to result less from the application of economic principles and more from the outcome of bargaining within the household. Furthermore, production and consumption decisions are closely intertwined.

There are several consequences for food security, explored in more detail in the section "*Inter-Household Issues.*" Even if we assume that the household can be treated as a single unit which maximises a joint utility function and allocates consumption resources accordingly, the pattern of consumption which emerges may be efficient, but impose high welfare costs on some individuals. For example, it may be efficient to allocate food resources to household members with the highest marginal value product of labour because it increases the aggregate income of the household. However, the functional and psychological costs borne by other members as a consequence of this skewed distribution may be very high (Gross and Underwood 1971). In addition, when we relax the assumption of the household as a single consumer, we introduce the possibility that decisions emerge as the result of conflict and bargaining across generations and gender. Thus, the incentive for household members to participate in production activities which maximise household income are weakened when the benefits from higher income are not shared.

The implications of all this for household food security would seem to be as follows: (a) efficiency is a legitimate objective to pursue, especially with regard to production decisions. Higher income at national and household levels creates resources for use in food security. In addition, sustained growth may raise households sufficiently above minimum thresholds so as to eliminate the risk of inadequate access to food. However, (b) efficiency considerations will be modified by others, especially risk avoidance and entitlement protection, and again at both national and household levels. In these cases, the objective will be to reach multiple goals in a cost-effective way. Furthermore, (c) in practice, both production and distribution decisions by households will reflect a process of bargaining between different household members with different interests and different views of cost-effectiveness.

Household Food Security and Human Rights

A final discussion concerns food security and human rights. Few human rights have been referred to as often as the right to food. In this section we review existing formulations of the right to food in international law and indicators that might be used to monitor whether this right has been implemented. The topic has particular importance because of the increasing role of conflict as a source of food insecurity. (Messer 1990)

The Universal Declaration of Human Rights adopted by the General Assembly of the United Nations in 1948 recognised economic, social, and cultural rights in articles 22 to 27. In the words of Article 25, the right to an adequate standard of living includes:

> food, clothing, housing and medical care and necessary social services, and the right to security in the event of unemployment, sickness, disability, widowhood, old age or other lack of livelihood... *(United Nations 1948).*

The right to food is more explicitly elaborated in the International Covenant On Economic, Social, and Cultural Rights which was adopted by the UN General Assembly in 1966. The Covenant was ratified or acceded to by nearly one hundred nations by 1987. Article 11 of the Covenant enshrines the right to food in the following manner:

> The States parties to the present Covenant, recognising the fundamental right of everyone to be free from hunger, shall take, individually, and through international cooperation, the measures, including specific programmes, which are needed:
>
> (a) To improve methods of production, conservation, and distribution of food...
> (b) ... to ensure an equitable distribution of world food supplies in relation to need. *(United Nations 1966)*

In addition to these provisions of the Universal Declaration and the International Covenant, the concern of the world community for the right to food was reaffirmed by the World Food Conference in 1974 which adopted the Universal Declaration on the Eradication of Hunger and Malnutrition. Endorsed by the General Assembly in the same year, the first paragraph of the Declaration proclaims:

> Every man, woman and child has the inalienable right to be free from hunger and malnutrition in order to develop fully and maintain their physical and mental faculties. *(United Nations 1974)*

Despite these legal commitments, little effort has been made to elaborate the content and the duties corresponding to these provisions. This neglect stands in stark contrast to the efforts of the international community with respect to civil and political rights (Van Hoof 1984 and Saksena 1991). In addition, there has been an ongoing debate about the legitimacy of economic and social rights, of which food is one. Thus, Cranston (1962) concludes that such rights are invalid because, although they may pass the test of "paramount importance," they are impractical. He argues that civil and political rights require governments merely to enact legislation whereas social and economic rights require access to "great wealth." Raphael (1967) accepts the validity of such rights but argues that they are only weak universal rights, leaving responsibility for their implementation with individual governments. Shue (1980) concludes that economic rights are basic, human rights because the absence of economic subsistence precludes the enjoyment of any other right.

However, when we confront the role of governments, the distinction between civil and political rights and economic and social rights can be said to dissolve. The work of

van Hoof (1984), Alston and Eide (1984), Eide (1989) and Eide et al (1991) has resulted in a typology of responsibilities for the state, the state being required to (a) respect, (b) protect and (c) to fulfil human rights. Once it is recognised that these obligations are applicable in respect of both categories of rights, the alleged distinction disappears.

These obligations can be correlated with the right to food. The obligation to respect requires the state not to do anything which will weaken the ability of individuals to provide for their own needs. This issue has far reaching significance during periods of conflict, for it is during such periods that the realisation of this right is so frequently hampered. The state or its agents can undermine the ability of individuals to self-provide by appropriation and destruction of the individual's resource base and by establishing controls which displace individuals from alternative systems of food acquisition.

The obligation to protect implies a duty on the part of the state to protect individuals from being deprived of their means of livelihood. The use of such resources may be invested in the individual through ownership or because of membership of a particular kinship or community. The state has a responsibility to ensure that rights to resources, whether or not they are protected by laws of ownership, are not threatened. In consequence, it has a duty to safeguard the interests of its citizens in common property resources; for example, in the physical environment. Eide (1989) has further argued that the duty to protect extends to enacting legislation which protects consumers from harmful food products or prohibits the promotion of food practices detrimental to the well being of the community.

The obligation to fulfil requires the state to provide assistance for members of society unable to meet their own food needs. Indeed, this obligation is implicit in Article 25 of the Universal Declaration quoted above. The duty to fulfil transcends periods of conflict or other emergencies. Thus if a state does nothing to avert a famine, it is violating its duty to provide.

Following a similar line of approach, Tomasevski (1984) argues that the norm for a human right to food can be established with respect to three levels of attainment. At the lowest level, "freedom from hunger" regards widespread starvation as a failure of a fundamental human right. Monitoring this standard requires the identification of the incidence of severe under-nutrition. On the next rung of the ladder, the "right to food" reflects the quantity and quality of food consumed by individuals. The "full-fledged" norm encompasses the entire range of human rights by recognising that the right to material wants cannot be bought at the cost of other freedoms. Thus proposed indicators of this standard require the evaluation of both material needs and political freedoms. The tripartite division allows for the progressive realization of the right to food while adhering to the notion of a universal set of criteria for its satisfaction. Thus a universally applicable minimum standard is established which, nevertheless, recognizes the limitations of resources in determining what is immediately achievable.

Putting the various lines of analysis together, Figure 1.13 summarises possible obligations for realising the right to food. It defines a framework of state action within which individuals and households can pursue their own food security.

Figure 1.13

Obligations for Realising the Right to Food

Type of Obligation	Questions to be asked
To Respect	1. Is the state a signatory to international treaties on human rights? 2. Is the right to food recognised in national development plans? 3. Has the state enacted legislation which recognises the significance of existing patterns of food acquisition? 4. Does the state recognise the role of NGO institutions in crisis management?
To Protect	1. Has legislation been enacted which will protect individuals' access to food or resources for producing food? 2. Does legislation recognise traditional systems of resource distribution? 3. Does the state protect the common physical environment against degradation? 4. Does the state monitor the introduction of new food sources and new habits, and does it disseminate information on these issues? 5. Has national legislation on food safety been enacted?
To Fulfil	1. Has a nationwide system of monitoring been established? 2. Have policies been designed and executed which provide assistance to those individuals in need? 3. Has a nationwide system of food control and inspection been implemented? 4. Have plans and programmes been established which support existing institutions for crisis management?

Source: Adapted from Tomasevski (1984), Eide 1989 and Eide et al (1991).

Taking food security into consideration with human rights requires (a) that the human rights community recognizes the validity of economic and social rights, (b) that international efforts to develop supervisory mechanisms in respect of these rights be intensified, (c) that states draw up frameworks for the monitoring of their own efforts along the lines suggested in the table, and (d) that the international community provides assistance to households and states who are unable to realize this right through their own efforts.

Summary of Conceptual Issues

It is apparent from this discussion that the concept of household food security draws on and interacts with literatures in many other sectors. We began with a discussion of the four core concepts implicit in the formulation "secure access to enough food all the time." This generated four main conclusions:

i. First, "enough" food is mostly defined in the food security literature at the individual rather than household level, with the emphasis on calories, and requirements defined in terms of calories needed for an active, healthy life rather than simple survival — although this assessment may in the end be subjective.

ii. Secondly, access to food is determined by food entitlements, which are derived from human and physical capital, assets and stores, access to common property resources and a variety of social contracts at household, community and state level.

iii. Thirdly, the risk of entitlement failure determines the level of vulnerability and hence the level of food insecurity, with risk being greater, the higher the share of resources normally devoted to food acquisition.

iv. And finally, food insecurity can exist on a permanent basis (chronic), on a temporary basis (transitory) or in cycles.

From the additional material discussed in this section, the following twelve further conclusions may be drawn:

v. With regard to the household, it is misleading to assume that household members share common preferences with regard to (a) the allocation of resources for income generation and food acquisition or (b) the distribution of income and food within the household.

vi. Furthermore, households cannot be analysed as discrete entities with respect to food behaviour, independently of other households and wider social/political institutions.

vii. It follows that food security shocks (work, output, food, asset, AIDS) will affect different kinds of household and members of individual households in different ways.

viii. With regard to nutrition, food security is a necessary but not sufficient condition for adequate nutritional status, which may also be affected by caring capacity, health and environmental conditions, as well (where stunting is present) as past nutritional history.

ix. In considering nutrition, more attention needs to be paid to diet quality, especially micro-nutrients, and within this category to Vitamin A, iron and iodine.

x. The relationship between nutritional stress and nutritional outcome is also modified by the adaptation strategies of individuals and households, which may be genetic, physiological or, most importantly, behavioural.

xi. A similar conclusion is reached by examining livelihood strategies. Food insecure groups balance competing needs for asset preservation, income generation and present and future food supplies in complex ways: people may go hungry, up to a point, to meet some other objective.

xii. It follows that the priority is to understand livelihood and coping strategies, how people gain access to food rather than how they fail to do so.

xiii. The analysis of livelihood strategies can be extended by drawing on ecological analysis, where the core concepts are sensitivity and resilience: the most vulnerable systems are high in sensitivity but low in resilience. Vulnerable human livelihood systems are often best understood as highly resilient and adaptable, in situations where uncertainty is the norm. Interventions should support this flexibility.

xiv. It follows from much of the above that a new priority also needs to be accorded to people's own perceptions of food security and insecurity, in order to remove the fear that there will not be enough to eat and provide food with human dignity and in a culturally acceptable way. This can be described in terms of the quality of food entitlement.

xv. Whatever people's own perceptions, issues of efficiency and cost-effectiveness arise at national and household level. Efficiency is a legitimate objective to pursue, especially with regard to production decisions; but it may need to be modified by others, especially with regard to risk avoidance and entitlement protection; and will in any case be subject to bargaining between individuals with different interests.

xvi. Finally, the right to food imposes obligations on states to respect, protect and fulfil food security.

We turn in section IV to the task of synthesizing general conclusions from these findings.

IV. Conclusion

The development of the concept of food security since the 1970s can best be characterised as vigorous. The concept was launched at that time with a relatively clear focus on national and international food supply. In the past twenty years, it has gradually acquired new dimensions and new levels of analysis. In the 1990s, the main focus is on questions of access to food by households and individuals. Here, as the review has shown, there coexist a bewildering number of paradigms and points of view. There are, however, common themes which cut across the discussions on intra-household bargaining, nutrition adaptation, livelihood security, ecological resilience and questions of culture and perception.

The first theme is substantive. It is that food insecure people implement highly complex livelihood strategies in which food security plays an important but not always predominant role. The key words are flexibility, adaptability, diversification and resilience. Perceptions matter as much as objective reality. Intra-household issues are central.

The second theme follows. Food security can no longer be considered uni-dimensional, but must be treated as a multi-objective phenomenon. This is necessarily true if all the many definitions reviewed in these pages are to be valid simultaneously, which would not be impossible. It is even true, however, if the definition is reduced to its simplest: the core definition "secure access to enough food at all times" already implies multiple objectives, including most obviously present and future access to food.

In practice, the simplest definition has been shown to be incomplete, precisely because it oversimplifies: intra-household issues are ignored, the relationship of food security to livelihood security is not explored and many questions of sustainability, cultural acceptability and self-perceived security are left out of account. One way to demonstrate the gaps is to gather together the key words used by different authors to define household food security. This is done in Figure 1.14.

It is probably not useful to construct a new definition of food security which encompasses all these ideas. A more important point to make is that there will inevitably be trade-offs between different objectives in food security. For example, it may be possible for a household to increase the current supply of food, but only at the cost of increasing vulnerability in the future, perhaps by over-exploiting the natural resource base or certain family members. Alternatively, the quantity of food available may increase, but at the cost of a reduced quality of entitlement, for example through increased dependence on the state or on powerful groups within a community.

The problem of multiple objectives is already familiar from food security planning, where interventions may be judged not only by cost-effectiveness, but also by scale, speed, compatibility with government policy, administrative feasibility and sustainability (Maxwell 1990:6). Multi-criteria tables, which allow for differential weighting of different objectives, have been used to rank alternative interventions

Figure 1.14

Key Words in Definitions of Household Food security

- Present security
- Future security
- Perceived security
- Buffered against risks
- Entitlement
- Culturally acceptable
- Procured with dignity
- Cost-effective
- Efficient
- Resilient
- Sustainable
- Consistent with livelihood strategy
- Equitably distributed within the household
- A diet adequate in quality
- Adaptable to uncertainty
- Rights respected, protected and fulfilled by the state

(Huddleston 1990). Perhaps a similar approach is needed to help establish the key defining characteristics and priorities for intervention in household food security in particular contexts. This will enable models to avoid reductionism and exploit the complexity and diversity of the concept.

A third theme follows from this. It is that the precise combination of objectives and their relative weighting will depend on context and cannot be imposed from outside. Concepts of food security need to be "people-driven." Different people can be expected to have different sets of priorities; and individual priorities will change over time, not least in response to changes in other components of livelihood strategy. For example, the development of a community or state-sponsored safety-net to protect food entitlements may change the relative importance individuals attach to risk-minimising production strategies within the household.

There are implications here for both policy and information collection. As far as policy is concerned, the emphasis on complexity and diversity would seem to militate against highly administered or centralised food security interventions, in favour of those which food insecure people themselves can activate as needed. This may mean opting for self-targeting interventions, like free-access work sites at wages slightly below the market rate, where people choose whether or not to participate. Alternatively, it may mean large-scale decentralisation to community-based schemes, like community nutrition programmes. In either case, the emphasis is on choice by individuals and flexible support by the state, to protect and promote food security.

As far as information is concerned, participative and multi-objective models of food insecurity present major problems in defining indicators, especially indicators which are reasonably stable over time. It is apparent that many conventional indicators — national food production or availability, anthropometric data, even current income and food consumption — may give a poor picture of food security in its new and wider sense.

Davies et al (1991:53ff) address this problem in the context of early warning. They review the wide scope of information needed for accurate and timely early warning of food crises and conclude that a "learning process approach" may be necessary, focusing on local monitoring systems and making use of data collected by rapid and participatory rural appraisal as well as more traditional methods. Nevertheless, data still need to be aggregated at national and international levels to ensure resources are made available for interventions.

A final point to make is that the new and more multi-faceted models of household food security represent an important advance over earlier uni-dimensional concepts. They complicate data collection and probably complicate policy. But they also reflect more accurately the complex and diverse lives of the food insecure themselves; and in so doing are more likely to have a positive effect.

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Appendix

Definitions of Food Security and Insecurity, 1975-1991

1. "Availability at all times of adequate world supplies of basic food-stuffs . . ., to sustain a steady expansion of food consumption . . . and to offset fluctuations in production and prices" (UN 1975)

2. "A condition in which the probability of a country's citizens falling below a minimal level of food consumption is low" (Reutlinger and Knapp 1980)

3. "The ability to meet target levels of consumption on a yearly basis" (Siamwalla and Valdes 1980)

4. "Everyone has enough to eat at any time — enough for life, health and growth of the young, and for productive effort" (Kracht 1981)

5. "The certain ability to finance needed imports to meet immediate targets for consumption levels" (Valdes and Konandreas 1981)

6. "Freedom from food deprivation for all of the world's people all of the time" (Reutlinger 1982)

7. "Ensuring that all people at all times have both physical and economic access to the basic food they need" (FAO 1983)

8. "The stabilisation of access, or of proportionate shortfalls in access, to calories by a population" (Heald and Lipton 1984)

9. "A basket of food, nutritionally adequate, culturally acceptable, procured in keeping with human dignity and enduring over time" (Oshaug 1985 in Eide et al 1985)

10. "Access by all people at all times to enough food for an active and healthy life" (Reutlinger 1985)

11. "Access by all people at all times to enough food for an active, healthy life" (World Bank 1986)

12. "Always having enough to eat" (Zipperer 1987)

13. "An assured supply and distribution of food for all social groups and individuals adequate in quality and quantity to meet their nutritional needs" (Barraclough and Utting 1987)

14. "Both physical and economic access to food for all citizens over both the short and the long run" (Falcon et al 1987)

15. "A country and people are food secure when their food system operates efficiently in such a way as to remove the fear that there will not be enough to eat" (Maxwell 1988)

16. "Adequate food available to all people on a regular basis" (UN World Food Council 1988)

17. "Adequate access to enough food to supply the energy needed for all family members to live healthy, active and productive lives" (Sahn 1989)

18. "Consumption of less than 80% of WHO average required daily caloric intake" (Reardon and Matlon 1989)

19. "The ability . . . to satisfy adequately food consumption needs for a normal and healthy life at all times" (Sarris 1989)

20. "Access to adequate food by and for households over time" (Eide 1990)

21. "Food insecurity exists when members of a household have an inadequate diet for part or all of the year or face the possibility of an inadequate diet in the future" (Phillips and Taylor 1990)

22. "The ability . . . to assure, on a long term basis, that the food system provides the total population access to a timely, reliable and nutritionally adequate supply of food" (Staatz 1990)

23. "The absence of hunger and malnutrition" (Kennes 1990)

24. "The assurance of food to meet needs throughout every season of the year" (UNICEF 1990)

25. "The inability . . . to purchase sufficient quantities of food from existing supplies" (Mellor 1990)

26. "The self-perceived ability of household members to provision themselves with adequate food through whatever means" (Gillespie and Mason 1991)

27. "(Low) risk of on-going lack of access by people to the food they need to lead healthy lives" (Von Braun 1991)

28. "A situation in which all individuals in a population possess the resources to assure access to enough food for an active and healthy life" (Weber and Jayne 1991)

29. "Access to food, adequate in quantity and quality, to fulfil all nutritional requirements for all household members throughout the year" (Jonsson and Toole 1991)

30. "Access to the food needed for a healthy life for all its members and . . . not at undue risk of losing such access" (ACC/SCN 1991)

31. "Enough food available to ensure a minimum necessary intake by all members" (Alamgir and Arora 1991)

32. "The viability of the household as a productive and reproductive unit (not) threatened by food shortage" (Frankenberger and Goldstein 1991)

Notes

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1. The literature on food security has expanded considerably during the last 10 years. Likewise, policy statements and corresponding agency guidelines have been developed by numerous international organizations. The annotated bibliography contained in Section 3 identifies most of the publications, outlining the different conceptual approaches developed. Some key publications in chronological order are the following: CIDA (1989); EC (1988); FAO (1983, 1988); Hindle (1990); Huddleston (1990); Hutchinson and Frankenberger (1992); Kennes (1990); Phillips (1991); Phillips and Taylor (1992); Smith et al (1992); von Braun (1992); World Bank (1986, 1988).

2. Cornia et al (1984), Hindle (1990).

3. Joy (1973), Berg and Austin (1984).

4. Sen (1981), Drèze and Sen (1989).

5. See also Payne and Lipton 1990, Payne 1990: 15ff.

6. This is a slightly different interpretation to that found in the original presentation, where it was assumed, with qualifications, that malnutrition was unlikely to be found among populations that were not poor or vulnerable (Maxwell 1985:5 and footnote 4). The new interpretation gives greater weight to care and sanitation factors. See Maxwell (1989) for an empirical illustration of the original model with data from North Sudan.

7. Conjugality refers to the marital relationship which is widely considered to be the "key" to any householding arrangement.

8. Guyer & Peters (1987) — household forms in the African context are identified in terms of (a) "overlapping memberships" where some but not all of the members of the minimal unit belong to a single all encompassing unit and (b) "nesting memberships" where each unit is totally assimilated into a larger unit.

9. For example, in the mother-child unit of a polygamous family grouping, or in the conjugal-unit of a nuclear household.

10. These are: self-actualisation needs; esteem needs; belonging and love needs; safety needs; and physiological needs (ibid).

11. Report of the Advisory Panel on Food Security, Agriculture, Forestry and Environment to the World Commission on Environment and Development, cited in Chambers (1988: 1).

12. Also published in Maxwell (ed) (1991).

13. For a review of these debates, see Maxwell (1990), von Braun (1991), Phillips et al (1992).

Part II

Indicators and Data Collection Methods for Assessing Household Food Security

Timothy R. Frankenberger

Indicators and Data Collection Methods for Assessing Household Food Security

Contents

List of Figures

Summary

The purpose of this paper is to provide an overview of the various indicators and data collection methods that have been used for assessing household food security (HFS). Much conceptual progress has been made in developing indicators due to a greater understanding of the processes that lead to food insecure situations for households. We have moved away from simplistic notions of food supply being the only cause of household food insecurity to assessing vulnerability of particular groups in terms of their access to food.

Food availability and stable access are both critical to HFS. For this reason, information should be collected on factors that play a role in limiting food availability and the options that households have for food access. A household's stable access to food will be determined by its means of procuring food (produced, purchased, gathered) and the social mechanisms that buffer households from periodic shocks. Vulnerability to food insecurity is location specific, therefore indicators are needed that measure supply and food entitlement changes at the local level.

A number of different indicators can be used for delineating HFS. These are divided into process indicators that reflect both food supply and food access, and outcome indicators which serve as proxies for food consumption. Indicators that reflect food supply include inputs and measures of agricultural production (agrometeorological data), access to natural resources, institutional development and market infrastructure, and exposure to regional conflict and its consequences. Indicators that reflect food access are the various means or strategies used by households to meet their HFS needs. These strategies will vary by region, community, social class, ethnic group, household, gender, and season. Thus, their use as indicators is location specific. Outcome indicators can be grouped into direct or indirect indicators. Direct indicators of food consumption include those that are closest to actual food consumption rather than marketing channel information or medical status (eg. household consumption surveys). Indirect indicators are generally used when direct indicators are either unavailable or too costly (in terms of time and money) to collect (eg. storage estimates, nutritional status assessments). The indicators that are used will depend upon the financial, human, institutional, and infrastructural resources available.

To date, few information systems are presently in place that adequately incorporate both food supply/production data and access/entitlement data in the same indicator set. A food supply orientation focusing on production data and nutritional status persists primarily because these data are easiest to obtain and are well suited to aggregated analysis. Few donors or governments are willing to commit the time or resources necessary to obtain information on socio-economic indicators that are sensitive to the vulnerability of different local groups. Decentralized HFS monitoring systems would be the best means of obtaining such information. Centralized HFS monitoring systems

are likely to experience more difficulties in adequately assessing the HFS status of local populations.

The information needs of different user groups will influence the selection of HFS indicators and data collection methods to be used. National governments and donors require quantitative information in a centralized system to help make informed planning and policy decisions regarding the sharing of limited resources across regions. Local governments, NGOs and local communities require qualitative, location specific information in a decentralized system to design appropriate interventions. A balance must be struck between the need for data for central decisions on the allocation of resources and a need for information appropriate for decentralized HFS monitoring and interventions.

HFS information systems can be designed to take both of these concerns into account. Using a staged process, vulnerability maps can help determine, in a cost-effective manner, where the decentralized food security monitoring systems should be located. Contingency plans can then be developed to link information to response.

For projects already established, monitoring systems should incorporate HFS process indicators as well as outcome indicators in order to detect changes in entitlements and food availability. Such changes may require modifications in the intervention mix presented by the projects in the course of the project life. Contingency plans also could allow for income transfer during stress periods to protect the asset base of the project beneficiaries.

Section I:

Indicators Used for Assessing Household Food Security

Introduction

Household Food Security (HFS) is emerging as an organizing principle for development thinking and an objective of development initiatives. To reduce and monitor food insecurity we must determine who is food insecure, why and how they became vulnerable, and where they reside? Government policy makers, donor agencies, and Non-Governmental Organizations (NGOs) have all attempted to operationalize this concept by deriving a series of indicators. Typical indicators of food consumption, for example, household calorie adequacy from recall, or more complex indicators such as income level and food expenditure, have proven to be difficult and too expensive to incorporate into on-going monitoring and evaluation systems (Haddad et al. 1991; O'Brien, Place and Frankenberger 1988). Alternative indicators have been sought which are less expensive, timely, and reliable in locating the food insecure. Consensus still has not been reached on acceptable indicators and methods of measurement (Haddad et al. 1991; University of Guelph 1991).

In the past, food security indicators have been measures of regional or national food supply or its correlate (rainfall) (Staatz et al. 1990). Many policy makers believed that supply indicators were highly correlated with indicators of household food access. Recently, however, many have begun to question the validity of commonly used indicators of food security measured at the national level as representative of indicators of access to food at the household level. The notion of food entitlement (Sen 1981) has played a critical role in this reassessment.

This section begins with an historical overview of the development of indicators used for measuring HFS. This is followed by a discussion of the various types of indicators presently used for HFS targeting and monitoring. The section concludes with a discussion of the criteria for selecting indicators and a number of issues related to their use.

Historic Overview of the Development of Indicators

One of the earliest examples of HFS monitoring comes from India. Because famine was a recurring phenomena in India, the British Administration drafted the Indian Famine Codes in 1880 (DeWaal 1989). The aim of these codes, developed on a provincial basis, was to "ensure the maintenance of efficient channels of information by means of which the approach of scarcity or famine may be detected in time and to provide for a state of preparedness in respect to measures of relief when the emergency arises." (Indian Famine Commission cited in DeWaal 1989:4; cited in Davies et al. 1991a:101). The information system relied on prices used as stress indicators as well as rainfall, agricultural production, and social indicators (e.g. credit, beggars, grain markets, crime, migration) (Davies et al. 1991a). The famine codes also outlined detailed contingency plans to ensure that information and response were intrinsically linked. Mass public works programs were devised to provide employment to the food insecure. While these famine codes did not work effectively in all provinces, they demonstrated that famine prevention involved extensive entitlement protection (Dreze and Sen 1989 cited in Davies et al 1991a:101). More recently designed food monitoring information systems have drawn their inspiration from this system, and will be discussed in greater detail in Section II (e.g. Botswana; Turkana, Kenya).

Focus on Food Supply

In Africa, the food crisis in the early 1970s stimulated a major concern on the part of the international donor community regarding supply short falls created by production failures due to drought and desert encroachment (Davies et al. 1991a:1). This primary focus on food supplies/production as the major cause of food insecurity was given credence at the 1974 World Food Conference. As a result, Early Warning Systems (EWS) were created to monitor the food supply situation for developing countries (Ibid. 1991). Indicators were developed on the basis of a food supply deficit model where the scale of the crisis could be measured at the macro (regional or national) level by shortfalls or deficits in supply of basic food stuffs in relation to aggregate population requirements (Shoham and Clay 1989). It was assumed that the crisis at the micro (individual or household) level would manifest itself in malnutrition or undernutrition (Ibid. 1989). Thus, supply deficits were translated directly into a decline in nutritional status. The strength of this food supply model in the choice of indicators in the late 1970s and early 1980s is demonstrated by the emphasis given to macro food balance sheets (45 countries in Africa) and nutrition surveillance programs (Davies et al. 1991a).

Nutritional Surveillance

Nutrition surveillance began to be established in developing countries from 1976 onward (Mason et al. 1984). Nutrition surveillance methods provided regular information about the nutrition situation in populations, relying on the nutritional status of children as the central indicator for monitoring progress. The most common use of nutrition surveillance was for health and development planning. Nutrition surveillance was also used for program management and evaluation and timely warning and intervention to alleviate epidemic inadequacies in food consumption (Ibid. 1984).

A recent assessment of the Inter-Agency Food and Nutrition (IFNS) Program (UNICEF, FAO, WHO/PAHO) has identified several problems associated with past nutrition surveillance systems. First, nutrition surveillance has had minimal impact on wider policy decisions because it has become closely identified with the health sector (Health Sector Entrapment). Second, a focus on nutritional status rather than the causes of nutritional problems has also contributed to weak impact on decision-making. Data which is more closely related to socio-economic development and economic policy is more likely to capture the interest of key government decision makers. In fact, in some countries where there has been a strong impact, there has been a focus on early warning that has encompassed other indicators in addition to nutritional status (e.g. Indonesia, Botswana). Efforts are currently ongoing to broaden the scope of nutrition surveillance programs (UNICEF 1991).

Focus on Food Entitlement: A Paradigm Shift

The food crisis that again plagued Africa in the mid-1980s was accompanied by a paradigm shift in the way famines were conceptualized. Researchers and development practitioners realized that food insecurity occurred in situations where food was available but not accessible because of an erosion of peoples entitlement to food (Borton and Shoham 1991). Sen's (1981) theory on food entitlement has had a considerable influence on this shift in thinking. Entitlement involves how much food households actually have access to from their own production, income, gathering of wild foods, community support (claims), assets, and migration. Thus, a number of socio-economic variables have an influence on a households' access to food. In addition, worsening food insecurity was viewed as an evolving process where the victims were not passive to its effects. Social anthropologists observed that vulnerable populations exhibited a sequence of responses to economic stress, giving recognition to the importance of behavioral responses and coping mechanisms in food crises (D'Sousa 1989; Campbell 1990; Flueret 1986; Corbett 1988; Watts 1983; Frankenberger 1990). For this reason, by the late 1980s, donor organizations (e.g. WFP, FAO, USAID), local governments (e.g. Ethiopia, Sudan), and NGOs (Save the Children Fund (U.K.), Sudan Red Crescent Society) began to incorporate socio-

economic indicators related to access/effective demand into their information monitoring systems.

In the wake of this paradigm shift has arisen more clarification of the concept of *vulnerability*. Chambers (1989) defines vulnerability as defenselessness, insecurity, exposure to risk, shocks and stress, and difficulty in coping with them (Borton and Shoham 1991). Vulnerability is not equal to poverty — it is not lack or want (Downing 1990). Vulnerability to food security, according to Borton and Shoham (1991), is "an aggregate measure for a given population or region of the risk of exposure to different types of shocks or disaster events and the households ability to cope with these events" (Ibid. 1991). Downing (1990) points out that an analysis of vulnerability provides us a basis for understanding HFS indicators. This understanding is enhanced by distinguishing between *baseline vulnerability* and *current vulnerability*. *Baseline vulnerability* assessments focus on the underlying factors that influence exposure to food insecurity and a household's predisposition to the consequences (Downing 1990). It provides the context for interpreting indicators of the current HFS risk. These contextual factors may encompass the food insecurity events over the previous season or years (See Figure 2.1: Household Vulnerability Assessment Matrix). *Current vulnerability* is related to the shocks overlaying the baseline (e.g. food shortages, exchange failure, institutional failure) (Borton and Shoham 1991). Vulnerability is thus a composite of the status of past and current events (Ibid. 1991) and monitoring household food insecurity requires an understanding of both the causal mechanisms of vulnerability and the current situation (Downing 1990). *Future vulnerability* can also be determined from this analysis by matching the coping responses of vulnerable households to long-term food security risks (Phillips and Taylor 1990) (See Figure 2.1). Pioneering efforts in vulnerability/risk mapping have been carried out in Bangladesh and Sudan under World Food Programme (WFP) support (See Section II). The USAID-funded Famine Early Warning Systems Project has also contributed substantially to this conceptual development.

This brief discussion has demonstrated that much conceptual progress has been made in developing indicators based on a greater understanding of the processes that lead to household food insecurity. First, we have moved away from simplistic notions of food supply being the only cause of household food insecurity to assessing vulnerability of particular groups in terms of their access to food (Davies et al. 1991a). We have come to realize that food availability and stable access are both keys to HFS. Households will have stable access to food if they have viable means for procuring food (either produced or purchased) that do not lead to environmental degradation (future vulnerability). Stable access is also influenced by local, informal social mechanisms that buffer households from periodic shocks, i.e. claims (Swift 1989a), food sharing networks, and by the local political/institutional environment (Campbell 1990). Thus, indicators for HFS must be able to measure food entitlement changes (Downing 1990).

Figure 2.1

Household Vulnerability Assessment Matrix

Risk of an Event	Ability to Cope			
Shocks/Trends	**HH Characteristics**	**Access to Resources**	**Production/Income Opportunities**	**Support Structures**
Baseline Vulnerability *Crop Production and Livestock Risks* drought episodes soil conditions pest infestations *Market Risks* market infrastructure price fluctuations (assets, food, cash crops, livestock) food shortages access to employment *Political Risks* conflict/war	composition (age dependancy ratio) education health status out migration	access to land access to labor liquid assets productive assets credit common property resources (for wild foods and other products) food stores	crop/livestock production other income sources seasonal migration	community support mechanisms (claims) NGOs government policies access to social services
Current Vulnerability *Crop Production and Livestock Risks* current drought pest attack *Market Risks* market infrastructure price fluctuations (assets, food, cash crops, livestock) food shortages access to employment *Political Risks* conflict/war	composition (age dependancy ratio) education health status outmigration	access to land access to labor liquid assets productive assets credit common property resources (wild foods and other products) food stores	crop/livestock production other income sources seasonal migration	community support mechanisms (claims) NGOs goverrnment policies access to social services
Future Vulnerability (trends) *Environmental Degradation* *Land Pressure* *Out Migration*	demographic changes	land tenure changes	employment trends	support structure changes

Second, it is important to acknowledge that conceptual models implicitly or explicitly influence our choice of indicators (Borton and York 1987). Therefore, we should make every attempt to understand the processes at work in a specific location in order to develop a model to choose the most appropriate indicators. Models that ignore the locational specificity of ecological and economic aspects are likely to select proxy indicators which are inappropriate or misinterpreted. Few agencies or researchers (with the exception of Cutler) have presented the HFS model they are using to determine the key indicators for monitoring.

Despite these conceptual advances in our understanding of HFS, few systems are presently in place that adequately incorporate both food supply/production data and access/entitlement data as part of their indicator set. The food supply orientation persists primarily because these data are the easiest to get and are well suited to aggregated analysis (Buchanan-Smith et al. 1991). To effectively use socio-economic indicators, an in-depth knowledge of the local area is needed. Few donors or governments are willing to commit the time or resources necessary to obtain these type of data, despite the fact that decentralized HFS monitoring systems hold the greatest promise for being sensitive to the vulnerabilities of different groups. It is time that the institutional capacities for HFS monitoring catch up to the conceptual development (a strategy for improving this capacity is outlined in Section II).

The following discussion describes a number of different indicators that can be used for delineating HFS. These are divided into *process indicators* that reflect both food supply and food access and *outcome indicators* which serve as proxies for food consumption. It is important to stress that the process indicators reflect some degree of vulnerability to HFS, either through availability of food supplies or access to food. Each indicator will be briefly described and assessed for its value for use in HFS monitoring. In most cases, a subset of these indicators would be used in any particular monitoring system.

Types of Indicators

Process Indicators

Indicators that Reflect Food Supply

One critical dimension of HFS is the availability of food in the area for the households to obtain. Regional food shortages have a strong influence on household food availability. A number of factors play a role in limiting food availability and the options households have for food access. Borton and Shoham (1991) classify these types of indicators as *risk of an event indicators*. These are indicators that provide

information on the likelihood of a shock or disaster event that will adversely affect HFS. They include such things as inputs and measures of agricultural production (agro-meteorological data), access to natural resources, institutional development and market infrastructure, and exposure to regional conflict or its consequences (influx of refugees). These types of indicators are not mutually exclusive of food access indicators, and considerable overlap and interaction between the two categories may exist. For example, market infrastructure and market coping responses are strongly related. Similarly, access to common property resources and reliance on gathered foods are closely linked. Distinctions are drawn here in the discussion to highlight the differences in vulnerability between availability and access. The following list of food supply indicators is not exhaustive but representative of those normally used in food monitoring systems.

Meteorological Data

Throughout the Sahel and the Horn of Africa, production is strongly influenced by climatic factors; especially rainfall (Davies et al. 1991a). Most countries monitor rainfall as part of their on-going agricultural monitoring activities so good historical data and current records of rainfall levels and variability normally exist (Borton and Shoham 1991). The availability of this data reflects the conventional emphasis on supply determinants of food security (Davis et al. 1991). From these data it should be possible to determine the probability of rainfall failure.

Rainfall is an appropriate indicator when acute food shortages result from drought. However, caution should be exercised in the way the data are used. For example, total rainfall may not correlate with yield unless distribution is taken into account (Mason et al. 1984). In addition, the start of the rainy season may vary by as much as a month in the Sahel, which may or may not adversely affect yield (Ibid. 1984).

Rainfall monitoring also has been enhanced by satellite remote sensing (FAO 1990a). FAO has been supporting the development and use of the METROSAT system for monitoring cold clouds that influence rainfall distribution (FAO 1990a). However, the establishment of remote sensing capacity in many national government monitoring systems on a sustainable basis is unlikely without donor support.

Information on Natural Resources

Agro-ecological differences across regions can contribute to substantial differences in food availability. For example, semiarid agricultural zones are likely to be more prone to fluctuations in food production due to recurrent droughts than humid zones (Downing 1990). Access to pasture resources will influence household coping responses with regards to livestock. The nature and extent of the availability of common property resources will have a strong influence on the part of rural households to buffer seasonal food shortages (Jodha 1986). The exploitation of

common property resources is particularly important for resource poor farmers for meeting HFS needs. Common property resources provide poor households with resources to meet basic subsistence needs for housing, fuel, food supplements as well as income generating activities (Campbell 1990; Haddad et al. 1991; Davies et al. 1991b). These resources are relied upon heavily during times of stress (Jodha 1986). Therefore, the degradation of common property resource and loss through the encroachment of privatized agriculture has disproportionately affected the HFS of the poor (Davies et al. 1991b). A decline in these resources may indicate regional food shortages.

Women are often more vulnerable to the effects of environmental degradation than men because they are often involved in the collection of common property resources (Davies et al. 1991b). Since women often make a greater contribution to HFS than men (Frankenberger 1985), a decline in women's access to resources may have a significant impact in the consumption status of the household (Frankenberger and Goldstein 1991).

Natural resources can be monitored by periodic visits from government staff, reporting networks established with local communities through NGOs, or satellite imagery. Vegetation monitoring has been facilitated by the NDVI (vegetation index) developed for the NOAA/AVHRR system (FAO 1990a). ARTEMIS is another environmental monitoring system being developed for this purpose. Again, the cost of maintaining these types of monitoring systems on a sustainable basis for some governments may be prohibitive without donor support (Milford 1989). They can serve a complementary role to other types of local monitoring efforts.

A special dimension of natural resources are foods which grow in the wild that in many places are gathered to form a significant part of the diet (Grivetti 1978; FAO 1989). Information is scarce about their actual significance, although it has been estimated that more than 30 percent of the total caloric intake comes from such foods for certain populations (Ogle 1991). Wild foods are often called "survival foods" by outsiders, however, the role that many of them play in the typical traditional diet should be recognized. A methodology is now being tested in some countries for assessing more precisely the degree of dependence on such foods for people in selected areas (Ogle 1991; Brinkman 1989). It should help in pinpointing the need to preserve this part of the local food base and promote its use as an explicit objective in natural resources assessment.

Agricultural Production Data

Data for crop production for the main food crops are normally collected by most countries on the basis of administrative areas (Borton and Shoham 1991). This again demonstrates the emphasis given to food supply factors as the primary determinant of food security (Davies et al. 1991a). Information is often collected on crop harvests

through crop cutting on sample plots as well as crop forecasting. Remote sensing is also being used in a number of countries to monitor crop development (FAO 1990a).

Crop production data can be used for assessing regional baseline vulnerability by calculating the average per capita food production over the previous years (Borton and Shoham 1991). One problem associated with these data is that they are rarely disaggregated by gender. A second problem with these assessments is that crop production figures for crops other than the major staple are not usually available. These alternative crops play a major role in the HFS of rural families and are often grown by women (Frankenberger 1985). In addition, crop production does not equal food access nor does it equal food consumption. Although crop cutting methods are normally used to estimate yield, a recent study in five African countries has raised the possibility that cheaper methods relying on farmer reports may be just as accurate (Verma et al. 1988). This study compared physical measurements of crop production using crop-cut methods with personal estimates of farmers (Ibid. 1988). It found farmer estimates to be remarkably close to actual production figures.

Agro-Ecological Models

To improve the accuracy of crop forecasts, considerable effort has gone into developing models that take into account access to soil and water conditions for specified crops (Davies et al. 1991a). One example of such a model is the FAO Crop Specific Soil Water Balance Model. The predictive value of such models is determined by the data input and the skill level of the people analyzing the information. In many countries, the use of such models may be inappropriate given the resources available.

Food Balance Sheets

Food balance sheets are the principle tools used for calculating national food security (Davies et al. 1991a). A twelve month food balance sheet is constructed assembling information on food supplies and disposals, usually consisting of six essential elements: opening stocks, production, and imports (supplies), domestic utilization, exports and closing stocks (disposals) (FAO 1990b). Food balance sheets are used to determine the expected food deficits or surpluses, the necessary food import requirements, and food aid requirements (Davies et al. 1991a). Presently, forty-five countries in Africa maintain food balance sheets for FAO.

One of the major criticisms of food balance sheets is that they are not usually drawn up on a disaggregated basis to detect differences across districts or regions (Davies et al. 1991a). They tell us nothing about how many people are affected by supply short falls, where, and what type of assistance is needed (Cutler 1984). If the information could be disaggregated, it would provide insights on trends for an area (Baseline vulnerability). Such supply data could provide an important complement to entitlement

information (Attwood 1992). Another weakness is that food balance sheets often under-estimate non-traded crops (e.g. cassava, yams).

Information on Pest Management

Periodic pest attacks on both plants (e.g. locust) or animals can have a devastating effect on production (Borton and Shoham 1991). Vulnerability to attacks is not only determined by the frequency of these attacks over the past several years, but also to the types of government services households have access to for response.

Information on Markets and Institutional Support Structures

The availability of and functioning of rural product, service, and factor markets is extremely important in determining HFS, especially in grain deficit areas (Staatz et al. 1990). The ability of households to obtain income to purchase grain depends upon the functioning of markets for the goods and services these households sell (Ibid. 1990). When distribution markets are vulnerable or unstable, prices tend to be volatile. These price fluctuations hit poor households hardest because they often run out of food early to meet pressing cash needs, and are forced to repurchase grain late in the season (Ibid. 1990). This is especially true for women headed households. Many coping strategies are intimately tied to the functioning of markets.

Considerable debate has arisen concerning the use of price fluctuations for stable food grains and livestock sales as indicators of approaching food crisis (Davies et al. 1991a; Seaman and Holt 1980; Cutler 1984; DeWaal 1988; Buchanan-Smith and Young 1991; Hesse 1987). What appears obvious from this debate is that a good understanding of local market conditions will enable accurate interpretation of price data. Supplemental information that is collected in addition to prices might include levels of market activity, origin of buyers and sellers, mix of goods available for purchase, and volume of exchange (Davies et al. 1991a). For example, a rise in petty trading may be a more reliable indicator of stress than price fluctuations (Cutler 1986; McCorkle 1987; Haddad et al. 1991). Likewise, the increased volume of livestock sales rather than prices may be a good indicator (Cutler 1984). Assessing the differential cultural value of animals within a given region will help improve the sensitivity of monitoring market sales of livestock (Cutler 1986).

The level of infrastructure within a region also will have a big influence on the availability of food to households. Access to all weather roads can ensure stable supply of food from other surplus regions as well as export potential for locally produced goods. Access to government social services such as credit facilities and food-for-work/cash-for-work programs also can influence food availability.

Regional Conflict and Its Consequences

Civil war and local traditional disputes over resources can lead to regional instability in markets, or result in destruction of crops and infrastructure (Downing 1990). Such conflict can drastically affect the food available for households within that region (e.g. Sudan, Angola, Liberia, Ethiopia, Mozambique) (Davies et al. 1991a). In addition, conflicts occurring in adjacent countries or regions can cause a large influx of refugees into the local area, taxing the resources that are regionally available (e.g. Malawi). In both of these cases the region is vulnerable to household food insecurity.

Discussion

Although food supply indicators can provide some useful information regarding regional trends in food availability, they are often too aggregated to detect pockets of vulnerability in a given area (Borton and York 1987). In addition, supply indicators that are valid for one region may not be valid for another (Staatz et al. 1990). For example, differences in regional agricultural production potential were not correlated with differences in household consumption in Northern Mali or Northern Burkina Faso because these areas have more diverse income sources and rely more on the market for food supply (Staatz et al. 1990; Reardon et al. 1988). However, agricultural production potential may be a better predictor in the higher rainfall zones of both countries.

These shortcomings do not mean that we should abandon all supply data in our search for indicators. What is important is understanding how people obtain access to food in relation to its potential availability. This means that food access indicators are needed that are locational specific.

Indicators that Reflect Food Access

The importance of indicators that measure food access became apparent when governments and development agencies realized that household food insecurity and famine conditions were occurring despite the availability of food. Food entitlement and effective demand of households are now seen as crucial to HFS. Socio-economic indicators are sought that represent the degree of stress being experienced by a population as economic and social conditions change and how they are responding to it. Recognizing that households are not passive to stress, a major aspect of vulnerability to HFS is the ability of the household to cope with the stress. Borton and Shoham (1991) refer to these types of indicators as *coping ability* indicators. These types of indicators provide information on the capacity of the population affected by a shock or disaster to withstand its effects (Borton and Shoham 1991).

Coping Strategies

People who live in conditions which put their main source of income at recurrent risk will develop self insurance coping strategies to minimize risks to their HFS and livelihoods (Longhurst 1986; Corbett 1988). Examples of such strategies are dispersed grazing, changes in cropping and planting practices, migration to towns in search of urban employment, increased petty commodity production, collection of wild foods, use of inter-household transfers and loans, use of credit from merchants and money lenders, migration to other rural areas for employment, rationing of current food consumption, sale of possessions (e.g. jewelry), sale of firewood and charcoal, consumption of food distributed through relief programs, sale of productive assets, breakup of the household, and distress migration (Corbett 1988 cited in Frankenberger and Goldstein 1991). Haddad et al. (1991) have provided an excellent summary of these strategies (See Annex 1). In general, coping strategies are pursued by households to ensure future income generating capacity (i.e. livelihood) rather than simply maintaining current levels of food consumption (Corbett 1988; DeWaal 1988; Haddad et al. 1991). These strategies will vary by region, community, social class, ethnic group, household, gender, age, and season (Chambers 1989; Thomas et al. 1989). *Their use as indicators is location specific.* The types of strategies employed by households also will vary depending upon the severity and duration of the potentially disruptive conditions (Thomas et al. 1989).

(1) Assets

In analyzing varieties of coping strategies, it is important to distinguish between two types of *assets* that farmers have at their disposal. Assets that represent stores of value for liquidation (liquid assets) are acquired during non-crisis years as a form of savings and self insurance; these may include small livestock or personal possessions such as jewelry (Corbett 1988; Frankenberger and Goldstein 1991). A second set of assets are those that play a key role in generating income (productive assets). These are less liquid as stores of value, and are much more costly to the farm household in their disposal. Households first will dispose of assets held as stores of value before disposing of productive assets (Corbett 1988). A households access to assets is often a good determinant of its vulnerability (Chambers 1989; Swift 1989a).

