

THE SSE-PROGRAM

FOOD SECURITY INDICATORS FOR  
DEVELOPMENT ACTIVITIES BY NORWEGIAN  
NGOS IN MALI, ETHIOPIA AND ERITREA

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Ingrid Nyborg and Ruth Haug

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## 1.0 Introduction

Whether or not development activities are "successful" is important to a wide range of actors, each of which require some form of information on the progress and effectiveness of investment in development. It is important to be able to collect, analyze and report the information necessary, in the appropriate degree of detail for each actor and in an accurate way.

The purpose of this study is to provide ideas and tools for how to assess the effect of project activities through the use of appropriate indicators. It is assumed that an appropriate set of indicators might contribute to improving the impact of the projects as well as improving the quality of reporting.

This paper is developed at the request of Norwegian NGOs and NORAD in connection with the SSE program (a long-term development program for the Sudano-Sahel Belt of Africa). Improved food security is one of the two overall objectives of the SSE program and the focus of the paper (the other main objective is sustainable development of natural resources). The main questions we address are: how can we assess the impact of different SSE project activities on the food security situation in the project areas; what kind of indicators should be used for different activities and in different situations; and how should we go about choosing the most appropriate indicators.

In the NORAD application forms "Søknad om støtte til nye tiltak" the NGOs are asked to fill in information on expected outcome/results, as well as specify which indicators will be used in project impact assessment (måloppnåelse). We expect this paper to be of use to NGOs when filling in these NORAD forms, particularly as regards identifying indicators which can assess project impact on the food security situation.

This paper is prepared on the assumption that each NGO has some system of monitoring already in place for its project activities. It is therefore not a goal of this study to design a separate or complete project monitoring system for NGOs. Instead, we recommend ways in which the identification and assessment of food security indicators might be integrated in the projects' present monitoring and/or management systems. This gives NGOs the flexibility to pick and choose from a list of possible indicators those which are most applicable for their specific project activities.

Although the study focuses on the project activities of the Norwegian SSE-funded NGOs in Eritrea, Ethiopia and Mali, the paper might be of interest to others interested in food security aspects of development assistance as well. The study reviews different food security indicators and discusses the appropriateness of these indicators for different activities and situations. The study also gives recommendations on how NGOs can go about choosing indicators, as well as

which type of approach might be used in measuring these indicators (e.g. Participatory Rural Appraisal -PRA).

## 1.1 How to read this report

This study is based on an extensive literature review, as well as personal knowledge of several of the projects under the SSE program. The literature on food security is very complex, and not easily accessible to project implementers. Nevertheless, we feel it is important that those involved in project implementation gain access to current theory being developed in food security so they can use this information in the field. We have therefore attempted to present some of the concepts from the literature in a more simplified form for those who are interested in gaining a more in-depth understanding of food security concepts. For these readers we recommend reading the report in its entirety. In addition, we include a list of references for further reading.

Those readers not wishing to read in detail on the concepts of general food security monitoring can, without losing too much continuity, hop over sections 4.1-4.3.1. For all readers, however, section 5.0 is critical, as well as the introduction and steps A and D in section 6.0. For those interested implementing steps B and C, at least the tables in sections 4.1, 4.2 and 4.3 should be studied.

## 2.0 What is food security?

The meaning of food security has changed significantly in recent years, making it difficult for development administrators, planners and field staff to adequately address the issue in projects, even when it appears as a major goal. Food security can mean very different things to different people, depending on their professional backgrounds and experience. For example, a nutritionist might associate food security with food habits, norms and malnutrition; an agricultural economist might focus on grain prices and stores at national and regional levels; while an agriculturalist might focus on food production and processing at the local level. While these aspects are important, they are not adequate in reflecting the broader definition of food security as it currently is manifested in development goals.

The most common definition of food security used by the North is that suggested by the World Bank (1986), "access by all people at all times for enough food for an active, healthy life." Because of the broadness of the term's mandate, however, confusion often arises in its use. Food security is a cross-sectoral concept which can be applied from the local to the national, even global level. It is interdisciplinary in nature, and there is therefore seldom agreement on which

indicators to use to measure food security. What is clear, however, is that food security is best measured using a set of indicators which assess not only food security status, but also changes in vulnerability to food insecurity over time.

While the World Bank definition offers a view of food security from the North, it is not sufficient for understanding food security as perceived by local populations. How local populations define and assess food security should be a central concern of not only development planners, but field staff working directly with the people. Since this type of definition is location specific, and may differ by for example socio-economic group, ethnic group, or gender, this report cannot offer any sort of wide-sweeping local definition. It will, however, provide suggestions on how an NGO can go about finding out local perceptions on food security, and how they can be combined with our Northern understanding of food security and its measurement.