Swift (1989) also has identified *claims* as another type of asset used by households to assure their food security. Claims refer to the ability of households to activate community support mechanisms. Claims also may encompass government support mechanisms or the international donor community (Borton and Shoham 1991).

(2) Risk-Minimizing Strategies to Assure Some Level of Production

Most initial responses to actual or potential food shortages are extensions of practices conducted in some measure during normal years to adapt to rainfall variability (Longhurst 1986; Watts 1988). Traditional methods of handling risk can be divided into routine *risk-minimizing practices* and *loss management mechanisms* (Walker and Jodha 1986). Risk-minimizing practices are adjustments to production

and resource use before and during a production season. These involve such practices as diversification of resources and enterprises, and adjustments within cropping systems. Crop centered diversification can include choice of crops with varying maturation periods, different sensitivities to environmental fluctuations, and flexible end use products (Ibid. 1986). Farmers also will reduce production risks by exploiting vertical, horizontal, and temporal dimensions of the natural resource base. Vertical adjustments involve planting at different elevations in a topographical sequence. Spatial risk adjustments include planting in different micro-environments or intercropping. Temporal risk adjustments involve staggering planting times (Ibid. 1986). Adjustments also may include extension of farming to marginal areas or overuse of a particular plot; practices that can have a destructive effect on the natural environment.

(3) Loss Management Strategies

Loss management mechanisms include farmers' responses to lower-than-expected crop production caused by natural hazards (Ibid. 1986). Reductions in crop production can be compensated for through non-farm income, the sale of assets, the management of stocks and reserves, seasonal migration, and reciprocal obligations among households. Over-exploitation of certain resources (forest reserves for example) for market sale also may be part of this loss management strategy.

(4) Community Inequalities

In communities marked by landholding and income inequalities, household responses occur differentially along the lines of wealth and access to resources (Longhurst 1986; Tobert 1985). Identical climatic conditions can affect households of varied economic levels to different degrees. Seasonal shortages for some families produce famine conditions for others. Poorer households, including many women-headed households, having smaller holdings and a weaker resource base, are more vulnerable to stress than are wealthier households, and begin to suffer earlier when food shortages hit (Frankenberger and Goldstein 1990). The poor resort to early sale of livestock, pledge farms, incur debt, sell labor, and borrow grain at higher interest rates (Watts 1988). In essence, crop failures and other shocks reveal rather than cause the fragile nature of HFS among vulnerable rural families. At the same time, prosperous households buy livestock at deflated prices in conditions of oversupply, sell or lend grain to needy farmers, purchase wage labor at depressed rates, and purchase land (Watts 1988). Thus, during a food crisis, a cycle of accumulation and decapitalization can occur simultaneously within a single community, depending on the depth of the current crisis.

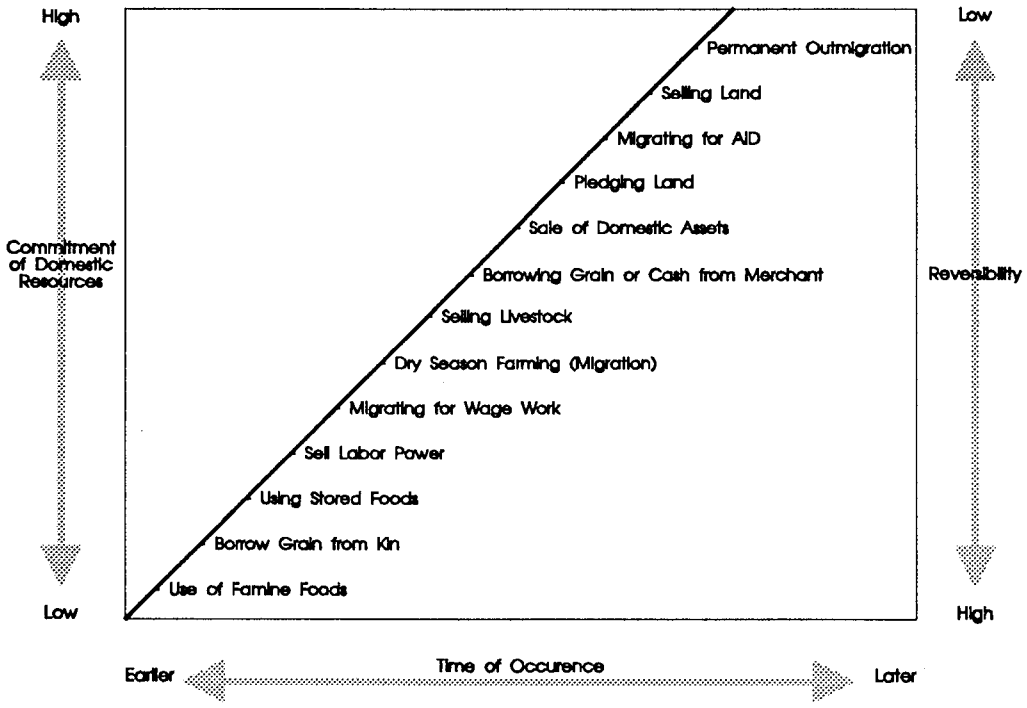
(5) Coping Strategy Patterns

Patterns of coping strategies can be diagramed to show the sequence of responses farm households typically employ when faced with a food crisis (Figure 2.2, Watts 1988). These sequences of response are most frequently divided in the literature into three distinct stages (Corbett 1988). In the earliest stages of crisis (*stage one*), households employ the types of risk-minimizing and loss-management strategies discussed above. These typically involve a low commitment of domestic resources,

enabling speedy recovery once the crisis has eased. As the crisis persists, households are increasingly forced into a greater commitment of resources just to meet subsistence needs (*stage two*). There may be a gradual disposal of key productive assets, making it harder to return to a pre-crisis state. At this stage, a household's vulnerability to food insecurity is extremely high. *Stage three* strategies are signs of failure to cope with the food crisis and usually involve destitution and distress migration (Corbett 1988).

Figure 2.2

A Model of Responses to Food Shortage



(Adapted from Watts, 1988)

The generalized patterns of coping strategies find practical application as tools for food security monitoring (Frankenberger and Goldstein 1991). Building upon the work of the World Food Program (WFP), there are three types of indicators that can be monitored for changing coping responses, thus suggesting worsening conditions and heightened food insecurity. *Leading indicators* (WFP refers to these as early indicators) are changes in conditions and responses prior to the onset of decreased food access. Examples of such indicators include: 1) crop failures (due to inadequate rainfall, poor access to seed and other inputs, pest damage, etc.); 2) sudden deterioration of rangeland conditions or conditions of livestock (e.g. unusual migration movements, unusual number of animal deaths, large numbers of young female animals being offered for sale); 3) significant deterioration in local economic

conditions (e.g. increases in the price of grain, unseasonable disappearance of essential food stuffs, increases in unemployment among laborers and artisans, unusual low levels of household foodstocks); and, 4) significant accumulation of livestock by some households (due to depressed prices caused by oversupply). Leading indicators can provide signs of an impending problem and may call for a detailed situational analysis to determine the extent of the problem, causes and need for monitoring. These indicators are a combination of process indicators dealing with both availability and access vulnerability.

Concurrent indicators (WFP calls these *stress indicators*) occur simultaneously with decreased access to food. Examples of such indicators are: 1) larger than normal able-bodied family members in search for food or work; 2) appearance in the market of unusual amounts of personal and capital goods, such as jewelry, farm implements, livestock (draft animals); 3) unusual increases in land sales or mortgages; 4) increases in the amount of people seeking credit; 5) increased dependence on wild foods; 6) reduction in the number of meals; and, 7) increased reliance on interhousehold exchanges. Concurrent indicators can be assessed while carrying out situational analysis using rapid rural appraisals. These indicators are primarily access/entitlement related. Once the nature and extent of the problems have been confirmed, interventions can be introduced that focus on the causes or mitigate the effects.

Trailing indicators (WFP calls these *late outcome indicators*) occur after food access has declined. They reflect the extent to which the well-being of particular households and communities have been affected. In addition to signs of malnutrition and high rates of morbidity and mortality, trailing indicators include increased land degradation, land sales, consumption of seed stocks and permanent outmigration. All of these indicators are signs that the household has failed to cope with the food crises (Frankenberger and Goldstein 1991).

An understanding of farmer coping strategies can be essential in guiding the design and implementation of interventions to increase HFS. As Figure 2.3 illustrates, the types of coping strategies employed by households not only indicate household vulnerability to food shortage, but also correspond to different types of government and donor responses. Household coping strategies that do not involve divestment normally indicate modest vulnerability, and government/donor response is more appropriately oriented towards longer-term *development* efforts. Such responses can be targeted to enhance the long-term sustainability of HFS, especially in those areas where future vulnerability is likely to increase. In regions where divestment is beginning to occur, household vulnerability becomes high and *mitigation* should be considered the appropriate response. Mitigative interventions are those that: 1) abate the impacts of the current emergency while reducing vulnerability to future emergencies; 2) target the conservation of productive assets at the household level; and, 3) reinforce and build upon existing patterns of coping (Hutchinson 1991). In areas where productive asset sales and permanent outmigration have begun to occur, the local population is extremely vulnerable to famine. Such indices would call for

immediate *relief* action on the part of the government and donors. Thus, an appropriately designed HFS monitoring system could be flexible enough to serve all three purposes. Presently, most Early Warning Systems operating in Africa are only used for food aid planning (i.e. the relief function).

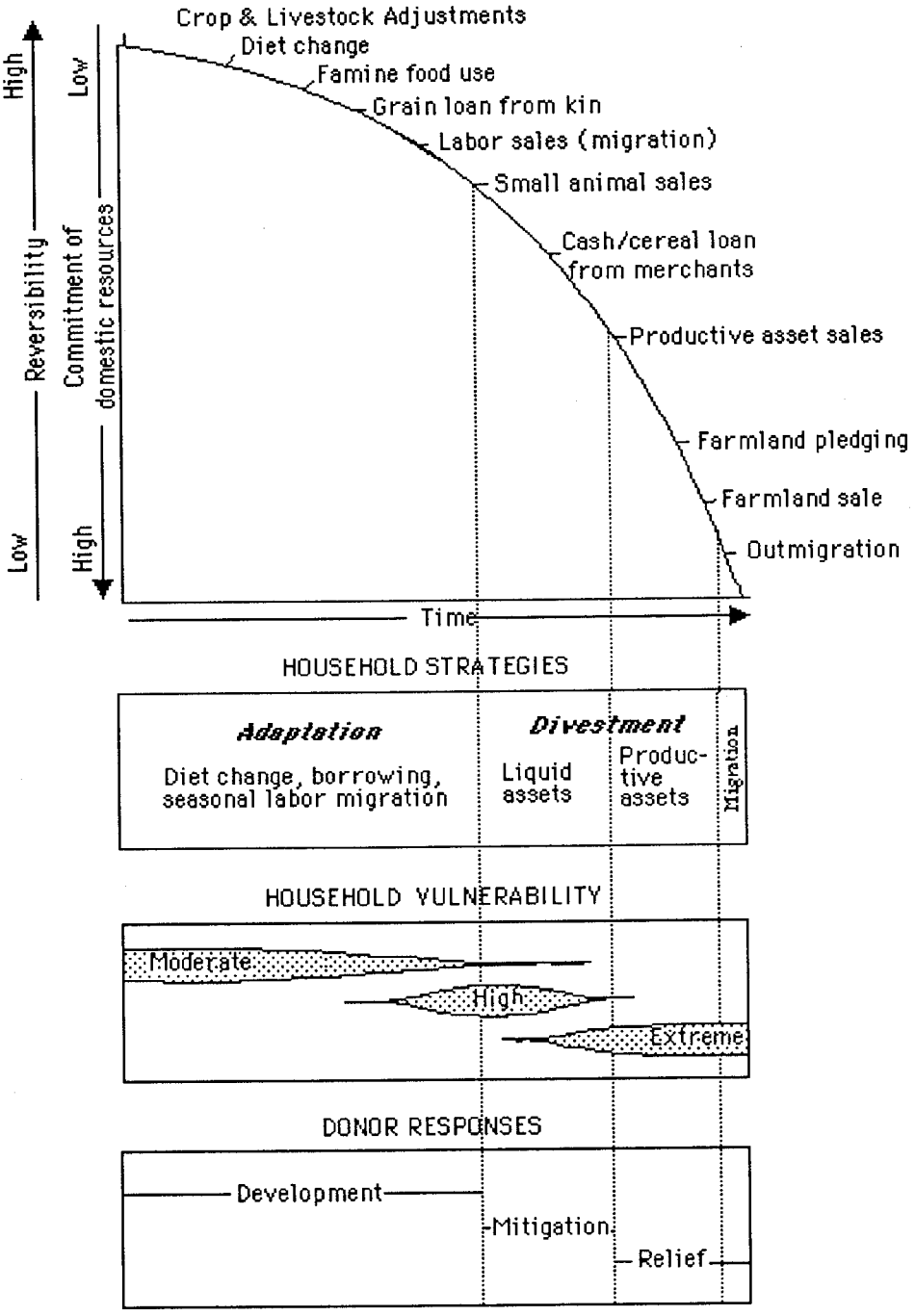
Discussion

Socio-economic indicators are becoming increasingly more important to food information monitoring systems focused on HFS. This is especially true of NGOs working in Africa (Shoham and Clay 1989). For example, the Suivi Alimentaire Delta Seno (SAPS) monitoring system in Mali funded by Save the Children Fund (U.K.) explicitly focuses on coping strategies. A good example of how coping strategies can form the basis for food access indicators is provided in Figure 2.4.

Given their usefulness in identifying vulnerable households, it is important to also recognize their limitations. First, socio-economic variables mean different things in different contexts (Borton and York 1987). Researchers and development practitioners should understand the locational specificity of socio-economic variables so that they are not misinterpreted. Second, the raw data used as indicators can be misleading. Hesse (1987) demonstrated that regional livestock market data from Mali could easily be misunderstood because individuals were buying and selling the same stock repeatedly in the same day. Thus, the quality of the data needs to be properly validated before being incorporated into a monitoring system. Third, without a baseline for determining what is "normal" behavior for a given population, it is difficult to make valid interpretations of trends displayed by indicators (Borton and York 1987). Fourth, given the locational specificity of socio-economic indicators, it is difficult to make comparisons across regions, or to aggregate the data. This remains one of the critical areas of research to be addressed. Because of these limitations, numerous challenges lay ahead for those HFS monitoring systems that incorporate socio-economic data (Haddad et al. 1991).

To minimize inaccuracies derived from the use of socio-economic indicators, multiple indicators should be used whenever possible (Ibid. 1991). The convergence of evidence will instill confidence in those agencies responsible for addressing the food crisis. In addition, attempts should be made to pre-test indicators to determine whether local factors may distort an indicator's validity and reliability (Ibid. 1991). Efforts also should be made to limit food access indicators to a manageable number.

Figure 2.3



Responses to household food shortages (after Watts, 1983)
The types of coping strategies employed by households indicate household vulnerability to food shortage, and correspond to different types of government and donor responses.
Office of Arid Lands Studies. The Universitu of Arizona. 1991.

Outcome Indicators

Given the cost and time involved with collecting individual intake data for households, outcome indicators are usually proxies for adequate food consumption. Selection of proxies should take into account the fact that the indicator may be measuring more than food (e.g. nutritional status). Given the technical methods associated with each proxy, not all are going to be cost effective or feasible to collect for most monitoring systems.

In general, HFS outcome indicators can be grouped into direct and indirect indicators (Ibid. 1988). Direct indicators of food consumption include those indicators which are closest to actual food consumption rather than to marketing channel information or medical status. Indirect indicators are generally used when direct indicators are either unavailable or too costly (in terms of time and money) to collect. Given the technical methods associated with these indicators, not all of them are easily aggregated upward.

Direct Indicators

Household Budget and Consumption Surveys

Data gathered through budget expenditure surveys can be used to determine the money spent on food by an individual or household. Data on food expenditures can be converted to calories using price per unit and calorie per unit conversion factors (Kumar 1989). Given that food is a composite of several different items, aggregation is limited by a choice of common denominators. Two methods are generally used: limit consideration to food grain consumption, or convert all food items to their calorie content (O'Brien-Place and Frankenberger 1988). The major limitations of this indicator are: 1) expenditure surveys tend to underestimate expenditures on food because the value of food produced at home or gathered locally is often not recorded; 2) the time and resource demands of such surveys; 3) data are often only collected every 10 years; and, 4) remote rural areas are generally under represented (Kumar 1989).

Household Perception of Food Security

People's own perception of food needs is an important aspect of HFS. Many households experience seasonal food shortages on a regular basis, and are forced to make behavioral adjustments to compensate for these shortfalls. Even when people have access to food that can meet their nutritional requirements, the food may not be culturally preferred or even be considered food (Eide et al. 1986). The cultural acceptability of food is critical to a households perception of food security. Therefore, inquiries could elicit the opinions of households regarding their food security status. Such responses could be sought during the hungry season, just prior to harvest. One

shortcoming of this approach is that households may deliberately distort their response in order to gain development assistance.

An example of such an indicator called "extent of self-provisioning" has been used in food systems studies (Chattopadhay 1991). Self-provisioning is defined here as household production and receipts in kind, either from labor transactions or claims. It is the number of months of self-provisioning as perceived by the household.

Food Frequency Assessments

Food frequency assessments involve the collection of minimum amounts of food consumption data. Inquiries focus on a limited number of food items (e.g. asking about ten food items which make up 90 percent of the diet), which are aggregated by food groups, and asking for the frequency of consumption of food items rather than the quantity of consumption (O'Brien-Place and Frankenberger 1988). Information is collected through a shortened 24 hour recall survey.

A variation of this type of assessment was used in Mali as part of the research undertaken by Michigan State University funded under the USAID Food Security in Africa Cooperative Agreement (Staatz et al. 1990). Household consumption security rankings were based on the following indicators for each household: number of meals eaten per day; number of meals which include meat or fish, number of ingredients in the sauce served with the main staple (a measure of dietary diversity), and number of times per day a nutrient-poor gruel was prepared as the main meal (Ibid. 1990). Households were then grouped into ranks of high, average, or low consumption security.

Although this method is limited in its level of precision, it is a cost effective simple tool for detecting consumption differences between households (O'Brien-Place and Frankenberger 1988). To ensure that relevant data are collected by this method, the technique must be fine-tuned to the cultural setting for which it is used.

Indirect Indicators

Storage Estimates

Estimates of food in storage during critical times of the year can give some indication of a households food security status, especially in communities that produce much of their own food. However, some people may be reluctant to discuss food in storage due to cultural beliefs, or may obscure how much food is in storage by having food distributed in more than one location (O'Brien-Place and Frankenberger 1988). Indirect questions might be used such as: "Given the amount of your last harvest, how long will the household be able to eat from it?" In Mauritania, female heads of

households were able to estimate the number of months their food stores would last quite easily (Ibid. 1988). Similar findings have been obtained in Malawi.

Subsistence Potential Ratio

This is the ratio of the households' ability to feed itself to its need to feed itself (Whelan 1983). The data needed for calculating this ratio are size of farm, expected yield, and age and sex composition of household. The subsistence potential ratio compares the amount of food (calculated in energy) which a household can produce over a year with the energy requirements of the entire household for the year (Frankenberger 1985). This ratio works best in communities that produce most of their own food.

A similar indicator used in Tanzania is the household food security card (Wagara 1991). The card is mainly an assessment curve that corresponds to individual household food balance, calculated on a monthly basis. From the month of harvest, the food available for the main crop (maize) is compared to the household food requirement. Each household is then classified as good, average, or poor. This is used as a tool by extension personnel for nutrition programming and evaluation.

Nutritional Status Assessments

Anthropometric measures are commonly used proxy indicators for food consumption. Nutritional surveys estimate the prevalence of malnutrition in a population by measuring the nutritional status of a random sample of children under five. Weight for age and height for age are widely used in nutrition surveillance programs. The advantages of anthropometric indicators are: 1) the data can be disaggregated; 2) the relative cost of data collection is not high in comparison to other surveys; and, 3) data may be available from secondary sources (Kumar 1989). Nutritional status information (e.g. heights/weights threshold measures) has been used for targeting relief operations and monitoring the impact of interventions (Mason et al. 1984). Nutritional status data also are used for defining areas of vulnerability (Borton and Shoham 1991).

Although nutritional status has been one of the most popular indicators used for HFS, there are a number of fundamental conceptual problems associated with its use. First, because nutritional status is a result of several factors in addition to food consumption, it does not always correlate directly with food availability and access. For example, there was no correlation between HFS and nutritional status in a study carried out in Mali (Staatz et al. 1990). Factors such as health status (e.g. disease prevalence), sanitation, mother care, and the level of activity of the individual can influence nutritional status outcomes (O'Brien-Place and Frankenberger 1988). Secure access to enough food to meet household food needs is a necessary but not sufficient condition for good nutritional status.

A second problem associated with the use of anthropometric measures is that they are often a late indicator of a food crisis (Borton and York 1987). There is a time lag between food shortages and changes in body size and composition (Galvin 1988). However, Young and Jaspars (1991) counter this argument by pointing out that changes in nutritional status of the population may occur early in the famine process. An early coping strategy followed by people in Ethiopia and Sudan is to deliberately reduce consumption in order to preserve their assets. This data seems to indicate the nutritional status of a community was very sensitive to changes in food security and should be used as an early indicator in food security information systems (Young and Jaspars 1991).

A third problem with nutritional status involved the use of age assessments in anthropometric measures (Galvin 1988). The correct age is critical to interpretation of height for age and weight for age. For this reason, weight for height is often used when age calculations are questionable (Mason et al. 1984).

Fourth, a number of other problems arise with the interpretation of anthropometric measures. For example, outmigration of destitute families or excess mortality may distort nutritional status assessments for a given area (Young and Jaspars 1991). In addition, pastoralists are usually under represented in clinical data (Mason et al. 1984).

Despite these short comings, donor organizations often perceive anthropometric data as hard objective data when compared to socio-economic indicators (Shoham and Borton 1989). High ratios of malnutrition are much more likely to elicit response than distress livestock sales (Ibid. 1989). Recognizing the power of anthropometric data to generate public sympathy and donor interest, some NGOs collect such data despite the problems associated with its use (e.g. Oxfam in Sudan) (Ibid. 1989).

Discussion

One of the major problems associated with HFS outcome measures is that many of the proxies that are appropriate for one area may not be appropriate for another. This makes it difficult to aggregate this information at the regional or national level. HFS status is not difficult to assess for administrators and staff working at or near the community level, because local processes are better understood. At the national level, however, local level circumstances are difficult to assess, so decision makers are more likely to favor indicators that can be aggregated and that allow for comparisons across regions. To ensure limited funds are dispersed correctly, indicators that appear to be objective and can be quantified have greater appeal. This holds true for donors as well. Unfortunately, such indicators are not very effective in identifying food insecure households due to many of the measurement problems previously discussed. For example, considerable emphasis is given to anthropometric measures and national expenditure data because the data are quantitative and can be aggregated.

Given that HFS status assessments will be more effective when they are locational specific, decentralized diagnosis and intervention should be supported whenever possible. A good example of such an approach is being implemented in Indonesia (Brooks et al. 1985) HFS status assessments will continue to be problematic if information and intervention decisions remain totally centralized.

Selection of Indicators

Indicators of household food security are selected for a specific purpose. Whether the goal is to evaluate a project, set up a monitoring system or to develop a HFS strategy for the country will to a large extent dictate the choice of the indicator. The user of the information on indicators also will drive the choice of the indicator (See Section II).

A number of criteria are used in the selection of indicators for use in monitoring HFS. These include resource availability, relevance, accuracy and timeliness. The following section deals with each of these criteria.

Resource Availability

Information on household food security conditions could help in general development planning as well as in early warning of potential food crises (Davies et al. 1991a). Data on both food availability and access will need to be collected. The types of data collected will however depend on what is feasible given existing resources as well as what is desirable (ibid. 1991). The design of any information system oriented to the collection of HFS data cannot ignore the limitations of existing operational capacity if it intends to be sustainable (Davies et al. 1991a). The financial, personal, institutional, and infrastructural resources available will set the boundaries within which such systems should operate. Because donor agencies are reluctant to fund food security agencies when a food crisis does not exist, careful consideration needs to be given to using existing information sources for multiple purposes (Koenig 1988). In cases where the collection of primary data is not feasible, reliance on secondary data collected by multiple agencies may be necessary. Problems may arise in achieving collaboration among agencies in sharing data, especially in a timely fashion. This is especially true if agencies are hierarchical and autonomous. Survey management skills will be the vital and often limiting factor (Casley and Kumar 1988).

Relevance and Accuracy

An appropriate indicator will be sensitive to changing conditions of stress for households in a given area. Relevancy is enhanced when indicators are selected on the basis of a good understanding of the local conditions leading to the food insecure situation (Davies et al. 1991a). Development of location specific food crisis models may help determine the most appropriate indicators for a community or region (Davies et al. 1991a).

Access to resources may seriously limit the ability to collect accurate data. Trade offs will be necessary between cost and level of accuracy (Davies et al. 1991a). The more emphasis that is placed on accuracy (e.g. how close the defined variable is to actual food intake), the more time and money will be necessary. Much of the information collected in surveys has a degree of accuracy that is not necessary (Eklund 1991). Chambers (1990) has described two principles that should be applied under such circumstances. The first principle is *optimal ignorance* (McCracken et al. 1988). Food monitoring systems should not try to find out more than is needed. The second principle is *appropriate imprecision* (Haddad et al. 1991). Information systems should not measure more accurately than is necessary for practical purposes. Both of these principles are commonly used in rapid rural appraisals.

Timeliness

Timeliness applies not only to predicting food shortages and change in entitlement, but also in the response to such change. Information required to help administrators make decisions becomes valueless, however accurate, if it is provided after the decisions are made (Casley and Kumar 1988). *Rapid rural appraisal* (RRA) techniques have been employed in food security monitoring as a way of increasing the speed and coverage of data collection (Frankenberger 1990; Maxwell 1989) (See Section II). They can be effectively used in carrying out pre-harvest surveys, and food systems inquiries in the initial stages of setting up an information system (Davies et al. 1991a). RRAs are extremely useful in determining what data need to be collected in greater detail for use as indicators (Ibid. 1991). Despite their usefulness, two potential problems are associated with the implementation of RRAs: 1) their propensity to focus on current rather than baseline vulnerability; and, 2) their need for multidisciplinary staffing. Such human resources may not be readily accessible to some monitoring units (Borton and Shoham 1991).

Two closely related techniques are currently being tried out that would enhance the timeliness of response to food crises are risk/vulnerability maps and contingency plans. Risk/vulnerability maps are maps representing sets of information which initially identify the areas and sectors of the population that are most vulnerable to food insecurity (Davies et al. 1991a; Borton and Shoham 1991). WFP has been instrumental in supporting the development of this technique in Bangladesh and Sudan (Borton and

Shoham 1991). The maps are intended to: 1) highlight those areas of the country or region that need to be monitored more closely; 2)

allow the weighting of allocations within regular food aid programs; and, 3) stimulate greater consideration of appropriate interventions for designated vulnerable areas (Ibid. 1991) (See Section II).

Another technique developed to improve the link between information and timely response are contingency plans for risk prone areas (Swift 1989a). These plans draw their inspiration from the Indian famine codes used in the 19th Century. Contingency plans are developed for a district or province, and involve formulating a set of actions that are closely tied to predetermined warning stages derived from a locally based food security monitoring system (Buchanan-Smith et al. 1991). The systems currently operating in Turkana, Kenya and Indonesia offer good models upon which to build in other countries (Swift 1989b; Brooks et al. 1985).

Summary

Food availability and stable access are both critical to HFS. For this reason, information should be collected on factors that play a role in limiting food availability and the options that households have for food access. A households' stable access to food will be determined by its means for procuring food (produced, purchased, gathered) and the social mechanisms that buffer households from periodic shocks. Vulnerability to food insecurity is location specific, so indicators are needed that measure supply and food entitlement changes at the local level. The types of indicators and their characteristics are summarized in Figure 2.5. The indicators that are used will depend upon the financial, human, institutional and infrastructural resources available.

To date, few information systems are presently in place that adequately incorporate both food supply/production data and access/entitlement data in the same indicator set. A food supply orientation focusing on production data and nutritional status persists primarily because these data are easiest to obtain and are well-suited to aggregated analysis. Few donors or governments are willing to commit the time or resources necessary to obtain information on socio-economic indicators that are sensitive to the vulnerability of different local groups. Decentralized HFS monitoring systems would be the best means for obtaining such information. Centralized HFS monitoring systems are likely to experience more difficulties in adequately assessing the HFS status of local populations.

The fact remains that donors and governments have to make difficult decisions regarding the allocation of resources across regions. These decisions often require different data needs and methods than what may be appropriate at the local level. A balance must be struck between the need for data for central decisions on the

Table 2.4

Indicators for Timely Warning and Coping Mechanisms of Communities

Community mechanism to deal with food crises	Potential indicators	Possible sources of data
Change of food source	Number of households dependent on reserve	Agricultural workers, health centres
Attempt to find employment	Unusual movement of adult males: change in wage rates or application for jobs	Chiefs, administrators, recruiting agencies, extension workers
Sell off livestock	Increase in sales, decline of livestock prices	Extension workers, cattle auctions, abattoirs
Attempt to purchase food in local markets	Increase in crop sales, Increase in crop prices	Marketing agencies, local price reporters
Request assistance from government	Number requesting assistance, applying	Records of assistance programmes, NGOs
Seek assistance from relatives	Change in school enrollment, changes in clinic attendance, increase in remittances	School, clinic records, books, post offices, (flow of remittances)
Migrate to areas not affected	Unusual movements of people	District and area administrators

Source: FGS 1990 and Eele 1987. (Taken from Davies et al. 1991)

allocation of resources and a need for information appropriate for decentralized HFS monitoring and interventions. Section II addresses these differential needs and identifies an approach that takes both of these concerns into account.

Figure 2.5

Household Food Security Indicators

Indicator	Availability	Sources of Information and Collection Method	Measurement	Level of Aggregation	Limitation
Food Supply Indicators					
Meteorological Data (rainfall)	readily available	government reports monitoring stations satellite remote sensing	cumulative amount/average change from average onset	national regional district	number of stations timing of rains may be false indicator
Information on Natural Resources (includes grazing resources)	readily available	periodic assessments government, NGOs satellite imagery government and donor studies	dekedal values dekadal value/previous dekadal dekadal average/long-term dekadal average	national regional district	access to remote sensing
Agricultural Production Data (crops and animals)	readily available	government reports crop cutting on sample plots remote sensing farmer reports	seasonal kg/capita departure from average kg/capita % change from past years	national regional district	limited information on other crops besides staple
Agroecological Models	not readily available	monitoring stations soil assessments	FAO Crop Specific Soil Water Balance Model	national regional district	computer capability for analysis
Food Balance Sheets	readily available	secondary sources government reports	production-consumption requirements (opening stocks, production, imports, domestic per capita requirements, exports and closing stocks)	national regional	underestimate nontraditional crops
Information on Pest Damage	moderately available	field assessments government reports	seasonal kg/capita for crops % of change from last year	national regional	frequency of assessment

Figure 2.5 (continued): Household Food Security Indicators

Indicator	Availability	Sources of Information and Collection Method	Measurement	Level of Aggregation	Limitation
Food Supply Indicators (continued)					
Market Information (prices)	readily available	price data market surveys	value of crop prices, livestock prices monthly value/average monthly value for previous year	national regional local	interpretation of sales and price
Regional Conflict	not readily available	key informants NGOs	# of incidents influx of refugees	regional local	collection of data in conflict zone

Figure 2.5 (continued): Household Food Security Indicators

Indicator	Availability	Sources of Information and Collection Method	Measurement	Level of Aggregation	Limitation
Food Access (Effective Demand or Entitlement)					
Risk Minimizing Strategies					
land use practices	limited	RRA formal surveys	changes in crop mix changes in time of planting	HH/village	location specific
diversification of livestock	limited	RRA formal surveys	changes in livestock mix early movement to alternative range # animal deaths	HH/village	location specific
Loss Management Strategies					
dietary change (both quantitative and qualitative)	limited	RRA HH surveys in-depth interviews	reduction in # of meals decreased dietary diversity shifts from preferred to lower status food	HH/village	location specific
change of food source	limited	RRA HH surveys	increased dependence on wild foods # of HH dependent on reserves grain price increases	HH/village	location specific
diversification of income sources	limited	RRA HH surveys	changes in petty marketing patterns changes in wage rates increase # of HH seeking off-farm employment	HH/village	location specific
access to loans/credit	limited	RRA HH surveys	increase # of people seeking assistance from relatives # of people seeking credit	HH/village	location specific
livestock sales	available	market surveys secondary data	increase sale of livestock/season decline of livestock prices	national regional local	location specific
seasonal migration	limited	RRA HH surveys	large # of people migrating for work	village HH	location specific

Figure 2.5 (continued): Household Food Security Indicators

Indicator	Availability	Sources of Information and Collection Method	Measurement	Level of Aggregation	Limitation
Food Access (Effective Demand or Entitlement) Loss Management Strategies (continued)					
sale of production assets	limited	RRA HH surveys	appearance in market of unusual amounts of personal and capital goods (jewelry, farm implements, draft animals) sale of young female animals	village HH	location specific
distress migration	limited	RRA HH surveys government records NGOs	# of whole families moving out of area	regional village HH	location specific

Figure 2.5 (continued): Household Food Security Indicators

Indicator	Availability	Sources of Information and Collection Method	Measurement	Level of Aggregation	Limitation
Outcome Indicators					
Direct Indicators					
household budget and consumption surveys	limited	national surveys	price per unit of food or caloric per unit of food conversion factors/capita	national regional district	high cost
household perception of food insecurity	limited	RRA in-depth interviews	# of months of self provisioning from household production and receipt of in-kind as perceived by the household	village HH	local population may distort data
food frequency assessments	limited	HH surveys 24-hr recall	# of meals per day # and types of ingredients in meals # of times per day a nutrient-poor gruel was served as main meal	village HH	difficult to aggregate at regional or national level limited level of precision culturally specific
Indirect Indicators					
storage estimates	limited	HH surveys RRA	# of months food stores will last as perceived by the HH	village HH	difficult to obtain due to cultural beliefs difficult to aggregate
subsistence potential ratio	readily available	HH surveys	size of farm, expected yield and age and sex composition of household Amount of food produced/food required	village HH	difficult to aggregate assumes all farm land used for food production
household food security card	limited	HH surveys	food available from main crop compared to HH requirements on monthly basis	village HH	only useful in areas where most food is grown by the household
nutritional status assessments	readily available	government health department formal surveys anthropometric measures	weight/age height/age weight/height arm circumference	national regional local	nutritional status influenced by sanitary conditions, care age assessment question

Section II:

Data Collection Methods for Using Household Food Security Indicators

Introduction

Household food security indicators are used by a number of different groups and organizational entities. The users include donors, national governments, local governments, NGOs and local communities. Each user group may have different data needs for the decisions they are going to make, requiring different types of collection methods. In designing HFS information systems and selecting the array of indicators to be used, the key questions to ask are: 1) who will be using the data; 2) what types of data will be needed; 3) what types of data already exist or are being collected by other agencies or organizations; 4) what methods are required to collect data that does not exist; 5) what resources (financial, personal, institutional) are available for collecting and analyzing the information; and, 6) what interventions are possible given the availability of resources.

This section begins with a discussion of the different user groups of HFS indicators and their data needs. This is followed by a discussion of the different types of data and collection methods that are used to meet these various needs. The section then addresses the various types of food security monitoring systems that presently exist, ranging from global and national systems to local systems implemented by NGOs. The section concludes with a discussion of a household food security monitoring approach that draws from the strengths of the various systems under review.

User Groups of Household Food Security Indicators

User groups requiring information on household food security operate at both the macro and micro levels. National governments and donors require such information to make informed planning and policy decisions, especially if limited resources have to be shared across regions. At the micro level, local governments, NGOs and local communities require information to identify vulnerable groups and appropriate interventions to improve HFS. Although there is considerable overlap in the decisions

and data that are used by different groups, some key differences do exist which have bearing on the types of data that are required.

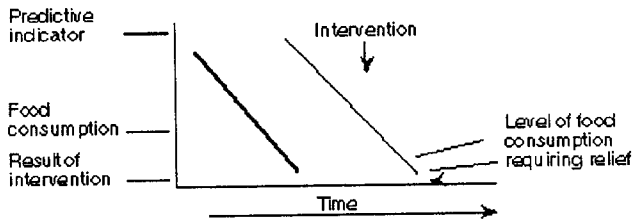
At the macro level (national or regional level), governments and donors seek a small range of indicators that can be aggregated and lend themselves for comparison across areas (Davies et al. 1991). This will allow for "objective" decisions to be made about the allocation of resources across regions. High quality, quantitative statistical data are required that are representative of the various regions under consideration. Supply indicators are well suited for this aggregate level of analysis (e.g. production, rainfall, food balance sheets), as well as anthropometric measures. Socio-economic data relevant to local populations are rarely used because of limitations on time, resources and knowledge, and the low potential for aggregation.

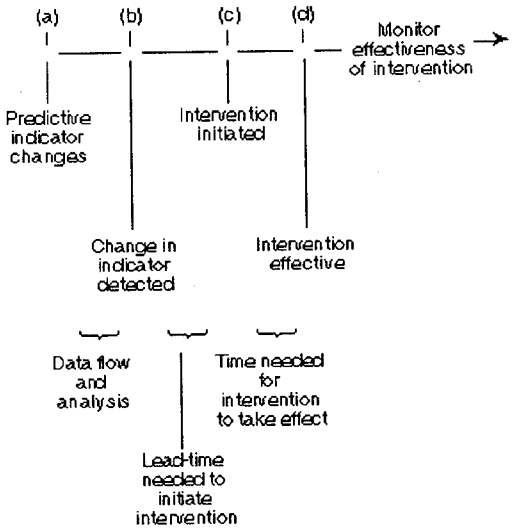
At the micro level, local governments, NGOs and local communities seek locational specific information that will enable them to detect food insecure groups and to identify appropriate interventions. Qualitative data that reveal the local processes at work are best suited for these types of decisions. Working close to the community, targeting errors regarding vulnerable households are less likely. Socio-economic data are often incorporated in the set of indicators used for monitoring at the local level. Locally relevant predictive HFS indicators are easier to incorporate into these decentralized monitoring systems. This is especially true for community based food security monitoring systems.

The differences in data needs have implications for detecting HFS problems and intervening in a timely manner. In countries where centralized decision makers are primarily responsible for identifying food insecure groups and interventions, problems may arise in detecting pockets of vulnerability in a given area due to the types of indicators used. The more remote the decision is from the problem, the greater the time lag in initiating appropriate action (Mason et al 1984) (See Figure 2.6). Location specific predictive indicators are difficult to incorporate into centralized decisions.

The time lag between detection of household food insecurity and appropriate action is decreased through decentralized diagnosis and response (Davies et al. 1991). Local food security monitoring systems can incorporate locally relevant socio-economic indicators to improve detection and response time. Examples of such decentralized monitoring systems are found in Indonesia (Brooks et al. 1985) and Botswana (Davies et al. 1991).

Figure 2.6





(Mason et al 1984)

Types of Data and Collection Methods

The information needs of different user groups entail the collection of different types of data using different kinds of methods. Data and collection methods can be classified into two general types: quantitative and qualitative. Quantitative methods produce numerical data usually through structured surveys (Casley and Kumar 1988) (See Figure 2.7). Quantitative data are collected when a number, ratio, or proportion related to the target population must be estimated or a variable such as crop production must be measured (Ibid. 1988). The major advantages of quantitative methods are: 1) the questionnaire can be standardized to remove interviewer biases; and 2) a sample of the population can be drawn to derive estimates about the whole population within known margins of probable error. The major disadvantages usually associated with

quantitative methods are: 1) the time lag required to produce results; 2) the high cost associated with administering the survey; and 3) the non-sampling errors associated with the wording of the questions and the lack of consideration of local context (Molnar 1989).

Table Figure 2.7

Selection Criteria for Methods

Criteria	Classification		
	A	B	C
1. Scale of Inquiry	Phenomena of interest are rare and clustered	Village or community level Specific site or institution	Phenomenon of interest widely distributed throughout area
2. Interview Type	Free ranging: Unstructured	Open-ended questions: Attitudinal studies	Closed or structured questionnaire
3. Observations and Measurement	Technical requiring professional skill	Accurate and detailed	Simple counts or measures
4. Frequency	Continuous or very frequent	Multi-visit over year	Single visit

Source: Casley and Lury, 1982.

Case Studies — Enquiries involving one or more A types. These include rare phenomena, free ranging interviews, professional encounters, and continuous observation. These are not conducive to large sample surveys due to the demanding nature of the inquiry in terms of identification of respondents and the time and skill needed for the investigation. Case study approaches are also best used when the inquiry is focused on villages or at the community level (1B) and when the questions are open-ended or attitudinal in nature (1B). (Classic sociological case studies)

Sample Surveys — Are well-suited for inquiry about phenomena widely distributed throughout the area (1C) and when the questionnaire is closed or structured (2C). Sample surveys are also used when observations and measurements are accurate and detailed (3B), simple counts and measures (3C), multi-visit over a year (4B), and single visit (4C). (A nutritional survey involving anthropometric measures of children, regular but simple price collection)

Qualitative methods produce descriptions of situations, events, people and systems interactions (Casley and Kumar 1988). Methods used include in-depth interviews with key informants, group interviews, focus groups and participant observation. Qualitative data are collected when the attitudes, beliefs, knowledge and perceptions of the target population must be known (Ibid. 1988). These types of methods are best used in case studies with small numbers of individuals or groups, where selecting is done deliberately according to specified characteristics rather than at random from the population. The major disadvantage associated with qualitative methods is that they do not generate information that is generalizable to a larger population.

Most information systems require collection of both quantitative and qualitative data. However, nationally based systems rely more on quantitative data that can be aggregated and compared across regions, while local level HFS information systems may operate with limited numerical information. Decentralized diagnosis may identify vulnerable groups through qualitative informal discussion. Thus, the types of data collected will depend upon the user of the information and resources available for obtaining it.

Sampling

One of the most controversial areas in sound use of HFS indicators is the selection of households and sampling. Qualitative techniques are criticized because they do not generate statistically sound survey data (Molnar 1989). Structured surveys using formal sampling techniques are criticized because many feel that what is gained in the reductions of random sampling error is lost through non-sampling error. As Molnar (1989) states, "random sampling gains the researcher nothing if the interviews selected through the random process are poorly conducted."

It is important to recognize that both quantitative and qualitative techniques are tools that play a useful and complementary role in improving our understanding of the HFS situation in a given area. Qualitative methods are useful for improving the depth of our understanding of the local circumstances that households operate in while quantitative tools help us determine the breadth to which observed behavioral practices, resources, or problems are distributed within a population. Although quantitative methods are very much concerned with representative probability sampling, sampling considerations also apply to qualitative information.

There are at least seven kinds of sampling procedures (Bernard 1988). These can be divided into probability based sampling and non-probability sampling techniques. Probability based samples are representative of a larger population and include simple random, stratified random and cluster samples. Simple random samples are samples where each individual within the population has an equal chance of being selected (Bernard 1988). Stratified random samples are done when it is likely that an important sub-population will be under represented in the simple random sample. Cluster samples narrow the sampling field down from large heterogeneous groups to small

homogeneous groups that are relatively easy to sample directly (Ibid. 1988). Cluster samples involve a multistaged process, such as sampling a geographical area then random sampling each cluster.

Population inferences are more difficult to draw from non-probability sampling, such as quota, purposive, snowball and haphazard sampling (Bernard 1988). The major disadvantage of these techniques is that studies based on them have very low external validity. Quota sampling involves identifying a number of sub-populations of interest and selecting proportions of those sub-populations for a sample. Purposive sampling, a technique commonly used in RRA and other qualitative methods, involves selecting a few cases (e.g. villages) for intensive study. Snowball sampling, commonly used in social network studies, involves asking a few key individuals to name others with similar interests, backgrounds or some other desirable characteristic. Haphazard or convenience sampling, involves selecting cases as they come along. It is an approach used in exploratory research (Ibid. 1988).

To draw a good sample, the first thing required is a good sampling frame. Unfortunately, in many rural areas where HFS problems exist, sampling frames are not easy to come by. Bernard (1988) recommends that whenever there is not a sampling frame (e.g. census) for a general population, a multi-staged cluster sample should be used. Sampling should be heavier at the higher levels in a multistaged sample and lighter at the lower stages. This is because as clusters get smaller, the homogeneity of the units of analysis within the cluster gets greater and greater. This means that when quantitative data on HFS indicators is being collected, the survey should attempt to cover more villages in the sample with fewer households per village, rather than many households in a few randomly chosen communities (Bernard 1988). A two-staged cluster sample design also will help save on transportation costs (Eklund 1991). However, cluster sampling also can increase the sampling error compared to simple random sampling, so the necessary sample size will increase (Eklund 1991). This may cancel out the cost savings.

Decisions on sample size are influenced as much by cost and time considerations as by the required precision in estimators (Eklund 1991). Other factors to take into account are the size of the population to which one wants to generalize, the heterogeneity of the population, the numbers of subgroups within the population, and how accurate one wants the sample statistics to be (Bernard 1988). There will always be a trade-off between greater accuracy and greater economy in sampling. Although the degree of accuracy may be reduced, smaller, more cost-effective samples will still provide administrators some notion of the trends that are occurring in the area (Eklund 1991).

Rapid Rural Appraisals

As stated in Section I, RRAs have been employed in food security monitoring as a way of increasing the speed of coverage of data collection. They bridge the gap between formal surveys and non-structured interviewing (Molnar 1989). RRAs are used to collect data on values, opinions, and objectives as well as on biophysical and economic factors. They neither generate statistically sound survey information nor provide an in-depth understanding comparable to long-term qualitative research methods used by anthropologists (Molnar 1989).

The major objective of RRAs is to gain maximum knowledge of the target area with a minimum amount of time and resources (Eklund 1991). They have gained in popularity in recent years because of the time and cost associated with more formal surveys.

In terms of sampling, RRAs normally use purposive sampling techniques in the selection of villages to interview people of different classes, ethnicity, age, gender and with different access to resources (Molnar 1989). Random sampling is then sometimes used (but not always) in selecting individual households (Eklund 1991). A minimum number of randomly selected observations will permit statistical inference to the agriculturalists in the village, even though the sample will not be representative of the population in the area (Ibid. 1991). This will allow for some exploration of relationships between variables upon which data are collected. Random sampling is not applicable to group interviews.

To correct the bias of purposive sampling, some researchers follow up informal RRAs with small formal surveys to test the hypothesis emerging from the RRA (Molnar 1989). Other ways that bias is reduced is through stratification, to ensure that less visible target groups are represented and that more remote agro-ecological zones are visited.

RRAs are well suited to decentralized food security monitoring systems. Such methods help local administrators and NGOs determine the constraints that impact the HFS of local populations, and help identify the key indicators that should be monitored in follow-up surveys. Because these data and their interpretation are location specific, it is often difficult to aggregate at the national level.