### **3.0 Types of Food Security Indicators**

Development activities can be measured and monitored in several ways. One way is to measure project output through comparing whether planned activities have or have not been implemented, or whether production goals have been met. Several project planning tools (i.e. logical framework analysis) are available for this type of measurement. Another concern, however, is measuring the impact of a project on the welfare of the population. This task is more difficult, and is the type of measurement we are concerned with when assessing food security.

This report deals with food security indicators in two ways. First, indicators which can measure and monitor food security and insecurity in general without reference to certain project activities, are described and discussed in section 4.0. This is based on the assumption that in order to adequately deal with food security problems through the implementation of activities, NGOs must understand the dynamics of food security in their areas. In section 5.0, indicators which can measure the impact of project activities on food security will be suggested. These indicators will be based on the types of activities presently undertaken by the NGOs. This is to help NGOs to assess their specific activities according to the changing food security situation of the target population.

### **4.0 Monitoring Food Security**

Choosing the best indicators of food security and insecurity is a difficult task, and many of the conventional indicators used have been shown to be inadequate in giving an accurate picture of the food security situation. Two of the most commonly used indicators include:

*Nutritional status* (anthropometric measures e.g. weight for age, height for age): This is perhaps the most popular measure of food security, but it ignores the fact that nutritional status is also directly affected by other factors, such as poor health and sanitation, level of individual activity and inadequate child and maternal care. In fact, some studies have shown that there has been no correlation between household food security (availability and access to food) and nutritional status. Additional problems include the difficulty of accurately determining age in certain societies, the underrepresentation of pastoralist in clinical data, and the fact that these measures it may not recognize nutritional problems until a very late stage in a process towards food insecurity.

*Agricultural production levels*::

Even when reported per capita, production levels alone cannot measure food security status. First, they only give an indication of how much food is available, not the degree of access the poor may have to this production. Further, decreases in production levels are not necessarily a good measure of food insecurity, since this would also depend on the degree to which a household actually depends on this production. Studies in the Sahel have shown that people living in unstable natural environments (i.e. frequent drought) tend to have a rather diversified portfolio of income sources, making decreases in production not as critical to maintaining food security as people in more productive areas who are to a much greater extent dependent on own farm production for food consumption<sup>1</sup>

In light of such findings, there have been several recent attempts to find new or improved indicators of food security which would be more useful in the design and evaluation of development interventions.

#### **4.1 Output indicators**

Food security output indicators<sup>2</sup> are used to measure the status of food security at a given point in time. While they are sometimes used to target intervention, they are mainly used to evaluate the food security status before and after intervention.

Most output indicators use food consumption as a measure of food security. Food consumption can be measured either directly, or indirectly through proxies. Direct and indirect indicators and their units of measurement are given in table 4.1.

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<sup>1</sup>For more information see Reardon and Delgado's 1990 study from Burkina Faso.

<sup>2</sup>Also referred to in the literature as outcome indicators

Table 4.1 Output Indicators and Measurements

Type of Output Indicator	Possible Units of Measurement
I. Direct Indicators	
National household consumption surveys	- price per unit of food - calories per unit of food - conversion factors per capita
Food frequency assessments	- # of meals per day - # of types of ingredients in meals - # of times a day a nutrient poor gruel is served as a main meal
Household perception of food insecurity	- # of months family can feed itself through sale or consumption of own production and in-kind gifts
II. Indirect Indicators	
Storage estimates	- # of months food stores will last as perceived by the household (in households very dependent on own production for food) - decrease in # of months hunger period lasts - improved availability of seed, either through household seed saving or through seed banks
Household food balance	- size of farm and expected yield per capita, matched with age and sex composition of household (can also use food security card maintained by household on monthly basis)
Nutritional status assessments	- weight/age, height/age, weight/height - arm circumference

Source: after Maxwell and Frankenberger, 1992

Household consumption surveys have proven to be relatively costly in terms of both time and money, and not always available. Food frequency measures, however, can be obtained through participatory methods. They are location specific, and depend on local perceptions of what types of changes in food frequency actually constitute changes in food security (for example, changes in meal ingredients may not mean a worsening of food security for all). Because of their local specificity, however, food frequency data are difficult to aggregate at regional and national levels. Household perceptions of food insecurity, can also be obtained through participatory methods, and the number of months of self-sufficiency can easily be aggregated at higher levels.

Indirect output indicators serve as proxies of food consumption where direct output indicators are not sufficiently accurate or available. Aside from nutritional status measures (discussed above), the examples presented here can be measured using participatory methods.



While direct and indirect output indicators can offer a simple check of food security, they do not by themselves give any indication of changes in vulnerability to food insecurity, and are thus not adequate for purposes of monitoring food security over time.

## 4.2 Process indicators

Process indicators are used to measure the changing status of food security. They are central in the effect of development activities on food security. Process indicators can offer the type of information necessary to plan and adjust development efforts *during* the life of a project (rather than only before or after). There are two main types of process indicators:

- a) *supply* indicators, and
- b) *access* indicators.

Both can be important when assessing food security, but access indicators have in recent years been seen as relatively more valuable in development planning, implementation and monitoring of food security interventions.

### 4.2.1 Supply Indicators

Supply indicators measure the availability of food. Most conventional assessments of food security, including famine early warning systems, have focused on indicators reflecting food supply, particularly at the regional and national levels. Table 4.2 summarizes the types of supply indicators and their units of measurement.

Table 4.2 Supply Indicators and Measurements

Type of Supply Indicator	Units of Measurement
Rainfall data	- cumulative amount/average
Information of national resources (including grazing resources)	- remote sensing data (dekadal values)
Agricultural production data (crops and animals)	- seasonal yield (kg) per capita - departure from average yield per capita - % change from past years
Agroecological models	- FAO Crop Specific Soil-Water Balance Model
Food balance sheets	- production-consumption balance at national/regional levels i.e. production, imports, exports, domestic consumption requirements etc.

Table 4.2 (cont.)

Type of Supply Indicator (cont.)	Units of Measurement (cont.)
Information on pest damage	- seasonal yield per capita for crops - % of change from last year
Regional conflict	- # of incidents - influx of refugees
Market information	- monthly value/average, and/or monthly values of previous year of following: - value of crop and livestock prices - volume of exchange - changes in type of exchange - origin of buyers and sellers

Source: after Maxwell and Frankenberger, 1992

Most of the information above focuses on food security at the national and regional levels. NGOs working at the local level would probably find locally monitored rainfall information, information on pest damage, market information, and some aspects of regional conflict directly applicable for use in monitoring food security.

#### 4.2.2 Access Indicators

Access indicators are used to measure people's access and entitlement<sup>3</sup> to food, either through own production, purchase, or transfer/gifts. Access indicators reflect to a large extent peoples responses to worsening conditions (threats to food access), often termed coping strategies in the literature. Examples of access indicators and their units of measurement are presented in table 4.3.

Table 4.3 Access Indicators and Measurements

Type of Access Indicators	Possible units of measurement
I. Risk minimizing strategies (adjustment during and before a production season)	
Land use practices	- changes in crop mix - changes in time of planting
Diversification of livestock	- changes in livestock mix - early movement to alternative range - # of animal deaths
II. Loss- management strategies (response to lower production)	

<sup>3</sup>Norwegian translation: berettigelse.

Table 4.3 (cont.)

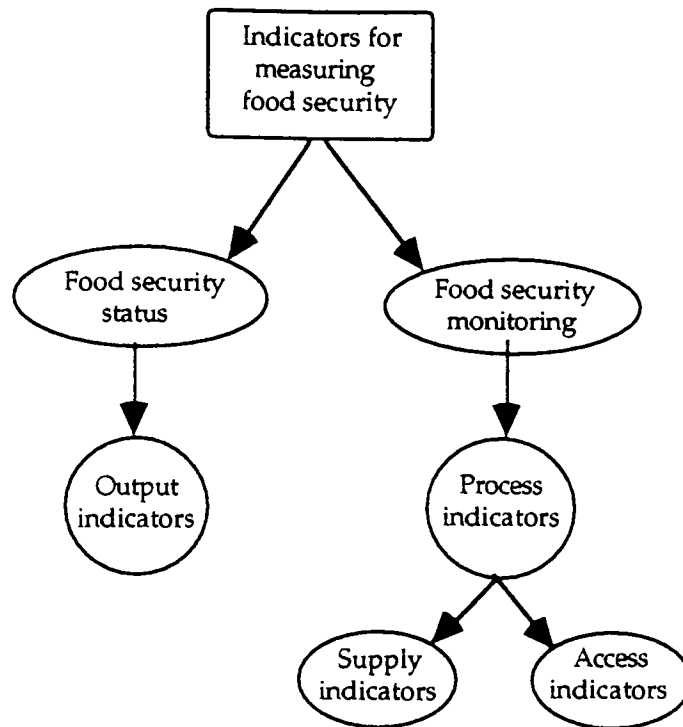
Type of Access Indicators	Possible units of measurement
Dietary change	- reduction in # of meals - decreased dietary diversity - shifts from preferred to low status food
Change in food source	- increased dependence on wild foods - # number of households dependent on reserves - grain price increases
Diversification of income sources	- changes in petty marketing patterns - changes in wage rates - increased number of households seeking off-farm employment
Access to loans/credit	- increased number of people seeking assistance from relatives - # of people seeking credit
Livestock sales	- increase sale of livestock for season - decline of livestock prices (relative to crops)
Seasonal migration	-increase in number of people migrating for work
Sale of production assets	- appearance in market of unusual amounts of personal and capital goods (jewelry, farm implements, draft animals) - sale of young female animals
Distress migration	- # of whole families moving out of area