Discussion

Ways should be sought to strengthen the communication links between local and national decision makers. This could be done in three ways. First, more responsibility could be delegated to local governments in the collection of HFS information and response. Given the locational specificity of problems, this would improve considerably the detection of household food insecurity and the timing of interventions. Second, locally relevant socio-economic data need to be better reflected

in national government and donor decisions. Third, local government and NGOs could attempt to collect data that can be aggregated more easily to address the data requirements of donors and national government decision makers in allocating resources. They should also aid in the interpretation of supply data and anthropometric measures.

Given that the decision requirements of different user groups require different types of HFS data and collection methods, the next section reviews the different types of information systems that have some relation to HFS monitoring.

Food Security Monitoring Systems

Early Warning Systems — National and Global Systems

Early warning systems (EWS) are systems of data collection established to monitor a populations' access to food in order to provide timely warning of impending crises and to elicit the appropriate response (Davies et al. 1991). As stated in Section I, the impetus for setting up such systems was directly related to the food crises that occurred in Africa in the 1970s and 1980s. The Global Early Warning System (GIEWS) was established by FAO following the 1974 World Food Conference to monitor aggregate food production and food supply both globally and on a national basis (Buchanan-Smith et al. 1991). Since then, a large number of different organizations and agencies have become involved in early warning, including multilateral and bilateral donors, national and local governments, NGOs and local communities. All countries in the Sahel and the Horn of Africa now have some kind of formal early warning system (except Senegal) (Ibid. 1991).

Most of the national EWS were established after 1985 as a response to the last major famine. This accounts for why many of these systems are famine focused, donor supported and located in country capitals (Buchanan-Smith et al. 1991). Until recently, very few systems were oriented towards household food security monitoring.

National and regional EWS were primarily created to monitor food supply indicators. Production data, rainfall and food balance sheets made up the basis of these information systems. Nutrition surveillance programs set up simultaneously in many of the same countries monitored nutritional status (Mason et al. 1984). Recently, some information systems such as the Famine Early Warning System (FEWS), have attempted to incorporate socio-economic indicators to assess vulnerability (Downing 1990). Geographic information systems and other computer software are being used to integrate multiple sources of data (Buchanan-Smith et al. 1991). GIEWS and the

Southern Africa Development Coordination Conference (SADCC) are also attempting to incorporate socio-economic information into their assessments.

Despite these ground breaking attempts, most of these EWS are still primarily using supply type process indicators and food balance sheet analysis. Few systems have been able to integrate local access/entitlement data because of the difficulty of aggregating this information at the national level.

Local Early Warning Systems

There are few EWS that have been established at the sub-national level. EWS run by local governments have been established in Darfur, Sudan, Turkana, Kenya and Lombok, Indonesia (Buchanan-Smith et al. 1991; Brooks et al. 1985). The regional EWS in Darfur is based in the Agricultural Planning Unit, and coordinates its efforts with a number of other government institutions, donor-funded projects and NGOs (Buchanan-Smith et al. 1991). This decentralized system uses both qualitative and quantitative data to identify vulnerable groups (Ibid. 1991). Information related to coping strategies is collected during pre-harvest surveys using RRAs. Nutritional data also are collected through community-based nutrition monitoring carried out by an NGO (Oxfam). Vulnerable groups are identified on a geographic basis rather than by socio-economic criteria.

The major problem associated with this system is that information and response are not formally linked. This is primarily due to the limited resources the regional government has been able to secure from the national government (Buchanan-Smith et al. 1991).

The EWS set up in Turkana, Kenya in 1987 also operates at the sub-national level (Swift 1989). Run by the Turkana Drought Contingency Planning Unit, this system alerts authorities of deteriorating food insecurity by monitoring local coping strategies as well as quantifiable data provided by other government departments (Buchanan-Smith et al. 1991). Vulnerability is determined on a geographical basis. Data are collected on livestock, crops, diet, income generating activities, attendance in school, aerial surveys, rainfall and through remote sensing (Ibid. 1991).

The major feature of this system is that it operates on the basis of a predetermined *drought contingency plan* (Swift 1989). Similar to the Indian Famine Codes, this plan consists of a district drought policy, an EWS, and a set of pre-determined responses should a drought occur to ensure food availability (Borton and York 1987). Warning stages of the information system correspond to specific actions.

The food security information system was designed in two stages. The first stage involved a qualitative analysis to identify key indicators that could be monitored quantitatively in the second stage (Buchanan-Smith et al. 1991).

A third example of a successful decentralized food security monitoring system operated by local government is found in Lombok, Indonesia (Davies et al. 1991). The Timely Warning and Intervention Information System (TWIIS) is a nutrition surveillance system set up at the district level (Brooks et al. 1985). It relies on villagers to collect food consumption data, and has developed a number of HFS indicators that are locally monitored. Operated at the District level, this system effectively links information to response in a cost efficient manner because the national government has delegated responsibility to the District.

NGOs also have been involved in establishing local level HFS early warning systems. For example, the Sudanese Red Crescent Society Drought Monitoring Program in Darfur, Sudan is a community-based EWS (Buchanan-Smith et al. 1991). Local level monitoring was carried out using participatory methods, collecting qualitative information on grain and livestock prices, migration, labor wages and availability and consumption patterns (Ibid. 1991). The key problem associated with this system was that information was not adequately linked to response.

A more effective decentralized food security monitoring system set up by an NGO is the Suivi Alimentaire Delta Sent (SADS) established by Save the Children Fund (U.K.) in Mali (Davies 1989). Set up in 1987, SADS is a food monitoring system based on village and household inquiries in the Fifth Region of Mali. This is a people-centered system that focuses on how people feed themselves (Buchanan-Smith et al. 1991). It collects both qualitative and quantitative information from local producers, key informants and local markets. Village level surveys (RRA) are carried out on a quarterly basis, collecting information on entitlement indicators such as availability of off-farm employment, access to wild foods, migration, available stocks, and crop production (Ibid. 1991). The data are collected on the basis of production systems to stress the HFS differences that exist within and between agro-ecological zones (Davies 1989). "Listening posts" also were established to monitor the situation on a monthly basis (Ibid. 1989). These are staffed by people recruited locally.

Similar to the system established in Turkana, SADS carried out qualitative surveys in the first year to understand the local HFS constraints in order to identify appropriate indicators (Davies 1989). Quantitative surveys were carried out the second year on these key indicators of access to food.

SADS also effectively links information with response. These interventions are intended to reinforce non-degrading food entitlements for well-defined target groups (Davies 1989). Interventions are initiated through NGOs and existing local structures such as village associations and local cooperatives. Potential interventions include seed banks, subsidized transport, small-scale credit and the replacement of productive assets (Ibid. 1989).

Vulnerability Mapping (Risk Mapping)

As stated in Section I, pioneering efforts in vulnerability/risk mapping have been carried out in Bangladesh and Sudan under WFP support (Borton and Shoham 1991). The USAID-funded Famine Early Warning Systems Project also has contributed significantly to this conceptual development (Downing 1990). Vulnerability maps are maps which identify the areas and sectors of the population which are most vulnerable to food insecurity. These maps highlight the regions that need to be monitored more closely, help governments and NGOs to target food aid more effectively and identify factors to take into consideration in designing interventions for vulnerable areas (Borton and Shoham 1991). An earlier version of vulnerability mapping used in the 1970s was "functional classification" of under-nourished populations as a basis for food and nutrition planning (Joy 1973).

Vulnerability to food insecurity, as explained in Section I, is an aggregate measure for a given population of the risk of exposure to different types of shocks or disaster events (primarily supply indicators) and the ability to cope with these events (primarily access/entitlement indicators) (See Figure 2.1). Mapping vulnerability involves assessing the *baseline vulnerability* (the contextual factors encompassing food insecurity events over the previous years), *current vulnerability* (the shocks overlaying the baseline) and *future vulnerability* (trends associated with long-term food security risks).

A number of different approaches have been used in mapping food-related vulnerability. These include: 1) disaggregating existing data on socio-economic groups; 2) surveys that collect information directly relevant to vulnerability; 3) using existing data on key indicators of vulnerability; and 4) conducting rapid rural appraisals (Borton and Shoham 1991). Combining approaches may be necessary due to quality differences in the data. Geographic Information Systems are now being used for combining different data sets (Hutchinson et al. 1992).

The types of information that can be used as indicators of vulnerability to food insecurity will vary considerably between countries and regions within a country. Some indicators may be more important than others in determining vulnerability, so subjective weighting of indicators is often necessary (Borton and Shoham 1991). If weighting must be done, it is important to rely on individuals who have local knowledge and experience in the areas to assign these weights.

Vulnerability maps drawn up for arid and/or semiarid regions should take into account the location of ecologically favorable areas that serve as refuge points during drought conditions (Susanna Davies, Personal Communication). The over-utilization of the resources in such areas by multiple users during times of stress can increase the future vulnerability of the local population. Monitoring posts or sentinel sites (Mason et al. 1984) could be established in these areas of convergence to assess the regional impact of droughts.

Vulnerability maps have great potential for donors and national governments in assisting with decisions regarding the allocation of resources across regions. The development of such maps could ideally be a first step in identifying districts or subregions where more location specific HFS information is necessary to collect for designing appropriate interventions. Decentralized HFS monitoring systems could then be developed in these designated areas.

A Systematic Approach to Identifying Food Insecure Households

To strike a balance between the need for data for allocation decisions and the need for information appropriate for decentralized HFS monitoring and interventions, a staged approach can be adapted that builds upon the strengths of the various information systems previously described. In countries where national early warning systems already exist (e.g. crop forecasting, food balance sheets, nutrition surveillance), information supplied by these systems can help develop vulnerability maps for various regions. Existing data should be used to formulate these maps as much as possible to cut down on costs. These vulnerability maps should be based on both supply-type indicators and access/entitlement indicators as much as possible to avoid designating an area as vulnerable which may not be. These maps should be fine-tuned as more information becomes available.

The vulnerability maps can then be used to designate areas where more location specific HFS information can be gathered. If such information does not already exist, RRAs can be used to understand the local socio-economic context and identify HFS constraints and key indicators to be used in decentralized food security monitoring systems. This information will feed directly into the development of a district or sub-regional contingency plan, consisting of the HFS monitoring system and a set of pre-determined responses that would be implemented if and when food security conditions change. These responses would be designed in non-crisis years, and would encompass *development-type* interventions that enhance the long-term sustainability of HFS, *mitigation-type* interventions that enable households to retain their productive assets and existing entitlement, and *relief-type* responses if immediate food aid distribution is warranted. Responsibilities for these various actions will be negotiated and assigned to government agencies, donors and local NGOs prior to the onset of food crises to improve response timing.

Whenever possible, participation of local communities in information gathering and response should be encouraged. People-centered systems like SADS in Mali provide a good model to follow for community-based food security monitoring. Participatory rural appraisal approaches can provide guidance for community-based interventions.

In situations where areas of chronic food insecurity have already been designated for project activities, location specific HFS information will be needed for identifying vulnerable groups in the area and appropriate interventions. Monitoring systems should incorporate process indicators as well as outcome indicators in order to detect changes in entitlement and food supply. Such changes can drastically affect the success of interventions, and may call for modifications or adjustments in the intervention mix being promoted by the project. For example, drought conditions may force some households to sell assets, diminishing their ability to take advantage of project inputs. Contingency plans may be necessary to provide income transfers through food for work/cash for work during stress periods to prevent project beneficiaries from selling off productive assets. Such plans can be built into the project design, and should be based on improvements in infrastructure and/or natural resource management that will enhance the long-term food security of the local area. To ensure such plans are appropriate, participation of local communities in identifying options will be necessary.

Summary

The information needs of different user groups will influence the selection of HFS indicators and the data collection methods to be used. National governments and donors require quantitative information to help make informed planning and policy decisions regarding the sharing of limited resources across regions. Local governments, NGOs and local communities require qualitative location specific information to design appropriate interventions.

HFS information systems can be designed to take both of these concerns into account. Using a staged process, vulnerability maps can help determine in a cost-effective manner where the decentralized food security monitoring systems should be located. Contingency plans can then be developed to link information to response.

For projects already established, monitoring systems should incorporate HFS process indicators as well as outcome indicators in order to detect changes in entitlement and food availability. Such changes may require modifications in the intervention mix presented by the project in the course of the project life. Contingency plans could also allow for income transfers during stress periods to protect the asset base of the project beneficiaries.

Conclusion

A number of conclusions can be drawn from this review of household food security indicators. First, it is apparent that much intellectual progress has been made in our understanding of the processes that lead to food insecure situations for households. Food availability and stable access are both critical to HFS. Thus, any particular monitoring system used for assessing HFS must incorporate both food supply/production data and access entitlement data as part of their indicator set.

Second, household food security indicators are used by a number of different groups in making a variety of decisions regarding the allocation of resources, intervention design, and the timing of response. These user groups include donors, national governments, local governments, NGOs, and local communities. Each user group may have different data needs for the decisions they are going to make requiring different types of indicators and data collection methods. The subset of indicators that are used by a particular user group will be determined by the specific data needs and the resources that are available to collect this information.

Third, vulnerability to food insecurity can be mapped for a country or region to assist national governments and donors in making decisions regarding the allocation of resources across regions. Vulnerability to food insecurity is an aggregate measure for a given population of the risk of exposure to different types of shocks or disaster events and the ability to cope with these events. The types of information that can be used as indicators of vulnerability to food insecurity will vary considerably between countries and regions within a country. The development of vulnerability maps could be a first step in identifying districts or subregions where more location specific HFS information is necessary to collect. This information could then be used for targeting development initiatives and for setting up decentralized HFS monitoring systems. Such systematic approaches for targeting development should be encouraged.

Fourth, development projects and programs should be designed in such a way to take into account periodic shocks that may negatively impact the food security situation of households. To prevent households from selling off their assets and diminishing their ability to take advantage of project inputs, project designs should incorporate: 1) a monitoring system with indicators that can detect changes in entitlement and food supply; and, 2) contingency plans that protect the asset base of the project beneficiaries during periods of stress through income transfers such as food-for-work/cash-for-work. Through local community participation, these contingency plans can be designed to focus on improvements in infrastructure and/or natural resource management that will enhance the long term food security of the local area.

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Annex I:

Potential Indicators of Household Food Security from the Broader Literature

(Socio-Economic Indicators Related to Food Access)*

Household	Indicator	Comments
Demographic	Household size/composition	Household's size/composition is not static, but changes with household biological life cycle (Caldwell, Reddy, and Caldwell 1986). Adjustment of household size/composition to recurrent food insecurity is a common strategy (Messer 1989a; Norris 1988: Nabarro, Cassels, and Pant 1989; von Braun and Pandya-Lorch 1991). During prolonged economic crisis the trend is toward smaller consumption units (Seaman and Holt 1980; Taal 1989; Shipton 1990; Chambers 1989). Larger/extended households are more likely than smaller/nuclear households to be associated with greater diversification of assets, income sources and crop cultivation (Toulmin 1986; Taal 1989; Nabarro, Cassels, and Pant 1989), and less vulnerable to illness/death of breadwinners (Toulmin 1986; Lipton 1983a; Caldwell, Reddy, and Caldwell 1986). However, the poorest households tend to have large young families (Lipton 1983b). Households with female heads are often, but not always, disadvantaged (Peters and Herrera 1989; Kennedy and Haadad 1991; Louat, Grosh, and van der Gaag 1991).
	Migration	Distinguish between seasonal migration of able-bodied adults prior to/during peak agricultural labor periods and migration during dry season (de Waal 1988; Campbell and Trechter 1982; Autier et al. 1989). Rural Ethiopians could predict six months in advance whether household members would have to migrate in search of wage labor (de Waal 1988). Distress migration of whole families is usually the last in a sequence of household responses and a clear indication that other coping strategies failed (Corbett 1988; Watts 1983).
	Ethnicity/region	Certain ethnic or caste groups may be historically or geographically more vulnerable to seasonal or chronic food insecurity (O'Brien-Place 1988). Welfare levels often vary distinctly by region (Haddad 1991).

* Taken from: Haddad et al. 1991.

Household	Indicator	Comments
Factor Market	Income sources	Smallholders spread risks through diversification of income sources most notably off-farm employment (Downing 1988; Shipton 1990; Caldwell, Reddy, and Caldwell 1985: Merryman 1984; Reutlinger 1987). The riskier the environment, the more diverse the economic activities relied upon will be (Reardon, Matlon and Delgado 1988; Staatz, D'Agostino and Sundberg 1990). The distribution of income sources within a given community may be U-shaped implying that income diversification has different purposes and consequences for the most and least vulnerable households (Castro, Hakansson, and Brokensha 1981: von Braun and Pandya-Lorch 1991). The source and/or control of income may be more important than total income in influencing household-level food security (Kennedy 1989).
	Changes in income/ income sources	Changes in petty marketing patterns of rural households may indicate anticipated food insecurity (McCorkle 1987; Cutler 1984). Increasing income within communities is associated with different diets but not necessarily improved nutrition (DeWalt et al. 1990; Behrman and Deolalikar 1987). The transition from subsistence to cash-cropping has been associated with increased vulnerability and increased malnutrition among children (Dewy 1981; Thomas, Paine, and Brenton 1989) and with increased household caloric intake (Kennedy 1989) or increased food expenditures (von Braun Hotchkiss and Immink 1989; von Braun de Haen and Blanken 1991). The effect of commercialization of semi-subsistence agriculture on food consumption and nutritional status of vulnerable groups has shown mixed results (von Braun and Kennedy 1986).
	Income flow	Income received seasonally in large sums will more likely be spent on lump-sum expenditures or consumer goods than on improved diets and other nutrition-related investments (Alderman 1986; Guyer 1980: Dewey 1979).
	Access to loans/credit	Nearly half of rural South Indian households took loans during a recent drought, and most felt these had been a considerable factor in maintaining minimum living conditions (Caldwell, Reddy, and Caldwell 1986). Access to traditional lines of credit through merchants collapses as collateral (for example. livestock) disappears during drought (Cutler 1986).
	Land ownership/ control	Number of different plots may be a more sensitive indicator than total acreage since households with fragmented landholdings can take advantage of different micro-climates more than households with larger but often less diverse landholdings (Dei 1990; Colson 1979; Paterson cited in Castro, Hakansson, and Brokensha 1981; Dewey 1981; Downs 1988, cited in Shipton 1990). Access to seasonally flooded lowlands is an important buffering mechanism in drought-prone areas (Longhurst 1986).

Household	Indicator	Comments
	Land use practices	Intensification of land-use practices is one of the earliest responses in a sequence of adjustments to stress by Indian farmers (Jodha 1975, 1978). Intercropping, multiple seed strains with different maturation periods/resistance to disease, and braced mixtures of available cultivars are important diversification strategies of African farmers to minimize the risk of crop failure and enhance food security (Shipton 1990; Taal 1989; Smith 1986). Access to good-quality land and alternative employment sources may be more important in determining nutritional status of rural populations than choice of crop (DeWalt et al. 1990).
	Sales of land	Distress sales of land is a desperate measure and tends to occur much later in the belt-tightening process (Caldwell, Ready, and Caldwell 1986; Corbett 1988). If land is a household's only asset, it will only be sold if there is no other way to survive; often the land is first mortgaged (Nabarro, Cassels, and Pant 1989). One of the more common reasons for land to come into markets in India was wedding and/or funeral expenditures (Srinivasan 1975 cited in Castro, Hakansson, and Brokensha 1981).
	Trees	Access to communal or private reserves of trees can significantly decrease the poor's vulnerability to contingencies (Chambers and Leach 1989; Chambers and Longhurst 1986). The percentage of cultivated land planted to tree crops can be used as a proxy for agro-climatic conditions, and was positively associated with child's height in Cote d'Ivoire (Strauss 1988).
	Livestock	Diversified herds with different pasture needs are less vulnerable to drought and infection than more homogenous herds that may produce more meat or milk (Colson 1979; Cutler 1986). The importance is not between small versus large herds, but between owning no animals at all and having at least some (de Waal 1988). Access to milk is indicated by having a female animal (de Waal 1988). Donkeys and mules are highly valued during famine because they help travel (Shipton 1990). Lack of access to resources, primarily oxen, makes women particularly vulnerable to drought in Ethiopia (McCann 1987).
	Sales of livestock	The ability to market livestock for grain commonly determines who will survive a famine and who will not (Shipton 1990). The sale of male animals before their optimum weight or of females before the end of their reproductive period is an indicator of insecurity (White 1986). Livestock sales occur normally, and do not necessarily imply a reduction of future productivity (Swinton 1988). Indicators related to livestock sales, prices or market demand/supply are difficult to interpret, and reliable data are hard to obtain in Chad and Mali (Autier et al. 1989).
Household	Indicator	Comments

Household	Indicator	Comments
	Sales of assets	Important to distinguish sales of key productive assets from sales of assets which are primarily forms of insurance/saving (Corbett 1988). Successfully surviving drought depends upon a household's ability to retain intact all its productive assets (including family labor supply) solely by cutting back on ceremonial forms of consumption and by liquidating nonproductive assets (Jodha 1978). Poor people become poorer by disposing of productive assets (Chambers 1989). The income and assets owned by the richest and poorest quintiles is one of 20 suggested indicators of human welfare (Anderson 1990).
	Sales of food	The conversion of surplus food into durable valuables which can be stored and traded for food in emergencies is an important strategy for reducing vulnerability to risk (Colson 1979). The very poor in India cannot afford to consume their own home products and must sell them to obtain cash (Bhattacharya et al. 1991).
	Capital equipment	The number or diversity of assets may be a more useful indicator than net-worth of assets; households with low number and diversity of productive assets may be more vulnerable to external shocks and contingencies (Chambers 1989: Swift 1989). But low asset status is not necessarily synonymous with greatest poverty (Swift 1989). Some landless peasants in Tanzania actually owned tractors (which they hired out) and sewing machines (Pipping 1976, cited in Castro, Hakansson, and Brokenska 1981). Wells have become crucially important assets to Malian farmers for producing a regular grain surplus (Toulmin 1986).
	Consumer durables/semi-durables	Determine whether household owns enough cooking utensils to avoid borrowing plates or pots from relatives or neighbors (Lewis 1951). Determine whether Indian women own more than one sari or blouse (Bhattacharya et al. 1991).
Proximate	Ill health	The main asset of most poor people is their bodies (Chambers 1989). All producers are vulnerable to sickness and disability (Toulmin 1986). Work-disabling accidents and/or morbidity of household's breadwinners are often the pivotal events which impoverish households, making them useful indicators (Corbett 1989; Pryer 1989).
	Education	Few households with at least one educated member starve (Swift 1989). Women's schooling, even after adjusting for income, has a higher elasticity of nutrient demand than those for household size or income (Behrman and Wolfe 1984). Years of child schooling could be used as an easily-measured proxy for household's living standards (Birdsall 1982; Anderson 1990).

Household	Indicator	Comments
	Food stores	Ability to store food post-harvest and availability of stored food pre-harvest are important indicators to monitor (Chambers 1989; Thomas, Paine, and Brenton 1989). Having two years household consumption requirements in store is seen as desirable in Sudan (Maxwell, Swift, and Buchanan-Smith 1990). Estimates of number of months stored grain will last are usually more accurate and culturally sensitive than asking farmers for volume estimates of stored quantity (Frankenberger 1985; O'Brien-Place 1988).
	Qualitative dietary changes	Shifts from preferred to lower status foods (starchy tubers or grain ground with stalks/ husks/bran) and unconventional foods (wild foods, insects or game: poorer products, e.g., broken rice grains) are a normal occurrence in areas facing seasonal food deficits, but may also indicate anticipated stress (Ogbu 1973; Colson 1579: Cutler 1986: Caldwell, Ready, and Caldwell 1986; Corbett 1988: Shipton 1990). Local sharing between families or households often intensifies when food is scarce (Shipton 1990; Maxwell, Swift and Buchanan-Smith 1990). The importance and intensity of wild food use depends upon severity and length of food shortages, the location of households with respect to wild food areas, and available household labor to collect them (Dewalt 1983; Zinyama, Matiza, and Campbell 1990). Households producing for auto-consumption are more likely to have greater dietary diversity than households producing primarily for the market (Fleuret and Fleuret 1980: Dewey 1979: Smith 1986). The correlation between dietary diversity and socioeconomic status is positive (Bentley 1987; DeWalt 1983; Schiff and Valdes 1990 b).
	Quantitative dietary changes	Fluctuation in consumption of main staple (Bhattacharya et al. 1991) or in meal patterns are indicative of food insecurity (Beck 1989; Taal 1989; Campbell and Trechter 1982; Oshaug and Wandel 1989; Galvin 1988). Food consumption reduction is part of a deliberate and early strategic household's response (Corbett 1988; Cutler 1984; Shipton 1990). The number of meals per day was not found to be a useful indicator in Chad and Mali (Autier et al. 1989), and missed meals did not necessarily imply food unavailability in India due to frequent eating outside the home or at work (Bhattacharya et al. 1991). Most agrarians derive the bulk of calories from one to three grain staples which could easily be monitored (de Garine 1988, cited in Shipton 1990). There was a drastic reduction in consumption of pulses in India during the 1967 drought (Rao 1989). Determine if household has recently participated in food aid programs (Cutler 1986; Beck 1989; O'Brien-Place and Frankenberger 1988).

Part III

Household Food Security: Concepts and Definitions — An Annotated Bibliography

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Household Food Security: Concepts and Definitions — An Annotated Bibliography

Introduction

This annotated bibliography contains nearly 200 items which together trace developments in the concept of household food security. The concept of "food security" is found as early as the 1970s, but the construct of "household food security" is more recent: the bulk of the literature dates from the 1980s. The evolution of "food security," from concern with national food stocks in the 1970s to a preoccupation with individual entitlements in the 1980s, is an important part of the story this bibliography tells.

Beyond that, the bibliography illustrates the many themes and sub-themes in studies of household food security: from the relationship between food security and nutrition, to wider concerns of livelihood security and long-term sustainability. There is no single definition (though some definitions are more often cited than others), but rather a complex weave of inter-related strands, which are adjusted to suit the needs and priorities of individual users.

Some clear patterns emerge. The studies produced under the auspices of national governments have tended to give high priority to food production, with the overall objective of national self-sufficiency. International agencies and the academic literature have taken a different tack, focusing more on consumption and nutritional outcomes. Geographically, all regions are represented, but sub-Saharan Africa dominates, especially in the later entries.

Household food security is linked increasingly to environmental considerations. Contrary to expectations, perhaps, the two issues were brought together as early as 1978, although it is only in more recent work that the complex links between environmental and food security concerns have been explored. Similarly, the role of gender relations in determining intra-household resource allocation has influenced food security studies, shaping their focus on individual food access. Finally, and perhaps heralding the issues which will dominate the literature in the coming decade, food security is being linked to wider concerns of human rights and cultural dignity.

A word on sources and methods: we have trawled both the academic literature and, so far as possible, the "grey" literature of government reports and unpublished manuscripts. In preparing abstracts, we have tried to quote the text verbatim, giving page references to aid citation. We should also make clear that we have limited ourselves to concepts and definitions, excluding questions relating to measurement and, importantly, policy. This is not because we

think those topics unimportant; on the contrary. Rather, we see clearer conceptual frameworks as essential ground-clearing, before moving on to policy.

The preparation of the bibliography was supervised by Simon Maxwell. We acknowledge the financial support of UNICEF. Responsibility, of course, is ours.

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1. Adedeji, Adebayo, (1989) Interaction between Structuralism, Structural Adjustment and Food Security Policies in Development Policy Management, ECDPM Occasional Paper, Maastricht.

   While the concept of food security was highlighted during the World Food Conference of 1974, emphasis was essentially on increasing food production in food-deficit countries and on creating a coordinated system of national and international grain reserves. This approach overlooked the demand side of the issue, especially the access of vulnerable groups to enough food for a normal life. Currently, the widely accepted definition of food security is "access by all people at all times to enough food for an active, healthy life." Its essential elements are the availability of food and the ability to acquire it. Food security is thus defined in much broader terms than food self-sufficiency which emphasises increasing domestic food production to meet domestic consumption. (p13).

2. Adelman, I., and P. Berck, (1991) "Food security policy in a stochastic world," Journal of Development Economics, vol 34 no 1, pp25-55.

   We accept the definition of food security offered by Reutlinger and Knapp (1980) — that it represents a condition in which the probability of a country's citizens falling below a minimal level of food consumption is quite low. Aside from the conceptual problems inherent in defining minimal nutritional standards, common to all food security analyses, this approach requires evaluating the probability of below-subsistence food consumption for all population groups in the economy as a function of international and domestic conditions. For each population group, this probability is clearly related to both the group's mean food consumption and to the variance of its food consumption. (p26).

3. Advisory Council on Develoment Co-operation, (1985) Food Security in Africa, Report and Recommendations, Republic of Ireland, Dublin, December.

   The concept of food security is taken as embracing three specific aims:

   ensuring production of adequate food supplies; maximising stability in the growth of supplies; and securing access to available supplies on the part of those who need them. (Report of the English session of the Committee on World Food Security, FAO, PL83/10, May, 1983). (p13).

4. Africa Leadership Forum, (1989) The Challenges of Agricultural Production and Food Security in Africa, Report of a Conference 27-30 July 1989, Ota, Nigeria.

   National food security should be defined within the context of national food self-reliance. It must imply adequate access by all people at national and household levels to adequate and largely domestically produced food at all times. It involves regular and sustainable access without dependence on

commercial and foreign-exchange-consuming imports or food aid detrimental to local production in Africa. In this context, food security should not hinder intra-African trade as a policy instrument, rather it should encourage and emphasise the full utilisation of Africa's productive food resources. (p2).

5. Alamgir, M., and P. Arora, (1991) Providing Food Security for All, International Fund for Agricultural Development, New York University Press, USA.

A food secure household should be defined as one which has enough food available to ensure a minimum necessary intake by all members. The minimum is related to, among other things, body size, weight, sex, nature of work and, for women, pregnancy or lactation status. (p6).

Food security at the sub-national level means the assured availability of food for individual households to draw on to meet their minimum consumption requirements during a given period. To be operational, the concept of "minimum" has to be modified here to reflect, at least partially, tastes and preferences and household status. (p7).

National food security is the sum of household and sub-national food security, and more. At the national level, food security can be defined as assured national availability of food to meet current minimum requirements per capita during a reference period (a year normally) and, also, to meet any unexpected shortfall over a limited period (say three months). (p7)

Global food security is the assurance of an adequate food supply and/or access to it for all, both at national and sub-national levels. (p8).

6. Amani, H.K.R. et al., (1988) "Effects of market liberalisation of food security in Tanzania" in M.Rukuni and R.H.Bernsten (eds), Southern Africa: Food Security Policy Options, Proceedings of the Third Annual Conference on Food Security Research in Southern Africa, 1-5 November,1987. University of Zimbabwe/Michigan State University Food Security Research Project, Department of Agricultural Economics and Extension, Harare.

Broadly defined, food security means "access by all people at all times to enough food for an active, healthy life" (World Bank, 1986). It entails both the availability of food and the ability of all members of society to have access to adequate amounts of food. At the aggregate level, the country should have adequate food from production, stocks, and imports to meet its citizens' food requirements for an active healthy life. At the household and individual level, all citizens should have entitlement to adequate food (Sen, 1982). (p65).

7. Amiti, M., (1982) "Food Security and Shortage Policies." Proceedings of the workshop on Food Policy Research Priorities, held in Nairobi 14-17 June, 1982.

"Food security generally implies arrangements whereby people are assured a minimum adequate level of food grain supply in periods of normal as well as poor harvest. It can be defined at rural, national, regional and international levels. It can also be seen from the viewpoint of either developed countries (the food surplus areas) or developing countries (food deficit areas)." (p154).

National Food Security: "It is a function of the ability of the country's production, marketing, trade and institutional systems to provide a continuously adequate supply of food to inhabitants even in times of adverse domestic production and international market conditions. It therefore depends on such critical factors as internal food production, income generation and distribution, foreign exchange earning capacity, provision on availability of storage and transportation, distribution facilities for meeting seasonal and emergency food needs plus other factors that may affect the maintenance and improvement of per capita food consumption." (p156).

International Food Security: "World food security includes the general attainment of food security in individual countries, and introduces the concept of collective or collaborative policy-making. As production changes, either stocks or consumption (or both) have to vary in response. The extent of trade liberalization, commodity price agreement, food aid and the like are powerless to alter this reality." (p162).

8. Badiane, O., (1988) National Food Security and Regional Integration in West Africa, Wissenschaftsverlag Vauk, Kiel.

Food security is defined as "the ability of food deficit countries, or regions or households within these countries, to meet target consumption levels on a year-to-year basis." (p1).

Food insecurity, aside from an inability to consume the desired amount of food at the individual level, can also exist in the form of excessive costs incurred by the economy to ensure food availability. (p7.)

9. Balaam, D.N., (1986) "Self-Sufficiency in Japanese agriculture: Telescoping and reconciling the food security-efficiency dilemma" in W.P.Browne and D.F.Hadwiger (eds), World Food Polices: Toward Agricultural Interdependence, Lynne Rienner Publishers, Boulder.

This analysis contends that until 1978 the issue of self-sufficiency in Japan was cast largely in terms of food security (enough food produced locally to meet demand) and efficiency (some food produced locally but excess demand met by importing cheaper food-stuffs). (p91).

10. Ballenger, N., and C. Mabbs-Zeno, (1990) "Targeting Food Security and Food Aid Issues at the GATT," National Center for Food and Agricultural Policy, Discussion Paper Series no FAP90-07, April.

    Three types of food security are defined here: global, national, and individual... Global food security requires that a sufficient quantity of food be present to feed the world's people... National food security is defined as an acceptable likelihood that food available for consumption within country is at least equal to biological needs throughout the year... Individual food security is defined as an acceptable likelihood that each person's income, broadly interpreted, is sufficient to satisfy all needs. (pp5-6).

11. Bapna, S.L., (1990) "Food security through the PDS: the Indian experience" in D.S. Tyagi and V.S. Vyas,(eds) Increasing Access to Food: The Asian Experience, Sage Publications, New Delhi and London

    Food security is defined as "access to adequate food for all people at all times," (World Bank, Poverty and Hunger, 1986). (p99).

12. Barraclough, S., and P. Utting, (1987) "Food Security Trends and Prospects in Latin America," Working Paper no 99, Helen Kellog Institute for International Studies, University of Notre Dame, USA.

    The normative concept of food security used for the research signifies an assured supply and distribution of food to all social groups and individuals adequate in quality and quantity to meet their nutritional needs, as well as effective demand above this minimum. Food systems offering food security should have the following characteristics: 1) the capacity to generate a sufficient internal food supply (via production, adequate storage and stocks and imports) to meet the basic food needs of all social groups and also of expanding effective demand; 2) have a maximum of autonomy and self-determination, reducing vulnerability to international market fluctuations and external political pressures (autonomy does not imply autarky, however, but rather dependability while taking prudent advantage of gains to be had from specialisation); 3) be reliable so that seasonal and cyclical variations in access to food are minimized; 4) possess long-term sustainability (ie the production base (the ecosystem) should be preserved and improved); 5) finally it should ensure equity, meaning, as a minimum, dependable access to adequate food for all social classes, groups and strata. (p2).

13. Barraclough, S.L., and M.F. Scott, (1988) "The Rich Have Already Eaten.." Roots of Catastrophe in Central America, Working Paper no 105, Helen Kellog Institute for International Studies, University of Notre Dame, USA, January.

    Food security can be defined as assured access by all social groups and individuals to food adequate in quantity and quality to meet nutritional needs.

Five characteristics of a secure food system are described (as in Barraclough and Utting 1987). (p4).

14. Benson, C., E.J. Clay and R.H. Green, (1986) Food Security in Sub-Saharan Africa, IDS, University of Sussex, Brighton.

National food security can be defined as a country having adequate assured supplies of food to meet aggregate consumption needs. It involves stability of supplies and secure access to available supplies on the part of those who need them.

Household food security can be defined as a household having assured sets of entitlements — from food production, cash income, reserves of food or assets and/or government assistance programmes — such that in times of need they will be able to maintain sufficient nutritional intake for physical well-being. There are three important elements in determining household security: the average level of household income, the magnitude and probability of seasonal and annual fluctuations around the average and the value and form of stocks a household can maintain. (pp2-6).

15. Bigman, D., (1982) Coping with Hunger: Toward a System of Food Security and Price Stabilization, Ballinger Publishing Company, Cambridge, Massachusetts.

Food security is measured by the probability that the quantity available for consumption by "poor" consumers does not fall below subsistence level (p.xxix) and is defined thus: "food security represents the ability of a country or the world at large to supply the food needs of all its people at all times, now and in the future." (p13).

16. Blein, Roger, (1990) "Marché céréalier et sécurité alimentaire," La Lettre de Solagral — Stratégies Alimentaires no 33.

Following Coulibaly, food security means the regular availability of food supplies taking into account the food habits and economic power of the population. (p14).

17. Botswana, Rural Development Unit, Ministry of Finance and Development Planning, (1985) Report on the National Food Strategy, Gaborone.

The problem areas whose existence necessitated the adoption of an NFS in Botswana are as follows: inadequate food production, poor nutritional status and lack of food security for the nation. Low productivity in arable agriculture is a major factor, as are generally low household incomes, and the pattern and extent of malnutrition is closely linked to this. National food security is viewed in terms of Botswana's inability to rely on internal supplies produced almost

entirely under rainfed conditions, the rising levels of imports during the current drought period, and the problems posed by being landlocked and situated within an unstable region. (p1).

18. Brandt, Hartmut, (1984) "Food Security Programmes in the Sudano-Sahel," Occasional Paper no 78, German Development Institute, Berlin.

    Food security signifies a form of global supply which at least ensures the continued availability of an average per capita quantity of food as population grows. Nutritional security is achieved when food is so distributed that the minimum physiological requirements of final consumers in all sections of the population are satisfied at all times. (p1)

19. Brandt, H., (1990) "Food security aspects in price and market policies for grain-based food systems of sub-Saharan Africa" in E.Chole (ed), Food Crisis in Africa: Policy and Management Issues, Vikas Publishing House PVT Ltd., New Delhi.

    The overall objective of food and nutrition security consists of three subsidiary objectives of central importance: increase in the availability of food, at least in line with demographic growth; stabilisation of food, ie., balancing annual fluctuations in supply; and improvement in the distribution of food to final consumer groups. (pp138-139).

20. Bryceson, D.F., (1990) Food Insecurity and the Social Division of Labour in Tanzania 1919-85, Macmillan, Oxford.

    Food insecurity, defined as "the inadequacy of the quantity and quality of food consumption, as well as the irregularity over time," can lead to the contraction and ineffectiveness of the institutions that might serve as positive spurs to the enhancement of food production and distribution. (p15)

21. Buchanan-Smith, M., J. Bailey and S. Maxwell, (1990) "Famine in Sudan: A Symposium held at the Institute of Development Studies, University of Sussex, 23 October 1990," in Disasters, vol 15 no 2, pp196-202.

    "Food insecurity.."'lack of enough food for an active, healthy life" or "the fear that there will not be enough to eat."(p196).

22. Calkins. P., (1988) "La sécurité alimentaire: Première démarche dans un jeu difficile," Série Conférences no 6, Centre Sahel de l'Université Laval, Québec.

    Food security means the capacity of a population to produce or to buy enough food, even in the worst years, to satisfy its basic food needs. (p4).

23. Calon, M.L.H., (1990) "Population, farming systems and food security," Paper no 7(E), International Course for Development Oriented Research in Agriculture. Farming Systems Analysis.

    Food security is linked with food self-sufficiency and is measured by the ability of the household to secure its need for staple food. Food security depends on the availability of cash which will enable a household to purchase staple food and basic factors of production such as land and labour. (p19).

24. CARE, (1988) "Project Food Aid: A Classification of its Uses as a Development Resource," CARE, New York, May.

    "Food security" refers to availability of a country's population of an adequate and reliable supply of food. This can involve a number of elements:

    1. Increasing local food production
    2. Improving the stability of food supplies
    3. Guaranteeing access to food supplies (through either purchasing power or compensatory mechanisms). (p1).

25. Cathie, J., and H. Dick, (1987) Food Security and Macroeconomic Stabilization: A Case Study of Botswana 1965-1984, Institut für Weltwirtschaft an der Universität Kiel, Tübingen.

    At the most general level, food security has been defined as "access by all people at all times to enough food for an active, healthy life." [Reutlinger, 1985].

    Food security can be refined to consider both its long-term and short-term aspects. Long-term food insecurity, or chronic insecurity is defined in terms of the persistent existence of malnutrition and the associated lack of development and growth in low-income developing economies or regions of those economies. ... The inability to attain food security in the short-term, or transitory food insecurity, is defined as a temporary decline in a household's or region's or nation's access to food. (p4).

26. Chisholm, A.H., and R. Tyers, (eds) (1982) "Introduction and overview," Food Security: Theory, Policy, and Perspectives from Asia and the Pacific Rim, Lexington Books, Massachusetts.

    Food security may be defined as the ability of countries to meet target consumption levels. The choice of the target consumption levels is perhaps the most important aspect of a developing country's food policy, and it can be viewed under two time frames. First, there is the problem of chronic and persistent malnutrition that is caused by low productive capacity and secular problems of poverty. This constitutes a long-term problem that can be overcome

only by a steady continuing rise in productive capacity and the real income levels of the poor...The second problem..is that of short-term variability of entitlements of consumers to food. Food insecurity in this sense is ultimately a problem that stems from real income fluctuations that affect the ability of people to command adequate food through legal means. (p5).

27. Christensen, Garry, (1991) "Towards food security in the horn of Africa," Working Paper no 4, Food Studies Group, Oxford.

    Food security is obtained when there is an adequate food supply to which all members of the population have full access. (p1).

28. CIDA, (1989) "Food Security: a Working Paper for the 4A's," Area Coordination Group, July.

    What is food security? Food security is a development priority and a programming objective. It is founded on and aimed specifically at redressing the global problem of food insecurity: the lack of access to adequate food. (p5).

29. Clay, E., (1981) "Food policy issues in low-income countries: an overview" in "Food Policy Issues in Low Income Countries," World Bank Staff Working Paper, no 473, World Bank, Washington DC, August.

    Food security is a problem most often conceptualised as a macro phenomenon — deviations from trend in aggregate consumption. However, as a human problem it is primarily one of the welfare vulnerability of distinct categories of people within the population. (p5).

30. Clay, E., S. Jones, A. Rahman and Q. Shahabuddin, (1988) "Introduction" in Food Strategies in Bangladesh, Proceedings of a Seminar held in Dhaka 8-10 October, and jointly sponsored by the Government of Bangladesh and the Commission of the European Communities, University Press Ltd.

    The term "food security" has two senses: national and individual. At the national level, typically it means the availability in the country of sufficient stocks of food to meet national needs (however defined) until such time as stocks can be replenished from harvests or imports. At the individual level, it means that all members of society have access to the food they need, either from the market, from their own production, or from the Public Food Distribution System (eg the ration system, or Food-for-Work). (p3).

31. Commission of the European Communities, (1988) "Food Security Policy: Examination of Recent Experiences in sub-Saharan Africa," Commission Staff Paper, Brussels, 28 July.

In its broadest sense, food security can be defined as access for everybody at all times to adequate quantities of good-quality food. This definition is very wide and various components of food security may be distinguished.

First, a distinction must be made between the various ways in which food security can be expressed at the different levels of socioeconomic life:

- at the microeconomic level (family, village);
- at the macroeconomic level (nation);
- at the regional level.

Secondly, various aspects relating to the food sector proper may be distinguished: production, marketing, processing, storage and transport, international trade in food products and food aid. Furthermore, all these points are related to a wider nexus of problems: income distribution, relations between town and country, macroeconomic policy, etc. (p3).

32. Corbett, J., (1988) "Famine and household coping strategies," World Development, vol 16 no 9, pp 1099-1112.

Food insecurity to many families in Africa is seen as problems in obtaining stable and adequate access to food. It remains one of the most visible manifestations of their poverty. Such food insecurity varies from the recurrent and predictable food deficits to more severe entitlement failures, which arise from a mix of socio-economic, environmental and political factors and which at their worst may lead to famine. (p1099).

33. Curtis, D., Hubbard, M., Shepherd, A., (1988) Preventing Famine: Policies and Prospects for Africa, Routledge, London.

The World Bank's definition and prescription is considered. The following is considered as an integral part in reducing food insecurity in sub-Saharan Africa:

"Strengthening of agricultural production by raising producer prices of internationally traded products to border price levels, and improving the technical, input, and marketing support to agriculture, for the production of both traded and non-traded agricultural commodities." They also consider that increasing food production must be a major part of policy to increase food security in many African countries. (p7).

34. Davies, O., and M. Witter, (1986) Issues in Food Security in Jamaica, National Food and Nutrition Co-ordinating Committee of Jamaica, Kingston.

The major objective of ensuring food and nutrition security for the people of Jamaica is easily stated. It entails the ability of the country to maintain, on a

continuous basis, the supply and distribution of food to all segments of the population, at or above specified nutritional levels. ...

Specifically, national food and nutrition security implies:

1. adequacy and continuity of food supply at the national level;
2. an efficient distribution system for both imports and domestic production;
3. equity in terms of access to food among households at all income levels;
4. reserve stocks in case of disasters;
5. the attainment of minimum levels of nutritional status of all households; and
6. a maximisation of the contribution to supply of domestic resources. (p1).

35. Davies, S. and M. Lipton, (1985) "A New Start: Preconditions for A Food Strategy in Zaire," report of Food Strategy Team's Mission to Zaire, 18 March, 1985.

"The objectives of national food security — the experience in some African countries (Kenya, Rwanda, Mali, Zambia) shows that there are four major objectives of national food strategies. These are (1) self-sufficiency, providing balance of payments relief from reduced imports of food; (2) effective growth in food and agricultural sector; (3) adequate or raised levels of nutrition or consumption for groups of the population at nutritional risk; (4) food security, defined as the stabilization of access to calories by a population." (p10).

36. Davies, S., Leach, M., David, R., (1991) "Food security and the environment: conflict and complementarity,"Discussion Paper no 285, IDS, University of Sussex, April 1991.

The World Bank (1986) definition of food security is quoted: "access by all people at all times to enough food for an active, healthy life." (p1).

37. Dey, Jennie, (1984) Women in Food Production and Food Security in Africa, FAO, Rome, pp3-4.

The recognition of the inter-related technical, social and economic dimensions of food security systems has led to a revised broader concept of food security by FAO. The ultimate objective is "to ensure that all people at all times have both physical and economic access to the basic food they need." Food security is seen to have three specific aims: "ensuring production of adequate food supplies; maximizing stability in the flow of supplies; and securing access to available supplies on the part of those who need them."

38. Diab, M., (1990) "Guidelines for Food Security Assessment," World Food Programme, Draft.

Food security is defined as a physical and economic access to food at all times by individuals and households in a nation for an active and healthy life. The two major elements of food security are the availability of food and economic ability to acquire it. (p5).

39. Diakosavvas, D., (1989) "On the causes of food insecurity in less developed countries: an empirical evaluation," World Development, vol 17 no 2, February, pp223-236.

For our purposes, food security is interpreted, as is usual in empirical studies in this field, as the short-term (year to year) variability of average per capita cereal consumption for a country as a whole. This variability is defined with shortfalls below "normal" levels identified either as a trend or an average. (p224).

40. Dommen, A., (1983) "Mali's National Food Strategy," paper prepared for the Food and Agricultural Political Panel, 26th Annual Meeting of the African Studies Association, Boston.