Source: After Maxwell and Frankenberger, 1992

The value of this information in terms of food security monitoring by NGOs is twofold. First, the early identification of worsening conditions can allow for timely and appropriate interventions which might prevent a more widespread crisis. For example, farmers' adjustments in crop mixes and production patterns might be an early signal for the need for improved technology; reductions in the number of meals may warrant credit or limited food provision to avoid the sale of productive assets. Access indicators may also give indications of which local coping mechanisms might be strengthened. Second, improvements in these indicators may be able to be attributed to specific development interventions, giving a better picture of which activities are most effective in ensuring food security.

It should be noted that the measurements presented above are merely examples from the literature. The number of indicators and the frequency of their monitoring will differ depending on local conditions and project resources available for monitoring. They are all location specific, and therefore the same indicators cannot automatically be used in another area. They do, however, provide a framework for understanding the type of information which is important for monitoring food security. All of the types of access indicators above can be defined and measured using participatory methods.

**Figure 4.1**  
**Categorization of food security indicators**



### 4.3 Challenges in Choosing Process Indicators

From the discussion thus far, choosing indicators for monitoring changes in food security may seem relatively straightforward. Unfortunately, the process is somewhat more complicated than it may first appear. Several important factors need to be considered before choosing monitoring indicators.

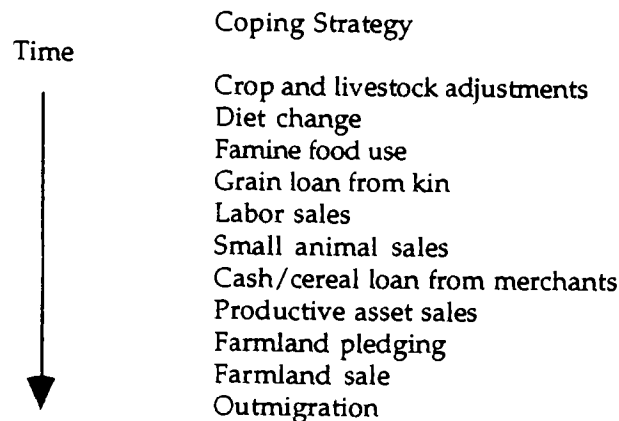
#### 4.3.1 Local supply indicators

Changes in factors affecting food supply can give an early indication of a potential food crisis. Government data on rainfall, production, pest damage, regional conflict and markets are all fairly available to project staff. Knowing which set of supply indicators is the most appropriate in each area, however, may not be so clear. Market information in particular is difficult to interpret for outsiders. One way of identifying appropriate supply indicators is to consult the local population. Local farmers have their own set of supply indicators which they use to determine the extent to which their food situation is threatened. These early indicators have been shown to be very much like those mentioned above. For example, local farmers will know how crops will be affected by poor rainfall, and often keep a close eye on activity and price changes in the market. Good contact with local farmers will give a more reliable picture of food supply in the project area than monitoring of government data which is meant for aggregation and planning at regional and national levels.

### 4.3.2 Coping strategies as a basis for access indicators

Perhaps the most important aspect to understand before choosing monitoring indicators is the nature of coping strategies in the area which is to be monitored. Previously, it was assumed that a single sequence of responses to worsening times could, in fact, be identified. For example, Watts (1983) identified the following sequence of responses to food shortages in Nigerian households:

Figure 4.2  
Sequence of Responses to Food Shortages



More recent research, however, has found that such sequences are by no means universal. The sequence and nature of coping strategies can, for example, differ significantly between people in different livelihood systems<sup>4</sup>. Also, the sequence and nature of coping strategies can differ between households within the same livelihood system, according to, for example, their socio-economic profile (rich vs. poor), ethnicity, and religion. Finally, coping strategies can differ within households by age and gender. It has also been found that since no two crises are identical in their causes or sequence of events, and no family is in exactly the same situation before each crisis, it follows that the sequence of coping strategies used by a particular group or household during a particular crisis may not be the same sequence chosen for the next crisis. It is therefore important to differentiate between coping strategies used by different groups and individuals, as well as to try to understand why they choose certain strategies over others in different situations.

Another problem with the monitoring of specific coping strategies is that they can be misinterpreted if those doing the monitoring do not have a thorough understanding of the current degree of structural stability of the livelihood

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<sup>4</sup>Livelihood systems can be defined as the systems within which one makes a living, and might be classified as farming, pastoral, fishing or a mixture of these. Within a livelihood system is found a wide array of production and income-earning activities.

system. Coping strategies can be defined as “short-term temporary responses to declining food entitlements<sup>5</sup>” and are characteristic of structurally secure households and livelihood systems. This means that households which are relatively food secure before a crisis, use coping strategies in difficult periods to attempt to return to a state of stable food access. Some systems and households, however, have experienced either a very severe crisis or several crises in close succession, and have become structurally unstable. This means that coping strategies which normally might bring them back to stability are no longer adequate. Instead of being short-term responses to crisis, coping strategies are used continuously, becoming a permanent part of a new, but structurally weaker system which is vulnerable to food insecurity<sup>6</sup>. The vulnerability of a system or household can be defined in terms of its *sensitivity* to shocks and its *resilience*, or ability to bounce back or recover. A vulnerable household, for example, might be described as very sensitive to shocks and with poor resilience, while one which is less vulnerable is less sensitive to shocks, and is in addition is resilient (able to bounce back to normal relatively easily using coping strategies).

Misinterpretation of these concepts can lead to serious faults in the choice of development activity. For example, supporting local coping strategies in households which are relatively structurally secure in ‘normal’ years may help them out of bad periods back to food security. However, supporting the same coping strategies in households which have experienced a structural collapse may help somewhat in the short run, but may at the same time be perpetuating an inherently vulnerable system which should instead be either significantly improved or abandoned and replaced by a different system.

In light of the complications mentioned above, how do we deal with the monitoring of coping strategies? It has been shown that coping strategies, despite their local specificity and cultural variability, can be categorized as to belonging to an early, middle and late stage of food insecurity. Thus, rather than trying to determine a single sequence of coping strategies as indicators of increasing food insecurity, it may be better to group coping strategies into sets of responses according to the ‘stage’ of food insecurity. For example, one set of coping strategies could be those chosen by a household for overcoming annual, recurring food insecurity (in the hungry months). These represent an early phase of coping, and may include reducing the number of meals, changes in the diet etc. A second stage would include those strategies chosen by households when the strategies from the first set are no longer adequate. These might include the sale of productive assets, local migration for work, etc. A third stage would be comprised of a set of late coping strategies, which might include permanent migration. A movement from one stage to the next would indicate the increasing vulnerability of a household to food security. It would also indicate decreasing reversibility, or the inability of a household to reverse the

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<sup>5</sup>see Davies, 1993

<sup>6</sup>In such cases, coping strategies become what is termed *adapting strategies* in the literature.

process without outside assistance. Movements between stages might be linked to specific responses by NGOs.

To summarize; in order to monitor food security one needs to:

- differentiate between the coping strategies of different groups (socio-economic, ethnic) and individuals (old, young, women, men)
- determine why different groups and individuals choose different strategies in different situations
- determine how vulnerable a group or household is to food insecurity by examining its sensitivity to shock as well as its resilience.
- determine whether groups, households or individuals are using coping strategies periodically in times of stress, or continuously as a sign of a collapsing system.
- group coping strategies into stages which can be monitored more easily.

#### 4.3.3 Local Perceptions and Participation

Additional challenges in choosing indicators for monitoring food security have been alluded to in the discussion of the importance of local specificity above. These are the understanding of local perceptions of food security, and the enlistment of local participation in food security assessment. Both are critical, particularly if project staff are trying to gain the complex type of information mentioned above as necessary for a better understanding of food security. As most experienced project staff would agree, the local population knows itself much better than 'outsiders', and can give a dynamic analysis of a food security situation which outsiders would be able to only superficially describe.

NGOs in general can be said to have been in the forefront of the development of techniques which allow for the active participation of the local population in the planning, implementation, monitoring and evaluation of development interventions. In section 6.0, this study will use one of these approaches, Participatory Rural Appraisal (PRA), as an example of techniques which can be used in the participatory monitoring and impact evaluation of food security. This in no way limits NGOs to the use of PRA in food security monitoring and project activity assessment. There exist many other participatory methods which NGOs may find more relevant for their activities<sup>7</sup>. NGOs may also have developed their own versions of participatory development. As long as the approach chosen focuses on active communication with and participation of the local population, an organization should choose the approach which best serves its experience and purpose.