National Food Security: "A national food strategy is distinguished by the following characteristics: (a) it links directly consumption needs to production objectives; (b) it emphasises the integration of policies and project activities and avoids fragmentation and duplication; (c) as a continuing process designed to sustain adequate priority for the food sector, it includes provisions for strengthening the institutions necessary for its implementation; (d) it facilitates national decisions over time covering the whole range of activities affecting food; (e) it facilitates the increased and coordinated international assistance needs for its implementation. 'A food strategy thus translates into effective action on a government's decision to resolve its food problem.'" (pp13-14).

"The strategy established seven strategic objectives, namely: (1) heighten food security; (2) attain food self-sufficiency; (3) improve the nutritional status of the population; (4) reduce consumer food costs; (5) reduce the government's budget deficit; (6) improve the balance of trade; (7) strengthen rural income." (p23).

41. Downing, Thomas E., et al., (1989) Coping with Drought in Kenya, Lynne Reinner Publishers, Boulder, pp169-170.

Food shortage refers to the availability of food relative to consumption requirements. It may be aggregated at a regional, national, community or household level. Food poverty refers to the ability of households to purchase food, primarily in local markets. Food deprivation implies that hunger is ultimately experienced by individuals who have insufficient food due to the failure of production, social, economic or political systems. Underlying these characteristics of hunger are two resource dimensions: temporal persistence and resource endowment.

42. Drèze, J., and A. Sen, (1989) Hunger and Public Action WIDER, Oxford

Drèze and Sen do not mention food security but link hunger and livelihood failure by use of the concept of entitlements. Entitlements are the means, in the broadest sense, by which individuals gain their livelihoods. The concept is best understood as *the set of bundles of "commodities" over which a person can establish command* given the existing social structure — the legal, political and economic arrangements and institutions that form and constrain individual preference. From this analysis, it becomes clear that, "The mere presence of food in the economy, or in the market, does not entitle a person to consume it." (p9).

That is, an individual's commodity bundles may be limited or extensive and what a person can consume depends directly on what these bundles constitute. (p9).

The definition is primarily in terms of ownership and exchange rights, and derives from the collapse in employment opportunities in famine situations where possession of labour power did not result in access to food in markets. However, there are also use rights — where use is guaranteed, and extended entitlements: socially sanctioned rights eg. of male head of household to more or better food.

The notion of food security, in more recent and sophisticated uses, depends implicitly on the concept of entitlements to explain why availability of food is not equivalent to equal distribution.

43. Economic Commission for Africa, (1991) Regional Cooperation in Food Security, Paper presented to the Symposium on Food Security in Africa, Dakar.

The concept of food security has gradually gone beyond reserve stocks to the final objective of ensuring that every individual can not only have access at all times to the food he needs but that he also has the necessary means to acquire it. Essential elements of food security include adequate levels of food production, stabilization of food supplies and guarantee of food availability for all. For the ECA, food insecurity in Africa is mainly due to low levels of production. (p3-4).

44. Eicher, C., (1986) "Facing up to Africa's food crisis" in J. Ravenhill (ed) Africa in Economic Crisis, MacMillan, Basingstoke.

Donors should urge African policy-makers to focus on policies and strategies to achieve a reliable food surplus (food security) based on local production, storage, and international trade. (p173).

45. Eicher, Carl K., (1990) "Africa's food battles" in Carl K. Eicher and John M. Staatz (eds), Agricultural Development in the Third World, John Hopkins University Press, Baltimore.

The linkages between food availability, poverty and access to food can be described as two sides of the food security equation. "The first is that increasing food production, storage, and trade can ensure national food availability, but food availability will not automatically end hunger and ensure that all people have enough to eat. The second is that because poverty is a central cause of hunger and malnutrition, special public and private efforts are needed to help resource-poor farmers and the landless increase their access to food through expanded home production, off-farm employment, new income streams, and targeted food transfer programs." The promotion of food security requires that both sides of the equation are addressed. (p506).

46. Eicher, C.K., and J.M.Staatz, (1986) "Food security policy in sub-Saharan Africa" in A.Maunder (ed) Agriculture in a Turbulent World Economy, Gower, Aldershot.

We define food security as the ability of a country or region to assure, on a long-term basis, that its food system provides the total population access to a timely, reliable, and nutritionally adequate supply of food. (p216).

47. Eicher, Carl K., and John M. Staatz (eds), (1990) Agricultural Development in the Third World, John Hopkins University Press, Baltimore.

Food security is one of four major components of food policy analysis (along with price policy, trade policy and food aid).

Food security is related to both price policy and technological change in agriculture and is best addressed within a framework that takes account of the linkages among the various sectors of the economy.

Food security can be addressed at four levels: international, regional, national (or subnational), and household. In the 1980s, focus shifted from the international and regional levels to the national and household levels. Analysis of national food security focuses on how domestic production, marketing and trade can achieve national food availability and access goals, including adequate nutrition. Increasing attention has been paid to household food security because of the growing understanding that expanded food production will not ensure that all families will be able to secure their food needs. (p118).

48. Eide, W.B., (1990) Proceedings of the Agriculture-Nutrition Linkage Workshop, Vol 1, February 12-13, Virginia.

Need for an appropriate definition of food security in the context of the need to explore, understand and improve the linkages among agriculture, food security and adequate nutritional status. Argues for adoption of a definition of food security that includes a number of elements that can be used in a normative framework for developing and evaluating interventions. Elements of the definition include:

Food Adequacy:

a) nutritional adequacy
b) cultural acceptability
c) food safety;

Viable procurement of foods given households' strategies for exploiting available food resources;

Sustainability of adequacy including:

a) endurance of food access and availability
b) improvement of the resilience of systems
c) avoidance of system fragility through the stabilisation of the food base with attention to culturally acceptable approaches and use of traditional/indigenous foods and strategies for food procurement.

Also, linkages take place at multiple levels of organisation — international, national/regional, community, household and individual, and all are somewhat different conceptually. (p35-36).

49. Eide, W.B., (1990) "Household Food Security — a 'nutritional safety net,'" Discussion Paper, International Fund for Agricultural Development, October.

Household food security is here defined through a set of principles or values that ought to be adhered to in all development measures to ensure access to adequate food by and for households over time. (p10).

50. Falcon, W.P., C.T. Kurien, F. Monckeberg, A.P. Okeyo, S.O. Olayide, F. Rabar and W. Tims, (1987) "The world food and hunger problem: changing perspectives and possibilities, 1974-84"in J.P. Gittinger, J. Leslie and C. Hoisington (eds), Food Policy: Integrating Supply, Distribution and Consumption, John Hopkins University Press, Baltimore and London.

A nation's food security is achieved when it can assure both physical and economic access to food for all its citizens over both the short and the long run. Behind this simplified definition, however, lie a number of complex and overlapping components involving agricultural production, international trade and economic interdependence, national stocking policies, development aid, and

a range of direct measures designed to enhance household consumption levels. (p20).

51. FAO, (1979) The Struggle for Food Security, FAO, Rome.

Food security means either being able to produce enough food for one's own needs or having enough money to buy provisions in the market. (p6).

52. FAO, (1981) Agriculture: Toward 2000, FAO, Rome.

Food security in its broadest sense is the availability of adequate food supplies now and in the future. In the narrower sense, food security means food stocks and arrangements to govern their establishment and use as a protection against crop failures or shortfalls in imported food supplies. In this sense, too, it has relevance to long-term development strategy. Better food security discourages countries from indulging in costly degrees of food autarky. Also the existence of food security stocks makes it less necessary to interrupt imports of capital goods and other development requisites, as inevitably occurs when foreign exchange has to be unexpectedly diverted to food imports. Finally, stocks are an essential source of emergency supplies for combating sudden famines and other disasters. (p114).

53. FAO, (1983) "World food security: a reappraisal of the concepts and approaches," Director-General's Report, Rome.

Food security is ensuring that all people at all times have both physical and economic access to the food they need.

54. FAO, (1988) "Agricultural policies, protectionism and trade: selected working papers, 1985-1987," FAO Economic and Social Development Paper No 75, FAO, Rome.

A broadened concept of food security which has as its principal aims the enhancement of access to and distribution of food as well as the acceleration of food production in developing countries, to be achieved through both domestic and international measures. Wider access to markets to permit a steady growth in the export earnings of developing food deficit countries is argued to be an integral part of food security. (p1).

55. FAO, (1989) "Preparation of Comprehensive National Food Security Programmes: Overall Approach and Issues," Second Ad Hoc Consultation with FSAS Donors, Rome, 27 October.

In April 1983, the Director-General of FAO, recognising that the conceptual framework of world food security must include very broad policy issues relating to agricultural and rural development, food production, stabilisation mechanism,

improved access and international trade, put forward an enlarged concept of food security to the Committee on World Food Security (CFS). In order to take action on a broad front, and yet remain within a manageable focus, he proposed that food security efforts be directed to three specific goals: adequacy of food supplies; stability in food supplies and markets; and security of access to supplies. The ultimate objective of this broader concept of food security is to ensure that all people at all times have both physical and economic access to the basic food they need. This broader concept of food security was endorsed by the CFS, the FAO Council and Conference, and by the World Food Council and ECOSOC. It has been referred to in numerous texts and resolutions since then, and forms the basis of the international consensus on actions required at global, regional and national level to achieve world food security. (p2).

56. FAO, (1989) "Food Security Assistance Programmes: Methodology for Preparing Comprehensive National Food Security Programmes," Second Ad Hoc Consultation with FSAS Donors, Rome, 27 October.

The ultimate objective of food security as defined by Committee on World Food Security, the Council and the Conference 1983 is "to ensure that all people at all times have both physical and economic access to the basic foods they need." (p2).

57. FAO, (1991) "Analysis of National Policies to be Pursued and the External Assistance Needed to Attain Food Security," Paper presented to the Symposium on Food Security in Africa, Dakar.

By food insecurity we mean a situation in which the individuals of a society have neither the physical nor the economic access to the nourishment they need. In some cases, there is not enough food at the time and location required to fulfil the needs of all members of the community, whether it be a nation, a region, a village or a household. This dimension constitutes the problem of the physical availability of food supplies. On the other hand, in order to provide physical access to food, it is necessary to have an efficient distribution system, including processing, storage, transportation and marketing to ensure the dispatch of food products within a specific country in the desired time. (p1).

58. Fones-Sundell, Melinda and Dennin Brasch, (1989) "World Food Crisis: Myth and Reality," Issue Paper No 11, Swedish University of Agricultural Sciences, Uppsala.

Food security is a widely misunderstood expression because it is often used without definition and because it has different meanings at different levels. Since the early 1980s concepts of food security have been revised to include the regional and household level. "It is not until we discuss food security at the individual level that it incorporates distributive and nutritional aspects. At this

level the focus on the balance of aggregate supply and demand for food is replaced with the notion of individual food needs." (p10).

59. Frankenberger, T.R. et al., (1990) Proceedings of the Agriculture-Nutrition Linkage Workshop, Volume I, USAID, Arlington, pp35-36.

These authors use a definition of food security based on Eide (1990).

60. Frankenberger, T. R., and Goldstein, D. M., (1991) "The Long and Short of It: Household Food Security, Coping Strategies, and Environmental Degradation in Africa," mimeo, Office of Arid Land Studies, The University of Arizona.

"..food insecurity [is] when the viability of the household as a productive and reproductive unit is threatened by food shortage" (p2).

Their definition of food security is based on that used by the World Bank — "access by all people at all times to enough food for an active and healthy life." However, they argue that operationalising the concept at the household level and national level are not the same. The issue at national level is one of overall supply through local production and food imports. At regional and household levels, access is determined by both productive and economic factors as well as overall availability. Stable access and availability are also determined by local coping mechanisms. (p37).

61. Gittinger, J., S. Chernick, N.R. Hosenstein and K. Saiter, (no date) "Household Food Security and the Role of Women," World Bank Discussion Papers No 96, The World Bank, Washington DC.

Causes of Household Food Insecurity: "Food insecurity arises from variation in the amount of food provided by the work and wealth of the household. The level of food consumption can vary because of shock in work, in production or in assets. The shock can be a change in the quantity available or a change in the price." (p13).

62. Green, Christopher and Colin Kirkpatrick, (1981) "Insecurity, food financing and the IMF," Food Policy, vol 6 no 3, August 1981, pp 135-146.

The food security problem has two principal dimensions: long-term and short-term. Problems of long-term food insecurity are reflected in the increasing gap between the consumption needs and production capacities of the developing countries. Irrespective of the long-run trend in per capita food consumption, however, variability in per capita consumption is per se a significant cause of food security. Short-run insecurity in food supplies has two main sources: domestic food production and foreign exchange availability. (p136).

63. Green, C., and Kirkpatrick, C., (1982) "A cross-section of food insecurity in developing countries: its magnitude and sources," The Journal of Development Studies vol 18 no 2, January, pp184-204.

Aim to expand current concept of food insecurity beyond the long term trend of increasing food imports by developing countries, and short term insecurity caused by fluctuations in annual supply. "Conventional estimates tend to suppose that insecurity can be identified with actual short-term variation in food consumption. In general, it is also believed that the principal source of food insecurity arises from variations in domestic food production." (p186).

Their argument places greater weight on the manner in which a country responds to periodic shortfalls in food supplies. Food insecurity may be concealed by a country's willingness to sacrifice other imports to maintain consumption levels.

"In short, the relations between food production and consumption cannot be analysed in isolation from the balance of payments position...it may be a misleading assumption to identify food insecurity with food consumption variability." (p193).

64. Hay, R.W. and M. Rukuni, (1988) "SADCC strategies: evolution and role," World Development, vol 16 no 9, pp1013-1024.

Food security is a notion capable of many interpretations. Indeed, it runs the danger of becoming a catch all concept. The ways SADCC officials, their advisors and national policymakers in the region have conceived of "food security," and the emphasis they have placed on dealing with the threats which might jeopardise it, have been subject to considerable change since the first SADCC food security activities were defined in 1981.

There are three main views of food security which have predominated at one time or another during the last seven years: food security based on the growth and stabilisation of food output; food security based on market supply stabilisation; and food security based on the growth and stability of food consumption. Although each of these three views has tended to predominate in turn, shifts in emphasis have not necessarily displaced former concerns; strands of all three now exist in activities promoted by SADCC.

SADCC's (1987) updated strategy paper defines food security as ".....ensuring that all members of a household, nation or region have access to an adequate diet to lead an active and normal life."

Whether or not this definition is adequate, it reflects the extent to which SADCC thinking has changed from an emphasis on production self-sufficiency to one of food availability and access to food. (pp1023-1024).

65. Heald, C., and M. Lipton, (1984) African Food Strategies and the EEC's Role: An Interim Review, Commissioned Study, no 6, Institute of Development Studies, Brighton.

Food security is best defined as the stabilisation of access, or of proportionate shortfalls in access, to calories by a population. (p11).

66. Hopkins, R.F., (1986) "Food security, policy options and the evolution of state responsibility," in Tullis, F.L. and Hollist, W.L. (eds), Food, the State and International Political Economy: Dilemmas of Developing Countries, University of Nebraska Press, Lincoln and London.

Food insecurity arises at various systems levels — household, national, and international — and does so because of a unit's insufficient "adaptive capacity." Households, the state, or the international system are unable to adjust patterns of food-related activities with a minimum of financial cost or dietary loss. (p3).

Ultimately, food insecurity is a national-level problem. It occurs in countries that experience variations in production or inadequate production to meet consumption needs. These countries cannot smooth out production variability through domestic carry-over or have a population whose consumption habits regularly exceed absolute production capacity or lack adequate internal mechanisms for re-allocating domestic food supplies. In such situations, household level actions, at least in the short run, put pressures on national governments which in turn frequently turn to international markets, either for commercial or concessional food imports....Ultimately, however, in order to achieve food security, insecure states must establish and carry out national policies to improve their adaptive capacity.

"...food security is a practical test of whether a government is a success or a failure." (p4).

Food security stands as a fundamental need, basic to all human needs and the organisation of social life. Access to necessary nutrients is fundamental not only to life per se, but also to stable and enduring social order.

Food security is the assurance of access to adequate nutrition, either through direct effort or exchange at acceptable prices. Its opposite, food insecurity, is best understood as a relative phenomenon. (p11).

67. Hopkins, R.H., (1987) "Aid for development: what motivates the donors" in Clay, E. and Shaw, J. (eds), Poverty, Development and Food, Macmillan, London.

The concept of food security implies an effort to integrate welfare needs and macropolicy, both in developing countries and in policy-linked aid commitments from donors. (p169).

68. Huddleston, B., D. Gale Johnson, S. Reutlinger and A. Valdes, (1984) International Finance for Food Security, John Hopkins University Press, Baltimore.

Food security is the assurance that supplies and financing will be available to meet minimally adequate consumption requirements without domestic price increases, regardless of world market conditions. (p3).

69. Huddleston, B., (1990) "FAO's overall approach and methodology for formulating national food security programmes in developing countries," IDS Bulletin, vol 21 no 3, Institute of Development Studies, Brighton, July.

..the FAO Committee on World Food Security, Council and Conference adopted a broadened concept of food security in 1983. The ultimate objective or goal of food security set forth in the broadened concept is "to ensure that all people at all times have both physical and economic access to the basic food they need." At the global level food security has three specific aims: "ensuring production of adequate food supplies; maximising stability in the flow of supplies; and securing access to available supplies on the part of those who need them." At the national level, the three components of national food security programmes are to be set in a broad policy framework and are defined as follows: "ensuring adequacy of food supplies to all consumers." (p72).

70. Hunger Project, (1989) "Ending Hunger: the Cyprus Initiative. A summary of the report presented to the president of the World Food Council," Fifteenth Ministerial Session of the World Food Council, Cairo, Egypt, 22-25 May, Occasional Paper.

Food security is defined as all people at all times having access to enough food for an active and healthy life. It is the equivalent of ending chronic and persistent hunger on a sustainable basis. (p4).

71. IFAD, (1991) "Food Security in Africa," Paper presented to the Symposium of Food Security in Africa, Dakar, pp3-4.

Food security is associated with food intake at the individual, household, sub-national, national and global levels. A food secure household can be defined as one which has access to enough food to ensure the minimum necessary food intake for all individual members to lead a healthy life. At the sub-national level, the concept has to reflect the assured availability of food during a given period for individual households to draw on to meet their minimum requirements. A food secure nation is able to assure availability of food

nationally, to meet current and future per capita requirements. Finally, global food security implies universal access to an adequate food supply.

It is critical to understand that food security relates equally to purchasing power and entitlement as to production/supply. Food security is directly related to the structural problems of poverty.

72. IGADD, (1990) "Food Security Strategy Study," Vol 1, Final Report, IGADD, Djibouti, October.

The overall objective is to provide food security, that is, to ensure that every person in the IGADD region has sufficient food at all times for an active and healthy life. (pv).

73. Jonsson, U., and D. Toole, (1991) "Household Food Security and Nutrition: A Conceptual Analysis," mimeo, UNICEF, New York, April.

Household food security is defined here as "access to food, adequate in quantity and quality, to fulfill all nutritional requirements for all household members throughout the year" (UNICEF 1986).

Analysis must therefore include two primary components:

- physical availability of food in proximity of household, regardless of process through which it was made available
- the level and type of resources expended to attain household food security relative to the total resources available at the household level

In defining concepts such as household food security it is equally important to spell out that the concept excludes as much as what it includes. Household food security does not include dietary intake. (p6).

74. Jonsson, U., and D. Toole, (1991) "Conceptual Analysis of Resources and Resource Control in Relation to Malnutrition, Disease and Mortality," mimeo, UNICEF, New York.

These authors identify adequate household food security as one of three conditions necessary for good nutrition. They argue that any assessment of the three conditions (the other two being care and health services), must include an investigation into the resources used to ensure their fulfillment. This permits "food secure" households to be differentiated by the share of total resources used to achieve food access. The higher the share the more vulnerable the household is to becoming food insecure. (p4).

75. Jones, J.V.S., (1988) "Food security and economic development in Tanzania: past problems and proposals for a new strategy," The African Review, vol 15 no 2, pp56-80.

Food security is more than simply ensuring adequate staple supply and distribution....food security requires the supply and consumption of a wide variety of foods and means to keep the foods in good condition. (p56).

76. Josling, T., (1975) "The world food problem — national and international aspects," Food Policy, vol 1 no 1, November, pp3-14.

"World food security" is the essence of the international aspect of the food problems of individual countries. It relates in part to the monitoring of global trends to give countries advance warning of problems which are likely to arise from shortages of raw materials and inputs into agriculture and to watch investment patterns in these supply industries as well as in agricultural output. (p10).

77. Kabeer, Naila, (1990) "Women, household food security and coping strategies" in United Nations, Women and Nutrition, United Nations, Geneva.

The concept of household food security refers to the ability of a household to assure all its members sustained access to sufficient quantity and quality of food to live active, healthy lives. (p171).

78. Kennedy, E., and B. Cogill, (1988) "The commercialisation of agriculture and household-level food security: the case of south-western Kenya," World Development, vol 16 no 9. pp1075-1081.

Household food security can be thought of as the ability to provide adequate energy intake either from food produced directly by household members and/or through the availability of sufficient income to purchase food. (p1076).

79. Kennes, W. (1990) "The European Community and food security," IDS Bulletin, vol 21 no 3, Institute of Development Studies, Brighton.

Food security can most simply be defined as the absence of hunger and malnutrition. For this to be possible, households, villages or countries must have enough resources to produce or otherwise obtain food. This condition is necessary, but not sufficient because the resources must also be used well. It is useful to subdivide food insecurity problems into transitory and chronic (see eg in the World Bank report of 1986 on Poverty and Hunger). Transitory food insecurity refers to a temporary decline in household's food intake resulting from instability in food production, food prices or income. In its extreme form it can mean famine, a situation where a sizeable population group lacks the resources for even a minimum subsistence diet. Chronic food insecurity occurs

when households on a more permanent basis lack the resources to acquire enough food for a healthy and active life, while they are not directly threatened by starvation. It is worthwhile to further subdivide chronic food insecurity into a lack of overall food quantity, normally measured in energy, ie calorie intake and insufficiencies at the level of particular nutrients. In most cases, the satisfaction of overall calorie needs implies that the needs for specific nutrients are covered as well. However, if the diet lacks variety, the intake of specific nutrients, such as iron, iodine and vitamins is often not guaranteed. This type of food insecurity does not necessarily result from lack of resources or income, it can be the consequence of a lack of information or nutritional knowledge. (p67).

80. Kenya, Republic of, (1982) "The concept of food security and how it relates to Kenya," Proceedings of the workshop on Food Policy Research Priorities held in Nairobi, 14-17 June, 1982.

Food security may be defined as the ability of countries and regions or households to meet adequate levels of food consumption on an annual basis. Two features are salient in this definition. First, the pursuit of policies, using the available resources to those countries, regions or households to be able to provide or make available the total complement of food required by the population. The total food complement is calculated on the basis of the calorific requirement of each member of the population. The total food requirement can therefore be met either from domestic food production or imports or a mixture of the two.

The second feature of the definition is the capacity of those countries or regions to make available all the food requirements of the population to be able to purchase quantities to satisfy their consumption requirements. (p143).

81. Khadka, N., (1990) "Regional cooperation for food security in South Asia," Food Policy, vol 15 no 6, December 1990, pp492-504.

Food insecurity in South Asia is strongly linked with poverty and hunger. Therefore the eradication of poverty and hunger and the achievement of regional food security would enable the poorer section of the population to buy enough food through the generation of employment opportunities and the redistribution of income and assets. (p504).

82. Khadka, N., (1991) "Regional food security through regional food reserve in South Asia: The Prospect," Quarterly Journal of International Agriculture, vol 30 no 3, July-September, pp264-283.

Food insecurity is defined as lack of access by members of society and nations to enough food throughout the year to live healthily. This is a situation caused

either by inadequate food availability ie lack of adequate supply or by inadequate entitlements ie lack of effective demand, or both. (p264).

83. Koester, Ulrich, (1986) Regional Cooperation to Improve Food Security in Southern and Eastern African Countries, IFPRI, Washington.

Food security is defined as the ability of food-deficit countries, or regions, or households within these countries to meet target consumption levels on a year-to-year basis. Food security has two facets: First, real income may be too low to provide target consumption for all groups of the society even in years of normal or above-normal domestic production, and second, real income may fluctuate as the result of variations in domestic production of food and nonfood products or of import and export prices or both. (p12).

84. Kracht, U., (1981) "Food Security for People in the 1980s," Paper prepared for discussion at the North — South Food Roundtable Meeting, Washington.

The term food security is used in this draft in its most fundamental sense, meaning that everyone has enough to eat at any time — enough for life, health and growth of the young, and for productive effort. In assessing food security, the paper adopts the concept of "economic entitlements," which are the goods and services over which people can establish command through the economic, political and legal mechanisms in operation in a given country. (pi).

85. Kumar, S.K., (1988) "Effect of seasonal food shortage on agricultural production in Zambia," World Development, vol 16 no 9, pp1051-1063.

... in the semi-arid tropical areas with unimodal rainfall and little or no dry season cultivation. These areas also tend to have a high level of year-to-year fluctuations in agricultural production, as well as a relatively high degree of subsistence orientation. They are also characterized by food-stock depletion early in the crop cycles associated with seasonal migration on crop cum livestock shortages to buffer the seasonal dip in food availability. Household food scarcities of this type depend on both production and food supply conditions and income and food demand conditions. (p1051).

86. Leslie, K., and Rankine, L.B. (eds) (1987) Papers and Recommendations on Food and Nutrition Security in Jamaica in the 1980s and Beyond, National Food and Nutrition Co-ordinating Committee of Jamaica, Kingston.

For the purpose of the workshop, the term "food and nutrition security" was defined as "the ability of the nation and the household to secure at all times a dependable and adequate supply of food in order to achieve a satisfactory level of nutritional well-being."

More specifically, the term was used to involve: (a) the mobilisaton and co-ordination of national and household resources for the production of food for local consumption as well as for export to purchase necessary food and other imports; (b) a level of processing, storage and distribution which permits a reduction of the effects of gluts and scarcities, and provides adequate insurance against periods of natural or man-made disasters; (c) a level of economic activity in the country which generates satisfactory levels of effective household food demand; and (d) sufficient knowledge about nutrition to encourage households to make wise food choices and to pursue desirable nutritional practices. (p1 preface).

87. Longhurst, Richard, (1988) "Cash crops, household food security and nutrition," IDS Bulletin, vol 19 no 2, University of Sussex, April 1988.

In examining the impact of increased cash-cropping on household food security and nutrition Longhurst accepts four elements in the cash crop/food security nexus identified by Pinstrup-Anderson (1983):

i) availability of food
ii) ability of the household to obtain food
iii) desire of the household to obtain food, and
iv) household distribution of food. (p28).

88. Malambo, L.M., (1988) "Rural food security in Zambia" in Studies in International Development, No 29, Hamburg.

The broadest definition of food security, which, p5 constitutes the various elements discussed in the literature, is summarized as the ability of a country, regions, or households to meet target consumption levels on a yearly basis in the face of fluctuating production, prices and incomes. (p5).

89. Marot, E., (1987) "Autosuffisance Alimentaire: Une Stratégie pour le Développement Économique et la Sécurité Alimentaire?," MSc. thesis, Université de Namur.

Food security at the household level therefore entails the security of supply at the national level, but demands in addition that households be able to obtain for themselves the food that is available on the national market. (p3-4).

90. Maxwell, Simon, (1988) "National food security planning: first thoughts from Sudan," Paper presented to Workshop on Food Security in the Sudan, IDS, Sussex, 3-5 October 1988; and in Maxwell, Simon (ed), 1991, To Cure All Hunger: Food policy and food security in Sudan, IT Publications, London, 1991

A country and people are food secure when their food system operates in such a way as to remove the fear that there will not be enough to eat. In particular,

food security will be achieved when the poor and vulnerable, particularly women and children and those living in marginal areas, have secure access to the food they want. Food security will be achieved when equitable growth ensures that these groups have sustainable livelihoods: in the meantime and in addition, however, food security requires the efficient and equitable operation of the food system. . ."Efficient" means that all stages in the food chain, from production to final consumption, should be efficient in a social-welfare sense. . ."Equitable" means that the benefits of production should be distributed equally and that food should be available to all.

91. Maxwell, Simon, (1989) Food Insecurity in North Sudan, Discussion Paper No 262, IDS, University of Sussex, Brighton.

The definition of food security which appears in the World Bank document, "Poverty and Hunger" (1986) has many virtues. It stresses consumption over production, allows for seasonal variation, distinguishes between chronic and transitory food insecurity and stresses the functionality of an adequate diet rather than a simple calorie count.

The roots of this definition can be traced to Sen's concept of "entitlement." (Sen, 1982) In recent years, Sen's basic model has been extended in several directions. First, there has been increased emphasis on the subjective dimensions of food security. Secondly, factors influencing "entitlements" such as assets and resiliency have received more attention. Thirdly, attempts to understand the underlying causes and dynamic nature of food security has become important.

Based on these ideas, the World Bank definition can be extended, especially to incorporate the subjective dimension and to lay greater emphasis on secure and sustainable livelihoods for poor people. The definition in Maxwell (1988) is cited.

In conceptual terms, the three dimensions of food security (poverty, vulnerability and malnutrition) can be depicted as overlapping circles. Transitory food security will be concentrated in the overlap between poverty and vulnerability, whereas chronic food insecurity will be concentrated in the area of overlap between the three.

92. Maxwell, Simon, (1990) "Food security in developing countries: issues and options for the 1990s," IDS Bulletin, vol 21 no 3, Institute of Development Studies, University of Sussex, Brighton.

Different definitions of food security reflect, in some cases, no more than a desire for product differentiation in a crowded market. In other respects, however, they do offer genuine differences of emphasis: on the importance of subjective assessments of food security; on the relationship between

malnutrition, access to food and livelihood security; and on the need for an efficient national food system. (p2).

The definitions by Clay, World Bank, FAO, EC and Maxwell are reviewed.

Three common themes which run through each of the definitions are:

i) focus on access to food rather than simply on supply
ii) attention to variability as well as to trends (including the distinction between chronic and transitory food insecurity)
iii) focus on the broad mandate of food security, encompassing production, marketing and consumption levels and ranging from household to international levels of analysis

Differences among the various definitions include:

i) the choice of individual or household as a unit of analysis
ii) varying emphasis given to the perceptions and feelings of the food insecure themselves, in the wider context of livelihood security
iii) varying emphasis regarding the efficiency of the national food system
iv) attention to the distinction between mild and acute food security as an additional dimension of analysis.

93. Maxwell, S. (ed) (1991) To Cure all Hunger: Food Policy and Food Security in Sudan, Intermediate Technology Publications, London.

Cites definition in Maxwell 1988.

94. Maxwell, S., J. Swift and M. Buchanan-Smith, (1990) "Is food security targeting possible in sub-Saharan Africa? evidence from North Sudan," IDS Bulletin, vol 21 no 3, Institute of Development Studies, University of Sussex.

The widely accepted definition of food security is: "access by all people at all times to enough food for an active, healthy life" (World Bank 1986:1). Food insecurity is the lack of access to enough food: chronic food insecurity is defined as a "continuously inadequate diet caused by the inability to acquire food," and transitory food insecurity as a "temporary decline in a household's access to enough food."

We find these definitions incomplete. As Maxwell has suggested elsewhere, they lay insufficient emphasis on subjective perceptions of food insecurity (Maxwell 1989:40). In addition, we find a unidimensional distinction between chronic and transitory food insecurity inadequate, since it deals only with the periodicity or incidence of food insecurity. Another dimension has to be introduced to describe the intensity or severity of episodes of food insecurity. A simple classification of "none," "mild" and "severe" is used.. to illustrate the point.

This perspective introduces a dynamic element into the analysis: policy makers and planners are primarily concerned with the movement of a population from one category describing the degree of food insecurity to another. (p53).

95. Maxwell, S., and M. Smith, et al, (1992) "Household food security: a conceptual review," mimeo, March, Institute of Development Studies, University of Sussex.

This paper is a conceptual review on household food security. The paper traces the shift in the focus of attention from national and global supply issues in the 1970s, to questions of access to food at household and individual levels in the 1980s. It identifies the core concepts underlying food security as (a) sufficiency of food, defined as the calories needed for an active, healthy life; (b) access to food, defined by entitlement to produce, purchase or exchange food or receive it as a gift; (c) security, defined by the balance between vulnerability, risk and insurance; and (d) time, where food insecurity can be chronic, transitory or cyclical.

Beyond these core concepts, the paper traces developments in relation to the household, nutrition adaptation, livelihood security, sustainability, people's own perceptions, and issues of efficiency and cost-effectiveness. The paper concludes that household food security must be treated as a multi-objective phenomenon, where the identification and weighting of objectives can only be decided by the food insecure themselves.

96. Mbogoh, S.G., (1982) "A Review of Kenya's National Food Policy: Proceedings of the workshop on Food Policy Research Priorities," Nairobi 14-17 June, 1982.

The broad objectives of Kenya's food policy are:

i) to maintain a position of broad self-sufficiency in the basic food stuffs,
ii) to ensure security of food supply in every area of the country and
iii) to provide nutritionally adequate diet to every member of the population. (p117).

97. McInerney, J., (1983) "A synoptic view of policy making for the food sector" in J.Burns., J.McInerney, and A.Swinbank (eds), The Food Industry, Heineman, London.

First, an improved availability of food (measured in terms of some standard unit) is desirable to cater for a growing population, to allow everyone to be quantitatively better fed, and to strengthen what is now discussed as "food security." The concept of "food security" — which is an amalgam of the level, reliability and sustainability of food supplies — has recently gained prominence in both an international and various individual country contexts. (p167).

98. McIntire, J., (1981) "Food security in the Sahel: variable import levy, grain reserves, and foreign exchange assistance" IFPRI Research Report No 26, IFPRI, Washington.

    Short term food security is the attainment of stable agricultural production and consumption of essential foods at an acceptable level. Short term food security has been linked to food self-sufficiency — often said to be the best guarantee of the former. Long-run food security would be attained by developing agricultural and industrial productivity by managing supplies, including imports and food aid. (p12).

99. Mellor J W., (1987) "Food aid for security and development" in Clay, E., and Shaw, J., (eds) Poverty, Development and Food Macmillan, London.

    Identifies chronic long-term food insecurity as a problem of aggregate food supply, and short-term transitory food insecurity as the result of fluctuations in annual food supply. (p177).

100. Mellor, J., (1988) "Global food balances and food security," World Development, vol 16 no 9, pp997-1011.

    Food insecurity is the inability of poor countries, poor families and poor individuals to purchase sufficient quantities of food from existing supplies. Improving food security requires both increasing the purchasing power of the poor and boosting overall food production. Developing countries can develop a two-pronged strategy to promote food security. In the long run, efforts must be made to increase the purchasing power of the poor by raising the overall level of food production in the Third World. Increased food supplies and purchasing power must be inextricably linked to elements of any long-term food security efforts. In the short run, redistributing food supplies from the developed to the developing world is likely to be the best way to meet the more immediate food security needs of the poor. (p997).

101. Mellor, John W., (1990) "Global food balances and food security" in Carl K. Eicher and John M. Staatz (eds), Agricultural Development in the Third World, John Hopkins University Press, Baltimore.

    In the late 1980s, food insecurity was defined as "the inability of poor countries, poor families and poor individuals to purchase sufficient quantities of food from existing supplies." The present food security situation is recognized as being much more complex and linked to acute structural imbalances. The promotion of food security requires: i) increasing the purchasing power of the poor, and ii) raising the overall level of food production in the Third World.

    In the developing world, agricultural production must be stimulated through cost-decreasing technological change...Food transfers from the structurally food-

deficient nations must be achieved through mechanisms which boost the purchasing power of the poor, while also increasing the incentives to raise agricultural and food production over the long run. (pp123-124).

102. Mellor, John W., Christopher L. Delgado and Malcolm J. Blackie (eds), (1987) Accelerating Food Production in Africa, IFPRI, Washington.

Food security has often been ill-defined by African governments as being synonymous with national food self-sufficiency. (p336).

103. Millman, S., (1991) "The Hunger Report, update 1991," The Alan Shawn Feinstein World Hunger Program, Brown University, Providence.

Distinguished primarily by the level of human organisation, from population to household to individual, at which scarcity is manifested, three distinct but related hunger situations — food shortage, food poverty and food deprivation — can be identified. "Food shortage" occurs when total food supplies within a bounded regions are insufficient to meet the needs of the population within that region. "Food poverty" refers to the situation in which a household cannot obtain enough food to meet the needs of all its members. "Food deprivation" refers to individual consumption of insufficient food. "Food security" refers to the ability to avoid hunger in any of the three hunger situations. Food shortage is one of the causes of food poverty, which in turn is one of the causes of food deprivation. However, other factors may operate to bring about food poverty even when there is no food shortage, and food deprivation where there is no food poverty. (p1).

104. Minhas, B.S., (1976) "Presidential Address-towards National Food Security." Indian Journal of Agricultural Economics. vol 31 no 4, October-December 1976, pp8-19.

Food security is considered on a national level rather than on a household one. A National Food Security System is defined as a means which will enable India to opt out of importing food thus reducing her vulnerability in the balance of payments which is considered to be inconsistent with a stable and self-reliant pattern of development. The maximum level of grain stocks (reserve plus operational) which will permit this is quantified. (pp14-18).

105. Mlambo, Lovejoy, (1988) "Rural Food Security in Zambia," Studies Related to Integrated Rural Development, N.29. Justus-Liebing-Giessen University, Hamburg.

At the World Food Conference in Rome in 1974, attainment of food security referred to the assurance of adequate food supplies. Currently, the broadest definition of food security is summarized as the ability of a country, region, or household to meet target consumption levels on a yearly basis in face of

fluctuating production, prices and incomes. Thus the current meaning of food security incorporates both supply and demand.

Food security has a chronic as well as transitory dimension. Chronic food insecurity is a problem which affects households that chronically lack sufficent purchasing power. Transitory food insecurity on the other hand, is a problem that concerns fluctuations in household income food consumption and the unavailability of food at national as well as village level. In this connection, transitory food insecurity is concerned with temporary lack of access to sufficent food supply. (pp5-7).

106. Mudimu, G., et. al., (1988) "Household food insecurity in low-rainfall areas of Zimbabwe: Initial findings in Mudzi, Mutoko and Buhera Communal Areas" in M.Rukuni and R.H.Bernsten (eds), Southern Africa: Food Security Policy Options, Proceedings of the Third Annual Conference on Food Security Research in Southern Africa, 1-5 November, 1987. University of Zimbabwe/Michigan state University Food Security Research Project, Department of Agricultural Economics and Extension, Harare.

A household is food secure when it is able to acquire — through transfers, production or purchase — food in qualities and quantities that meet the nutritional requirements of its members. (p218).

107. Muhammed, A., (1987) "Present Situation and Future Outlook for Food Security in the Muslim World," in Food Security in the Muslim World, Proceedings of the Seminar on Food Security in the Muslim World, Organized by the Islamic Academy of Sciences, Amman, Jordan, 5-7 December.

Food security has been defined as the ability of food-deficit countries or regions, or households to meet target consumption levels on year to year basis. Food security has two facets:

a) The real family income of the vulnerable groups may be too low to provide the basic food requirements for all members of the family even in years of normal and above normal domestic food production.

b) It may be due to reduced domestic production or policy changes and a major dislocation in food imports, which reduces the overall per capita availability of food in the country, even though the average income is adequate to purchase food at normal prices, if available. (p104).

108. Mwaka, V.M., (1991) "The environment and food security in Uganda," Eastern and Southern Africa Geographical Journal, vol 2 no 1, pp67-82.

The ultimate objective of any nation should be to ensure that at all times, people have both physical and economic access to basic food needs. In this context

food security is seen to have five basic aims: i) Ensuring production of adequate food supplies both in quality and quantity to avoid malnutrition and undernutrition; ii) Maximisation of the stability in the flow of supplies from surplus to deficit areas; iii) Ensuring availability of food surpluses for periods of scarcity; iv) Being in a position to supply food to other nations in want; v) Maintaining a sound ecological balance so that the natural resources on which agriculture itself is dependent are well managed so that they can be exploited in perpetuity. (p68).

109. US Agency for International Developoment (1992) "Definition of Food Security," Policy Determination, No. 19, Document PN-AAV-468, USAID, Washington, April.

Food security is when all people at all times have both physical and economic access to sufficient food to meet their dietary needs for a productive andhealth life (p1). It requires food available food availability, food access and food utilization/consumption.

110. Nour, M.A., (1987) "The constraints that have faced the Muslim world in making progress towards food security," in Food Security in the Muslim World, Proceedings of the Seminar on Food Security in the Muslim World, Organized by the Islamic Academy of Sciences, Amman, Jordan, 5-7 December, 1987.

Food security is essentially access by all people at all times to enough food for an active, healthy life. (p155).

111. Oomen, Ir. A., (1988) "Food security: experiences and prospects" in From Beyond Adjustment: SDA, Africa Seminar, Maastricht.

A widely shared definition of food security is "access by all people at all times to enough food of good quality for an active and healthy life."

Ensuring food security entails four conditions: first, to ensure that there are adequate food supplies available; secondly, to ensure that households have adequate ability to acquire food, either because they produce it or because they have the income to acquire it; thirdly, to ensure a stable availability on the market and a stable relation between wages and food prices; and, finally, an adequate quality of the food from the point of view of appreciation by the consumers (local food habits) and from the point of view of nutrition and health. (p167).

112. Oshaug, A., (1985) "The composite concept of food security," in Introducing Nutritional Considerations into Rural Development Programs with Focus on Agriculture, Report No 1, A Theoretical Contribution, Institute for Nutrition Research, University of Oslo, June.

A society which can be said to enjoy food security is not only one which has reached the Food Norm (here defined as "a basket of food, nutritionally adequate, culturally acceptable, and procured in keeping with human dignity"), but which has also developed the internal structures that will enable it to sustain the Norm in the face of crises threatening to lower the achieved level of food consumption. The internal structures form the basis of the capacity to endure. The definition of food security will thus be:

Food Security = Food Norm + Endurance

The meaning of endurance here needs further elaboration. We suggest the following general definition:

The capacity of a given social system/unit to undergo a perturbation without a decline in the degree of progress made towards the Food Norm. (p?).

113. Otzen, U., Hilderbrand, K., Hellberg, R., Ralle, B., Korte, R., Camman, L., (1979) "Integrated rural development planning with emphasis on nutritional basic needs for Serowe District/Botswana." German Development Institute.

Quotes the FAO policy and action plan for strengthening national food security. This considers the following general objectives to be reasonable and consistent with general national development aims:

-there is a need to produce more food; there is a need to retain for consumption in Botswana all food grains grown in the country; there is a need to make food available to the consumer within price policies which are conistent; there is a need for the Government to have and observe stocking policies for foodgrains. (p19).

114. Phillips, T., et al, (1991) "Background Paper on Food Security: Penultimate Report," University of Guelph, Ontario, September.

This paper reviews the historical evolution of the food security concept. It is claimed that the mid-1980s marked a watershed in the understanding of the concept with access to food by all individuals replacing the traditional concern of food supplies. To support the argument, a list of six definitions of food security is presented, all originating in this period. The elements of the definitions reviewed (FAO 1983; World Bank 1986; UNSTD 1986; Eide 1990; UNICEF 1990; SCN 1991) are remarkably similar.

Generally speaking, there are a number of commonly recognised features of food security. One, food insecurity is a problem ultimately faced by individuals, although food security is commonly defined in terms of household or nation. Two, household and national level food insecurity is generally seen as result of

lack of actual food supplies or lack of access (via purchasing power) to acquire food supplies.

Three, it is commonly agreed that incidence of food insecurity differ in both frequency and intensity. The frequency of food insecurity is often defined as transitory, chronic or seasonal in nature. The intensity of food insecurity is often defined as a lack of overall food quantity or insufficiencies of particular nutrients. Food insecurity is recognised as a result of man-made and natural phenomenon and is increasingly being recognised as a dynamic concept that affects all segments of the population equally.

Finally, the paper argues that food security can be considered an objective; a strategy; a set of linked policies and programmes; and, a measure of success. (p8).

115. Phillips, T., and D. Taylor, (1990) "Food Security: An Analysis of the SEARCA/Guelph Survey," Centre for Food Security WPO11, University of Guelph, Ontario, July.

A state of food insecurity exists when members of a household have an inadequate diet, during part or all of the year, or face the possibility of having an inadequate diet in the future.

The two fundamental concepts implicit in the above definition are that it is defined in terms of the individual, and that it relates to both the current and future adequacy of the diet of individuals within the household. (p2).

116. _____ (1990) "Optimal control of food insecurity: A conceptual framework," American Journal of Agricultural Economics, vol 72 no 5, December, pp1304-1310.

The definition of food insecurity adopted in this paper is: A state of food insecurity exists when members of a household have an inadequate diet for part or all of the year or face the possibility of an inadequate diet in the future...States of food insecurity may be defined in terms of types of food insecurity (eg temporary, cyclical, chronic), levels of food insecurity (eg dietary intake as a percentage of an acceptable standard), or a combination of both. Food insecurity results from an unfavourable balance between risk and insurance. (p1305).

117. Pinstrup-Andersen, P., (1983) "Export crop production and malnutrition," Food and Nutrition, vol 9 no 2, pp 6-14.

This author identifies four essential elements to food security; (a) the physical availability of food; (b) the ability to acquire food; (c) the desire to acquire food and (d) the distribution of food within the household.

118. Pinstrup-Andersen, P., (ed), (1988) Food Subsidies in Developing Countries: Costs, Benefits, and Policy Options, John Hopkins University Press, Baltimore and London.

Household-level food security is here defined as a measure of access to food over time. (p8).

119. Reardon, T., and P. Matlon, (1989) "Seasonal food insecurity and vulnerability in drought-affected regions of Burkina Faso," in D.E. Sahn (ed), Seasonal Variability in Third World Agriculture: the Consequences for Food Security, John Hopkins University Press, Baltimore and London.

We define food insecurity in a farm household as the consumption of less than 80 percent of what the World Health Organisation (WHO) considers to be an average required daily caloric intake of 2,850 kilocalories (kcals) for a moderately active adult equivalent (FAO-WHO-UNU 1985). This then includes households that consume less than 2,280 kcals per adult equivalent (AE) per day. We define a household to have chronic food insecurity when consumption during two or more seasons is inadequate, particularly if consumption is deficient during the cropping season. Households that are chronically food-insecure constitute the highest-risk group and for policy purposes might be considered a primary target group for aid. (p118-119).

120. Reutlinger, S., (1977) "Food insecurity: magnitude and remedies," World Bank Staff Working Paper no 267, World Bank, Washington DC.

Abstract

Food insecurity is given an operational definition: the probability of food grain consumption in developing countries falling below a desired level due to a fixed upper limit on the food imort bill they can afford and an unfavourable combination of poor harvests and world food grain prices.

121. Reutlinger, S., (1982) "Policies for food security in food-importing developing countries," in A.H. Chisholm and R. Tyers, (eds) Food Security: Theory, Policy, and Perspectives from Asia and the Pacific Rim, Lexington Books, Massachusetts.

The ultimate goal of food security might be described as the freedom from food deprivation for all of the world's people all of the time. (p21).

122. Reutlinger, S., (1985) "Policy Options for food security," Discussion Paper, Report no: ARU 44, Agriculture and Rural Development Department, Research Unit, World Bank, Washington DC.