A participatory approach is chosen over a more quantitative statistical survey approach for several reasons. PRA-type methods have been shown to be less

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<sup>7</sup>Appendix 1 gives a list of some of the approaches which have developed since the 1970s.

costly and less time-consuming than statistical surveys. Also, the information obtained can be analyzed on-the-spot in collaboration with the local population, allowing for a more correct interpretation of the information than would have been possible using other methods. While participatory methods focus on the importance of qualitative analysis, quantitative data can also be collected using these methods. Rather than relying on statistical methods to ensure accuracy of data, PRA, for example, uses a system of triangulation, where several tools are used to cross-check or verify the information.

## 5.0 Assessing the Impact of Project Activities on Food Security

The sections above offer suggestions as to how NGOs can gain a better understanding of the changing food security situation in their project areas through the monitoring of indicators such as those presented in section 4.0. The question remains, however, how to assess the impact of project activities on household food security. Which activities promote food security? How can we improve or redirect activities to make a greater impact on food security?

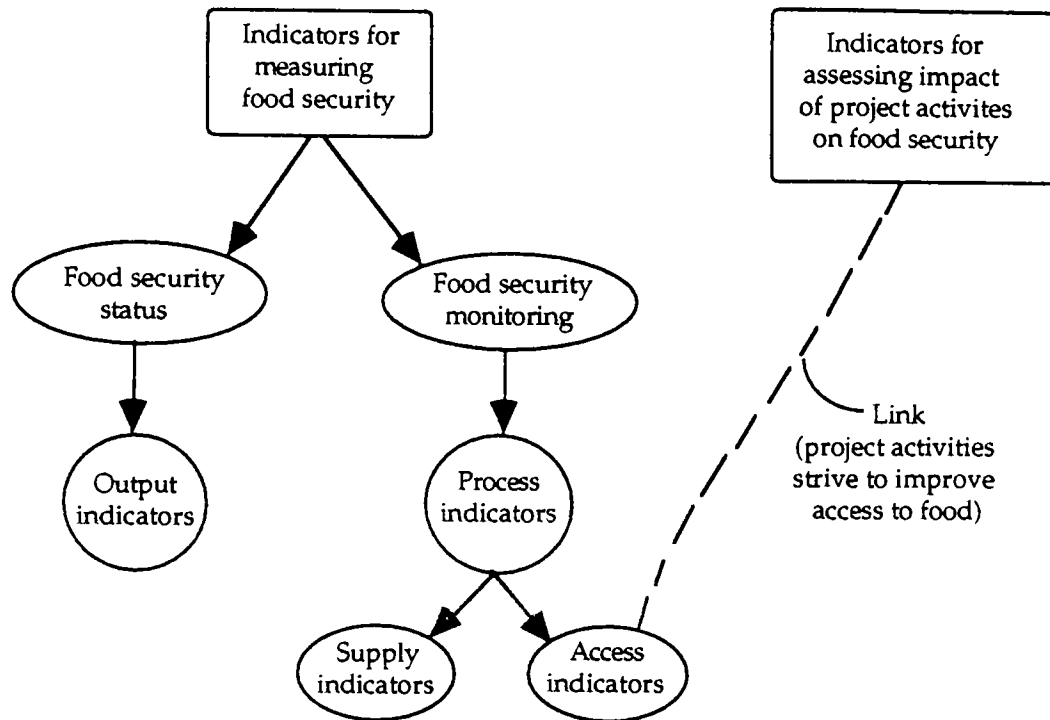
Determining the impact of project activities is by no means straight forward. It is difficult to isolate project effects from other socio-economic, climatic, and political factors affecting the local population. For example, increased production might be due to improved techniques, or it might be that rainfall was exceptionally favorable that season. The same applies when measuring project impact on food security. In addition, the dynamic, location-specific nature of food security described above makes it difficult to prescribe a fixed set of project activities and indicators which will always be relevant. As food security situations change, so does the relative importance of specific activities in ensuring food security. In other words, certain activities may be very important for food security in one period, but not so important as conditions change. Therefore, just as one needs a set of indicators of general food security monitoring, one needs a set of activities and impact indicators which are flexible enough to respond to changing food security situations.

Identifying indicators for assessing the impact of activities on food security will necessarily differ from indicators monitoring food security, although they are closely related. While food security monitoring indicators act as warning signals to worsening conditions, project activity indicators try to measure the extent to which project activities have been able to prevent the sounding of these warning signals. For example, assume that the local population has identified two sets of coping strategies for each socio-economic group; the first set being those strategies used in the event of short-term, annual food shortage, the second set being those resorted to when annual coping strategies are no longer adequate. Project activities, intent on reducing the length of the hungry season and strengthening the stability of the system, try to help households avoid having to resort to coping strategies of their second stage. Consequently, the fact that fewer households are resorting to such activities might be a measure of improved food



security. If this reduction in number of vulnerable households can be related to project activities, one can determine more accurately their impact on food security.