The author claims the term "food security" came into use in the mid-1970s. He reviews briefly the different meanings which have been given to the term and alleges that while numerous authors define food security as a problem of people not having enough to eat, their recommendations imply that the problem originates in slow production growth or rapid increases in food imports. He further argues that the "confusion" can be attributed to the political difficulties of focusing on income distribution which leads writers to concentrate on problems of production and supply. (p2).

123. Reutlinger, S., (1985) "Food security and poverty in LDCs," Finance and Development, vol 22 no 4, pp7-11.

Food security is defined as "access by all people at all times to enough food for an active and healthy life." Food insecurity is the converse and a distinction is drawn between chronic and transitory insecurity. (p7).

This definition was adopted by the World Bank in their influential report Poverty and Hunger (1986).

124. Reutlinger, S. (1987) "Food security and poverty in developing countries," in J.P. Gittinger, J. Leslie and C. Hoisington (eds), Food Policy: Integrating Supply, Distribution and Consumption, John Hopkins University Press, Baltimore and London.

Food security defined as access by all people at all times to enough food for an active, healthy life. Its essential elements are the availability of food and the ability to acquire it. Conversely, food insecurity is the lack of access to sufficient food and can be either chronic or transitory. Chronic food insecurity is a continuously inadequate diet resulting from the lack of resources to produce or acquire food. Transitory food insecurity, however, is a temporary decline in a household's access to enough food. It results from instability in food production and prices or in household incomes. The worst form of transitory food insecurity is famine. (p205).

125. Reutlinger, S., and K. Knapp, (1980) "Food security in food deficit countries," World Bank Staff Working Paper no 393, World Bank, Washington DC.

This report defines food security as "the assurance of a minimally adequate level of food consumption." (p1).

126. Roche, C., (1991) "An NGO perspective on food security and the environment: ACORD in the Sahel and Horn of Africa," IDS Bulletin, vol 22 no 3, July, Institute of Development Studies, University of Sussex.

Although ACORD does not have its own definition of food security, it recognises that to be food secure means more than producing enough to eat.

Entitlements to food, the seasonal and intra-seasonal variance of food insecurity, and the impact of macro-level factors all have to be taken into account. (p32).

127. Roumasset, J., (1982) "Rural food security," in A.H. Chisholm and R. Tyers (eds), Food Security: Theory, Policy, and Perspectives from Asia and the Pacific Rim, Lexington Books, Massachusetts.

Food security is commonly regarded as the ability to meet target consumption levels in the face of fluctuating production, prices and incomes. (p129).

128. Rukuni, M. and Eicher, CK., (1988) "The food security equation." in C. Bryant (ed), Poverty, Policy, and Food Security in Southern Africa, Mansell Publishing Limited, England.

They adopt the World Bank's definition of food security "ensuring that all members of society have access to enough food throughout the year to lead an active and healthy life." (p140).

129. Rukuni, M., and R.H. Bernsten, (1988) "Major issues in designing a research programme on household food insecurity" in M.Rukuni and R.H.Bernsten (eds), Southern Africa: Food Security Policy Options, Proceedings of the Third Annual Conference on Food Security Research in Southern Africa, 1-5 November,1987. University of Zimbabwe/Michigan State University Food Security Research Project, Department of Agricultural Economics and Extension, Harare.

Food security is defined as the ability of all households in a nation to acquire a calorie-adequate diet throughout the year. Food security has two interrelated components: food availability through production, storage, or trade; and access to food through production, purchases in the market from income earned or food transfers. Food insecurity has both short-run and long-run dimensions. Short-run food insecurity results from intra and interseasonal shortfalls in food supplies and effective demand for food. Long-run food insecurity arises from a persistent failure of the economy to assure stable, long term growth in food supplies — especially for nutritionally at risk groups — as population increases and consumer demands change as a consequence of income growth and urbanisation. (p175-176).

130. Sahn, D.E., (1989) "A conceptual framework for examining the seasonal aspects of household food security," in D.E. Sahn (ed), Seasonal Variability in Third World Agriculture: the Consequences for Food Security, John Hopkins University Press, Baltimore and London.

Food security, at the household level, is defined as adequate access to enough food to supply the energy needed for all family members to live healthy, active and productive lives. Country-level aggregate data obscure the fact that even though a country may achieve adequate and relatively stable levels of food

supply and prices, there may be great regional and local inequality and seasonal disparities in the distribution of consumption. For example, within a given town or village, only part of the population may face a seasonal shortage of food or display marked deficiencies in its level of food intake. Similarly, aggregate data do not account for the fact that some members of a household may receive less food than others; thus the data may conceal the fact that some individuals, most likely women or children, may suffer from transitory seasonal declines in food intake while other family members do not. The concept of food security is based on target levels of consumption. A number of factors determine whether the normative target levels are consumed. These include the availability of food in the market or on the farm, the command over adequate resources to grow or purchase food, and the desire to acquire sufficient food. (p3-4).

131. Sakiyama, Teruji, (1986) Trade and Food Security in the Pacific Region, Centre for Japan — U.S. Relations, International University of Japan.

It is important to clarify the basic principles of food security because the implications and perceptions borne in mind among those food surplus (exporting) countries are sometimes greatly different from those held by food deficit (importing) countries.

Military and political security is an essential underlying principle of food security. Food security is a combination of hardware factors (food supplies, storage, transportation facilities, etc.) and software factors (the state system of government, governability of the citizens, etc.). (pp7-11).

132. Sarris, A.H., (1989) "Food security and international security," Discussion Paper no 301, Centre for Economic Policy Research, London, May.

Food security is the ability of a group (an individual, a family, a village, a nation etc) to satisfy adequately food consumption needs for a normal and healthy life at all times. Food insecurity is the opposite of food security. (p1).

133. SCN, (1991) "Some options for improving nutrition in the 1990s," SCN News no 7: in Supplement, United Nations, Geneva.

An operational definition of household food security is proposed as: "A household is food secure when it has access to the food needed for a healthy life for all its members (adequate in terms of quality, safety and culturally acceptable), and when it is not at undue risk of losing such access." (p5).

134. Scott, M., (1987) "The role of non-government organizations in famine relief and prevention" in M.Glantz (ed), Drought and Hunger in Africa: Denying Famine a Future, Cambridge University Press, Cambridge.

Food security for the majority implies broad popular participation by the majority in defining policy and carrying out programs of social and economic development. ... food security means "minimum" access to staple foods for all persons and groups. (p355).

135. Shamala, M., (1982) "Food security and storage policies," Proceedings of the workshop on Food Policy Research Priorities, held in Nairobi, 14-17 June, 1982.

National Food Security and Nutrition: The national food security policy recognizes the interrelationship between food itself as well as its nutritive values. Thus, a sound national food nutrition policy must aim to provide the citizens of this country with adequate food supplies at all times while ensuring that each food supply also provides sufficient nutrient requirements. In trying to achieve the objectives of food security therefore, adequate consideration ought to be given to the concomitant factor of nutritive efficiency. Whereas efficient bulk of food should be stored to ensure security, the income distribution must aim at ensuring that every adult citizen has means to afford a variety of food that may not be locally grown on his holding.

In combating malnutrition problems, this should involve integration of nutrition in the overall development programme in relation to increased food production, increased employment and income for rural population so that they can afford improved consumption and nutrition requirements, increase population education on nutrition, health and family planning. (p141).

136. Shuttleworth, G., R. Bull and P. Hodgkinson, (1988) "Food security through seasonal destabilisation: the case of Madagascar," Food Policy, vol 13 no 2, May, pp150-153.

Food security is the guarantee that all members of a society have continuous access to their basic food requirements. (p140).

137. Siamwalla, A., and A. Valdes, (1980) "Food insecurity in developing countries," Food Policy, vol 5 no 4, November, pp258-272.

Food security may be defined as the ability of food-deficit countries, or regions or households within these countries, to meet target levels of consumption on a yearly basis. What constitutes target consumption levels, and whose ability to maintain consumption is being referred to, are two central issues of a country's food policy. (p258).

138. Siamwalla, A., and A. Valdes, (1984) "Food security in developing countrie, international issues" in C. Eider and J.M. Staatz (eds), Agricultural Development in the Third World, John Hopkins University Press, Baltimore.

Food security may be defined as the ability of food-deficit countries, and regions or households within these countries, to meet target levels of consumption on a yearly basis. (p190).

139. Srinivasan, T.N., (1983) "Hunger: Defining it, estimating its global incidence, and alleviating it" in D.G. Johnson and G.E. Schuh (eds), The Role of Markets in the World Food Economy, Westview Press Inc., Boulder.

It is therefore of interest to look both at the distribution of aggregate food output and the access to the available food (through trade and transfer) among countries, as well as among socio-economic groups within countries. ... This is the issue of food security for countries and for socioeconomic groups within countries. (p78).

140. Staatz, J., (1990) "Food security and agricultural policy," in T.R. Frankenberger et al., Proceedings of the Agriculture-Nutrition Linkage Workshop, Volume I, USAID, Arlington.

In the mid-1970s and early 1980s, food security analyses focused primarily on stabilizing the supply of basic staples at the international and national levels. Since the mid-1980s, more emphasis has been placed on assuring access of households and individuals to reliable food supplies. The focus has thus shifted from simply producing and stocking food at the national and regional levels to the creation of reliable income streams for the poor and the improvement of rural and urban food markets to allow the poor greater access to food.

Food security is the ability of a country or region to assure, on a long-term basis, that its food system provides the total population access to a timely, reliable and nutritionally adequate supply of food.

A three-dimensional matrix can be used to illustrate the interacting elements of food security. The three dimensions are: i) Transitory v. Chronic; ii) Supply v. Effective Demand; and iii) Individual v. Household v. National/Regional. (pp7-8).

141. Staatz, J., (1990) "Food security and agricultural policy: summary," Proceedings of the Agriculture-Nutrition Linkage Workshop, vol 1, February 12-13, Virginia.

Food security is the ability of a country or region to assure, on a long-term basis, that its food system provides the total population access to a timely, reliable, and nutritionally adequate supply of food. (p7).

142. Staatz, John M., Victoire C. D'Agostino and Shelly Sundberg, (1990) "Measuring food security in Africa: conceptual, empirical and policy issues," American Journal of Agricultural Economics, vol 72 no 5, December 1990, pp1311-1317.

Initially, food security meant avoiding transitory shortfalls in the aggregate supply of food. The conceptual understanding of food security has evolved gradually over the past fifteen years to include not only transitory problems of inadequate supply at the national level but also chronic problems of inadequate access and unequal distribution at the household level. Food security can be perceived at the national, regional, household and individual level. (p1311).

143. Staatz, John M., and Carl K. Eicher, (1990) "Agricultural development ideas in historical perspective," in Carl K. Eicher and John M. Staatz (eds), Agricultural Development in the Third World, John Hopkins University Press, Baltimore.

In the mid 1980s, policy makers in many countries became increasingly concerned about food security, moving beyond the belief that national food self-sufficiency could solve problems of famine and malnutrition. Food security involves assuring both an adequate supply of food (through production and trade) and access by the population to that supply. Food insecurity can be either transitory (the short-term inability to secure adequate food due to temporary shortfalls in either production or income) or chronic (a long-term problem of inadequate food intake due to low productivity and incomes). (p22).

144. Streeten, P., (1987) What Price Food? Macmillan, London.

National food security in the face of international uncertainties is listed as one of the fundamental goals of development. (p5)

Food security has been defined in a number of different ways. In its widest sense it means assured physical and economic access to food, at all times, to all citizens. Recognises chronic, transitory, anticipated and unanticipated, regular and random, and seasonal and year to year insecurity. In relevant section confines the meaning to reducing fluctuations in food consumption and to the international contribution to food security. (p44).

145. Stryker, J. Dirck., (1978) "Food Security, Self-Sufficiency, and Economic Growth in the Sahelian Countries of West Africa" prepared for USAID from Food Research Institute, Stanford University.

Food security is defined in terms of national food supplies probably positively related to self-sufficiency. National food security is when a country can ensure that even in the worst years, their populations have adequate food and water, and at the same time, the national environment is preserved so that it may be used to sustain their needs over an indefinite period of time. This definition requires further clarification: what is meant by "adequate food and water," for example? This might alternatively imply the physiological minimum required for survival or that which permits worker productivity to be maintained, or the minimum subsistence which is socially acceptable within any given "historical and cross-cultural context." There is also the question of for whom must food

and water supplies be adequate, at what point does the increase in the numbers of the normally food insecure become critical. Variations in supply constitute a further dimension, as do fluctuations in price and the availability of foreign exchange and food aid. It is recognised that food security may conflict with self-sufficiency, and economic growth and efficiency. (p?).

146. Sudan, Republic of, (1988) "Proceedings of the National Food Security Workshop," Khartoum, 4-5 June.

Food security .. could be defined as "access by all people at all times to enough food for an active, healthy life." (p3).

147. Sudan, Republic of, Ministry of Finance and Economic Planning (1988) Food Security Study: Phase 1, Final Report, Institute of Development Studies, University of Sussex.

Food security is defined as "adequate" access to food for all sections of the population at all times. "Adequate" means enough for an active, healthy life. "Access" means the ability to acquire food by production, purchase or exchange. (p1).

148. Swaminathan, M.S., (1986) "Building national and global nutrition security systems," in M.S. Swaminathan and S.K. Sinha (eds), Global Aspects of Food Production, Tycooly International, Oxford.

(a) The ultimate objective of world food security should be to ensure that all people at all times have both the physical and economic access to the food they need.

(b) Food security should have three specific aims, namely ensuring production of adequate food supplies; maximising the stability in the flow of supplies; and ensuring access to available supplies on the part of those who need them. (p419).

149. Swift, J.J., (1989) "Why are rural people vulnerable to famine?," IDS Bulletin, vol 20 no 2, Institute of Development Studies, University of Sussex, Brighton.

This author does not employ the term food security, but is discussing the vulnerability of rural households to famine, he raises many of the issues found in food security studies. He argues that vulnerability to famine, defined as a "sudden, catastrophic and prolonged consumption deficit," is a function of the asset status of rural households and communities. Swift divides assets into tangible and intangible investments, stores, and claims on individuals or institutions. These are accumulated in periods when households are able to generate resources over and above their immediate needs and are drawn down during periods of crisis. While the form of assets will differ among households

and communities, their primary function is similar; notably, to act as consumption buffers during times of adverse economic or social shocks. As successive crises deplete the range of buffering mechanisms, the vulnerability of households to famine can be understood with respect to the number of crises to which the household has been exposed previously and their severity and duration.

150. Swift, J.J., Gray, J., (1989) "Report on Darfur food security policy and planning," The Republic of Sudan Darfur Regional Government, under assignment from the Overseas Development Administration.

An analysis is made of food insecurity according to three inter-relating components: production, exchange and assets, emphasising the recent recognition of the role of assets in determining food security. A distinction is drawn between "chronic" and "acute" food insecurity. (p9).

151. Syarief, H., (1990) "Combating malnutrition through improvements in food and nutrition systems" in D.S.Tyagi and V.S.Vyas (eds), Increasing Access to Food: the Asian Experience, Sage Publications, New Delhi and London.

The problem is to have enough food available at all times and at all places to permit every member of the population to lead an active and healthy life. Food security as defined by the World Bank (1986) is considered essential in promoting the nutritional status of the people. (pp301-302).

152. Tanzania, Ministry of Agriculture and Livestock Development, (1984) Tanzania National Food Strategy. Volume II: A Framework for Action, Dar-es-Salaam.

The Government is determined to provide food security for all households under all circumstances. This task has four dimensions: that food production be expanded and made less susceptible to variations in the weather; that arrangements be made to meet unforeseen strategies; that all households be capable of meeting certain minimum food requirements; and that machinery be set up to give advance warning of impending food shortages. (p196).

153. Tanzania, Republic of, Ministry of Agriculture and Livestock, (1984) Tanzania National Food Strategy: Report on Zanzibar, printed by FAO, Rome.

Zanzibar Food Strategy: The strategy forms an integral part of Zanzibar's overall agricultural strategy of achieving greater self-sufficiency in the production of staple foods, increasing the supply of animal and fish protein, increasing and diversifying cash crop production and increasing agricultural processing. The four major objectives of the strategy are: (a) raising nutrition levels; (b) meeting future demand increases; (c) establishing food reserves; (d) minimizing the food import bill. (p21).

154. Tapsoba, E.K., (1990) "Food security policy issues in West Africa: past lessons and future prospects," FAO Economic and Social Development Paper No 93, FAO Rome.

Uses Reutlinger (1985) and FAO (1989) definitions. (p17-18).

155. Taylor, D., (1991) "Assessing household food insecurity: a framework and questionnaire," Centre for Food Security, University of Guelph, Ontario, mimeo.

Food insecurity is a state that exists when members of a household have an inadequate diet, during part or all of the year, or face the possibility of having an inadequate diet in the future. (p2).

156. Tekolla, Y., (1990) "The African food crisis" in E.Chole (ed), Food Crisis in Africa: Policy and Management Issues, Vikas Publishing House PVT Ltd., New Delhi.

A significant component of such measures is the establishment of a viable food security system geared to the requirements of the country's vulnerable population. The requirements for such a system are the existence of adequate food reserves; early warning devices; efficient storage structures; and effective country-wide distribution networks. (p14).

157. Teller, C. H., Frankenberger, T. and Yambi, O., (1991) "Developing a Regional Nutrition Strategy for East and Southern Africa: strategic elements and practical opportunities for A.I.D" Food and Nutrition Division, The Pragma Corporation, A Working Document.

Attempts to give conceptual and definitional clarity to the World Bank definition of "access by all people at all times to enough food for an active and healthy life" (World Bank 1986) by building on the differential operationalisation of this concept at household and national levels. Result is the conceptual framework of household food security that entails the "availability of adequate food (e.g.culturally acceptable, safe and nutritionally adequate) as well as the ability of the household to have stable access to such food through its own production or purchase. Availability and access are keys to household food security. Viable procurement entails different types of access to assets, credit, non-farm income, social networks of shared food, etc. Stable access is also influenced by local, informal social mechanisms (e.g.food sharing networks) that buffer households from periodic shocks and the stability of the government."

(Frankenberger and Goldstein, 1991, also use this conceptual framework). (p15).

158. Thompson, R.L., (1983) "The role of trade in food security and agricultural development" in D.G. Johnson and G.E. Schuh (eds), The Role of Markets in the World Food Economy, Westview Press Inc., Boulder.

Ultimately, food security concerns the individual or the family unit. Its principal determinant is purchasing power-income adjusted for the cost of what that income must buy. Much of the recent literature on food security concerns what we might call a country's "aggregate food security," not the individual food security discussed so far. One definition of aggregate food security is ensuring adequate food supplies to feed the country's population at reasonable prices, regardless of how crop yields fluctuate from year to year. (pp228-229).

159. Toole, Daniel, (1989) Reaching the Poor in Africa: Household Food Security in Africa: An Overview of UNICEF Experience, UNICEF, New York.

In reviewing UNICEF's experience, the author highlights the mid-1980s as the period when household food security came to be seen as a major determinant of malnutrition and death. As a consequence, UNICEF programmes took as a starting point the idea that "all households should be able to assure adequate food for all family members throughout the year." (p2).

160. Tullis, F. L., and Hollist, W. L. (eds) (1986) Food, the State, and International Political Economy: dilemmas of developing countries University of Nebraska Press, Lincoln and London.

Introduction

[Food insecurity is]... domestic and international vulnerability to shifts in food and agricultural production and exchange practices...the insecurity that could result from international food shortfall or boycott. Some governments found that "cheap food" seemed less desirable than secure food and the political tranquillity that such security implied. Increased food security may lead to increased protection and subsidisation of national food production. (pviii).

161. Tyagi, D.S., (1990) "Increasing access to food through interaction of price and technology policies-the Indian experience" in D.S.Tyagi and V.S.Vyas (eds), Increasing Access to Food: the Asian Experience, Sage Publications, New Delhi.

These essential elements of India's national food policy also broadly coincide with the three specific goals of food security as they are commonly understood, namely, attaining desirable levels of food production, ensuring access to food supplies on the part of those who need it, and increasing the stability of food supply through the mechanism of buffer stocking. (p65).

162. UNICEF, Malawi, (1990) Poverty Reduction from Below: A Household Food Security Approach, mimeo, UNICEF, Lilongwe.

This report argues that national food security can only be achieved when all households in the country are food secure. Security at the household level is reached when households are "able to obtain adequate levels of food, either through home production, purchases or exchanges, to maintain a healthy and active life throughout the year." It is further argued that child nutritional status is a good proxy for measuring household food security. (p2).

163. UNICEF, (1990) Strategy for Improved Nutrition of Children and Women in Developing Countries, UNICEF Policy Review, New York.

Household food security requires special attention. For a long time nutrition has almost been equated with food supply, primarily because for a large number of people, food accessibility is not assured. Access to food is necessary for adequate nutrition, but it does not guarantee it. This difference is underlined in the distinction between national and household food security. National food security means adequate food supplies through local production and food imports. National food policies often neglect to take into account the common maldistribution of food among households or even communities and regions. Household food security, on the other hand, focuses on the family's capacity to produce and acquire food. In addition, explicit attention is paid to how food is produced, in particular the effect on women's work-load and how that food is distributed within the household. All of those factors have a direct effect on nutrition at the household level. (p20).

164. UNICEF, Namibia, (1991) A Situation Analysis of Children and Women in Namibia, mimeo, UNICEF, Windhoek.

This report draws a distinction between national food security, denoted as sufficiency of aggregate food supply, and household food security, which focuses on the capacity to produce or acquire food by individual families. It argues that national food security is a necessary but not sufficient condition for household food security and that household food security, while necessary, does not guarantee improved nutrition. (p31).

165. United Nations, (1975) Report of the World Food Conference, Rome, 5-16 November 1974, New York.

..the urgent need to ensure availability at all times of adequate world supplies of basic food-stuffs, particularly so as to avoid acute food shortages in the event of widespread crop failure, natural or other disasters, to sustain a steady expansion of food consumption in countries with low levels of per capita intake and to offset fluctuations in production and prices. (p14).

166. United Nations, (1988) Towards Sustainable Food Security: Critical Issues, Report by the Secretariat, World Food Council, Fourteenth Ministerial Session, Nicosia, Cyprus, 23-26 May.

Food security implies two things. First, it implies that food is available, accessible, affordable — when and where needed — in sufficient quantity and quality. Second, it implies an assurance that this state of affairs can reasonably be expected to continue; or in other words, that it can be sustained. To put it simply, food security exists when adequate food is available to all people on a regular basis. (p2).

167. United Nations, (1989) Right to Adequate Food as a Human Right, United Nations, New York.

It is proposed to use, as the framework for analysing "de lege ferenda" the range of State obligations in meeting the right to food, the concept of food security, and to give it a content which can accommodate both developmental and legislative perspectives. The concept as used here deviates somewhat from recent usage in food agencies. National food security, as used in this study, should be considered as the ultimate achievement of food security for all members of a nation. (p25-26).

168. United Nations, (1990) "Nutrition-Relevant Actions in the Eighties: Some Experience and Lessons from Developing Countries," Background Paper for the ACC/SCN Ad Hoc Group Meeting on Policies to Alleviate Underconsumption and Malnutrition in Deprived Areas, 12-14 November, London.

While food security refers to the self-perceived ability of household members to provision themeselves with adequate food through whatever means, ensuring it is often not sufficient to ensure the adequate nutrition of its individual members.

There has recently been considerable debate as to what exactly "food security" is and is not. This has to a large extent been fuelled by the need perceived by many development agencies to separate out food issues from nutrition issues in order to avoid departmental overlap in programme planning. Household food security essentially refers to the ability of household members to assure themselves sustained access to a sufficient quantity and quality of food to live active, healthy lives. This may occur as a result of adequate home production of food and/or adequate economic and physical access to food. Economic access comes from an adequate purchasing power, while physical access refers to the proximity of markets or other distribution channels through which food may be acquired. The distinction between chronic and transitory states of food insecurity is necessary to keep in mind. The latter may be triggered by seasonal fluctuations in food availability, food prices and/or incomes, which themselves may result in seasonal fluctuations in individual nutritional status. While not as serious as chronic food insecurity, it is nevertheless important, particularly as it may precipitate the chronic condition. it is also worth noting here that the concept can be both subjective — as households members perceive it — and objective, as security in fact turns out. (p7, 18).

169. UNSTD, (1986) Report of the Ad Hoc Panel of Specialists on Science, Technology and Food Security, Harare, 7-13 January, United Nations Advisory Committee on Science and Technology for Development.

Food security refers to a country's ability to have stable and reliable access to the food it needs through a mixture of production, trade, purchase or barter. The mixture is seen to vary according to the resource endowments of the country and its comparative advantage in different types of food, fibre and industrial production. Food security can also be used at the household level and implies stability in access to food through sufficient food self-provisioning and/or food purchasing power whatever the season of the year. (p6)

170. US Dept. of Agriculture, Office of the Secretary, (1977) "The Relationship Between Trade and World Food Security," Speech by Dale Hathaway, Assistant Secretary for International Affairs and Commodity Programs before the International Food Conference at the Pan American Health Organisation, Washington DC, April 29.

Food security has both a long-term and a short-term meaning. In the long-term, food security is the assurance that per capita food consumption can at least be maintained at current levels and preferably increased over time, particularly in poor countries. In the short-term, food security is the capability to prevent sharp declines in supplies and resultant sharp increases in prices to levels which many low income consumers at home and abroad cannot afford.

171. Valdes, A., and Panos Konandreas, (1981) "Assessing food insecurity based on national aggregates in developing countries," in Alberto Valdes (ed), Food Security for Developing Countries, Westview Press, Boulder.

Food insecurity in developing countries is the uncertain ability to finance needed imports to meet immediate targets for consumption levels. There are two main causes of food insecurity: shortfalls in domestic production and sudden fluctuations in the prices of food imports and national food or non-food exports. (p25).

172. Valdes, A., and Ammar Siamwalla, (1981) "Introduction," in Alberto Valdes (ed.), Food Security for Developing Countries, Westview Press, Boulder.

Food security may be defined as the ability of food-deficit countries, or regions within those countries, to meet target consumption levels on a year-to-year basis. (p1).

173. Valdes, A., (1983) "Discussion" in D.G.Johnson and G.E.Schuh (eds), The Role of Markets in the World Food Economy, Westview Press Inc., Boulder.

In our discussion of food security, I believe we are mainly concerned with how international trade should support the attempts of countries to meet annual targets of food consumption on a year-to-year basis. (p266).

174. Van Zyl, J., and G.K. Coetzee, (1990) "Food security and structural adjustment: Empirical evidence on the food price dilemma in Southern Africa," Development Southern Africa, vol 7 no 1, pp105-116.

In recent years food security has come to be defined as "the ability of a country or region to assure, on a long term basis, that its food system provides the total population access to a timely, reliable and nutritionally adequate supply of food." (p106).

175. von Braun, J.(1988) "Effects of technological change in agriculture on food consumption and nutrition: rice in a West African setting," World Development, vol 16 no 9, pp1083-1098.

Food security is understood in this context as the ability of all members of a household to acquire sufficient amounts of food continuously over time for a healthy and productive life. (p1083).

176. von Braun, J., (1991) "Improving Household Food Security," a "Theme Paper" in preparation for the FAO/WHO International Conference on Nutrition, International Food Policy Research Institute, Washington, DC. October.

Food security at the household and individual levels is defined, in its most basic form, as access by all people at all times to the food needed for a healthy life. The food security concept addresses people's risks of not having access to needed food. Those risks can be with respect to incomes and food production, for instance. Typically, those risks are higher the closer a household is even in a "normal situation" to inadequate dietary intake. Thus, at the household level, food security is the ability of the household to secure enough food to ensure adequate dietary intake for all of its members. Availability of food *and* access to food are two essential determinants of food security. Argues that household food security is not necessarily related to national food availability, and accepts the chronic/transitory distinctions of household food security. Distinguishes between rural and urban household food security: in urban areas this is a function of the real wage rate affected by a frequently poor health environment. (pp3-4).

177. von Braun, J., (1991) "A Policy Agenda for Famine Prevention in Africa" Food Policy Report, International Food Policy Research Institute.

"Food insecurity is the risk of an ongoing lack of access by people to the food they need to lead healthy lives." (p1). Food insecurity, with its severest expression in famine, is the outcome of an interaction between environmental

and socioeconomic factors, both in the short and the long terms, and a failure of policy to deal with them. (4). "Food insecurity and famine are inseparable from poverty." (p201).

178. von Braun, J., D. Hotchkiss and M. Immink, (1989) "Non-traditional export crops in Guatemala: effects on production, income and nutrition," Research Report no 73, International Food Policy Research Institute, Washington DC, May.

Food security... is understood in the broad sense as the ability of households and their members to acquire sufficient quantities of food over time, whether from their own produce or from the market. (p15).

179. Warley, T.K., (1983) "Discussion" in D.G. Johnson and G.E. Schuh (eds), The Role of Markets in the World Food Economy, Westview Press Inc., Boulder.

In the long term, enhanced food security requires the assured availability of increasing per capita food supplies. ... The shorter-term concept of food security dealt with here entails developing the capacity to avoid sharp reductions in the food consumption of countries, regions, groups, and individuals due to variation in incomes, food prices, supplies, and availability. (p271).

180. Watts, M., (1987) "Drought, environment and food security: some reflections on peasants, pastoralists and commoditization in dryland west Africa," in M. Glantz (ed), Drought and Hunger in Africa: Denying Famine a Future, Cambridge University Press, Cambridge.

Considers food security in terms of social relations between households and more generally, of the inter-section of commodity markets. A strong sense of food security is given in relation to household inequality by examining, first, the cycle of reproduction and, then, what one might call the social relations of trade, particularly seasonal sequences of grain sale and purchase and the critical role of debt. (p201).

181. Weber, M.T., J.M. Staatz, J.S. Holtzman, E.W. Crawford and R.H. Bernsten, (1988) "Informing food security decisions in Africa: empirical analysis and policy dialogue" American Journal of Agricultural Economics, vol 70 no 5, December, pp1044-1052

In recent years food security has come to be defined as "the ability of a country or region to assure, on a long-term basis, that its food system provides the total population access to a timely, reliable and nutritionally adequate supply of food." Food security thus involves assuring both an adequate supply of food and access of the population to that supply, usually through generating adequate levels of effective demand via income growth or transfers. Food security is therefore influenced by both micro and macro factors, ranging from the

technology and support institutions available to farmers and merchants, to monetary, fiscal, and exchange rate policies that affect the overall rate of growth and distribution of income. Food insecurity can be either short-term (eg a famine resulting from a crop failure) or chronic (long-term undernutrition). (p1044).

182. Weber, M.T.and T.S.Jayne, (1991) "Food security and its relationship to technology, institutions, policies, and human capital" in G.Johnson et al. (eds), Social Science Agricultural Agendas and Strategies, Michigan State University Press, East Lansing.

We define food security as a situation in which all individuals in a population possess the resources to assure access to enough food for an active and healthy life. This definition highlights three critical dimensions: (1) supply/demand, (2) time, (3) level of aggregation. (pII-114).

183. World Bank, (1980) "Food Security in Food Deficit Countries," World Bank Staff Working Paper no 393, Washington D.C., June.

Food security.. meaning the assurance of a minimally adequate level of food consumption... (p1).

184. World Bank, (1986) Poverty and Hunger: Issues and Options for Food Security in Developing Countries, World Bank Policy Study, Washington D.C.

The term "food security," although interpreted in many ways, is defined here as access by all people at all times to enough food for an active, healthy life. Its essential elements are the availability of food and the ability to acquire it. Food insecurity, in turn, is the lack of access to enough food. There are two kinds of food insecurity: chronic and transitory. Chronic food insecurity is a continuously inadequate diet caused by the inability to acquire food. It affects households that persistently lack the ability either to buy enough food or to produce their own. Transitory food insecurity is a temporary decline in a household's access to enough food. It results from instability in food prices, food production, or household incomes — and in its worst form it produces famine. (p1).

185. World Bank, (1988) Food Security in Africa: Task Force Report, Washington D.C.

This report agrees with the World Bank Policy Study, "Poverty and Hunger" (1988) in defining food security as "access by all people at all times to enough food for an active and healthy life." Achieving food security entails ensuring the availability of adequate food supplies and the ability of vulnerable households to acquire food. (p?).

186. World Bank, (1988) The Challenge of Hunger in Africa, Washington D.C.

Food security has two main requirements: one is assuring the availability of food, and the other is assuring the ability of households to acquire food.

In any country, the food insecure comprise different sub-groups. Cost-effective programs to improve food security must be tailored to the needs and the circumstances of each group of food insecure. (p3).

187. World Bank, (1989) Mozambique Food Security Study, Washington D.C., Draft.

Food security is best defined as access by all people at all times to sufficient food for a healthy and productive life. Within the framework of this definition, attainment of food security requires fulfilling certain conditions for the supply, demand and household-level utilisation of food. At the national level, an aggregate supply of food (either from domestic production or imports) is a necessary condition for food security — however, it is not sufficient. The "access" part of the definition of food security is also critical. Food security requires that all households have the ability to acquire enough food, either by producing it themselves or by generating sufficient income to purchase needed food supplies. Moreover, to the extent that household food security is not an end in itself but rather a means to achieving an active and healthy life, it also requires satisfactory health conditions and social practices — to ensure efficient allocation of available food among household members and optimal physiological utilisation by individual household members of nutrients contained in the food. These factors, in turn, have an impact on nutritional status and, hence, on the capacity of household members to work and so provide food. (p1).

188. World Bank, (1989) Analysis Plan: Food Security and Nutrition, World Bank, Draft.

Food security has been defined as the (secure) access by all people at all times to enough food for an active and healthy life. This definition implies that access to adequate food is subjected to threats of different types and that the analysis of risk of inadequate access is an important concern. There are two main dimensions to analysis of food security issues. The first concerns the level of analysis. Food security can be analysed at an individual, household, community, regional or national level. The second dimension relates to the time frame. Individuals or groups of people may suffer from inadequate food consumption all of the time. The focus of the analysis in this situation is on the level of food consumption and the factors that determine this. In other circumstances, the average level of food consumption may be adequate when compared with some measure of need but variations around this average imply that people do not have enough to eat for some of the time. In this case, the analytical concentration should be on the variability in food consumption (typically between seasons and between years) and the main consequences of this variation. A working definition of food security can only be specified when the level and time frame of the desired analysis is also specified. (p3).

189. World Bank, (1990) Symposium on Household Food Security and the Role of Women, Harare, January 21 -24, 1990.

Food security may be defined as access by all people at all times to sufficient food for a healthy and productive life. It comprises two main elements: i) assuring the availability of adequate food and supplies, through domestic production or imports; and ii) assuring the ability of households to acquire food, either by producing it themselves or by having the income to purchase it.

National food security is a necessary but not a sufficient condition for household food security. (pp1-2).

190. World Bank and World Food Programme, (1991) Food Aid in Africa: An Agenda for the 1990s, Washington D.C.

Food security is "access by all people at all times to enough food for an active and healthy life." Food security entails ensuring: i) that there are adequate food supplies (through domestic production or imports); and ii) that people who suffer from undernutrition can acquire food by producing it themselves or buying it.

Food insecurity is either chronic (meaning a continuously inadequate diet) or transitory (implying a temporary decline in a household's access to enough food). (p14).

191. World Food Council, (1988) Towards Sustainable Food Security: Critical Issues, Report by the World Food Council Secretariat, Fourteenth Ministerial Session, Nicosia, Cyprus, 23-6 May, WFC/1988/5.

Food security implies two things. First, it implies that food is available, accessible, affordable — when and where needed — in sufficient quantity and quality. Second, it implies an assurance that this state of affairs can reasonably be expected to continue; or, in other words, that it can be sustained. To put it simply, food security exists when adequate food is available to all people on a regular basis. (p2).

192. World Food Council, (1989) Ending Hunger: The Cyprus Initiative, Fifteenth Ministerial Session of the World Food Council, Cairo.

Food security is defined as all people at all times having access to enough food for an active and healthy life. It is the equivalent of ending chronic and persistent hunger on a sustainable basis. (p4).

193. World Food Programme, (1989) WFP Guidelines on Women and Development: Gender Variables in Food-Assisted Projects, Rome.

Food security refers to the sustained ability of all people to have physical and economic access to their basic food consumption needs at all times. A successful national food security strategy cannot be achieved without assuring food security at the household level. (p?).

194. Zipperer, S., (1987) Food Security and Agricultural Policy and Hunger, Zimbabwe Foundation for Education with Production, Harare.

"Food Security" means always having enough to eat. People reach food security by: 1. having land and resources to grow food; or 2. having employment which pays enough to buy food. (p5).

Part IV

A Selected Annotated Bibliography on Indicators with Application to Household Food Security

compiled by
Barbara Hutchinson and Timothy R. Frankenberger

A Selected Annotated Bibliography on Indicators with Application to Household Food Security

Introduction

This annotated bibliography contains a selection of works dealing with indicators for assessing food security. While it contains some references on indicators used at the national or regional level, the major focus is oriented towards those that can help identify villages or households with food insecure situations. It was compiled as a background document and as supplement to a report on *Indicators Used for Assessing Household Food Security* prepared for the International Fund for Agricultural Development and UNICEF.

The scope is necessarily broad so that it covers topics of related interest including: rapid appraisals; coping strategies, remote sensing applications, indigenous solutions to food stress, nutritional surveys, and Early Warning Systems. However, it does not attempt to include everything on all of these subjects, but cites only those with some applicability to food security assessments.

In addition, the bibliography draws upon a number of other bibliographic works for many of the references and annotations included. These are referenced here in full and, in the bibliography, in a parenthetical statement at the end of an annotation. They are:

Hassin-Brack, Jeanette. 1988. *Rapid Rural Appraisal Annotated Bibliography*, Vol. 2. Areport prepared for the Nutrition in Agriculture Cooperative Agreement. Tucson, Arizona, USA: University of Arizona, Office of Arid Lands Studies.

Lambert, R., M. Gershon, M. Buchanan-Smith, and S. Davies. 1991. *Famine Early Warning and Food Information Systems in the Sahel and Horn of Africa: An Annotated Bibliography*. Development Bibliography Series, 6. Brighton, U.K.: University of Sussex, Institute of Development Studies.

Mack, Maura D., Sandra Saenz de Tejada. 1988. *Nutrition in Agriculture Annotated Bibliography*, Vol. 1. A report prepared for the Nutrition in Agriculture Cooperative Agreement. Tucson, Arizona, USA: University of Arizona, Office of Arid Lands Studies.

Wood, Anita and Jennifer Shumaker. 1990. *Household Food Security Annotated Bibliography*, Vol. 3. A report prepared for the Nutrition in Agriculture Cooperative Agreement. Tucson, Arizona, USA: University of Arizona, Office of Arid Lands Studies.

Finally, while most acronyms are spelled out in full within the bibliographic text, a few of the most common ones are not. They are:

FAO — Food and Agricultural Organization of the United Nations
FEWS — Famine Early Warning System (USAID Project)
UNDP — United Nations Development Programme
USAID — United States Agency for International Development

1. ACC/SCN
   1991 *Some Options for Improving Nutrition in the 1990s [Draft Brief].* Report of the ACC/SCN's Ad Hoc Group on Policies to Alleviate Underconsumption and Malnutrition in Deprived Areas, 12-14 November, 1990. Geneva: United Nations Administrative Committee for Coordination, Subcommittee on Nutrition (ACC/SCN).

   The first section of this paper provides a short history of global interests in nutrition and current development policies related to nutrition. The second defines household food security and describes possible assessment strategies. Policy options for household food security include promotion of small-scale agricultural production, development of income generating projects, initiation of credit programs, investment in infrastructure, public stockpiling of food, food price stabilization, food price subsidy and rationing policies, food- and cash-for-work programs, free distribution of food to selected groups, food quality and safety control, timely warning and intervention systems, and specific micronutrient programs. The third section discusses concerns impacting nutrition and infectious disease control such as dietary management and prevention of infection and measurement issues. The caring capacity of a household is illustrated in section four. General constraints to adequate care are viewed as lack of knowledge, lack of time, and lack of control over resources. Possible interventions include education and literacy, access to health and related services, improved infrastructure and technology, women's property and income rights, access to credit, employment, home productivity and control of resources, and social security for women. The final section looks at specific programs to control micronutrient deficiencies, specifically, iodine, iron, and vitamin A.

2. ACC/SCN
   1988 *Nutrition in Times of Disaster.* Report of an International Conference Held at the World Health Organization Headquarters, Geneva, 27-30 September, 1988. Geneva: United Nations Administrative Committee for Coordination, Subcommittee on Nutrition (ACC/SCN).

   This report contains summaries of discussion papers presented on the topics of preparedness and early warning, assessment and monitoring, food rations, logistics and distribution, and the transition from emergency to development. Each paper is followed by review comments and recommendations of working groups. Issues which achieved consensus among the participants included: 1) response is the key for gathering preparedness and assessment information; 2) information systems need to be reviewed periodically; 3) affected communities should participate in all relief activities; 4) socioeconomic, health, and nutrition information should be used for

assessment and monitoring; 5) food security should be constantly monitored in famine-prone areas; 6) international standards should be used as a guide for setting ration levels; 7) food aid needs to be distributed equitably, quickly, and with consideration to local food habits; and, 8) strategies for making the transition from relief to development should be formulated at the beginning of the response. Issues for further research also are listed.

3. Agricultural Planning Unit (Darfur, Sudan)
   1990 *Results of North Darfur Pre-Harvest Survey*, October 1989, mimeo. Darfur Regional Government.

   A similar methodology to the 1988 harvest survey is described. An overview of the food and agricultural situation in North Darfur is presented, as well as a more detailed commentary for each Area Council. The prospective grain harvest is estimated, and food security conditions are assessed also taking into account on-farm grain storage, market, livestock and production indicators. The results show a very poor grain harvest, and it is expected that some areas will face acute food insecurity during the coming year. Recommendations are made for targeted relief assistance, within the context of long-term food security planning. (Famine Early Warning Bibliography)

4. Agricultural Planning Unit (Darfur, Sudan)
   1988 *Results of North Darfur Pre-Harvest Survey*, October 1988, mimeo. Darfur Regional Government.

   The survey methodology is described, based on rapid rural appraisal and key informant survey techniques. The crop production prospects for each Area Council are presented and compared with estimated consumption requirements. Pasture conditions, the agricultural labour market, and pest damage, primarily locusts and millet headworm, are reported upon. Food security status for the province is assessed, taking into account other factors than simply food production. The best harvest for a number of years is forecast. A relief programme is not required, but recommendations are made to build up a regional strategic grain reserve, to strengthen the food security of the region in the long-term. (Famine Early Warning Bibliography)

5. Arnould, E.J. and T.R. Frankenberger
   1990 *Guidelines for Including Nutrition and Food Security in Agricultural Projects [Draft]*. A Report Prepared under the Nutrition in Agricultural Cooperative Agreement. Tucson, Arizona, USA: University of Arizona, Office of Arid Lands Studies.

This document provides technical guidelines for incorporating food consumption and nutritional concerns in USAID-funded projects. It first looks at the linkages between agricultural production and food consumption which include: governmental policies; household resource endowments; crop diversity; seasonality of production; distribution of production/consumption tasks by gender; market prices; structure and organization; the time value of household labor; and, form and functions of the productive unit. It is demonstrated that linkages between agricultural policy and development, consumption, and nutrition are complex and indirect making broad generalizations for setting policy inappropriate. In addition, it is suggested a critical step to improving food security at the household level is to support indigenous coping strategies. The second section of the document walks through the planning process for incorporating food consumption/food security issues into Mission portfolios including planning stages and information needs, sources of information, data collection methods, key questions for planners and evaluators, nutritional indicators, and guidelines for providing strategic support to coping mechanisms.

6. Attwood, D.A.

"Why aggregate food supply information remains an important early warning indicator of famine." *Food Policy* 16(3): (forthcoming).

While the shift away from traditional supply-side theories of famine is appropriate, this article comments that aggregate food availability data are a critical, if not sufficient component of an Early Warning System. The food balance sheet is the most common way of assessing food supply, although it has received criticism for being too general to highlight specific areas or groups at risk. While accepting its serious limitations, it is important to see that it may offer one of the earliest signs of impending crisis, and is often the principal tool used by host governments and international donor agencies. Use of case studies from Botswana, Kenya, Ethiopia and Mali show how an accurate estimate of food supply can serve as an important complement to entitlement information in anticipating and responding to food crises in a timely way. (Famine Early Warning Bibliography)

7. Autier, P.

1988 "Nutrition assessment through the use of a nutritional scoring system." *Disasters* 12(1): 70-80.

In 1984 and 1985, Chad was affected by a large scale drought. In order to ensure rapid decision making for the allocation of food and because of the practical problems encountered when using the

classical nutritional survey methods, a Nutritional Score System (N.S.S.) was developed. This method was based on the use of social, economic, and nutritional indicators and allowed comparison of nutritional status between communities. The nine indicators used were: cause of displacement; number of displaced people; type of displaced or threatened people; mortality; nutritional status of the population; homogeneity of the families; type of food consumed; food reserves of the families; and, existence of avitaminosis A. This paper discusses how the N.S.S. was developed and applied, and how it compared with the classical survey methods. A conclusion drawn was that although the N.S.S. represented a reliable nutritional evaluation method, it should substitute for the classical methods only if certain rules regarding their development are respected and if one validates them by comparison with the classical methods. (Adapted from author's abstract)

8. Autier, P., J. D'Altilia, J. Delmalle and V. Vercruysse.
1989 "The food and nutrition surveillance systems of Chad and Mali: the "SAP" after two years." *Disasters* 13(1): 9-32.

Summarises the operational and methodological lessons learned after two and a half years of experience of the Systemes d'Alerte Precoce (SAPs) in Chad and Mali. Their aim is to detect food shortages as early as possible in drought-prone areas of each country. They are based on the concept of "rising-risk monitoring," which involves the assessment and follow up of the level of risk to which any one group is exposed. This requires a multi-disciplinary strategy, taking into account indicators from all important domains associated with food and nutritional conditions. The validity of indicators is based upon the criteria of relevance, usability and reliability. SAPs are integrated within governmental structures yet they include some innovative concepts, like the "participative information network." SAP's procedures should permit progressive improvement in the ability of the system to analyse and interpret the food security situation. (Famine Early Warning Bibliography)

9. Autier, P., J. D'Altilia, B. Callewaert, B. Tamboura, J. Delamalle and V. Vercruysse.
1989 "Migrations and nutritional status in the Sahel." *Disasters* 13(3): 247-254.

Aims to assess whether the departure of peasant households from their native villages is associated with higher levels of malnutrition among the migrating families, based upon the routinely performed socioeconomic/nutritional surveys carried out by the SAP in Mali. In areas affected by food shortages, it was found that as the number

of recently abandoned houses in a cluster increased, the prevalence of malnutrition decreased. Malnutrition is already known as a late indicator for early warning purposes; the migration of those most "at risk" tends to exacerbate this late characteristic. However, it is noted that the data were collected in the dry season; that exceptions to the phenomenon can occur; and that other forms of nutritional surveys may pick up a deterioration in nutritional status. Also gives a brief description of current migration patterns in the Sahel, and the effects of drought on them. (Famine Early Warning Bibliography)

10. Bashir, L.O.
    1991 *Famine Codes in Sudan.* Paper presented at the Conference on The Future of Food Security, 25-27 July, 1991, Institute of Development Studies. Brighton, U.K.: University of Sussex, Institute of Development Studies.

    Why famine codes in Sudan? India might have experienced the same drought problems as Africa had it not achieved success in famine prevention through the application of famine codes. The main factors that led to India's success story were its strong administration, its well developed infrastructure, its agricultural production policy, and a carefully planned public works programme. On the other hand, the adoption of famine codes in Sudan in the 1920s had limited results because the British government depended on non-professional native administration whose legitimacy was questioned, and the infrastructure and information system were both weak and inappropriate. The project failed because these differentials were not taken into account. Recent attempts at famine prevention in Sudan are ad hoc with the government seemingly caught by surprise at each crisis even though the process is usually long, slow, and predictable. Recent experience shows that response is often *too little and too late.* Thus, a contingency plan to create a situation of preparedness and automatic response is essential, if not to prevent famines, then to reduce the severity. (Adapted from author's abstract)

11. Bernard, H. Russell
    1988 *Research Methods in Cultural Anthropology.* Newbury Park, California, USA: Sage Publications, Inc.

    This step-by-step guide lays out the major methods for designing research and collecting and analyzing data in a systematic, scientific fashion. Part I provides a basic foundation for field research preparation including a discussion of the experimental method, sampling, site selection and conducting a preliminary literature search. Part II focuses on collecting data through participant observation, various interview techniques, questionnaires, and by

direct and unobtrusive observation. The various methods for analyzing data are covered in Part III including qualitative, quantitative, bivariate and multivariate analysis.

12. Borton, J. and J. Shoham
1991 *Mapping Vulnerability to Food Insecurity: Tentative Guidelines for WFP Offices*, mimeo, Study Commissioned by the World Food Programme. London: Relief and Development Institute.

This report, prepared for World Food Programme (WFP), seeks to identify ways in which WFP can build on its experience in mapping vulnerability to food insecurity and famine, taking account of developments in food security and the way in which famines are now conceptualised. The intention is to explore ways in which WFP Country Offices might incorporate notions of food-related vulnerability into their programming and monitoring exercises. Sudan is used as a case study. The report examines the concept of vulnerability and reviews WFP's experience in vulnerability mapping in Bangladesh and Sudan and that of USAID's Famine Early Warning System (FEWS). It also offers a methodology for preparing vulnerability maps tested in Sudan. (Famine Early Warning Bibliography)

13. Borton, J. and J. Shoham
1989 *A Review of the Sudanese Red Crescent Society's Drought Monitoring Programme*, mimeo. London: Relief and Development Institute.

A review was carried out during October-November 1988, of the Drought Monitoring Programme (DMP) implemented by the Sudanese Red Crescent Society (SRC), primarily in North Darfur Province. The DMP began as a pilot project in 1985, and was designed to test the feasibility of establishing a sustainable, low-cost information network, using local SRC branches to report on local conditions, according to selected socioeconomic indicators. The DMP has suffered from its inception from lack of technical and financial support. Although necessary modifications are identified in the review, it is recognised that this is one of the few projects in Africa using local communities to monitor for signs of food-related stress. Its main strengths are its excellent outreach, its sustainability as a result of its low operating costs, and its location within an indigenous Non-Governmental Organization (NGO). The SRC is able to provide far greater continuity than any of the international Non-Governmental Organizations. However, the DMP is not a stand-alone Early Warning System capable of triggering large scale response,

and needs to be linked closely to response capacities of the SRC and other institutions. (Famine Early Warning Bibliography)

14. Borton, J. and J. Shoham
    1985 *Risk Mapping and Early Warning Indicators: The Zambia Case Study*, mimeo. Report for the Food and Agricultural Organization of the United Nations. London: International Disaster Institute and London School of Hygiene and Tropical Medicine.

    Stresses the need for an Early Warning System to supply decision makers with clear and credible warnings when necessary. Early warning indicators are needed which can feed into the local administrative structures as far as is possible, in order to avoid creating a by-pass structure. With reference to Zambia, the report differentiates between: status indicators, which can be analysed in advance of a food emergency, and can give information on who and where the at-risk groups are; and dynamic indicators which give more detailed ongoing data about the at-risk groups. Crop forecasting is an early indicator, but focuses too much on aggregate production, whilst nutritional data are seen to be too late as an indicator. Examines the potential of "intermediate" indicators, and shows that price data might be the earliest of these. The final section examines the need to link early warning to response, and stresses the need for an Early Warning System to feed into a structure which is both willing and capable of responding. (Famine Early Warning Bibliography)

15. Borton, J. and S. York
    1987 *Experiences of the Collection and Use of Micro-Level Data in Disaster Preparedness and Managing Emergency Operations*, mimeo. Report on the workshop held at the London School of Hygiene and Tropical Medicine, January 1987. London: Relief and Development Institute.

    The workshop was based on the premise that micro-indicators have a role to play in early warning and disaster preparedness. The role of "models" of the processes leading up to famine is discussed, and they are seen as abstractions of the process, rather than as predictive tools. They indicate the sequential nature of events, but fail to indicate their timing. More stress should be placed on "insider" models: the set of ideas, knowledge and perceptions held by those affected. The relative merits and problems of three types of indicators — meteorological/agricultural, socio-economic, and nutritional/health are briefly discussed. The proliferation of Early Warning Systems is indicated, and their variety illustrated by discussion of the four Early Warning Systems in Mali, the Sudanese

UNDP-United Nations Emergency Office of Sudan Early Warning System and by the two "social security systems" in place in Botswana and Turkana, North Kenya. Four areas of further investigation are raised: coordination and overlapping of systems; costs of monitoring systems; institution building; and donor response and decision making. (Famine Early Warning Bibliography)

16. Brooks, R.M., D. Abunain, D. Karyadi, I. Sumarno, D. Williamson, M.C. Latham, and J.P. Habicht
    1985 "A timely warning and intervention system for preventing food crises in Indonesia: applying guidelines for nutrition surveillance." *Food and Nutrition* 11(2): 37-43.

    The paper is concerned with an integrated nutritional surveillance programme in Indonesia, known as the "timely warning and intervention information system" (TWIIS). It was decided that the nutritional surveillance system should be established and used at the local level, because: it could be created at low cost by local officials; it could provide useful information for local level decision making; and, it could lead to the implementation of appropriate interventions which would alleviate food crises. Insufficient purchasing power was identified as the main problem, and the use of indicators adjusted accordingly. Lessons are drawn from the Indonesian experience. It concludes that the operational goal of coupling information to intervention decisions should be seen as the cornerstone of effective Early Warning Systems. (Famine Early Warning Bibliography)

17. Buchanan-Smith, M.
    1990 *Food Security Planning in the Wake of an Emergency Relief Operation: The Case of Darfur, Western Sudan.* IDS Discussion Paper No 278. Brighton, U.K.: University of Sussex, Institute of Development Studies.

    The differences are examined between an emergency relief operation and food security planning with a long-term perspective, which typically follows. The approach usually aimed for in the latter is almost the exact opposite to the approach adopted in emergency relief planning and therefore the transition between the two can be uneasy. A model is developed to show this and is applied to Darfur, Western Sudan, where a period of long-term food security planning followed the emergency relief operation launched in response to famine in the mid-1980s. Two years after the emergency, a smaller scale Western Relief Operation was launched. An attempt was made to shift away from the emergency style, but serious problems were encountered. These are analysed in the light of the model showing the different characteristics of emergency relief and long-term food

security planning. Recommendations are made on how to ease the transition in practice. (Based on the author's abstract.)

18. Buchanan-Smith, M. and H. Young
1991 *Recent Developments in Gathering and Using Early Warning Information in Darfur, Sudan*, mimeo. Brighton, U.K.: Institute of Development Studies.

The authors first suggest that socio-economic indicators cannot distinguish between different kinds of famine, secondly that they are complex to use and not early or accurate enough as indicators, and thirdly that they cannot predict excess mortality. These issues are considered in the light of the experience of Darfur's Early Warning System between 1987 and 1989. Socio-economic indicators are just one part of the jigsaw of the information system, in which agricultural and health data form the backbone. Grain market data have been particularly important to the Darfur Early Warning System, and simple and low cost methodologies have been developed for early warning. The case is made for strengthening local decentralised Early Warning Systems, although problems of the information response link are raised. (Adapted from Famine Early Warning Bibliography)

19. Buchanan-Smith, M., S. Davies, and R. Lambert
1991 *A Guide to Famine Early Warning and Food Information Systems in the Sahel and Horn of Africa. A Review of the Literature.* Volume 2 of a Three Part Series. IDS Research Reports Rr 21. Brighton, U.K.: University of Sussex, Institute of Development Studies.

This guide provides information on all the major Early Warning Systems in the Sahel and Horn of Africa. Descriptions cover four different levels of Early Warning Systems: global, regional, national, and sub-national. Major characteristics of each Early Warning System are given followed by a factual description, including its history, objectives, institutional set up, methods and types of data collection, and any links with response mechanisms. A discussion of the relative merits, problems, successes, and failures of the Early Warning Eystem follows. The authors conclude that global, regional, and even national Early Warning Systems rely most heavily on food production/food supply data. Socio-economic indicators are often only incorporated at the local level. It is suggested that more decentralized monitoring units serving a central Early Warning System might provide the mechanism for coordinating both micro-level and macro-level data. Questions are raised about the increasing reliance on "high-tech" approaches to data collection and the dependence of EWS on donor funding. The importance of linking

Early Warning Systems to other uses such as development and planning needs and using indigenous organizations for providing information is indicated.

20. Burki, S.J.
1986 "The African food crisis: looking beyond the emergency." *Journal of Social Development in Africa* 1: 5-22.

This paper on the African food crisis is presented in four parts. The first section focuses on the current nexus of problems that has created an endemic economic crisis in many African countries, the background against which both the drought and certain domestic policies have operated. The second part introduces the concept of entitlement, a concept that is used to understand better the human response to a diminished ability to produce or purchase food. This section looks at the food crisis as an income and productivity crisis, rather than food shortages per se. In the third section, a formulation is introduced that describes three stages of disinvestment among affected people, stages that have been observed historically as a result of drought and famine. The last section examines possible solutions and the most appropriate national and international response to the various stages described. (Author's abstract)

21. Campbell, D.J.
1990 "Community-based strategies for coping with food scarcity: a role in African famine Early-Warning Systems." *GeoJournal* 20(3): 231-241.

The effectiveness of Famine Early Warning Systems being used in Africa is being questioned because they are unable to provide sufficiently accurate information on the specific locations vulnerable to food scarcity. The data currently used to assess the emergence of local deficits are criticized as being inaccurate or belated. This paper proposes the use of indicators, based on the observed responses of people vulnerable to food shortage, to improve the quality of Early Warning Systems. It argues that monitoring of peoples' coping behavior provides accurate and timely information at a spatial scale, the village level, which allows more effective interventions by relief agencies. Rural African societies employ a variety of strategies to reduce the impact of recurrent food deficits. These strategies differ from one society to another and, within societies their use can be differentiated by the gender, age, and economic status of individuals. Further, adoption of coping strategies follows a sequence from more to less palatable alternatives as a shortage intensifies, ultimately resulting in the liquidation of productive assets, abandonment of the rural economy and, if access to food becomes so difficult, death.

The paper concludes that the variety of coping strategies, and the complexity of the structure and sequence of their adoption, provides a basis for consideration of monitoring coping behavior as a component of Early Warning Systems. Such behavior reflects the actual status of food supply among specific groups of people. It is a sensitive indicator of food availability which could complement those used by existing Early Warning Systems and permit relief efforts to be focussed in a more spatially discrete and timely fashion than is currently possible. (Adapted from author's introduction)

22. Campbell, D.J.
1990 "Strategies for coping with severe food deficits in rural Africa: a review of the literature." *Food and Foodways* 4(2): 143-162.

Coping strategies have developed at the community level through interactions over time between social, political, and economic institutions and the physical environment. Prior to the colonial period, Africa's rural societies were relatively closed systems, and the pattern of life was largely determined by processes acting at the level of the village. Not all members of society had access to resources, but in many situations the wealthy had obligations to support the poor in times of difficulty. The structure of support was able to cope with most difficult circumstances, but in some cases where particularly severe conditions arose, breakdown of supportive structures occurred and hardship and death ensued.

Integration into the world market economy during the present century has made these systems more open and has increasingly distanced from the village the determinants of the systems' configuration. In both market and socialist economies centralized decision-making with a sectoral focus and a much more restricted planning horizon has replaced local decision-making, which incorporated a long-term perspective on the total people-environment system. As local structures have been forced to respond to sectoral institutions, so their ability to manage the interactive people-environment has weakened.

Among the strategies used by very different societies a number of common points exist. Firstly, such strategies are an integral part of the rural livelihood system. They are not unique measures resorted to only in times of stress but are elements that exist at all times and assume greater importance under difficult conditions. Being part of the system they undergo change as the society changes. Secondly, the strategies are adopted in sequence beginning with those that involve relatively little discomfort. The details of the strategies and their order differ from society to society, but the notion of a

sequence is common. Thirdly, a small number of studies indicate that resorting to coping strategies varies among individuals and households within a society, according to factors such as economic status, gender, and age. (Author's summary)

23. Campbell, D.J. and D.D. Trechter
1982 "Strategies for coping with food consumption shortage in the Mandara Mountains region of North Cameroon." *Social Science and Medicine* 16: 2117-2127.

Two major approaches to the question of food shortages in Africa have emerged. One discusses the food deficits of different communities and the other has focused on the provision of food relief from external sources. The success of those concerned with external relief has been constrained by the relative insensitivity of their warning systems to local food supply conditions. This paper draws on research in the Mandara Mountains region of Cameroon to argue that the monitoring of community-level responses to food shortage can provide an early warning of impending severe food deficits which may enable more rapid provision of external assistance. (Author's abstract)

The results of this survey show that men and women respond somewhat differently to food shortage. Women appear to be responsible for the seasonal shortages, while both men and women are active in overcoming the more severe problems. Seasonal shortage is managed mainly by selling/slaughtering livestock, borrowing food or money, and family assistance. But coping during unusually severe food deficit years is through family assistance, wild foods, food purchases, migration, selling stock, special plantings, and selling food. More women report planting special foods, while migration is more common among men. The timing of migration is an important indicator of impending food shortages, as is reduction in food consumption by missing meals or not eating for an entire day. (Household Food Security Bibliography)

24. Casley, D.J. and K. Kumar
1988 *The Collection, Analysis, and Use of Monitoring and Evaluation Data.* Baltimore, Maryland, USA: The Johns Hopkins University Press (for The World Bank).

A companion to the 1987 volume, *Project Monitoring and Evaluation in Agriculture* and successor to *Monitoring and Evaluation of Agriculture and Rural Development Projects* (1982), this volume outlines simple and inexpensive methods of collecting and analyzing data for monitoring and evaluating agricultural

projects. Chapters cover qualitative and quantitative methods of data collection, conducting group interviews, participant observation, structured surveys, sampling, crop measurement, exploratory analysis, statistical analysis, and data presentation. Examples of interview techniques and types of questions are given.

25. Casley, D.J. and K. Kumar
1987 *Project Monitoring and Evaluation in Agriculture.* Baltimore, Maryland, USA: The Johns Hopkins University Press (for The World Bank).

Project appraisal routinely includes monitoring the implementation of projects and evaluating their achievements. This book uses over thirty examples to illustrate the concepts of monitoring and evaluation as applied to agricultural and rural development projects. Chapters cover setting up management information systems, monitoring physical and financial progress, follow-up diagnostic studies, communication techniques, production measurement and types of evaluation.

26. Casley, D.J. and D.A. Lury
1987 *Data Collection in Developing Countries*, 2nd. ed. Oxford: Clarendon Press.

Although the authors consider a range of inquiry techniques, the major emphasis of the book is on data collection by sample survey. The special difficulties of conducting surveys in developing countries are outlined and techniques for dealing with them are discussed. Emphasis is placed on simplicity both in survey design and content. Chapters cover the case study; the questionnaire; data collection, processing and interpretation; household surveys; agricultural surveys; and monitoring and evaluation.

27. Casley, D.J. and D.A. Lury
1982 *Monitoring and Evaluation of Agriculture and Rural Development Projects.* Baltimore, Maryland, USA: The Johns Hopkins University Press.

Rural development projects are complex, seek to benefit large numbers of people in usually remote rural areas, and involve a variety of investments. The need for monitoring and evaluating them during implementation has been accepted in principle, but effective systems have been slow to be developed. This book provides a how-to tool for the design and implementation of monitoring and evaluation systems. It differentiates the concepts of monitoring and evaluation and sets out the issues that need to be considered in

designing systems to monitor and evaluate specific projects, emphasizing the timeliness of the monitoring functions for effective management. Also discussed are selection of indicators, selection of sample methodology, data analysis, and presentation.

28. Centre for Food Security
    1991 *Background Paper on Food Security: Draft Final.* Guelph, Ontario, Canada: University of Guelph, Centre for Food Security.

    This background paper attempts to synthesize current thinking on food security. Section 1 outlines the evolution of food security definitions and concepts over five decades. During the last decade the view of food security was to ensure both physical and economic access to food supplies. Section 2 examines the data and techniques currently being used to assess and measure evidence of food insecurity. Six levels of aggregated measures were considered. It was found that although the global level of world food stocks seem relatively secure, regional level trends in per capita food production for some regions, particularly Africa, are disheartening. At the national level new indicators of food insecurity, which capture both static and dynamic elements, suggested that the general trend in many developing countries is worsening national level food insecurity. Sub-national analyses also provided a bleak picture of some population groups facing extremely high food insecurity risk. Evidence of food insecurity at the household level provides a new means of mapping food insecurity trends. At the individual level nutritional deficiencies were found to be a major problem for many people, worldwide.

    Section 3 examines the relative merits and demerits of various food security strategies and associated instruments used to achieve food security objectives. It was discovered that alternate viewpoints and evidence exist regarding the impact of these instruments on food security. Furthermore, it was found that generalizable conclusions could not be reached from country specific evidence. Section 4 examines food security projects of six institutions. Projects funded in 1989-90 preferred strategies that increased the supply of food, increased access to food, and increased food security planning and coordination. Predominate investment sectors were agriculture and food aid. Thirty-eight percent of total budgetary allocations were applied to increasing access through food aid. (Adapted from Authors' Background Summary)

29. Chambers, R.
    1989 "Editorial introduction: vulnerability, coping and policy." *IDS Bulletin* 2(2): 1-7.

Considers the concept of vulnerability, which refers to exposure to contingencies and to stress. This is often neglected in analysis, or treated as being the same as poverty, when it is more appropriate to see it as another dimension of deprivation. Vulnerability is linked with net assets and it raises a number of neglected issues, such as poor people's own priorities and strategies in this respect. These have policy and research implications, drawing attention to the need to ensure that anti-poverty programmes do not increase vulnerability. Concludes that much remains to be known and understood about vulnerability and coping, and the approach must be humble. (Famine Early Warning Bibliography)

30. Chambers, R.
    1985 Shortcut methods of gathering social information for rural development projects. In *Putting People First: Sociology and Development Projects*, M. Cernea, ed., 399-415. Washington, D.C.: World Bank.

    The author presents a method of data collection that is more cost-effective than traditional methods. Inaccuracies in data can be avoided if researchers use collection methods which are sensitive to each situation and population. While there is neither a correct nor incorrect way of conducting rapid rural appraisal, it incorporates some of the following: a) using existing information; b) learning indigenous technologies; c) using key agricultural and economic indicators; d) using teams of social and agricultural scientists to conduct reconnaissance of rural areas; e) employing local researchers; f) using direct observation; g) conducting both formal and informal interviews with key persons and groups; and, h) conducting aerial inspection and surveys. (Nutrition in Agriculture Bibliography.)

31. Clay, E.J. and S. York, eds.
    1987 *Information and Emergencies: A Report on the 5th IDS Food Aid Seminar*, 21-24th April 1987. IDS Discussion Paper, No 236. Brighton, U.K.: University of Sussex, Institute of Development Studies.

    "What lessons have been learned during and since the 'African Emergency'?" was the question asked at the Seminar. The discussions were overshadowed by the massive relief operation just beginning in Mozambique, where there was minimal information to guide donor responses and the movement and targeting of assistance. Food aid donors and Non-Governmental Organizations (NGOs) rely on international information systems, supplemented by agency and in-country assessments. The growing influence of the media, and the

implications of the related information technology revolution are recognised, but imperfectly understood. The success of international information sharing during 1985-86 justifies further efforts at continued information pooling and preparedness for cooperative emergency action. It is crucial that national and NGO-based information systems are strengthened. (Based on author's abstract)

32. Cohen, J.M. and D.B. Lewis
1987 Role of Government in Combating Food Shortages: Lessons from Kenya 1984-85. In *Drought and Hunger in Africa: Denying Famine a Future*, M.H. Glantz, ed., 269-296. Cambridge, U.K.: Cambridge University Press.

Little specific literature exists on steps to anticipate and respond to food shortages. What does exist is fragmented, and commonly eschews consideration of the administrative and financial capabilities of governments to respond. However, four major categories of recommendations are drawn from existing publications of international agencies: 1) to establish permanent structures responsible for food security; 2) to carry out hunger-prevention activities during non-crisis periods; 3) to ensure rapid and effective response during crisis periods; and 4) to ensure rapid and effective post-crisis rehabilitation. The experience of Kenya in 1984-5 is analysed showing how the government drew upon the management and operational resources of existing systems. The authors differentiate this approach — the "functional standby strategy" — from the "permanent structure strategy" typically recommended by international agencies. The former is more likely to keep costs down, and to promote a flexible adaptive problem-solving capacity. (Famine Early Warning Bibliography)

33. Conelly, W.T. and M.S. Chaiken
1987 *Land, Labor, and Livestock: The Impact of Intense Population Pressure on Food Security in Western Kenya.* Paper presented at the 1987 Meeting of the American Anthropological Association, November 18-22, Chicago, Illinois, USA.

The results of a study of food consumption patterns in two areas of Western Kenya is the focus of this paper. While cash cropping and off-farm labor are determining factors in obtaining an adequate diet, population pressure is an important third variable in analyzing food security. Even in farming systems which exhibit a good balance of cash and food crop production, very high population densities will result in a decline in adequacy of diet and a decrease in food security. This data from Kenya showed that in the community of Masumbi, which experienced less reliable rainfall and lower

participation in the cash economy, consumption levels of both starch and protein foods was greater than in Hamisi, a village which has more favorable environmental conditions and a balanced economy. Intense population pressure in Hamisi has: 1) limited the availability of land for food crop production; 2) pressured farmers to seek off-farm employment and re-allocate labor to cash crops; and, 3) placed restrictions on the ability of farmers to maintain livestock. All of these factors have led to observed lower level of food consumption in the community. With rapid population growth in Kenya, attention needs to be paid to the relationship between population density and food security. (Household Food Security Bibliography)

34. Corbett, J.
1988 "Famine and household coping strategies." *World Development* 16:1099-1112.

Households faced with risks to their entitlement to food will plan strategically to minimize their impact. The task of doing this will be particularly demanding during famines. This paper reviews the evidence on household strategies for coping with famine in Africa and identifies some distinctive patterns in these strategies which can be used to examine household objectives at times of crisis, the management of resources to meet these objectives, and limits to the effectiveness of coping strategies. In particular, it examines the role of asset management and trade-offs between maintaining current food consumption levels and protecting the future income generating capacity of the household. (Author's abstract)

35. Cutler, P.
1987 "Early warning of famine: a red herring?" *Proceedings of the Nutrition Society* 46: 263-266.

Improving famine early warning systems poses several administrative and conceptual problems. Although data-collection systems are in place at the international level and to some extent at the national level, donor response was slow to respond to an identified potential crisis situation in 1983-84. In the case of the Ethiopian disaster, this is blamed partly on the disproportional weight given to faulty United Nations' assessments instead of the more accurate information supplied by the Ethiopian Relief and Rehabilitation Commission. To improve information gathering systems, the author suggests a need to identify both what indicators will prompt action and what response should be made at the initial stage of a crisis. In addition, donor agencies should give their representatives leeway to respond quickly to calls for assistance and they should provide a long-term funding commitment for providing relief and for building improved

Early Warning Systems. The importance of integrating information and response systems is stressed.

36. Cutler, P.
1987 *Micro-Agro-Economic Indicators of Food Crisis: Famine Early Warning and Response in Ethiopia and Bangladesh*, mimeo. London: London School of Hygeine and Tropical Medicine.

Investigates the famine early warning and response in Ethiopia and Bangladesh, during the 1983-85 period. Widely used methods of famine assessment, such as crop forecasting, food balance sheets, and nutritional surveillance are seen as unsatisfactory, having serious conceptual, methodological, and practical shortcomings. Data for early warning need to be either readily available, or able to be simply and cheaply collected. The information should be easy to use as distress indicators, amenable to quick analysis and presentation, and accessible to decision makers. The use of

socio-economic data is investigated in the Ethiopian and Bangladeshi contexts. However, even with good early information about famine, a response from government or aid agencies is not guaranteed. Political will is required to shift from reactive responses to terminal famine migration, to more timely initiatives to strengthen food entitlement. (Famine Early Warning Bibliography)

37. Cutler, P.
1985 "Detecting food emergencies: lessons from the 1979 Bangladesh crisis." *Food Policy* 10(3): 207-224.

Examines the experience of Bangladesh in 1979, when outright famine was narrowly averted, although there were excess deaths from starvation in some localities. The paper outlines the main features of the crisis and considers the use of available macro-economic indicators of stress, which could be a basis for future government action. Food availability at the national level cannot be taken as a reliable indicator, although a decline in food availability is important in its impact on market prices. Wage-price indices are not useful predictors, since the lead time is short, but may help identify distressed areas. Concludes with an outline of appropriate responses to food crisis in Bangladesh. (Famine Early Warning Bibliography)

38. Cutler, P.
1985 *Review of Progress Made Towards Instituting Technical and Institutional Improvements in the Early Warning System*, mimeo. Ethiopia/Sudan: Relief and Rehabilitation Commission and UNICEF.

Reviews problems and progress made with the Ethiopian Early Warning Ssystem since a workshop held in 1984. Focuses on improvements in report presentation, questionnaire design, and background information requirements. More collaboration is needed between relevant institutions, but better institutional links are compromised by lack of clear directives from senior personnel. Critical shortages of staff and resources exist, but can be met to some extent by reorganisation. Recent progress has included establishment of a pastoral area assessment programmes for lowland Ethiopia, not previously covered by the Early Warning System. (Famine Early Warning Bibliography)

39. Cutler, P.
1985 *The Use of Economic and Social Information in Famine Prediction and Response*, mimeo. Report for the Overseas Development Administration. London: Food Emergencies Research Unit and London School of Hygiene and Tropical Medicine.

This report aims to identify data sets available to food planners in Ethiopia and Bangladesh, which could form the basis for famine early warning and response systems. Seeks to uncover indicators which are relatively simple, inexpensive and accurate, which will be of relevance elsewhere. Establishes the necessity of recording experiences of drought conditions, especially the effects of crop failure on markets. As famine conditions develop, more people are drawn into the market in order to survive. While Bangladesh was found to be well-served with regional and centralised information, and could handle food crises, Ethiopia, despite the presence of an Early Warning System, had little information from the worst affected regions, did not know about peasant coping abilities, and gave low priority to famine and relief management. (Famine Early Warning Bibliography)

40. Cutler, P.
1984 "Famine forecasting: prices and peasant behaviour in Northern Ethiopia." *Disasters* 8(1): 48-56.

Various hypotheses and observations about food and livestock price behaviour during famine are tested. An hypothesis is developed to account for peasant and price behaviour under developing famine conditions. The main conclusions are: that high food prices are typical of famine zones, although food prices can behave relatively normally at the edge of these zones; that as migration takes place, there is a "ripple effect" as prices rise further from the epicentre of famine zones; that increased volume (rather than prices) of livestock sales may be a good famine indicator; that livestock-for-grain terms

of trade do not necessarily deteriorate; and that different "waves" of migration may characterise famine. (Adapted from Famine Early Warning Bibliography)

41. Cutler, P.
1984 "Food crisis detection: going beyond the balance sheet." *Food Policy* 9(3): 189-192.

There is a disquieting tendency for agencies and governments involved in food crisis monitoring to neglect both the practical lessons of the past and the widely disseminated recent academic research. One result of this is our inability to tackle adequately Africa's current food crises and famines. This article argues that we already know enough to devise viable strategies to deal with crisis, and that governments should be able to implement these without serious practical difficulty. The real difficulty lies in persuading officials in agencies and governments to view food crises as socioeconomic events, rather than purely as a result of climatological and agricultural catastrophes. (Author's abstract)

42. Davies, S.
1991 *What Can Markets Tell Us About Food Entitlements?*, mimeo. Brighton, U.K.: University of Sussex, Institute of Development Studies.

Using data from ten rural markets in the Malian Sahel and Inner Niger Delta, over a three year period, this article assesses utility of different market indicators in monitoring access to food. In addition to conventional market price indicators, levels of market activity, origin of buyers and sellers, mix of goods available for purchase, and volume of exchange are considered. It is argued, firstly, that if market price data are to be correctly interpreted, supplementary information must be collected in the marketplace; and, secondly, that more detailed market surveys can provide a range of useful early warning information not shown by prices alone. Methodological guidelines for conducting comprehensive market surveys are given. (Famine Early Warning Bibliography)

43. Davies, S.
1989 *Micro-Level Food Monitoring in the Sahel: The Food Information Project in Mali*, mimeo. Brighton, U.K.: University of Sussex, Institute of Development Studies.

This paper examines the food monitoring system, the Suivi Alimentaire Delta Seno (SADS), set up by Save the Children Fund (UK) in Mali, which collects and analyses information about how

people in the Sahelian zone and Inner Niger Delta gain access to food. Micro-level data are obtained through "listening posts" situated in the different production systems. Rather than try to provide early warning of impending crisis using conventional indicators, the approach is to study existing coping strategies, so that interventions can be planned which strengthen those coping strategies to raise people's food entitlements during critical parts of the year. The paper briefly reviews the food situation in the SADS zone between October 1987 and March 1989. It suggests that SADS, which is heavily orientated to local perceptions and needs, could help to identify ways of challenging the structural causes of food insecurity. (Famine Early Warning Bibliography)

44. Davies, S. and M. Buchanan-Smith
1990 *Can Local Communities in the Sahel Use Seasonal Rainfall Forecasts?*, mimeo. Report for the Climatic Research Unit, University of East Anglia. Brighton, U.K.: University of Sussex, Institute of Development Studies.

Report on the potential impacts of routine seasonal rainfall forecasts for local communities in the Sahel, divided according to various user groups. Examines the decision making processes within pastoralist, subsistence farmer, large- and small-scale cash cropper and fisherman groups. To be of use to the groups, forecasts must be accurate, timely, and relevant in relation to their decision making processes. Forecast data must be at least as accurate as indigenous information, and seen to complement rather than replace it. For all groups, potential direct benefits of forecast data are limited because of their imprecision, and restricted response capacity. Indirect benefits may result from initiatives in better food security planning by government and donors and, for example, in greater input provision. Greatest scope lies in linking forecasts to Early Warning Systems, contingency planning, and response mechanisms. (Famine Early Warning Bibliography)

45. Davies, S. and A. Thiam
1987 *The Slow-Onset of Famine, Early Warning, Migration and Post-Drought Recovery: The Case of Displaced Persons in Gao-Ville*, mimeo. Report No 1. Bamako, Mali: Save the Children Fund-Food Emergencies Research Unit, Early Warning Project.

Examines the potential of migration as an early warning indicator, in a study of displaced persons in Gao-Ville, Mali. The composition of the camps in the post-drought period is examined. A preliminary assessment is made of how displaced persons gain a livelihood, and of the implications of this for their food entitlements in the post-

drought period. Draws lessons from the 1984-5 experience for future interventions in a drought year. These include: distinguishing between different groups of producers, and the stage they are at in the downward spiral towards collapsed entitlements; and identifying coping strategies (including post-drought actions) to see whether these can be reinforced. (Famine Early Warning Bibliography)

46. Davies, S., M. Buchanan-Smith and R. Lambert
1991 *Early Warning in the Sahel and Horn of Africa: The State of the Art. A Review of the Literature.* Volume 1 of A Three Part Series. IDS Research Reports Rr 20. Brighton, U.K.: University of Sussex, Institute of Development Studies.

A comprehensive review of the current literature dealing with all aspects of Early Warning Systems for famine conditions in parts of Africa. Chapter 1 defines food security and Early Warning Systems. Chapter 2 reviews five areas of indicators: meteorological, natural resource monitoring, agricultural production data, nutritional and health information, and socio-economic considerations. Chapter 3 looks at the role of indigenous knowledge systems. Chapter 4 discusses the factors involved in the design and implementation of Early Warning Systems. Chapter 5 lists the local, national, and international organizations responsible for Early Warning Systems. Institutional constraints and costs are covered in Chapters 6 and 7. Chapter 8 gives specific examples of response to Early Warning Systems in African and Asian countries. Chapter 9 outlines the political factors affecting early warning and Chapter 10 asks the question, "Is there a future for famine early warning?" In the conclusions, it is suggested that while there are limitations on the effectiveness of Early Warning Systems, they have been able to help identify why people have succeeded or failed to feed themselves. In addition, to work towards long-term sustainability it is important to incorporate indigenous knowledge into the response mechanisms triggered by the Early Warning System. The reference list correlates to Volume 3 which is an annotated bibliography on famine early warning and food information systems in the Sahel and Horn of Africa.

47. Davies, S., M. Leach, and R. David.
1991 *Food Security and the Environment: Conflict or Complementarity?* IDS Discussion Paper. Brighton, U.K.: University of Sussex, Institute for Development Studies.

This paper explores linkages between food security and the environment in terms of policy trade-offs between access to food and the conservation of natural resources. In historical perspective, these

concerns have alternately dominated development agendas but have only recently shared a prominent position. Conflicts and complementarities between food security and the environment are identified at international, national and local levels. These levels involve quite different actors and issues. Arguing that a single conceptual framework is unlikely to be found, the paper concludes by suggesting some useful analytical tools and indicating directions for future research.

48. Davies, S., A. Thiam, M. Bangaly, M. Karambe, A. Ag Hatalaya and M. Coulibaly
1990 *Elements a Suivre: Indicateurs Saisonniers de la Situation Alimentaire*, mimeo. Mopti, Mali: Suivi Alimentaire Delta Seno (SADS) Document de Reference; Projet Information Alimentaire, Save the Children Fund (Mali); and, Brighton, U.K.: University of Sussex, Institute of Development Studies.

Lists the indicators built up over two years and used by the SADS food information system (FIS) in the 5th Region of Mali, run by Save the Children Fund's "Projet Information Alimentaire." Indicators are listed by season (harvest, dry, hot, and rainy) and by production system (dry and wet-land cultivators, agro-pastoralists, agro-fishermen, transhumant fishermen, and transhumant pastoralists). The indicators cover an extensive range of socio-economic factors, including production issues, bartering and exchange, intra-rural and rural-urban migration, coping strategies and consumption levels, as well as some meteorological and pest infestation factors. (Famine Early Warning Bibliography)

49. Davies, S., A. Thiam, M. Bangaly, M. Karambe, A. Ag Hatalaya and M. Coulibaly
1990 *Calendriers d'Acces a la Nourriture*, mimeo. Mopti, Mali: Suivi Alimentaire Delta Seno (SADS) Document de Reference; Projet Information Alimentaire, Save the Children Fund (Mali); and, Brighton, U.K.: University of Sussex, Institute of Development Studies.

Presents the qualitative results of two years of monitoring of food entitlements of different production systems (dry and wet-land cultivators, agro-pastoralists) by season, in the zone covered by the SADS system in the 5th Region of Mali. This Food Information System is run by Save the Children Fund's "Project Information Alimentaire." Questionnaires showing how food entitlements are monitored by the system are included. (Famine Early Warning Bibliography)

50. De Waal, A.
1989 "Is famine relief irrelevant to rural people?." *IDS Bulletin* 20(2): 63-67.

Based on observations in Darfur, Sudan, between 1984 and 1985 this paper challenges the notion that famine relief in the form of food aid is of the utmost concern to famine victims. Rather, people place a higher priority on preserving the basis of their future livelihoods than on satisfying immediate consumption requirements. This is referred to as the use of "anti-destitution" rather than "survival" strategies. The indirect effects of food aid, such as avoiding the need to sell off productive assets, or to migrate to areas of greater health risk, may be greater than its role in directly saving lives. Concludes that attention should shift away from food aid towards other forms of famine relief. (Famine Early Warning Bibliography)

51. De Waal, A.
1989 *Famine that Kills: Darfur, Sudan, 1984-1985*. Oxford, U.K.: Clarendon Press.

Analyses events in Darfur in 1984-85, focussing on the perspective of the rural people who suffered. Challenges conventional views of famines which sees them as mass starvation events. Discusses the history of subsistence crises in Darfur, indigenous understanding of famine, and local people's responses. Emphasises that local concerns were with the preservation of their way of life, rather than with hunger itself. Argues that mortality was caused not by lack of food, but by health crises. Discusses relief programmes; local, governmental, and those of international relief agencies. The latter in particular were misconceived for whilst food aid helped some avoid impoverishment, other interventions would have been more effective. (Famine Early Warning Bibliography)

52. De Waal, A.
1988 "Famine Early Warning Systems and the use of socio-economic data." *Disasters* 12(1): 81-91.

Famine Early Warning Systems using socio-economic data suffer from several problems. One is that they cannot, and do not attempt to, distinguish between qualitatively different kinds of famine. The second is that they cannot predict these either accurately or early enough. This is because all the socio-economic indicators produce both false positives and false negatives, the indicators themselves are "late" and because interpretation of the data is complex and timeconsuming. The third problem is that within the context of a famine that is occurring, these indicators cannot predict excess

mortality. The argument is illustrated with examples from the 1984-5 famine in Darfur, Sudan. (Author's abstract)

53. Dowler, E.A. and Y.O. Seo
1985 "Assessment of energy intake: estimates of food supply versus measurement of food consumption." *Food Policy* 10(3): 278-288.

National consumption indicators are frequently compiled using food supply estimates in the absence of reliable household or individual intake data. The authors examine the relationship between these three level of information and, in particular, the potential "losses" of energy in the food system, comparing data from different countries and over time. They demonstrate the unreliability of supply estimates as proxy indicators of consumption and question their current usage in statements about global hunger and the links between health and food intake. (Authors' abstract)

54. Dowler, E.A., P.R. Payne, Y.O. Seo, A.M. Thompson and E.F. Wheeler
1982 "Nutritional status indicators: interpretation and policy making role." *Food Policy* 7(2): 99-112.

Measurements of nutritional status, usually based on the growth of children, have been suggested as potentially useful indicators of the health and welfare of communities, in addition to their value for screening individuals for curative treatment. The article discusses the limitations of these applications of nutritional data from a systems viewpoint. It should be recognized that numerical scales and critical levels of indicators reflect social valuations (of "bad" states or "good" states) and are not simply technical descriptions of physiological states. Properly understood and employed, nutritional indicators could be used for the planning and evaluation of programmes, not only in the health sector, but in all areas concerned with social development. (Authors' abstract)

55. Downing, T.E. and A.S. Feinstein
1990 *Assessing Socioeconomic Vulnerability to Famine: Frameworks, Concepts, and Applications.* FEWS Working Paper 2.1. Washington, D.C.: USAID, Famine Early Warning System Project.

This background paper addresses the questions: Who are vulnerable to famine? Where do they reside? Why are they vulnerable to famine? Why does famine occur? How many people are vulnerable to famine? What is the current likelihood of famine? After reviewing current research on vulnerability, a framework is proposed for assessing the causal structure of hunger, for identifying socioeconomic vulnerability to famine, and for monitoring indicators

of the prevalence of famine. Recommendations are made for how to incorporate an analysis of vulnerability into the Famine Early Warning Systems project (FEWS) of the USAID.

56. Downing, T.E., K.W. Gitu and M.K. Crispin, eds.
1989 *Coping with Drought in Kenya.* Boulder and London: Lynne Rienner.

This book is based on a project to document the effects of the severe 1984 drought in six districts of Kenya and to record the response of the government and Non-Governmental Organizations (NGOs). The aim is to collect the lessons learned during the drought in order to make future efforts at famine prevention more successful. The first part of the book identifies major themes discussed throughout the text before examining the background to the 1984 drought in Kenya. The rest of the book draws on various papers which assess drought forecasting and monitoring, document famine vulnerability and household coping strategies, and examine institutional drought management. These papers cite examples and case studies from the Kenyan experience and are followed by a review of issues about the future of drought policy in Kenya, and in Africa as a whole. (Famine Early Warning Bibliography)

57. Dreze, J. and, A.K. Sen
1989 *Hunger and Public Action.* Oxford, U.K.: Clarendon Press.

This is a study on the role that public action can play in eradicating hunger and famines. It covers a wide range of issues related to this theme, including the nutritional, economic, social and political causes of hunger, the strategy of famine prevention, the connections between economic growth and public support, the influence of class and gender conflicts, the role of adversarial politics, and the relationship between state action and public action. The book also includes a large number of case studies. (Publisher's abstract)

58. D'Souza, F.
1989 *Famine and the Art of Early Warning: The African Experience,* mimeo. Report for the Overseas Development Administration and the Save the Children Fund (U.K.). London.

Earlier hopes that relatively simple Early Warning Systems would accurately forecast famine have not been realised. Section 1 looks at the evolution of systems set up after the famines of the 1970s and the relative merits of different indicators. Case studies of Mali, Ethiopia, and Mozambique in Section 2 reveal how indicators must be chosen with sensitivity to local conditions. Section 3 notes that "stress indicators," which reflect economic and social behaviour,

offer the chance both to catch the earliest stages of crisis and to build upon local knowledge. Looks at the potential of "vulnerability profiling" to monitor pre-famine conditions. Concludes that collapse of local food systems is the crux of famine and provides recommendations to counter this occurrence. (Famine Early Warning Bibliography)

59. D'Souza, F.
1985 "Anthropology and disasters: a roundup after six years." *Anthropology Today* 1(1): 18-19.

This paper examines the role that anthropologists can play in informing governments and donor agencies about emerging famine conditions and what might constitute an appropriate relief response. Anthropologists are able to provide indicators of crisis, primarily predictive social information, as well as showing what kinds of intervention could help people become less vulnerable to future crises. Conventional agricultural data cannot tell us how people respond to crop failures, such as by selling assets and migrating, which was systematically recorded in Ethiopia up until the 1984 famine. As yet, social data do not have sufficient credibility as a basis for action, yet they could be the key to famine prevention. (Famine Early Warning Bibliography)

60. D'Souza, F. and J. Shoham
1985 "The spread of famine in Africa: avoiding the worst." *Third World Quarterly* 7(3): 515-531.

This article has two related themes: first a consideration of what kind of Early Warning System can be set up in the immediate future; and second, how major food aid bodies could be persuaded to act on the basis of early information. Both issues embody technical research as well as political difficulties that are in need of resolution. After examining the main causes of famine and definitions of vulnerability, conventional Early Warning Systems currently used are divided into two categories: agricultural/meteorological and health/nutrition based. The need for Early Warning Systems is discussed in the context of Sudan, and it is argued that development problems are of such an intractable nature that the implementation of an efficient Early Warning System should be a first priority. Over time, however, the Early Warning System structure could act as a channel for the delivery of long-term development aid. (Famine Early Warning Bibliography)

61. Eklund, P.

1990 *Rapid Rural Assessments for Sub-Saharan Africa: Two Case Studies.* The Economic Development Institute of The World Bank.

In the past, policies were formulated and projects were designed without sufficient relevant facts about how African farmers and their production systems operate. Consequently, increases in agricultural production have been much less than expected. This paper suggests that targeted rapid rural assessments (RRAs) within the context of farming systems research can provide the information necessary for redesigning effective programs.

RRAs can be cost-effective because they can be undertaken with limited manpower resources, are based on a single visit to selected locations, make use of small samples, and rely on farmers' capacity for recall which permits useful interviews with both households and groups of farmers. Nonsampling error is reduced because the enumerators used are few and their supervision is intensive. Two to three local assistants in each locality are trained on site. The cost of each RRA undertaken in the cases described for Zambia and Zaire was below U.S. $5,000. The cost did not include the salaries of staff.

The RRAs undertaken in Zambia and Zaire explored trends and constraints in farming systems. In Zambia, the results of the RRA selected areas contributed to changes to the national field crop recommendations in 1984/85 which introduced a low-input strategy. The survey in Zaire found soil fertility was declining across sampled areas faster than officials had expected. The survey emphasized the need for improved intercropping, rotations, and integration of trees with annual crops as a means of maintaining soil fertility. Both RRAs confirmed the feasibility of low-cost extension systems drawing upon farmers' own capacity for experimentation and testing.

62. Eldredge, E. and D. Rydjeski
1988 "Food crises, crisis response and emergency preparedness: the Sudan case." *Disasters* 12(1): 1-4.

In the semi-arid areas of the Sudan, people can be considered as normally permanently at risk of food crises. Every production system has developed ways of coping during critical periods, although these response mechanisms become swamped during major food emergencies. The paper argues that it is impossible to set up a sustainable food information system in a subsistence agricultural society totally lacking in infrastructure. It is better to address the normal pockets of need by strengthening the functioning mechanisms now in place, such as the market, through which subsistence farmers frequently try to supplement their incomes. During major crises,

however, it is believed that international relief assistance will continue to play crucial role. (Famine Early Warning Bibliography)

63. FAO
1990 *Strengthening National Early Warning and Food Information Systems in Africa*, Food and Agricultural Organization of the United Nations Workshop, Accra, Ghana, 23-26 October.

The precarious food supply situation in Africa means that the need to monitor national food supplies is greater than ever before. This report of the workshop reflects the increased priority given to national Early Warning Systems by FAO, to anticipate impending food supply problems and plan responses well in advance. The main objectives of the workshop were to share experiences and provide feedback from various national Early Warning Systems in Africa, and learn more of the new methods of early warning being developed. Papers from the workshop, included in the report cover: the role of national Early Warning Systems; the contribution of agricultural statistical services to crop forecasting; the role of satellite remote sensing; the use of food balance sheets; the incorporation of nutrition and socio-economic data; and, a proposal for the establishment of a technical network for Africa. Finally, a number of case studies of national level Early Warning Systems are included to present experience of integrating information from several sources. (Famine Early Warning Bibliography)

64. FAO
1990 Annex 4, "National early warning and food information systems — their purpose, method and use." *Strengthening National Early Warning and Food Information Systems in Africa*, Food and Agricultural Organization of the United Nations Workshop, Accra, Ghana, 23-26 October 1989.

There is now an impressive range of tools available to provide information on food supply prospects. The main aim of a national Early Warning System is to assist government in the implementation of food management policies by assembling data from different sources and providing a timely forecast of the food situation. The accuracy of forecasts depends on the ability of a multi-disciplinary team to correctly interpret the information it receives. It is also vital that the national Early Warning System is able to communicate its results to users, such as government departments, the private sector, and regional and global organisations. Because global forecasts can be no better than data supplied at the national level, the FAO has been active in supporting national Early Warning Systems, particularly in Africa. (Famine Early Warning Bibliography)

65. FAO
1990 Annex 7, "Satellite remote sensing in support of early warning and food information systems." *Strengthening National Early Warning and Food Information Systems in Africa*, Food and Agricultural Organization of the United Nations Workshop, Accra, Ghana, 23-26 October 1989.