**Figure 5.1**  
**Link between indicators for food security monitoring**  
**and project impact assessment**



### 5.1 Norwegian NGO activities in Mali, Ethiopia and Eritrea, and Food Security Indicators

Since project impact indicators are so closely related to local perceptions of food security, we are not able in a desk study to prescribe exactly which indicators are best for evaluating project activities. Instead, we will:

- discuss how different types of activities might affect food security in different situations
- suggest ways of measuring project activity impact on food security

From a cursory overview of Norwegian NGO projects in Mali, Ethiopia and Eritrea<sup>8</sup> we can broadly categorize project activities by their general purpose (some of the activities can fall into several of these categories):

<sup>8</sup>based on project information available in Cowiconsult's 1992 evaluation of the SSE program for the Norwegian Ministry of Foreign Affairs as well as field visits.

- rehabilitation of the environment
- agricultural production activities
- food distribution activities
- general development activities (health, education, off-farm training)

Activities in each category can be said to have a potential for improving food security, either directly or indirectly, in the short or long term. These effects, however, may be difficult to measure. Below, food security indicators are suggested for each of the four categories of activities.

#### A. Environmental Rehabilitation Activities

Examples of activities which fall into this category are:

- a. Afforestation:
  - tree planting
  - farmer nurseries
  - forest conservation
  - fruit tree plantations
  - live fences
  - windbreaks
- b. Soil conservation
  - terracing
  - dune fixation
  - composting
  - range management, vegetation regeneration
  - fodder grass production (bourgou)
- c. Water conservation and irrigation
  - dikes construction
  - sluice gates construction
  - water harvesting
  - support to watering points
  - irrigated agriculture
  - rainfed agriculture

Some of the above listed activities could be categorized in the next group *Agricultural production activities*. However, we prefer to categorize in this way according to Cowiconsult.

Activities which aim to rehabilitate the environment might contribute significantly to the long-term food security of future generations by allowing production to continue in a sustainable manner. This is particularly true for those households which depend on own production for the majority of their food and income. Determining the impact of rehabilitation activities on food production in the future, however, is difficult, as there is so much uncertainty involved. It might be somewhat easier instead to use past experience to estimate the potential loss of production in the absence of environmental rehabilitation measures. Nevertheless, since production alone is not an adequate indicator of

food security, trying to use it as a single indicator to measure the impact of environmental rehabilitation activities on food security is of limited value. We have several examples of agricultural production increases not resulting in the expected improvements in household food security. From this we learn that production indicators should be used in combination with other kinds of indicators to make sure that production increases do result in improved household food security.

Future access to production resources (entitlements) may be limited, and other sources of income and food may become more important for food security in the future than what they are today. On the other hand, it may be that production increases may become the most important source of ensuring food security in the future. With these considerations in mind, we would like to suggest the following indicators to be used to assess the impact of environmental rehabilitation activities on the food security situation:

**Table 5.1.1.**  
**Environmental rehabilitation activities and**  
**food security indicators**

Activity	Output indicator	General impact indicator **	Food security impact indicator **
Afforestation farmer nurseries*, tree planting, forest conservation, fruit trees, live fences, windbreaks	-no of seedlings produced -no of farmers participating	-no of farmers continuing their nursery by themselves -no of seedlings sold -no of seedlings planted -tree survival rate -yield if applicable (fruit-trees) -increased access to firewood, shade, fence	-increase in income from sale -fruit consumption increase pr individual -anthropometric measures (weight for age etc., arm circumference) -yield increase due to live fence crop protection -female time saved due to increases in firewood availability -quality of life (shade etc.)

Table 5.1.1. (cont.)

Activity	Output indicator	General impact indicator **	Food security impact indicator **
Soil conservation <u>terracing (physical)*</u> , dune fixation, composting, range management, vegetation regeneration, fodder grass production	-m of terraces built -no and category of farmers/people participating	-m of terraces maintained -m of terraces built by own initiative -yield increase -% change from past years (yield)	-yield increase pr person -months food stores will last (increase) -length of hunger period (decrease) -nutritional status (weight for age, arm circumference etc.) -changes in number of meals pr day -reduced food aid -social interaction and empowerment of people (joint effort)
Water conservation and irrigation <u>dike construction*</u> , sluice gates, water harvesting, watering points, irrigation	-no of dikes constructed -no and category of farmers/households benefiting	-no of dikes maintained -increase in cultivated area due to improved water situation -no of dikes built by own initiative -yield increase -% change from past years (yield)	-yield increase pr person -months food stores will last (increase) -changes in length of hunger period -nutritional status (weight for age, arm circumference etc.) -changes in cropping patterns (increased diversity) -time saved -social interaction and empowerment of people (joint effort)

\* The one activity which is underlined is chosen as an example for output, general impact and food security impact indicators

\*\* All of these measurements should be reported by category (e.g. socio-economic group, food secure vs. food insecure) and gender.