Some of the limitations of ground observations of rainfall and agricultural assessments are outlined, and the advantages of using satellite remote sensing data are reviewed. Examples of remote sensing as used by the FAO Remote Sensing Centre are described, based on the ARTEMIS environmental monitoring system. Explanations are given of the workings of the METEOSAT imagery to monitor cold clouds and hence rainfall, and also of NOAA/AVHRR imagery for vegetation monitoring. The applications of remote sensing for collecting agricultural statistics, monitoring land use, and identifying crops are discussed. (Famine Early Warning Bibliography)

66. FAO
1990 Annex 9, "Use of food balance sheets for the estimation of deficits and surpluses." *Strengthening National Early Warning and Food Information Systems in Africa*, Food and Agriculture Organization of the United Nations Workshop, Accra, Ghana, 23-26 October 1989.

Describes how a food balance sheet can be used for estimating food deficits and surpluses as a component of national Early Warning Systems. Explains how to construct a 12 month food balance sheet based on six essential elements, which are all defined: opening stocks, production, and imports (supplies); and domestic utilization, exports, and closing stocks (disposals). This is based on the FAO Global Information and Early Warning System experience of the food balance sheet which is used to monitor 45 sub-Saharan African countries. (Famine Early Warning Bibliography)

67. FAO
1990 Annex 10, "Incorporating nutrition and socio-economic information into early warning and food information systems." *Strengthening National Early Warning and Food Information Systems in Africa*, Food and Agriculture Organization of the United Nations Workshop, Accra, Ghana, 23-26 October 1989.

A variety of nutritional and socio-economic indicators can be used to identify vulnerable groups and to provide EW of potential food security problems. Specific indicators to be selected will depend on local conditions, and the sequence of events leading to food

problems in that country. Nutritional surveillance is seen as an integral part of Early Warning, via different levels of indicators a different stages of the planning process. The needs of planners for information on national food supply, characteristics of vulnerable groups, detection of deteriorating socio-economic conditions, and safety-net information, require a broader definition of early warning than has traditionally been used, if the information system is not to be divorced from the planning process. (Famine Early Warning Bibliography)

68. FEWS (USAID)
1988 *Famine Early Warning System.* Project Paper, mimeo.

Describes the history and background to the FEWS project from 1985 to 1988, and proposes the strategy and design for the second phase. Some modifications are suggested, with greater attention given to strengthening early warning capability within the countries concerned. The three components of phase 2 are: internalising early warning within USAID; reinforcing early warning capability in host government systems; and promoting international collaboration and coordination in early warning. Systematising and standardising early warning data are stressed, and socio-economic indicators are to be given greater attention. (Famine Early Warning Bibliography)

69. Fleuret, A.
1986 "Indigenous Responses to Drought in Sub-Saharan Africa." *Disasters* 10: 224-229.

Drought is a frequent occurrence in contemporary sub-Saharan Africa, and the existence of periodic drought can be documented over hundreds of years. As a consequence of the routine rainfall shortages that affect them, agricultural and pastoral societies have developed a number of social institutions and mechanisms for bridging temporary food production shortfalls caused by drought. Drawing on the literature and field data from southeastern Kenya, this paper discusses a number of regular indigenous responses to short-term drought in sub-Saharan Africa. Changes in these patterns in the present day are also discussed. It is concluded that market-based responses are now the most important strategies, but that traditional institutions remain significant and contribute to the viability of drought-affected societies. (Author's abstract)

70. Francis, C. and R. Harwood
1985 *Enough Food: Achieving Food Security Through Regenerative Agriculture.* Pennsylvania, USA: Rodale Press.

Food security must be achieved by the use of systems that use local, renewable resources and human creativity while combining successful farmer's practices with potentials discovered through science. Practices such as rotations with overseeded legumes, pest control through cultural patterns, more efficient use of major nutrients, integration of crops and livestock, and use of biological interactions between plants, animals and microbes are having a significant impact on agriculture both in the Third World and in more developed regions. Constraints to food security are: the instability of the international marketplace, increasing costs of energy, population pressures, and the instability of the biological environment. Long-term solutions depend on our understanding of biological realities and adapting tomorrow's technologies to these realities. Policies must reflect a priority for food security, and farming systems must depend largely on renewable, internal resources. The paper ends with a checklist for measuring regenerative potential in a small trading area centered around weekly market activities. (Household Food Security Bibliography)

71. Frankenberger, T.R.
1990 Production-Consumption Linkages and Coping Strategies at the Household Level. In *Proceedings of the Agriculture-Nutrition Linkage Workshop*, Volume 2., papers presented at the Agriculture-Nutrition Linkage Workshop, 12-13 February, 1990, Arlington, Virginia. A report prepared for the Nutrition in Agriculture Cooperative Agreement. Washington, D.C.: USAID, Office of Nutrition; USDA, Office of International Cooperation and Development; and, Tucson, Arizona, USA: University of Arizona, Office of Arid Lands Studies.

Understanding the linkages between production and consumption will help in the design of appropriate development alternatives for achieving household food security. Some linkages are: crop diversity or cash crops versus subsistence crops, household income, seasonality of production, role of women in production, crop labor requirements, food preferences, and market prices. The relative importance of these linkages is tied to the coping strategies farmers pursue to maintain food security. Three stages of coping responses to food crises are discussed: 1) risk minimizing and loss management insurance practices; 2) disposal of productive assets; and, 3) destitution/distress migration. By studying the relationship between production/consumption linkages and coping strategies, key food consumption/nutrition indicators can be identified. These include production estimates, storage estimates, subsistence potential ratio, access to non-farm income, access to liquid assets, anthropometric measures, and infant mortality and child death rates.

The paper concludes with an evaluation of rapid appraisals and formal surveys as techniques for data collection.

72. Frankenberger, T.R.
1985 *Adding a Food Consumption Perspective to Farming Systems Research.* Report prepared for USDA, Office of International Cooperation and Development, Nutrition Economics Group. Washington, D.C.: U.S. Department of Agriculture.

Methods in which the food consumption concerns of small farmers can be better integrated into each stage of farming systems research are presented, emphasizing the importance of food consumption to agricultural production. Considered first are production and consumption linkages of which farming systems research teams must be aware if they are to understand how a proposed production recommendation will affect household consumption — seasonality of production, crop mix and minor crops, income, the role of women in production, crop labor requirements, and market prices and their seasonality. Discussion is then given to data collection measures which can be implemented at each stage of the research process (target area selection, diagnostic surveys, recommendation domain definition, on-farm research, evaluation and extension) to incorporate consumption perspectives into farming systems research, and the kinds of data that can be collected. In conclusion, recent farming systems research projects which have attempted to implement such procedures are identified. (Nutrition in Agriculture Bibliography)

73. Frankenberger, T.R., and D.M. Goldstein.
1991 Linking Household Food Security with Environmental Sustainability Through an Analysis of Coping Strategies. In *Growing Our Future*, K. Smith, ed. New York: Kumarian Press.

Household food security entails stable access by household members to adequate supplies of food. Households will have stable access to food if they have viable means of procuring food that do not lead to environmental degradation. Researchers, intervention specialists, and donor organizations concerned with improving the household food security of small farmers should consider the ways in which these households respond to food crises. This paper identifies the various coping strategies that small farmers employ to deal with threats to household food security. For resource-poor farmers, such strategies often may include practices that provide for immediate subsistence needs but are destructive to the local environment and thus to the long-term productive potential of the farming system. Trends in coping responses can serve as indicators of impending famine, as farmers shift away from more sustainable strategies towards more

environmentally destructive practices. These trends are useful in identifying appropriate and timely interventions to assist farmers in meeting their short-term food needs while enabling longer-term natural resource management. Interventions that take both household food security and environmental issues into account must consider both the short- and long-term tradeoffs associated with these dual objectives. (authors' abstract)

74. Frankenberger, T.R., and D.M. Goldstein.
1990 Food Security, Coping Strategies, and Environmental Degradation. *Arid Lands Newsletter* 30: 21-27.

People who live in conditions that put their main source of income at recurrent risk develop self-insurance or coping strategies to deal with that risk. In small-farm households these coping strategies often have a detrimental effect on the environment. The dilemma faced by farmers is the trade-off between immediate subsistence and long-term sustainability. This article presents an analysis of farmer coping strategies and how they are employed in maintaining household food security. Recent trends in coping strategies are discussed, as well as their environmental impacts and potential use as indicators of impending food crisis. The authors suggest that coping strategies can be incorporated as part of an early warning system which relies on behavioral as well as natural indicators to identify the approach of famine.

75. Galvin, K.
1988 "Nutritional status as an indicator of impending food stress." *Disasters* 12(2): 147-156.

Famine Early Warning Systems benefit from a variety of indicators which together signal the initial stages of food stress for particular population groups. Anthropometry has been used as an indicator in Early Warning Systems, but there are inherent problems in its use which should be understood. Using data from Turkana pastoralists of northwest Kenya, this paper discusses the problems of: time lag between food shortages and changes in body size and composition; use of reference points; accurate age assessment; and, establishment of baseline data. Diet composition data are suggested to be an additional nutrition-orientated indicator of impending food stress and one in which problems associated with anthropometry are not inherent. Both measures may be useful in monitoring a population, but their strengths and weaknesses should be appreciated. (Author's abstract)

76. Gershon, M.

1990 *Building a Bridge from Prediction to Prevention: The Evolution of Famine Early Warning Systems in Sub-Saharan Africa*, mimeo. Unpublished MA thesis, School of Development Studies, University of East Anglia, Norwich, U.K.

This paper sets out to question the continuing inability to successfully predict and prevent the occurrence of widespread acute hunger. Considers the concept of famine and the range of theories for famine causation, which determine the indicators used in early warning. Shows that information is not by itself an alternative to action and that too little attention has been paid to the response part of information networks. The different levels at which Early Warning Ssystems are located are examined, with case studies of FAO's Global Information and Early Warning System (GIEWS), Sudan's national Early Warning System and the Save the Children Fund's Drought Monitoring Programme in Darfur. Tackles the issue of sustainability and considers the alternatives to a permanent structure dedicated to early warning. Finally, argues that future information systems should seek not just to prevent famine by appropriate relief, but also to strengthen year-round food security by highlighting interventions that merge relief and development objectives. (Famine Early Warning Bibliography)

77. Gillespie, S. and J. Mason

1991 *Nutrition-Relevant Actions: Some Experiences from the Eighties and Lessons for the Nineties*. ACC/SCN State-of-the-Art Series Nutrition Policy Discussion Paper No. 10. Geneva: United Nations Administrative Committee on Coordination — Subcommittee on Nutrition.

Based on the ACC/SCN Ad Hoc Group meeting held in 1990, this report presents and interprets nutrition-related experience. It's aim is to help in analyzing and grouping nutrition issues and in deciding the best approaches for dealing with these issues. It is not meant to be prescriptive, but a summary of options for improving nutrition adaptable to specific situations. The introduction addresses types of nutritional problems, potential solutions, and how to formulate policy. Household food security is covered in Chapter 2 including how to measure and promote it. Chapter 3 is about nutrition and its links with infectious disease and Chapter 4 contains a discussion of women's role in nutrition. It addresses social discriminations, improving women's resource control and increasing the effects of women's caring capacity. The final chapter summarizes the options discussed with a section on micronutrient deficiencies.

78. Gittinger, J.P., S. Chernick, N. Horenstein and K. Saito

1990 *Household Food Security and the Role of Women.* World Bank Discussion Paper No 96. Washington, D.C.: World Bank.

This paper reports on a symposium held in Zimbabwe which focused on the work women do, the constraints they face, and practical measures to reduce these. The aim was to promote a better understanding of the key gender issues for food security and to identify appropriate policies and programmes that could be implemented. Improving household food security in Africa means focusing on the role of women because they play a critical role as food producers and as income earners for their families. Women are therefore an integral part of the solution to increase agricultural productivity in particular, and household food security in general. This discussion paper draws on plenary sessions, panel discussions and structured working groups as well as papers presented by delegates at the symposium. (Famine Early Warning Bibliography)

79. Grandin, B.

1988 *Wealth Ranking in Smallholder Communities: A Field Manual.* Nottingham, U.K.: Intermediate Technology, Russell Press.

Wealth ranking is a technique which allows researchers to learn rapidly about the relative wealth status of households in selected rural communities, according to the community's own perceptions. It tries to overcome the usual unwillingness of people to provide information on such a sensitive subject. The book first looks at the definitions of wealth and its implications for households, and then examines the methodology of wealth ranking with reference to case studies from Kenya. Agricultural development must take into account differences in wealth among farmers so that interventions do not accentuate inequalities. Yet it continues to be assumed that all farmers in an area are essentially alike or have equal access to resources. Wealth ranking, involving a card-sorting technique to arrange households according to wealth as defined by that community, allows future samples to be representative of a community. (Famine Early Warning Bibliography)

80. Greer, J. and E. Thorbecke

1986 "A methodology for measuring food poverty applied to Kenya." *Journal of Development Economics* 24: 59-74.

This paper proposes a new way of establishing a food poverty line taking into account regional food preferences and prices. It uses this poverty line to derive a food poverty measure which satisfies the desirable fundamental properties of such measures and has the additional advantage of being additively decomposable. The

measurement of food poverty is further generalized to heterogeneous groups of households facing different sets of relative prices and exhibiting different food preferences. Finally, the above methodology is applied to the empirical estimation of food poverty among Kenyan smallholders, and the results contrasted with those obtained by two other methods.

81. Guha-Sapir, D. and M.F. Lechat
1986 "Information systems and needs assessment in natural disasters: an approach for better disaster relief management." *Disasters* 10(3): 232-237.

This paper addresses the issue of information system organisation in disaster relief. Planning, evaluation, and preparedness have been so far ignored in the management of disaster relief, with serious consequences. A multidisciplinary approach, with the stress on accuracy and appropriateness of data gathered, is the key to raising preparedness levels and the damage-absorption capacities at community level. The organisational network of information collection is presented, including staff composition and responsibilities. The main research issues are identified, which include preparation of strategies for disaster preparedness action, integrated with existing health care programmes. (Famine Early Warning Bibliography)

82. Haddad, L., J. Sullivan and E. Kennedy.
1991 *Identification and Evaluation of Alternative Indicators of Food and Nutrition Security: Some Conceptual Issues and an Analysis of Extant Data.* Washington, D.C.: International Food Policy Research Institute.

The objectives of this report are: 1) to identify nontraditional or "alternative" indicators of food and nutrition security; and, 2) to develop a conceptual framework in which to evaluate them. Traditional indicators of food and nutrition security — household calorie adequacy from recall and preschooler anthropometric indicators, for example — have been found difficult to incorporate into ongoing monitoring and evaluation systems. Using information from seven data sets, representing four countries, the authors' rank the ability of several promising indicators to locate the food and nutrition insecure as defined by the more traditional indicators. In addition, a conceptual framework for thinking about the utility of different alternative indicators is developed. The central message of the analysis is that relatively simple indicators perform well in locating the food and nutrition insecure. Comparable to more complex indicators, such as household income level and food

expenditure, indicators such as the number of unique foods consumed, the household's dependency ration, household rooms per capita, incidence of illness, vaccination status, age at weaning of the preschooler, and household drinking water and sanitation facilities — all coded with only two or three different values — were able, either singly or in combination, to identify households and preschoolers at risk of food and nutrition insecurity. The authors conclude that much better classification will likely be achieved in a location-specific setting, preferably in a participatory manner. (Adapted from authors' Executive Summary)

83. Harrison, G.G.
1988 *Nutritional Status Indicators: Their Use in Applied Agricultural Development.* Paper prepared for the Nutrition in Agriculture Cooperative Agreement. Washington, D.C.: USAID, Office of Nutrition; USDA, Office of International Cooperation and Development; and, Tucson, Arizona, USA: University of Arizona, Office of Arid Lands Studies.

To be effective in raising the health and nutrition status of the poor, agricultural development projects must be aware of household food consumption patterns. This means that nutritional goals should be incorporated early in the project design and evaluation process. Reasons why nutritional status indicators have not been used more often to evaluate the impact of agricultural development include misconceptions as to the costs involved, whose domain nutrition falls under, and the mistaken assumption that increases in production automatically improve the food supply. It is suggested that nutritional status and dietary indicators can be used for targeting, selection of interventions, and project evaluation. Indicators for three types of malnutrition (protein-energy, iron deficiency, and vitamin A) and rapid assessment methods are discussed.

84. Healey, P. and P. Walker
1990 *Famine Early Warning Systems and Disaster Preparedness*, mimeo. Proceedings of a Workshop hosted by the Sudanese Red Crescent Society, Khartoum, Sudan, 17-23 May 1990, Institute of Development and Disaster Studies of the Ethiopian Red Cross Society.

Summarises the proceedings of a workshop which set out to improve the contribution of National Red Cross and Red Crescent Societies to early warning and response. Other objectives included a review of National Societies' experiences of famine and famine relief, and attempts to arrive at a better understanding of vulnerability and local coping mechanisms. There is a summary of the Save the Children's

Drought Monitoring Programme in Darfur, Sudan and an overview of the League of Red Cross and Red Crescent Societies' (LCRS) drought relief operations in Africa. Considerable advantage in coping with famine is seen to lie in the branch structure and volunteer membership of National Societies. (Famine Early Warning Bibliography)

85. Hervio, M.G.
1987 *Evaluation des Systemes d'Alerte Precoce mis en Oeuvre dans le Sahel: Resume*, mimeo. Paris: Organization for Economic Cooperation and Development, CILSS, Club du Sahel, Doc Sahel D (87) 308.

Summary report of an evaluation of existing Early Warning Systems in the Sahel, commissioned by the Club du Sahel. Covers four main themes: 1) the area of intervention of the Early Warning System, and of the information needs of decision makers; 2) a review of existing Early Warning Systems projects; 3) methodologies employed and institutional involvement; and, 4) evaluations of the various Early Warning System projects with recommendations. Divides Early Warning Systems into macro and micro systems, arguing that each act at different economic, geographical, and temporal levels, collect information for distinctly different uses, and employ different methodologies. (Famine Early Warning Bibliography)

86. Hesse, C.
1987 *Livestock Market Data as an Early Warning Indicator of Stress in the Pastoral Economy*. Pastoral Development Network, Discussion Paper No 24f. London: Overseas Development Institute.

Tests the hypothesis that livestock prices and the number of animals presented and sold on local markets constitute useful early warning indicators of stress in pastoral economies, using data from livestock markets in Mali. Starts from the premise that the pastoral sector is marginalised within Early Warning Systems, and that Early Warning Systems tend to address only food production, not social, political and economic factors relating to food acquisition. However, the extent to which the Malian livestock marketing data could be used as a warning indicator is questionable. No clear and consistent picture emerged of seasonal trends, nor was it possible to identify "breakpoints" heralding sustained deviations from a "normal" pattern. Some explanations for this are given. More work is required to investigate how to ensure that indicators are valid in terms of their advance warning capacity, replicability, sustainability, and sensitivity. (Famine Early Warning Bibliography)

87. Hindle, R.E.
1990 "The World Bank Approach to Food Security Analysis." *IDS Bulletin* 21(3).

The goal of the 1988 World Bank food security initiative for Africa is to alleviate in the long-term the massive problem of hunger in the region. Working with other donors and the African governments, the Bank is developing food security action plans for individual countries. The action plans analyze five components: 1) macroeconomics, microeconomics, food availability, food consumption, and markets. Several common themes have emerged from the analysis: 1) it is necessary to continue to work towards increasing Africa's agricultural growth; 2) the level of food poverty from a nutritional standpoint is greater than anticipated; 3) targeted interventions are needed; and 4) gender must be a consideration in the design of any sound development strategies.

88. Holtzman, J.S.
1986 *Rapid Reconnaissance Guidelines for Agricultural Marketing and Food System Research in Developing Countries.* Michigan State University International Papers. Department of Agricultural Economics Working Paper No. 30. East Lansing, Michigan, USA: Michigan State University, Department of Economics.

This paper develops rapid reconnaissance guidelines for conducting research on agricultural marketing components of food systems. After examining the substance of rapid reconnaissance in agricultural marketing research, the author reviews the analytical framework used in rapid reconnaissance of commodity marketing systems, key areas of investigation during rapid appraisals, analysis of prices and marketing margins, proxy variables and key indicators and noneconomic factors. In the second part of the paper, he discusses the process of rapid reconnaissance, including preparation for fieldwork and implementation of surveys. Report preparation, presentation of findings and follow up to rapid reconnaissance surveys are discussed in a section on wrapping up rapid reconnaissance. In the final chapter, the limitations of rapid appraisal methods are addressed. (Nutrition in Agriculture Bibliography)

89. Hutchinson, C.F.
1991 Famine and Mitigation. In *Famine Mitigation: Proceedings of Workshops Held in Tucson, Arizona, May 20-May 23, 1991 and Berkeley Springs, West Virginia, July 31-August 2, 1991.* Tucson, Arizona, USA: University of Arizona, Office of Arid Lands Studies.

In response to the rising number of emergencies, particularly in Africa, attention has been drawn to the types of institutional responses that have been applied in food security emergencies. As understanding of the causes, nature and process of famine evolves, more innovative approaches to relief efforts become possible. While emergency food relief has been effective in saving lives, the constraints imposed by shrinking budgets necessitates the consideration of more effective and efficient alternatives to minimize the impact of food security emergencies and preventing future ones. Traditional assistance to famine-prone regions has been divided between relief and development. Between these two ends, another class of activities can be defined that targets the conservation of productive assets at the household level early in the famine process. These activities can be called mitigation. These activities are largely untested and present special logistical and institutional problems.

90. Jodha, N.S.
1986 Poor in Dry Regions of India. *Economic and Political Weekly* XXI(27):1169-81.

Common property resources (CPRs), though neglected by policy makers and planners, pay a significant role in the life of the rural poor. This paper, part of a larger study on the role of CPRs in farming systems of dry areas of India, attempts to quantify the extent to which the rural poor benefit from CPRs. Based on data from over 80 villages in 21 districts in dry regions of seven states, the study reveals significant contribution of CPRs towards the employment and income generation for the rural poor, i.e., labour and small farm households. The per household per year income derived from CPRs ranged between Rs 530 and Rs 830 in different areas. This is higher than the income generated by a number of anti-poverty programmes in some areas. The dependence of richer households on CPRs is much less.

Despite such contributions of CPRs, their area and productivity are declining in all the regions. The area of CPRs has declined by 26 to 63 percent during the last three decades. Large-scale privatisation of CPR has taken place mainly during the last three decades. The privatisation of CPRs was done largely to help the poor. However, 49-86 percent of the privatised CPR ended up in the hands of the non-poor in different areas. Furthermore, most of the land received by the poor households was also given up by them as they did not have complementary resources to develop and use the newly received lands. Thus, the rural poor collectively lost a significant part of the source of their sustenance through the decline of CPRs. This loss does not seem to be compensated by privatised CPR lands

given to (or retained by) them. The situation calls for greater attention to CPRs as a part of the anti-poverty strategy. (authors abstract)

91. Khon Kaen University
1987 *Proceedings of the 1985 International Conference on Rapid Rural Appraisal.* Thailand: Khon Kaen University.

Rapid Rural Appraisal (RRA) has emerged as a new methodology which may improve the cost-effectiveness, timeliness and quality of rural development related research. Khon Kaen University organised a conference to identify emerging principles and draw lessons from the experience of RRA practitioners with the intention of compiling a range of RRA tools and techniques. This volume contains fifteen papers on topics ranging from the history and conceptual basis of RRA to recommendations for the development of RRA as a legitimate research methodology. RRA offers the opportunity through iterative learning to enhance understanding of rural conditions, making better use of the cumulative knowledge of local inhabitants. (Famine Early Warning Bibliography)

92. Kiregyera, B.
1989 Institutional Arrangements for the Collection and Handling of Agricultural Statistics in Africa. In *Food Supply Information Systems in Africa*, Commonwealth Secretariat, mimeo, 78-91, Report of a Commonwealth Workshop, Nairobi, Kenya.

This paper reviews the different institutional arrangements for data collection in Botswana, Ethiopia, Kenya, Lesotho, Malawi, Tanzania, Zambia and Zimbabwe. Statistical systems vary according to: whether or not they are integrated; links between data producers and users; the nature of the national statistical office; and, the statistical capacity of the Ministry of Agriculture. Although national experiences vary, there are common features which characterise data collection and handling in the countries studies. (Famine Early Warning Bibliography)

93. Koenig, D.
1988 "National organizations and famine early warning: the case of Mali." *Disasters* 12(2): 157-168.

In the Sahelian countries of West Africa, the problems of drought and famine are sufficiently long-term to justify the existence of permanent food security agencies. Yet donors are reluctant to fund these agencies when there is not a crisis, forcing poor countries to use their own resources for food security and famine early warning

efforts. To make more effective use of limited resources and since the data needs for effective famine early warning are similar to those for basic rural development, information systems to provide data simultaneously for development projects and famine early warning should be developed and supported. In Mali, one of the larger and poorer countries of the West African Sahel, basic information systems which gather a range of appropriate data already exist, but there need to be improvements in the quality of design and the timeliness of analysis to make the information more useful for either development or famine early warning. (Author's abstract)

94. Kumar, K.
1989 *Indicators for Measuring Changes in Income, Food Availability and Consumption, and the Natural Resource Base.* A.I.D. Program Design and Evaluation Methodology No. 12. Washington, D.C.: USAID.

This report presents the major conclusions and findings of a workshop held on June 20-22, 1988 and organized by various USAID bureaus. The purpose was to identify a set of simple, practical indicators to be used by overseas Missions and A.I.D./Washington for monitoring the impact of agricultural and rural development assistance. The characteristics of indicators are discussed in relationship to multiple user needs and selection criteria is listed. Indicators are defined as variables whose purpose is to measure change in a given phenomenon or process. Requirements are that they be valid, reliable, sensitive to change, replicable, timely, and cost-effective. Micro-level indicators for measuring changes in income include household income, expenditures, and assets. Macro-level indicators include gross national product, gross domestic product, and net national product. Food consumption indicators include per capita calorie intake, per capita food expenditure, per capita food availability, market prices, household food availability, and anthropometric measures. Major natural resource indicators were identified as water, soils, and plants.

95. Longhurst, R.
1987 "Rapid rural appraisal: an improved means of information-gathering for rural development and nutrition projects." *Food and Nutrition* 13(1):44-47.

The essence of the rapid rural appraisal approach is that the methods chosen should be those which are appropriate to the circumstances governing the research effort: the amount of time available, what needs to be known and with what degree of accuracy, the level of financial resources available, and what is to be the actual end use of

the information. Several of these methods are outlined: use of secondary sources, learning local technical knowledge, the use of key indicators, local researchers, direct observation, key informants, and group interviews. The paper concludes with suggestions for their application to nutritional considerations in agriculture and rural development. (Nutrition in Agriculture Bibliography)

96. Longhurst, R.
1986 "Famines, food and nutrition: issues and opportunities for policy and research." *Food and Nutrition* 9(1).

Examines the nutritional issues in the genesis and establishment of famine. The nature, causes, and impact of famine are touched upon, together with changes in nutrition and in household sources of food in a famine situation. The policy consequences of the shift towards "entitlement" thinking are elaborated, which include: a stress on economic development to alleviate poverty; modification of existing nutrition interventions during famine; an expansion and more imaginative use of food aid; expansion of "cash-for-work" projects; and finally, a re-examination of Early Warning Systems, nutritional surveillance, and project monitoring and evaluation in famine-prone areas. (Famine Early Warning Bibliography)

97. Longhurst, R.
1986 "Household food strategies in response to seasonality and famine." *IDS Bulletin* 17: 27-35.

The article reviews some literature on the ways families, primarily in Northern Nigeria, ensure their household food security during both seasonal food shortages as well as unexpected non-seasonal events. Agricultural seasonal coping strategies utilized by farmers include giving first priority to food crops, use of water logged flooded areas, use of secondary crops, both gathered and grown, and adaptive flexibility in cropping patterns depending on how rains progress. Other strategies include drawing on stores and assets, redistributive mechanisms, and diversifying off-farm income sources. Famine coping strategies discussed were gathering of foods, intensified migration of whole families, and the sale of farmland assets. The author looks at several famine coping strategies described in the literature including gathering of foods, migration, and sale of farmland and assets. Rural families can extend normal seasonal mechanisms to meet a drought famine, but the poorest families must begin early to dispose of assets and resources. Longhurst makes suggestions for ways to improve rural welfare and insuring food security which do not undermine the coping mechanisms which are in place. (Household Food Security Bibliography)

98. Maganda, B.F.
1989 Surveys and Activities of the Central Bureau of Statistics Related to Food Monitoring. In *Coping with Drought in Kenya*, T.E. Downing, K.W. Gitu, and M.K. Crispin, eds. Boulder and London: Lynne Rienner.

Describes the activities of the food sector monitoring programme of the Central Bureau of Statistics in Kenya, and its efforts to establish a nationwide forecasting and monitoring system for the major food crops. The system includes: an agro-climatic crop-yield model; processing of data collected in crop forecast surveys; monitoring market prices; analysis of trends in health and nutrition; and, analysis of food flows reported by the National Cereals and Produce Board. Data processing using micro-computers has produced a large quantity of good quality data. However, the Interministerial Food Forecasting Committee appears to suffer from a number of problems (for example, lack of full participation, failure

to have data in accessible form, no statutory powers), which reduces its effectiveness. (Famine Early Warning Bibliography)

99. Malambo, L.M.
1988 *Rural Food Security in Zambia.* Studies relating to Integrated Rural Development, No. 29. Hamburg: Justus-Liebig-Giessen University, H. -U. Thimm.

The purpose of this study was to provide a better understanding of food security problems in Zambia from a rural household perspective. The study specifically looked at how households meet target consumption levels on a yearly basis in the face of fluctuating production, prices, and household incomes. It includes a descriptive analysis of the food grain production and distribution system in Zambia, followed by an investigation of rural households' food production and disposal behavior, including the utilization of on-farm storage facilities.

Maize is the major food grain produced in Zambia and is also the main staple food commodity. Besides being the most important food item among rural households, it is also the main source of income. Over 60 percent of the maize produced is used for home consumption, the rest is sold to the monopsonistic grain marketing board or cooperative unions that operate in each Zambian province. The government policy of pan-territorial and pan-seasonal pricing has made it unprofitable to store food crops on farms and has encouraged farmers to sell the grain following the harvest. This has made rural food deficit households more vulnerable to food

insecurity. The public sector grain marketing system operates to move grain from rural areas to urban centers but has largely neglected the back-flow of grain. Grain deficit households in rural areas mainly depend on other rural households for supplemental food supplies.

The investigations also revealed that households undertake various actions to guard against poor food harvests. These include storing more grain than what is required in a single season, undertaking other agricultural activities that can raise income, such as growing vegetables and other cash crops, practicing mixed cropping or selling animals, beer and fish. Beer selling was particularly common among the low income households. (Adapted from author's abstract)

100. Margoluis, R. and M.O. Mukhier
1989 *Community-based Information Systems for Food Security Monitoring: The Role of the Sudanese Red Crescent Drought Monitoring Programme in Northern Darfur*, mimeo, Sudan.

During the drought and subsequent famine in the Sahel which peaked in 1984-85, Northern Darfur province in Sudan was particularly badly affected. In 1985, the Sudanese Red Cross Society (SRC) and the LRCS developed a community-based food security monitoring system for this province. The purpose was to provide reliable, timely and specific information to interested agencies concerning the food situation of people in this famine-vulnerable zone. In 1986, the SRC system became known as the Drought Monitoring Programme (DMP). Its community-based data collection and analysis provide exceptionally site-specific information on the basis of which targeting of assistance could be carried out. Information collection and needs assessment are linked directly to the provision of assistance, through the SRC and LRCS. The DMP is integrated into the SRC development network, supported by community SRC branches, and is therefore argued to be a relatively sustainable system. (Based on authors' abstract)

101. Mason, J.B.
1984 "Proposed guidelines for designing evaluation for nutrition and health programmes." *Food and Nutrition Bulletin* 6(4): 11-23.

Programme management involves making decisions about allocation of human and material resources. These decisions require different information depending on the level of the administrative structure. This paper provides various suggestions on methods for setting up procedures to provide the minimum information necessary to make these decisions. Its purpose is to give guidance to those responsible

for designing a built-in evaluation mechanism for country programmes under the Joint Nutrition Support Programme (JNSP) of the World Health Organization and UNICEF. It is intended primarily for the initial needs of those considering evaluation. The perspective is one of a government planning officer or consultant who must produce recommendations during the planning of a country programme in a relatively short period of time. (Author's abstract)

102. Mason, J.B.
1982 *Minimum Data Needs for Assessing the Nutritional Effects of Agricultural and Rural Development Projects.* Cornell Nutritional Surveillance Program. ACC-SCN Working Group on Nutrition in Agriculture and Rural Development. Geneva: United Nations Administrative Committee for Coordination, Subcommittee on Nutrition.

Recommendations are made on "minimum" methods that would have wide application in assessing the nutritional effects of agricultural and rural development, especially in the planning stage. An outline of the important decisions, relative to nutrition, on project design is presented. The author specifies the questions that need to be answered to provide information for these decisions. Minimum data required, possible sources of data and appropriate analysis methods for fieldwork are evaluated. The underlying theory is that the major effect of rural development projects on nutrition comes through the income generated for malnourished households. The planning decisions include targeting towards the malnourished, design of activities, and decisions on indirect effects and trade-offs. Policy decisions are based on the evaluation of nutritional effects. (Nutrition in Agriculture Bibliography)

103. Mason, J.B., J.G. Haaga, T.O. Maribe, G. Marks, V.J. Quinn and K.E. Test
1987 "Using agricultural data for timely warning to prevent the effects of drought on child nutrition in Botswana." *Ecology of Food and Nutrition* 19: 169-184.

Data from agricultural reporting systems in Botswana for the period 1978-83 are combined with data from the Ministry of Health's clinic-based nutritional surveillance system in a retrospective analysis to investigate the usefulness of agricultural indicators for timely warning of unusually severe child malnutrition due to drought. In the arable farming areas in eastern Botswana, deficits in an index of groundwater sufficiency for maize growth during the growing season (January-April) were associated with the deviation from trend in children's malnutrition (measured by weight-for-age) during the peak season for malnutrition, later in the year, across

regions and over time. In arid Western Botswana, as well as the East, qualitative reports on the condition of cattle were also shown to be useful predictors of child malnutrition. Decisions on the allocation of resources for relief could be made early in the year, based on agricultural data, even before confirmation from clinic data is available. (Authors' abstract)

104. Mason, J.B., J.P. Habicht, H. Tabatabao and V. Valverde
1984 *Nutritional Surveillance.* Geneva: World Health Organisation.

This book examines the concept of nutritional surveillance, looks at the role it can play in better informing decisions to improve a population's nutritional status, and outlines the types of interventions that are used to bring about adequate nutritional status. Three applications of nutritional surveillance information are considered specifically: 1) for health and development planning; 2) for programme management and evaluation; and, 3) for timely warning to prevent short-term food crises. Several sectors of government should be involved in the collection and use of nutrition data, in order to assess the effects of different activities on nutritional well-being. (Famine Early Warning Bibliography)

105. Mason, J.B., F. Trowbridge and J. Haaga
1983 *Defining Nutritional Data Needs.* Ithaca, New York, USA: Cornell University, Division of Nutritional Sciences, Cornell Nutritional Surveillance Program.

This paper outlines an approach to the initial assessment of nutritional data needs in developing countries. Such an approach may be useful to planners who are considering nutritional survey or surveillance activities as part of the planning process for improving the nutritional status of high-risk populations in their countries. (Nutrition in Agriculture Bibliography.)

106. Maxwell, S.
1989 *Food Insecurity in North Sudan.* Institute of Development Studies Discussion Paper #262. Brighton, U.K.: University of Sussex, Institute of Development Studies.

Food security planning must begin with an analysis of "who is food insecure and why." These questions are neglected, at least in Sudan. The paper helps fill the gap, by assembling information on the causes, dimensions, and characteristics of food insecurity in North Sudan, excluding the war torn South. A model of food insecurity is presented which focuses on the inter-connection between poverty, malnutrition, and vulnerability. This is then applied to North Sudan,

where a combination of long-term processes and short term shocks have resulted in worsening food insecurity. Over two million people are estimated to be chronically food insecure, with another seven million subject to transitory food insecurity: this is half the population of North Sudan. In order to produce a disaggregation by region and socio-economic group, a programme of "Rapid Food Security Assessments" was carried out in nine communities across North Sudan. Seven main groups of food insecure people are identified and their numbers plotted down to the Provincial level. Resource-poor households in the rural areas and the urban poor form the largest groups, concentrated in Darfur, Khartoum, and Kordofan. The paper ends with a review of food security interventions. (Author's abstract)

107. Maxwell, S.
1989 "Rapid food security assessment: a pilot exercise in Sudan." *RRA Notes*, No. 5. London: International Institute for Environment and Development.

This paper examines the application of rapid rural appraisal (RRA) techniques to assessing the causes, dimensions, and characteristics of food insecurity. This was carried out as a pilot exercise in nine communities in North Sudan as part of an investigation into the links between poverty, vulnerability, and malnutrition. The methodology was based on the "Sondeo" approach to RRA. A checklist of questions had been prepared, but interviews were essentially unstructured, initially with the sheikh or local leader, and then with representative households in the community. Some other RRA "tricks of the trade" were also used. (Famine Early Warning Bibliography)

108. McCorkle, C.M.
1987 "Foodgrain disposals as early warning famine signals: a case from Burkina Faso." *Disasters* 11(4): 273-281.

Recent research suggests that monitoring key events in social, economic, cultural, and political systems may provide more timely, frequent, and reliable warnings of impending famine than monitoring physical processes alone. But empirical data on early warning distress signals in these arenas are slim. Based on anthropological investigations in a southern Volta Noire community of Burkina Faso (formerly Upper Volta) during the drought of 1983-1984, this paper outlines a variety of possible early warning signals in disposal systems for staple foodgrains — the nutritional "bottom line" for farmers and herders in the West African savannah. Pre-famine distress signals in five broad categories are discussed: changes in

marketing patterns, non-markets exchanges, dietary practices, utilization of agricultural and pastoral labour, and ideological and sociopolitical behaviors. Data consist of both quantitative and qualitative comparisons of cereal disposals in these categories between 1983 and preceding years. (Author's abstract)

109. McCracken, J., Pretty, J. and Conway, G.
1988 *An Introduction to Rapid Rural Appraisal for Agricultural Development*, mimeo. London: International Institute for Environment and Development.

Rapid rural appraisal (RRA) arose out of the need for new methods of analysis that were powerful, quick, cheap, insightful and multi-disciplinary in nature. This report looks at the philosophy behind RRA and the techniques commonly used in assisting agricultural development. Its objective is to help development workers select those techniques most appropriate to their needs and resources. Four classes of RRA methodologies are examined: i) exploratory — used to produce preliminary hypotheses; ii) topical — used to answer specific key questions; iii) participatory — used to help involve rural households in research; iv) monitoring — used to evaluate the impact of development activities. RRA is finally set in the context of other alternatives to find stages in the development planning and implementation process where it can best complement more formal approaches. (Famine Early Warning Bibliography)

110. Merriam, J.M.
1989 *Simple Linkages Between Agricultural Activities and Food Consumption.* Washington, D.C.: Chemonics International.

The purpose of this paper is to provide a framework for agricultural project designers, implementors, and evaluators to better understand the important linkages between project activities and food consumption. It contains four flowcharts (production, labor, income, and markets) illustrating how development project activities may affect household food consumption, and a questionnaire to facilitate the identification of the linkages between the two. The first chart depicts the production decision and its affect on food consumption and food security. Changes in crop production patterns may lead to changes in labor patterns, which have a major impact on families' food consumption. The second chart examines changes in traditional labor patterns caused by project activities. Receiving income from the sale of farm products or farm labor begs the question of how this income is utilized, i.e., how much of a priority is given to the purchase of food. The third chart looks at some important food consumption considerations related to income. The final chart shows

the flow of cash and goods between the household and local, national, and international markets. It demonstrate the role the market plays in defining food consumption patterns. The questionnaire provides an example of a survey tool for determining the specific linkages for a particular situation and suggests sources for gathering information and the skills most appropriate to complete a survey. (Adapted from author's introduction)

111. Messer, E.
1989 Seasonality in Food Systems: An Anthropological Perspective on Household Food Security. In *Seasonal Variability in Third World Agriculture*, David E. Sahn, ed., 151-175. Baltimore, Maryland, USA: The Johns Hopkins University Press for the International Food Policy Research Institute.

Through an analysis of anthropological studies, Messer explores the significance of food insecurity by examining (1) ethnographic evidence of seasonal hunger and (2) concepts and methods that can be used to both identify and address seasonal food problems. The author reviews literature pertaining to the adaptation of forager societies, pastoralists, and peasant households to periodic food shortages. She next examines anthropological literature on some causes of seasonal hunger, including male migration, cash crop production and deterioration of ecological conditions of production. She then turns to more specialized anthropological approaches to the topic of seasonal food insecurity and adaptation and examines food strategies for coping with hunger, including dietary diversification through foraging, home food production, income diversification, food flow through gifts, household consumptive behavior, and adjustment of household size and composition. In the following section, Messer reviews literature from materialist (ecological and economic) or cognitive (cultural or symbolic) frameworks on the subject of seasonal food habits. In a concluding section, she uses anthropological literature which has illuminated the complexity of overcoming seasonality and achieving food security to draw a number of conclusions and to present possibilities for future research. (Household Food Security Bibliography)

112. Milford, J.R.
1989 "Satellite monitoring of the Sahel." *Weather* 4(2): 77-82.

Describes and assesses some ways in which satellites are being used to provide regular, continuous information in the Sahel. These include monitoring of long-term surface changes, seasonal vegetation growth, soil moisture, and rainfall estimates. One of the main limitations of remote sensing is that satellite data have to be

analysed through various models, all of which introduce uncertainty. Another is that trade-offs are inevitably involved between space and time resolution, or between number of wavelengths used and sensitivity. At present, operational monitoring in the Sahel is in its infancy. It is hoped that by the time the utility of the data is known, it has not been priced out of the market. (Famine Early Warning Bibliography)

113. Miller, D.C., M. Nichaman and M. Lane
1977 "Simplified field assessment of nutritional status in early childhood: practical suggestions for developing countries." *Bulletin of the World Health Organization* 55: 79-86.

This paper proposes a simple and inexpensive method for the field assessment of certain objective indicators of nutritional status in children of preschool age. It emphasizes the need for statistically valid sample selection and presents a design for randomly selecting 30 children from each of the 30 village sites in each region for which quantitative inferences are to be made, the main purpose being to estimate the prevalence of protein-energy under-nutrition and anaemia. The need to train indigenous para-professional workers as assessors and periodically to control their accuracy is stressed. The method used is limited to an estimate of the location and magnitude of common childhood malnutrition. It is recommended that it be supplemented by detailed ecological analysis to determine causal factors and propose remedial actions. (Authors' abstract)

114. Molnar, A.
1989 *Community Forestry: Rapid Appraisal.* Rome: Food and Agricultural Organization of the United Nations.

Rapid appraisal is a method that has been used increasingly in development projects for gathering socio-economic information. It is essentially a process of learning about rural conditions in an intensive, iterative and expeditious manner, specifically designed to improve quality and timeliness and to reduce cost. Characteristically, rapid appraisal adopts a dialogue method in which a small interdisciplinary team works directly with local people to identify the constraints they face and opportunities for addressing them. This report explores the range of rapid appraisal techniques and their potential in community forestry efforts: specifically, the information they could provide either alone or in combination with other methods; how they could be used in a participatory manner; and the training and other requirements necessary to assure quality information. (Adapted from author's Foreward)

115. Morgan, R.
1985 "The development and application of a drought Early Warning System in Botswana." *Disasters* 9(1): 44-50.

The article describes the indicators and data sources used in the Botswana Early Warning System, established in 1984. The main indicators used for assessment include: human nutrition (the main outcome indicator); agricultural data from local extension staff; rainfall/agro-meteorological data (the input indicator); stocks held in the National Strategic Grain Reserve; donor commitments; and, subjective but valuable district level reports. Data collection is concentrated on those indicators which are considered to be cost-effective. The problems associated with each indicator are discussed, as are possible further indicators. The importance of a functioning Early Warning System in a country highly susceptible to drought is stressed, in the context of the effort to elaborate a comprehensive National Food Strategy and to establish a Regional Early Warning System for southern Africa. (Famine Early Warning Bibliography)

116. Moris, J.R.
1989 Indigenous Versus Introduced Solutions to Food Stress in Africa. In *Seasonal Variability in Third World Agriculture: The Consequences for Food Security.* David E. Sahn, ed., 209-234. Baltimore, Maryland, USA: The Johns Hopkins University Press for the International Food Policy Research Institute.

Based on data from East and Southern Africa and adduced from data in the Sahel, the author examines how indigenous and introduced technologies utilized by households address marked seasonal variability in the food supply in Africa. He considers the indigenous production strategies of diversification, growing of root crops, exploitation of vertisols, livestock enterprises, bush collecting, and off-farm income. Three household social and economic adjustment mechanisms are discussed: reciprocal economic exchange, gender-linked allocation of farming tasks, and varying modes of household integration. Moris evaluates introduced solutions including specialized commercial production, mechanization, and irrigation and finds that introduced solutions to seasonal food insecurity are not better than indigenous strategies except under favorable conditions. Through a comparative evaluation of indigenous and introduced strategies, Moris concludes that indigenous production strategies generally outperform introduced options in two key areas; the return obtained from labor at planting time and cash outlays which are required at the critical hunger periods. These findings explain the rejection of recommended technical packages in African development projects. Insecure funding from outside service agencies on top of

natural risks make entry into modern agriculture only for those with a cushion of nonfarm income. (Household Food Security Bibliography)

117. Mulhier, M.O.M.
1991 *The Role of Indigenous Non-Governmental Organizations in Early Warning Systems and Response: The Case of the Sudanese Red Crescent Society's Drought Monitoring Programme in Darfur.* Paper presented at the Conference on The Future of Food Security, 25-27 July 1991, Institute of Development Studies. Brighton, U.K.: University of Sussex, Institute of Development Studies.

This paper is about the role of indigenous Non-Governmental Organizations (NGOs) in Early Warning Systems (EWS) and response. It discusses the case of the Sudanese Red Crescent Society's (SCR) Drought Monitoring Programme (DMP) in Darfur. The paper considers the different approaches to understanding famines and designing an EWS: the conventional approach based on food supply determinants entitlement theory and the recent expansion of entitlement theory to include assets as a determinant of vulnerability. The problem of monitoring assets for early warning and whether indigenous NGOs have a comparative advantage to do that are addressed. Also reviewed are the practical problems NGOs face in realising their perceived micro-development advantages.

The paper discusses and assesses the role of the SRC's DMP in food security monitoring and response in Darfur according to the various theories of famine and in regards to possible NGO's advantages. Other topics include the DMP's successes on the information side such as low cost sustainable systems, community participation and its achievement of building a good relationship with the Regional Government, and other monitoring systems in the region. Response time weaknesses (despite the existence of considerable potentials) and the dependence on external funds also are addressed. Finally, the paper looks at the role that could be played by the DMP in monitoring assets; and the potential of using the DMP for sustainable humanitarian assistance to avoid the influence of politics on development aid. (Adapted from the author's abstract)

118. Newhouse, P.
1987 "Monitoring food supplies." *UNDRO News.* Jan/Feb, Geneva.

The Global Information and Early Warning System (GIEWS) of the FAO has three functions: monitoring global food supply; monitoring national level food supply; and providing assistance to strengthen national early warning capacities. Whilst it aims to cover all food

staples, the main emphasis is on cereals, partly due to lack of information on other crops. National government information requirements are different to those of donors. Recent measures to improve the system include emphasis on socio-economic indicators, more refined use of satellite monitoring, and greater disaggregation of food estimates. (Famine Early Warning Bibliography)

119. Nieburg, P., A. Berry, R. Steketee, N. Binkin, T. Dondero and N. Aziz
1988 "Limitations of anthropometry during acute food shortages: high mortality can mask refugees' deteriorating nutritional status." *Disasters* 12(3): 252-258.

This paper is based on data received from a refugee camp in eastern Sudan between January and March 1985. It demonstrates that collection and analysis of mortality data are essential for the correct interpretation of anthropometric data during periods of uncertain food supply. Focuses on the deceptive appearance of stability in nutritional status in the face of high mortality, which may be explained by ongoing nutritional deterioration of surviving children. (Famine Early Warning Bibliography)

120. Niger Integrated Livestock Project
1988 *1987 Pasture Assessment Early Warning System. Research on Satellite-Based Pasture Assessment Implementation Techniques*, mimeo. Niamey: Government of Niger, Tufts University (USA) and USAID.

Report of a study conducted to determine appropriate and efficient analysis and sampling methods for the development of a cost-effective timely satellite-based pasture assessment drought Early Warning System in Niger. Pasture production estimates were obtained from twenty-three ground control stations in 1986 and 1987. These were combined with NOAA-9 satellite NDVI (normalised difference vegetation index) values for the same stations, and two variations of NDVI were evaluated. The advantage of a larger number of sites was hypothesized to more than compensate for the slight inaccuracies associated with the smaller site size. A sampling scheme was proposed for the 1988 rainy season. (Famine Early Warning Bibliography)

121. Nutrition Research Project
1983 *Development of Nutrition Indices for a Nutrition Surveillance System for Nepal.* Teku, Nepal: Department of Health Services, Nutrition Section, Nutrition Research Project.

A project was undertaken to develop simple and reliable indicators to be used by community health workers and paramedical personnel to identify groups at greatest risk of malnutrition. The first chapter provides a brief overview of Nepal and its nutritional status as well as an outline of project goals and objectives. Chapter 2 outlines the nutritional surveillance system in Nepal, the agencies involved, types of data collected, and criteria for selecting nutritional indicators. It is emphasized that regular nutritional surveillance is required as well as monitoring and evaluation of nutrition intervention programs. Recommended indicators include anthropometric, socio-economic, health, and use of health and other services by household members.

122. O'Brien-Place, P. and T.R. Frankenberger
1988 *Food Availability and Consumption Indicators.* Nutrition in Agriculture Cooperative Agreement, Report No. 3. Tucson, Arizona, USA: University of Arizona, Office of Arid Lands Studies.

In choosing a food consumption indicator there are three major questions to address: what will the indicator be used for, what population group must it cover, and what definition of food consumption will be most effective. The first two questions are generally self-evident, the third cannot be answered simply. Two strategies for measuring food consumption exist: direct and indirect methods. The former aims to collect information at the household or individual level on actual food consumed. These direct methods can vary greatly in their approaches and results despite being "direct." The indirect methods use strategies of either less quantification of a direct definition of food consumption or choice of a definition which is more remote from the direct meaning of food consumption. Once an indicator is chosen it can be converted to nutrients and compared with nutritional requirements. There is a range of nutritional and economic "ratios" which can be derived from an indicator. These ratios can be used to describe and monitor the food consumption situation in an area or country over time. (Nutrition in Agriculture Bibliography)

123. Obbo, C.
1985 Food Sharing During Food Crisis: Case Studies from Uganda and Ciskei. In *Food Systems in Central and Southern Africa*, Johan Pottier, ed., 265-279. London: University of London, School of Oriental and African Studies.

"Kinship is eating" is a Kiganda saying which embodies the concept of sharing food. Food sharing and strategies for dealing with scarcity and high food prices is examined in four urban Ugandan families living in Kampala in the first section of the paper. The main

strategies employed were urban food production and reliance on rural relatives. In order to establish whether geographical distance was influential in food sharing, families were chosen from four different regions. In all four cases rural-urban networks were maintained and intensified during times of food shortages. In the second section, food sharing in the territorial area of Ciskei, in the village of Cata in South Africa is examined. The author found that during times of acute food shortages, visits from neighbors intensified, and reluctant food sharing and forced reciprocity was the norm. These were reinforced through preying techniques, in which children played a large part. The Cata case illustrates a gender and age differential access to food and shows evidence that women's and children's nutritional needs are not being met. (Household Food Security Bibliography)

124. Overseas Development Administration
1989 *Report on Current Knowledge of Sahelian Farmers' and Pastoralists' Use of Weather Forecasting*, mimeo. Edinburgh, U.K.: University of Edinburgh, Department of Social Anthropology.

This report, carried out by a team of anthropologists, reviews traditional systems of weather forecasting. There is a considerable body of indigenous meteorological knowledge in Sahelian Africa, although it is under-reported in the literature. Knowledge is rooted in social structures, through which it is acquired, used, and judged. Weather is frequently seen from a moral perspective, being a reflection of the well-being of the community. A range of indicators are used in forecasting, including behaviour of birds and growth of plants. However, traditional structures have been undermined by experience of aridity, and introduction of new systems of cultivation. Finally, the report notes that there is little information on the use of modern communication systems for the dissemination of "high-tech" meteorological information to farmers and pastoralists. (Famine Early Warning Bibliography)

125. Pacey, A.
1982 "Taking soundings for development and health." *World Health Forum* 3(1):38-47.

The inefficiency of data collection in rural development is only partly due to the costs and delays involved in obtaining information. A major problem is that much of the information is biased and often does not reflect the full extent of poverty and ill health in the area concerned. Rapid and cost-effective reconnaissance can provide a "sounding" of the local situation and enable projects to be started

that will automatically generate further data as they proceed. (Nutrition in Agriculture Bibliography)

126. Paris, T.R. and L. Unnevehr
1985 *Human Nutrition in Relation to Agriculture Production: An Example in the Philippines.* Los Banos, Laguna, Philippines: International Rice Research Institute, Department of Agricultural Economics.

This study examines the linkages between production, consumption, and nutritional status of households in selected farming villages in Solana, Gagayan, the Philippines. The nutritional status of households under specific production systems was assessed using indicators such as food and nutrient intake adequacy ratios of households, anthropometric indices, and clinical signs of nutritional deficiencies in preschool children. Subsistence ratios were used to study the capability of farm households to produce their own food and meet their nutrient requirements. Data on crop production activities, income, credit, and food consumption were obtained through formal and informal interviews, food recall, food weighing, record keeping, and participant observation. To determine the effects of seasonality in food production on consumption and nutritional status, crop production, consumption, and anthropometric surveys were conducted every 2-3 months to coincide with agricultural production activities. (Nutrition in Agriculture Bibliography)

127. Payne, P.R.
1979 *Assessment of Nutritional Problems: Who Do We Look At and What Do We Measure?* Paper presented at Rapid Rural Appraisal Conference, 407 December 1979, Institute of Development Studies. Brighton, U.K.: University of Sussex, Institute of Development Studies.

This paper looks at the different levels at which nutritional needs can be viewed and understood. At the personal level, nutritional status, severity, and prevalence rates should be studied, at the situational level, indicators of poverty, household food supply and descriptions concerning events leading to malnutrition; at the social level, changes in the number of people in high nutritional risk situations, rates of displacement migration, and descriptive information on the process of impoverishment. This choice of indicators and the way they are regarded should involve a dialogue among assessors, managers, and decision-makers. To reduce the time factor in gathering information smaller sample size rather than fewer measurements as indicators of change in communities, such that the number of severely malnourished can be accurately measured. In assessing food intake, the quality of the diet — staples and other

foods, drink, and flavoring items — should be noted. (Rapid Rural Appraisal Bibliography)

128. Pelletier, D.L.
1990 The Role of Nutritional Status Information in Government Decision-Making Following and Agricultural Disaster in Malawi: Are the Lessons Generalizable? In *Proceedings of the Agriculture-Nutrition Linkage Workshop*, Volume 2, papers presented 12-13 February, 1990, Arlington, Virginia. A report prepared for the Nutrition in Agriculture Cooperative Agreement. Tucson, Arizona, USA: University of Arizona, Office of Arid Lands Studies.

This paper raises questions that address the complexities of incorporating nutritional considerations into the agricultural planning process such as: Whose nutritional status is of concern? What influence this choice has on intervention design? and, How nutritional status can be assessed operationally? An example of the impact a nutritional focus can have on government planning, decision-making, and intervention strategies is taken from the experience of the Malawi Government's response to an agricultural disaster in a northern district. It is suggested that indicators of nutritional status not only make contributions to technocratic decisions, but also help catalyze discussions on broader policy decisions and can legitimize political decisions. If a concern for nutrition-in-agriculture is to be institutionalized, the research suggests that these distinct roles should be appreciated.

129. People's Democratic Republic of Ethiopia
1990 *Guidelines on Nutritional Status Data and Food Relief*, mimeo. Addis Ababa, Ethiopia: Early Warning and Planning Services.

Provides background information on how nutritional surveillance is being used in Ethiopia. It is incorporated into early warning in a three stage approach, based upon food supply indicators, social stress indicators, and individual stress indicators. Nutritional surveillance is part of the third stage. Five stages of relief planning are outlined, again indicating where nutritional surveillance fits in. Guidelines are given on how to conduct a survey to measure nutritional status, incorporating "context" data, on how to interpret the data, and on the monitoring of relief programmes. The manual is intended to standardise the approach to nutritional surveillance. A number of technical appendices are included. (Famine Early Warning Bibliography)

130. Pinstrup-Anderson, P.

1986 An Analytical Framework for Assessing Nutrition Effects of Policies and Programs. In *Food Policy: Frameworks for Analysis and Action*, Charles K. Mann and Barbara Huddleston, eds., 55-66. Bloomington, Indiana, USA: Indian University Press.

This chapter addresses the question of appropriate assessment of the nutrition effects of public policies and programs. A large share of past studies have failed to explain how and why certain effects occurred. While useful as ex post facto evaluations of particular programs, such studies offer little assistance for those attempting to design new and improved programs and policies because the results are difficult to apply to programs other than those evaluated. Needed is an approach which not only estimates the nutrition impact of particular programs but also explains how the impact occurred and what would be the impact of certain program modifications. This requires analysis of the processes by which programs and policies influence the nutritional studies. The chapter identifies some of the most important processes and factors and makes suggestions regarding the analytical approach. It discusses household food acquisition behavior, program implementation issues, and the local power structure. (Author's summary)

131. Pinstrup-Anderson, P., J. Katona-Apte and S. Reutinger
1983 *Nutritional Aspects of Agricultural Projects: An Overview.* Falls Church, Virginia, USA: The Pragma Corporation/Division of Agricultural and Rural Development.

This paper briefly summarizes the main issues regarding the nutritional impact of agricultural and rural development projects and policies. These include: decreased production of foods for household consumption, insufficient increases in the income of "nutritionally at risk" households, higher food prices, and nutritionally undesirable expenditure patterns resulting from an increase in cash income, among other issues. Efforts to incorporate nutritional considerations into agricultural and rural development projects and policies are also reviewed. (Nutrition in Agriculture Bibliography)

132. Prehm, M.S.
1987 *Data Analysis Manual for Food Consumption/Nutrition Aspects of Rapid Community Assessment for Planning Procedure — Bicol Region Farming System Research and Development Project, Philippines.* Manual prepared for the Virginia Polytechnic Institute and State University and the Bicol Farming Systems Research and Development Project. Blacksburg, Virginia, USA: The Virginia Polytechnic Institute and State University.

The purpose of this manual is to provide background information to regional and local project staff for the consideration of food consumption/nutrition and selected income generating activities in the Rapid Community Assessment for Planning (RCAP) procedures. Background information on procedures and data analysis are included for each of the four phases of the RCAP. Examples of different data summarization techniques are given based on the initial field testing in Nahapunan, Bacacay, Albay, Philippines. The manual is inteded to be used along with the RCAP procedures modified for including food consumption and nutrition. (Author's abstract)

133. Pyle, A.S. and O.A. Gabbar
1989 *Household Vulnerability to Famine: Survival and Recovery Strategies Among Zaghawa and Berti Migrants in Northern Darfur, Sudan.* Paper presented at the Farming Systems Research/Extension Symposium, 8-11 October, 1989, The University of Arkansas in collaboration with Winrock International Institute for Agricultural Development, USA.

An understanding of household risk-reducing strategies during stress periods is important for understanding vulnerability to famine. Another significant factor in vulnerability to famine is the opportunity structure which determines households' access to resources in the community and to alternative sources of income. In this study, the authors look at the impact of widespread famine on traditional coping strategies in households which migrate to the town, El Pasher, during the 1984-85 famine in northwest Sudan. The response of two ethnic groups to famine are compared, the Zaghawa and the Berti. Research which examines the role of intracommunal institutions in normal times and indigenous support mechanisms during famine is needed. The authors make suggestions for follow up research, some of which should concentrate on (1) the strategies of households remaining in the town, (2) whether a shift towards investment in market oriented activities has excluded use of community resources and traditional institutions, and (3) intrahousehold vulnerability to famine. (Household Food Security Bibliography)

134. Rahmato, D.
1987 "Peasant survival strategies in Ethiopia." *Disasters* 12: 326-344.

This paper focuses on peasant farmers in Ethiopia, and their behaviour as serious famine sets in. In many of the last seventeen years the crop yields on rain-fed plots in drought-prone areas have failed to meet the requirements of the peasant farmers and their

families. Significant numbers have received food aid either at distribution points or in the shelters which developed in 1973 and 1984. Seeking food relief from external sources, however, is the last resort of peasants who have managed their dwindling resources for months, if not years, in order to survive. (Author's abstract)

135. Reardon, T., P. Matlon and C. Delgado
1988 "Coping with household-level food insecurity in drought-affected areas of Burkino Faso." *World Development* 16(9): 1065-1074.

The paper examines strategies used by rural households in the Sahelian and Sudanian zones of Burkino Faso to ensure food security on the face of drought-induced cropping shortfalls. It finds that three-quarters of the average household income in the Sahel sample and half of the same in the Sudanian sample come from non-cropping sources. These are more diversified regionally and sectorally in the case of the Sahel. The latter's non-cropping income is less covariant with the local cereal economy than is the case of the Sudanian sample. Moreover, much greater food aid was targeted to the Sahel for geographical reasons, without taking into account the more stable and higher level of purchasing power in that zone *vis-à-vis* the Sudanian zone. (Author's abstract)

136. Sabry, Z.I.
1982 "Issues in the evaluation of nutrition interventions." *Food and Nutrition* 8(2): 3.

Malnutrition in developing countries is essentially a problem of poverty and low food consumption. Thus, its alleviation rests in integrating nutrition interventions with socio-economic development measures. With this orientation, evaluation is becoming increasingly necessary. However, the methodology available for assessing nutritional status places unreasonable demands on the human and financial resources of any programme. There is also a serious lack of knowledge of the effect of malnutrition on the physical capacity and mental functioning and on the relationship between malnutrition and income. Evaluation may, with advantage, be built into the framework of the intervention project design, and be introduced at the appropriate time when impact is likely to be detectable. Of concern are such operational aspects as the relation of evaluators to operation staff, the involvement of project participants and the management of evaluation data. In addition, the political and ethical implications of evaluating nutrition interventions need to be kept in focus in order to maximize the value of evaluation efforts. (Author's abstract)

137. Sahn, D.E., ed.
1989 *Seasonal Variability in Third World Agriculture: The Consequences for Food Security.* Baltimore, Maryland, USA: Johns Hopkins University Press for the International Food Policy Research Institute.

Seasonal patterns of nutritional status indicators (measures of leanness and linear growth) and seasonal patterns of household food security (measured by calorie intake) are explored, as are the causes and predictability of seasonal patterns in nutrition and food security. Policy options are presented for mitigating the potential food security and nutritional risks associated with seasonal undulations. Conclusions include: 1) further research is needed to better understand the implications and importance of seasonal reductions in food; 2) the recognition that there may be long-term deleterious economic and social consequences of seasonal stress; 3) agricultural growth and market development are the long-term means of reducing seasonal food insecurity; 4) governments should encourage private-sector initiatives to improve seasonal food security; 5) there is a role for seasonally targeted interventions such as food-for-work, food subsidies and stamps, and mother-and-child feeding projects; 6) rural populations are most susceptible to the deleterious effects of seasonality; 7) seasonalities vary from year to year, country to country, region to region, village to village, and household to household; and, 8) seasonal variability in food security does not necessarily require seasonal solutions. (Adapted from editor's summary)

138. Schreiner, D.F. and L.G. Tweeten
1987 *Socio-Economic Indicators of Agrarian Reform and Rural Development.* Report prepared for the Statistics Division, Economic and Social Policy Department, Food and Agriculture Organization of the United Nations. Statistical Development Series No. 3. Rome: Food and Agricultural Organization of the United Nations.

This manual is directed at national statistical organizations responsible for providing socio-economic indicators for monitoring and evaluating agrarian reform and rural development. Chapter 1 summarizes the basic principles and areas of concern. Chapter 2 deals with the processes of monitoring and evaluation with emphasis on the role of socio-economic indicators. In Chapter 3, the general type and form of socio-economic indicators, their desirable properties, and their needed level of disaggregation are presented. Each primary indicator is listed and described, and supplementary indicators are given in an Appendix. This is followed in Chapter 4 by a general indication of the statistical development that is a prerequisite to meeting the needs of monitoring and evaluation. In

particular, the development and implementation of appropriate components of a long-term integrated national statistical programme is advocated. Chapter 5 presents several elementary and advanced analytical methods which can be employed in the analytical phase of monitoring and evaluation using the primary socio-economic indicators and related data. The concluding Chapter 6 provides a set of guidelines for countries to use in planning and implementing a long-term program of basic data development, processing, and analysis to support a national program of monitoring and evaluating agrarian reform and rural development.

139. Schumaker, J.
1990 *Achieving Household Food Security: A Review of Methodologies.* A report prepared for the Nutrition in Agriculture Cooperative Agreement. Tucson, Arizona, USA: University of Arizona, Office of Arid Lands Studies.

This manual is intended for those already aware of the importance of incorporating food security interests in agricultural development projects. The first section summarizes issues that influence food security: 1) production-consumption linkages; 2) risk and coping strategies; and, 3) trade-offs during transition to increased participation in commercial agriculture. Conceptual issues also are discussed including targeting groups at risk, equity and distribution of resources, and indicators that can be used to measure food insecurity. The third section covers methods for investigating consumption issues. Included are the lowest cost methods for projects and programs with the most limited resources (mostly Non-Governmental Organizations and small scale local projects), those programs that adapt and apply research to development through extension of new technology (i.e. farming systems or cropping systems research methods), and the more basic research programs which have most of their resources invested in research rather than the application of development technologies (International and National Research Centers). (Adapted from author's introduction)

140. Seaman, J. and J. Holt
1980 "Markets and famines in the third world." *Disasters* 4(3): 283-297.

Through a discussion of the characteristics of famine in Bangladesh, Ethiopia, and the Sahel, the authors illustrate some of the factors which may intervene between the production of food and its consumption, and the variety of outcomes which may result from economic disasters. They argue that the factors which decide the occurrence, or non-occurrence of starvation, and the way in which starvation occurs, have had to do not simply with the quantity of

food produced in an area but with the market and other means of storage and redistribution. In these areas relief has mitigated starvation to a rather small extent because of these factors. Vulnerability to famine is increased when a shift from a "communal" to a "market" economy occurs, as well as through political decision-making. Problems with timing of food aid and targeting those in need also are addressed. The final conclusion is that under conditions where the market mediates some or all of the starvation, a rational approach to relief is through the sale of food rather than entirely through free distribution. (Adapted from author's summary)

141. Shoham, J.
1987 "Does nutritional surveillance have a role to play in early warning of food crisis and in the management of relief operations?" *Disasters* 11(4): 282-285.

A major area of investment in data collection in developing countries has been that of nutritional surveillance and monitoring. From recent debate it is clear

that there is currently no consensus on the potential role of nutritional status as an early warning indicator.

The author presents a synthesis of the broad spectrum of views on the role nutritional surveillance could or should have in early warning. Conceptual problems and technical difficulties are reviewed in the light of recent experiences in Africa and Asia. The author raises a number of issues for future discussion in this ongoing debate. (Author's abstract)

142. Shoham, J. and J.B. Borton
1989 *Targeting Emergency Food Aid: Methods Used by NGOs During the Response to the African Food Crisis of 1983-86.* Final Report of Joint Study by the Relief and Development Institute and the Human Nutrition Unit, London School of Hygiene and Tropical Medicine. London: Relief and Development Institute.

This paper represents the final report of a study which involved the preparation and analysis of 13 case studies of the experiences of 11 European-based Non-Governmental Organizations during relief programs implemented in Sudan, Ethiopia, Niger, and Chad. The reasons why agencies target appear to be because of their own resource limitations, the desire to concentrate on the worst affected areas, and the desire not to distribute amounts of food relief that cause disincentive effects. The methods used for targeting cover three "levels": 1) the selection of the programme area; 2) the

selection of areas and population groups within the programme area, and 3) the selection of families and individuals within the programme area. In the first level, the targeting was done by agency personnel who were already present in the area. For those agencies who did not have a prior presence, surveys were undertaken to confirm need following a request, or to ascertain the scale of requirements. In the second level, approaches included: 1) anthropometric surveys in conjunction with low cost qualitative socio-economic assessment using local indigenous information sources; 2) quantitative sampling, based on socio-economic assessment relating assets to subsistence needs; and 3) standardised subjective assessment of a panel of socio-economic and nutritional indicators, based on extensive local experience of agency staff.

This paper considers the different types of situations and resulting programs that might be best served by prioritizing one type of assessment over another. Suggestions also are make as to how the different approaches might be strengthened and thus how recommendations about appropriateness of survey approach might eventually be concretized into guidelines for future programs. Within the third "level" of targeting, the study found some limited attempts to target individuals and households in the context of general feeding programs. Where attempted there was little documentation or evaluation of methods and outcome. The paper also considers the role of anthropometric cut-off points in determining family and individual child access to a supplementary food ration. It suggests making greater use of local indigenous identification mechanisms. It is suggested that further research could be conducted in the form of on-going evaluation of future targeted programs.

143. Shoham, J. and E. Clay
1989 "The role of socio-economic data in food needs assessment and monitoring." *Disasters* 13(1): 41-60.

This paper reviews six case studies examined as part of a project to review targeting methodologies employed by Non-Government Organisations in Africa during the 1984-6 food crisis. Most agencies have not yet fully evaluated the role of data in formulating policy decisions during their respective emergency programmes. The case studies presented reflect a wide variety of approaches to targeting emergency food aid that are based largely on the use of "socio-economic" data. The recent emergency relief operations in Africa seem to indicate a change in relief agencies' approaches to the assessment and monitoring of needs of the affected populations. Earlier dependence on nutritional data has given way to an increasing reliance on the use of socio-economic indicators. There

was a wide variation in the case studies of the type of indicators collected and utilized in needs assessment and monitoring. There were those who relied almost exclusively on nutritional data to target resources during the 1984-86 African crisis, and others whose experiences during that period lead them to attach more weight to socio-economic data. Other agencies appear to have recognised the problems of relying solely on nutritional data to target food aid during their 1984-86 emergency programmes, and thus more or less abandoned classical anthropometric surveys in their needs assessment and monitoring methodologies during this period. Thus nutritional data has a less significant role in the decision making process than previously had been the case. (Authors' abstract)

144. Staatz, J. M., V.C. D'Agostino and S. Sundberg
1990 "Measuring food security in Africa: conceptual, empirical, and policy issues." *American Journal of Agricultural Economics* December: 1311-1317.

Using Mali as an example, this paper shows that commonly used indicators of food security at the regional and national level are often poor predictors of household and individual food security. Hence, they also may be poor guides for intervention strategies. There is a need to develop more accurate, area-specific indicators and cost-effective means to monitor individual and household food security. In addition, household and individual food security must be separated from the vagaries of local agricultural production. It is crucial to improve both the mechanisms for moving food at low cost among regions and income streams for the food insecure. Rural capital markets also must be strengthened to allow households to bridge temporary shortfalls. Finally, it is necessary to have a better understanding of how disease, intrahousehold food distribution, and nutrition education mediate the relationship between household food availability and individual food security. (Adapted from author's conclusions)

145. Stocking, M. and N. Abel
1981 "Ecological and environmental indicators for the rapid appraisal of natural resources." *Agricultural Administration* 8: 473-484.

Natural resource assessment is traditionally of a long-term nature. This paper examines some of the underlying assumptions and proxy measures involved in their rapid appraisal. Three case studies on soil colour, plant indicators, and soil erosion illustrate a range of possibilities in using ecological and environmental indicators to appraise aspects of the physical environment which might normally be assessed by longer methods or not at all. It is concluded that the

interdependence of environmental factors is high and hence suitable proxy measures can be found. Rapid — and thus low cost — monitoring of change is discussed. The importance of a clear statement of assumptions is stressed. (Authors' abstract)

146. Suivi Alimentaire Delta Seno (SADS)
1989 *La Methodologie du Suivi Alimentaire Delta Seno*, mimeo. Mopti, Mali: Projet Information Alimentaire, Save the Children Fund (Mali) and Save the Children Fund (London).

A brief summary of the main components of the methodology used by the SADS food information system, run by Save the Children Fund's Projet Information Alimentaire in the 5th Region of Mali. Stresses a phased approach to data collection, based on principally qualitative information in the first instance, followed by quantification of key indicators in subsequent phases. Data collection is at village level, and geared towards tapping indigenous information networks, as well as exploiting existing sources of information. (Famine Early Warning Bibliography)

147. Sundberg, S. and V. D'Agostino
1990 Household Production and Income Strategies as Indicators of Consumption Security in South Central Mali. In *Proceedings of the Agriculture-Nutrition Linkage Workshop*, Volume 2, papers presented 12-13 February, 1990, Arlington, Virginia. A report prepared for the project entitled Nutrition in Agriculture Cooperative Agreement. Tucson, Arizona, USA: University of Arizona, Office of Arid Lands Studies.

As part of the 1985 to 1988 Michigan State University/CESA (the Malian Food Security Commission) Food Security Project surveys were conducted in 90

households to identify production-and-transactions and later consumption-and-expenditures relationships. This paper looks at how these households designed food production and income strategies to meet seasonal and annual consumption needs. In the first section food production and marketing strategies are documented. Such strategies include timing of grain sales, timing of grain purchases, diversification of crops on family fields, existence of individual fields and allocation of cultivated crops, and ownership and use of agricultural equipment. A section on household income strategies lists the various income-earning activities undertaken by men and women. It is suggested that food secure households tend to be more diversified in their income sources especially for women, and remittances from migrated family members are also more common.

The implication drawn is that the degree of household participation in the agricultural and non-agricultural economy is related to the household's ability to achieve food security. A comparison of children's nutritional status with agricultural-equipment ownership shows little correlation between the two. Thus, the validity of using agricultural-equipment status as an indicator of rural well-being is called into question.

148. Swift, J.
1989 Planning Against Drought and Famine in Turkana: A District Contingency Plan. In *Coping with Drought in Kenya*, T.E. Downing, K.W. Gitu and M.K. Crispin, eds. Boulder and London: Lynne Rienner.

This book chapter summarizes a report commissioned by Oxfam and the Turkana Rehabilitation Project (TRP), and carried out with the support of the Turkana District and Nairobi authorities. The aim of the study was to assess the risk of drought and famine in Turkana District and to recommend measures to reduce the likelihood of a drought deteriorating into a famine. The study emphasizes policies and actions for Turkana District. Three themes suggest: 1) drought is inevitable, but famine is not; 2) measures to prevent famine need not be expensive; 3) traditional response systems should be encouraged. Preparedness plans and the operation of an early warning system are presented. (Adapted from the authors introduction)

149. Swift, J.
1989 "Why are rural people vulnerable to famine?" *IDS Bulletin* 20(2): 8-16.

Rural people are vulnerable to famine for more reasons than the traditional explanations of production and exchange failures. Other key areas for analysis are household assets, investments, food stores and stores of value and claims on the community and government. The author suggests that better policies to reduce vulnerability will be possible when these issues are taken into consideration. Such policies should include early warning, exchange interventions and improving assets and claims.

150. Swift, J.
1986 *Early Warning Monitoring and Drought Contingency Planning in Turkana District.* Project Proposal for the Ministry of Energy and Regional Development, Turkana Development Support Unit, Lodwar, Kenya. [Brighton, U.K.: University of Sussex, Institute of Development Studies].

Suggested drought preparedness strategies are outlined including: 1) initiation of an emergency drought management sub-committee; 2) appointment of a district drought contingency officer; 3) preparation of a drought manual; 4) creation of a drought contingency fund with donor commitments established in advance of a crisis; 5) baseline surveys and development research, and 6) establishing an Early Warning System. The early warning system would be composed of certain key indicators including weather data, crop production and storage, animal mortality, nutritional and health conditions of animals, migration patterns, livestock sales, prices of animals and cereals, food situation in herding camps, unusual sources of income among herders, human pathology pattern, and human nutritional status. It is proposed to set up an Early Warning Monitoring and Drought Contingency Planning Unit to initiate the monitoring and planning activities.

151. Swift, J.
1981 "Rapid appraisal and cost-effective participatory research in dry pastoral areas of West Africa." *Agricultural Administration* 8: 485-492.

Special problems exist for data collection in pastoral areas. These are discussed together with experience in West Africa and with methods which require the pastoralists to generate information about themselves. Plant indicators can be interpreted by ecologists and herdsmen to give estimates of carrying capacity. It is suggested that local knowledge could be enhanced by training some pastoralists living in the camps who are supervised by a visiting researcher. Promising results of an experiment in Mali are reported and it is considered that the initial effort and expense of setting up such information networks is worthwhile. (Author's abstract)

152. Swinton, S.M.
1988 "Drought survival tactics of subsistence farmers in Niger." *Human Ecology* 16: 123-144.

Previous research into drought-response tactics has tended to be undertaken after the fact, and hence has been forced to be impressionistic. This study quantifies the importance of farmer drought-response strategies in south-central Niger based on a survey which began during the drought of 1984. Livestock sales, food aid, temporary migration, remunerative non-agricultural activities, and loans were the principal drought-survival tactics employed. (Author's abstract)

153. Taal, H.

1989 "How farmers cope with risk and stress in rural Gambia." *IDS Bulletin* 20: 16-22.

As a result of continuing food crises in sub-Saharan Africa, there is a need to identify and analyze various sources of farm risk and how households cope with these risks in order to see how development programs can best help them. To examine the varieties of strategies employed, the author presents the findings of 15 months of fieldwork in two villages (Dobo and Kundam) which are located in MacCarthy Island and Upper River Division of The Gambia, and combines this research with an examination of secondary data. In the first section, the range of risks faced by farmers is presented, including rainfall variation, price variation, access to markets and food, and regular seasonal stress. In the second section, farmers responses to farm risk are analyzed, focusing on choices in cropping pattern, storage of food crops, reduced consumption, off farm work, asset disposal, community and kinship ties, and the evolution of household strategies in recent years. The author concludes that because farming has become riskier and vulnerability has increased, especially among the assetless and poorest, coping strategies have diversified. Policy makers need to recognize the trends and devise interventions to help farmers cope with their situations. (Household Food Security Bibliography)

154. Tata, R.J. and R.R. Schultz

1988 "World variation in human welfare: a new index of development status." *Annals of the Association of American Geographers* 78(4): 580-593.

In constructing the Index, the author's selected the following variables of systems outputs: physical — total value of primary industry output per capita, persons per square kilometer of arable land; economic — GPS/capita, and manufacturing value-added per capita; social — infant deaths per 1000 live births, percentage of rural population; political — government expenditures per capita, political rights index, and number of radios per 1000 population. Factor analysis with varimax rotation yielded four principal factors that correspond conceptually with the physical, economic, social, and political systems. Based on factor scores, 160 countries were arrayed according to the sum of the quintile ranks of their four systems, from most developed to least developed. Various combinations of quintile scores permit ranking and mapping countries for overall human welfare, socio-economic human welfare, sociopolitical human welfare, and politico-economic human welfare. The scale of analysis can be varied to sub-national regions, variables can be added to each macrosystem to extend the concepts of human welfare, and

additional development categories can be defined for more detailed study. These analyses yield a wealth of information for evaluating each country on many development scales.

155. Tobert, N.
1985 "The effect of drought among the Zaghawa in Northern Darfur." *Disasters* 9: 213-223.

Through an analysis of data gathered in two different years in norther Darfur, the author examines changes in traditions and customs of Zaghawa potters and blacksmiths in response to drought. Through an examination of subsistence activities to crisis over the period of one year, the author considers the question of whether patterns may be said to exist for predicting crisis. The paper is organized into four parts; a description of the Dar Zaghawa from 1965 to 1972, the traditional village life as it was in 1982, a month by month chronology of events and household agricultural and craftwork strategies during 1984 to 1985, when drought and food shortages reached crisis levels, and finally a discussion on the invisibility of the famine in urban areas. In the concluding section, through graphs Tobert illustrates the three cycles of change during the last twenty years and ends with a discussion of the responses to the 1984 drought. She concludes that drought does not affect everyone equally. The severity of a drought may be underestimated by outside administrators because those affected may be living in the compounds of relatives in urban areas and others affected may be in rural areas out of sight of government officials and aid workers. (Household Food Security Bibliography)

156. Toulmin, C.
1986 "Access to food, dry season strategies and household size amongst the Bambara of Central Mali." *International Development Studies Bulletin* 17(3): 58-66.

This article discusses strategies for dealing with food shortage in Bambara among marginal and high risk farmers. The advantages for these villagers of the large household size are: 1) the diversification of income sources from family members; and, 2) economies of scale that can be afforded by the larger size of family assets, such as oxen ploughteams, and labor for well-digging. The two seasons (wet and dry) influence all aspects of life, including the eating patterns. During peak labor season, food is more substantial to supply energy needs for production. In this study, 15 out of 29 households suffered food deficits both years. The traditional methods of coping with this shortage, such as pawning children to the wealthy, or raiding other villages, have given way to migration of young men and

diversification of income sources during the dry season. Help to those in need is still an important element of Bambara society. (Household Food Security Bibliography)

157. Uzzell, J.D.
1982 *Training Module: Rapid Nutrition Reconnaissance.* Washington, D.C.: U.S. Department of Agriculture, Office of International Cooperation and Development, Nutrition Economic Group.

This unit explains the use of rapid micro-surveys for assessing nutritional status and nutrition-related behavior among populations felt to be at nutritional risk. It suggests ways of sampling to permit maximum generalizability from the data obtained and gives a number of suggestions for carrying out the surveys themselves, including selection and training of field workers. Although the focus is on rural areas, most of the methods could be translated to urban areas as well. This kind of research has been shown to be effective when time and/or funding for large-scale surveys are lacking and when macro-economic studies are unable to pinpoint the exact distribution of malnutrition and the cultural-economic conditions which affect it. (Author's abstract)

158. van Willigen, J. and T.L. Finan, eds.
1990 *Soundings: Rapid and Reliable Research Methods for Practicing Anthropologists.* Napa Bulletin 10. Washington, D.C.: American Anthropological Association, National Association for the Practice of Anthropology.

Seven articles discuss different methodologies for conducting assessments and evaluations. Topics include the application of rapid appraisals in project planning and implementation, the use of focus group research, ethnographic evaluations, community service assessment and data collection needs on women farmers in the Sahel.

159. Verma, V., T. Marchant and C. Scott
1988 *Evaluation of Crop-Cut Methods and Farmer Reports for Estimating Crop Production.* London: Longacre Agricultural Development Centre Limited.

Assesses the comparative performance of the physical measurement of crop production, using crop-cut methods, with personal estimates by farmers themselves. Tests the hypothesis that production estimates obtained by interviewing farmers soon after the harvest can be at least as accurate as any estimates obtainable through physical measurement on sample plots. If this were so, then a number of cheaper and more efficient improvements in the design of sample

surveys could be made. Report is based on five methodological studies carried out in 1987, in Benin, Central African Republic, Kenya, Niger, and Zimbabwe, using a common experimental design. Farmers' estimates turned out to be remarkably close to actual production figures, though their estimates of planted areas were less accurate. Over a wide range of geographical, social and administrative conditions, however, farmers' post-harvest estimates performed better than "objective" methods in terms of prediction and variance. (Famine Early Warning Bibliography)

160. Wagara, A.O.
1987 *Simple Quantitative Models and Results from Tanzania Studies.* Paper presented at the UNICEF/Sokoine University of Agriculture Course in "Food ad Nutrition in Society."

This paper discusses food and nutrition planning programs in Tanzania based on village-level participation. Emphasis is placed on the gathering of data by extension workers on agricultural production and nutrition at the household and village levels. Models for assessing household food supply (the food and "bag model") and nutritional requirements are presented. The government's approved training guide for improving food and nutrition planning outlines a plan for determining the best crop mix for meeting household requirements without increasing social or economic costs. Using a household food security card also is mentioned.

161. Walker, P.
1989 *Famine Early Warning Systems: Victims and Destitution.* London: Earthscan.

Looks at those who are caught up in the process of famine, how they perceive their predicament, and what they do to avert starvation. Examines the objectives of Early Warning Systems, and the range of methodological tools that are available. The systems operated by national governments in India, Bangladesh, Botswana and Ethiopia are investigated, and various international, and non-governmental EWS are reviewed. A two-phase Early Warning System is suggested, the primary objective of which is to warn of the onset of the famine process, but which can switch to providing information necessary to warn of mass starvation, if this proves necessary. (Famine Early Warning Bibliography)

162. Walker, T.S. and N.S. Jodha
1986 How Small Farm Households Adapt to Risk. In *Crop Insurance for Agricultural Development: Issues and Experience.* P. Hazell, C.

Pomareda and A. Valdez, eds., 17-34. Baltimore, USA: John Hopkins University Press.

The article begins with a description of farmers' risk management in South Asia, Central America, and East Africa, contrasting agroclimatic, socioeconomic, and institutional contexts. Secondly, the author considers the efficacy of traditional risk management measures on stabilization of household income, concentrating on spatial diversification of crops, intercropping, and tenancy. Finally, the authors comment on efficiency costs and the potential adverse effect on equity of traditional risk-adjustment practices. It is difficult to assess whether small farm households adaptations to risk are effective, primarily due to a paucity of data, but evidence shows it to be far from perfect. Crop and spatial diversification can enhance yield stability in some ecological settings, but intercropping by itself contributes little to yield stability. To consider crop insurance as an effective risk management strategy, more knowledge about the influence of crop revenue on consumption stability is needed. The authors are unsure that a public program of crop insurance is the answer to greater security, or even a step in the right direction. (Household Food Security Bibliography)

163. Walsh, J.
1986 "Famine early warning closer to reality." *Science* 233: 1145-1147.

This article discusses the use of remote-sensing data to monitor crop development in order to give early warning of food emergencies. Essentially this is run by and for western aid agencies, and because of its cost, African countries will continue to depend on external sources for the products of remote-sensing technology. Examines USAID's FEWS and notes that it uses the US NOAA weather satellite. Together with crop assessments and social data, FEWS compiles monthly reports throughout the agricultural season in an attempt to shorten response time to serious food crises. (Famine Early Warning Bibliography)

164. Watts, M.
1988 Coping with the Market: Uncertainty and Food Security Among Hausa Peasants. In *Coping with Uncertainty in Food Supply,* I. De Garine and G.A. Harrison, eds., 260-290. Oxford: Clarendon Press.

This article discusses the food supply and household subsistence security of the Hausa people of drought-prone northern Nigeria. It's findings are based on field research conducted by the author in the last 1970s. How the Hausa cope with environmental uncertainty, food shortage, the market and crisis, such as famine are examined.

The history of the Hausa is not one of a subsistence economy. They had previously been integrated into the regional trade economy, in which the household formed the unit of production. The effects of colonialism transformed their economy and undermined the Hausa's food security. Colonial capitalism dissolved systems which buffered households from the uncertainty of the natural environment and the market. The efforts of the Hausa to mitigate the effects of this imposed economy constitute the core of this article, with attention paid to seasonal hunger cycles, patterns of vulnerability from incomplete market development, and the "larger crisis of social reproduction."

165. Watts, M.
1987 Drought, Environment and Food Security: Some Reflections on Peasants, Pastoralists and Commoditization in Dryland West Africa. In *Drought and Hunger in Africa: Denying Famine a Future*, M.H. Glantz, ed. Cambridge: Cambridge University Press.

This article examines the relationship between drought, environmental change and famine, arguing that an indigenous agricultural revolution has taken place in the semi-arid savannas of West Africa. Drawing on case study material from the Nigerien and Nigerian Hausaland, the author argues that environmental problems can be understood in the context of social, political, and economic changes in land use patterns. These changes — particularly the process of commoditization and the social context of the development of markets — also affect food security. The implications of this local level work for the analysis of famines is then discussed. It is argued that greater attention should be paid to long-term, structural patterns in agricultural development when explaining the causes of famine, as well as to intra-household differences in entitlements. Only by looking at structural rather than conjunctural causes of famine can long-term solutions to food crises, rather than short-term palliatives, be found. (Famine Early Warning Bibliography)

166. Watts, M.
1983 *Silent Violence: Food, Famine and Peasantry in Northern Nigeria.* Berkeley, California, USA: University of California Press.

Taking a historical perspective, the book examines the African food crisis in the context of Hausa peasant farmers in northern Nigeria. The relationship between the food crisis, climate, and society are discussed. In particular, household response to variable climatic conditions and the push to join the global economy are analyzed. Also considered are food security and food policy issues.

167. Wisner, B., P. O'Keefe and K. Westgate
1977 "Global systems and local disasters: the untapped power of peoples' science." *Disasters* 1(1): 47-57.

This paper attempts to show how detailed and important information stored in the environmental perceptions and management practices of peasant farmers and herdsmen is being under-utilised for purposes of disaster prevention. The authors argue that: 1) peasants do possess a great deal of understanding of their environment and elaborate repertoires of "adjustments" of daily practices which help them survive disasters; 2) these systems of understanding and adjustment become distorted — sometimes to the point of complete destruction — under the market conditions that characterise most underdeveloped countries; 3) distortion or destruction of the systems of "peoples' science" produces a situation of "decision pathology" on the part of peasants, which in turn explains apparently "irrational" or "non-adaptive" behavior such as overgrazing in Africa, or refusing to evacuate a flood-plain in Asia; 4) increased vulnerability to disaster is the result of such a situation; and, 5) increased numbers of people suffering increased vulnerability to disasters explain why there has been a statistically significant increase in the number and severity of disasters in the last decade. (Adapted from the authors' introduction)

168. York, S.
1985 "Report on a pilot project to set up a drought information network in conjunction with the Red Crescent Society in Darfur." *Disasters* 9(3): 173-178.

The project brief was to test the feasibility of setting-up an information gathering network in Darfur province, Western Sudan, in order to monitor changes in the food situation, based on existing Red Crescent Branches. This would regularly collect base-line data on food and livestock prices, and on population movements which could be used to identify vulnerable groups and areas. There is a brief summary of current conditions in Darfur and a review of what data sources already exist in the province. This is followed by a review of the work of the Red Crescent Society and how its branches present a ready-made structure on which to develop an information network. This could provide a low cost sustainable way to signal the onset of food crisis using the untapped resource of the local population themselves. (Famine Early Warning Bibliography)

169. Young, H. and S. Jaspars

1991 *Nutrition Surveillance for Rural People — Action and Impact in Darfur, Sudan, 1984-1991.* Unpublished paper. Brighton, U.K.: University of Susses, Institute for Development Studies.

Drawing on experiences from Sudan, the authors suggest the need to take a broad view of nutrition in situations of famine. Traditionally, famine has been looked at as a decline in food availability or food entitlement that leads to excess deaths. However, other factors need to be considered including the complex strategies populations take for coping with famine-related events and changes in nutritional status as an early indicator of famine. New approaches for incorporating nutrition data into an early warning system are outlined. Also discussed are different types of nutritional surveys used for surveillance with special consideration given to those that include the participation of local communities.

170. Zaki, E. A.A., J. von Braun, and T. Teklu
1991 *Drought and Famine Prevention in Sudan.* Famine and Food Policy Discussion Paper 5. Washington, D.C.: International Food Policy Research Institute, Food Consumption and Nutrition Division.

During a workshop organized by the Government of Sudan and the International Food Policy Research Institute the results of a three-year project on famine prevention were presented. Four discussion papers are included in the document: "Drought and Famine Prevention Policy for Sudan: An Overview," "Macroeconomic Policy Perspectives for Famine Prevention: Commentary," "Household Experiences with the 1984/85 Famine and Potential for Public Intervention: An Overview," and "Food and Agricultural Policy Aspects of Drought and Famine: Commentary." Summaries of participant's comments, discussions of possible interventions, and a final wrap up of concluding remarks follow. Ten issues for which there was not a clear consensus are outlined including: definition of hunger, causes of famine, food security, development strategy, macroeconomic policy, investment policy, institution building, relief and famine prevention, priority setting, and research agenda.

171. Zalla, T.
1979 *Incorporating Nutrition and Consumption in Farming Systems Research and Rural Development Projects.* Washington, D.C.: USAID, Bureau for Science and Technology, Office of Rural Development.

Rural development projects affect consumption by influencing rural household production decisions, the end product of which is traded to consumers or consumed by the producers themselves. Rural

development efforts also influence employment and income levels both of which affect consumption patterns and effective demand. Changes in both the quantity and composition of food production and consumption lead to dietary changes and to an expansion or contraction in other areas of rural and urban economic activity. An understanding of these kinds of production-consumption linkages will assist program and project planners to maximize both the nutritional impact of rural development projects and the growth linkages between rural development projects and other sectors of the economy. The household consumption unit rather than the production unit is the approximate unit of analysis for studying the linkages between production and consumption. Consumption data should be collected on the same households on which production and income data are collected in order to permit multivariate analysis of the production-consumption interrelationship. (Nutrition in Agriculture Bibliography)

172. Zinyama, L.M., D.J. Campbell and T. Matiza
1987 Traditional Household Strategies to Cope with Food Insecurity in the SADCC Region. In *Southern Africa: Food Security Policy Options*, M. Rukuni and R.H. Bernsten, eds., 183-205. East Lancing, Michigan, USA: University of Zimbabwe UZ/MSU Food Research in Southern Africa.

In a review of literature on coping strategies in the face of food shortages in rural Africa and an examination of available data on coping strategies in the Southern African Development Coordination Committee (SADCC) countries, theoretical approaches to analysis of coping behaviour are compared, strategies are described and the structure of coping behavior is discussed. The authors first consider literature from the environmental, cultural ecological, and political ecological approaches. They next examine coping strategies through literature on herding and farming communities in Sub-Saharan Africa and follow this with coping strategies in SADCC countries in which they discuss recent changes such as have appeared under the impact of colonialization and governmental intervention. The authors found that in Africa, long-standing local strategies are being replaced with redistribution strategies dependent on external institutions. Exogenous-based relief is less sensitive to local conditions and may fail to respond to local needs. It is also expensive compared to local strategies, which are essentially free. Because the reality in Africa is that open systems have replaced more closed systems, there is a need to balance local and external coping strategies for meeting food deficits. (Household Food Security Bibliography)