One question which may arise after reviewing the above table is: what if there are no improvements in the food security impact indicators? If such is the case, we suggest the project consider the following:

- a. How appropriate is the chosen set of indicators?
- b. How appropriate is the project activity regarding reaching the food security improvement objective?
- c. What about the time aspect? Will more time be needed before the expected results become apparent?
- d. Does this activity aim at reaching another objective than food security, e.g. environmental rehabilitation?

## B. Agricultural Production Activities

Examples of activities which fall within this category are:

- a. Input distribution
  - general input distribution (seed, fertilizer, tools and oxen)
  - distribution of seed
  - distribution of animals (sheep, goats and/or oxen)
  - gardening
  - animal traction
- b. Credit service
  - ox-banks
  - seedbanks
  - credit
- c. Institutional development
  - cooperatives
  - cereal banks
  - women groups
  - grinding mills
  - other groups (Ogokanas, Baitos)
- d. Extension and training
  - farm visited
  - formal and informal training
  - demonstration plots
- e. Veterinary service (vaccinations, bull service etc.)

The improvement of agricultural systems can have a significant impact on current and future food security, and is the focus of the majority of project activities for all of the NGOs. In general, the main goal of agricultural activities is to secure and/or increase the production of crops, animals, and animal products to be consumed, or sold for the purchase of food or for income generation. Norwegian NGOs promote a wide array of activities as listed above. The NGOs have been able to report on the effectiveness of these activities in terms of increases in production. As stated earlier, however, increases in production cannot directly be translated into improvements in food security. There are many examples of production increases resulting in a decline in household food security. For example, production increases have often taken place at the expense of both food crop production and mothers' time for child care activities, resulting in less food for consumption and in poorer nutritional status for both mothers and their children.

Below are some examples of indicators which might be used to assess the impact of agricultural production activities on the food security situation:

**Table 5.1.2.**  
**Agricultural production activities**  
**and food security indicators**

Activity	Output indicator	General impact indicator *	Food security impact indicator *
<b>Input distribution</b> seed, fertilizer, tools, animals	-no and type of inputs distributed -no and category of farmers benefiting	-yield increase -% change from past years (yield) -farmers continuing on their own (own seed production, replacement of worn tools etc.) -animal survival and reproduction rate	-amount of own production saved for seeds -yield increase pr person -months food stores will last (increase) -length of hunger period (decrease) -building of buffer stock -nutritional status (weight for age, arm c) -changes in no of meals pr day and composition of meals
<b>Credit service</b> ox-banks, seed-banks	-no and type of credit given -no and category of farmers benefiting	-repayment rates -yield increase -% change from past years -farmers continuing on their own (input, oxen, seed) -animal survival and reproduction rates	-changes in supply of seed at community level -yield increase pr person -months food stores will last (increase) -length of hunger period (decrease) -nutritional status (weight for age, arm c) -diversification of production (security)
<b>Institutional development</b> cooperatives, women groups, cereal banks, traditional groups (baitos, ogokans)	-no and type of groups supported (formed) -no and category of participants in the different groups	-group survival rate -group membership increase -group activity record -repayment rates for saving and credit clubs, cereal banks etc. -establishment of guarantee/risk funds	-yield increase pr person -increased income -increase in women's income -changes in level of savings -length of hunger period (decrease) -increased consciousness and social interaction -more time

Table 5.1.2 (cont.)

Activity	Output indicator	General impact indicator *	Food security impact indicator *
Extension and training farm visits, formal and informal training, demonstration fields, PRA-activities	-no and category of farmers visited -no of training activities held and no of participants -no of demonstration fields established and no of people visited these	-level of participation (e.g. in PRA- activities) -no of farmers following advice -no of farmers applying knowledge from training -yield increase -% change from past years (years)	-yield increase pr person -improved production stability -changes in crop mixes (food crops) -months food stores will last (increase) -length of hunger period (decrease) -increased knowledge and problem solving capacity by people
Veterinary service bull service, vaccination etc.	-no and kind of service given -no and category of farmers assisted	-survival and health of animals -increase in stock -% change from past years (stock)	-increase in stock pr person -building of a buffer stock -decrease in length of hunger period

\*all of these measurements should be reported by category (e.g. socio-economic group, food secure vs. food insecure) and gender

If there are no improvements in the indicators, the same considerations as elaborated in the previous section should be assessed (appropriateness of indicator-set, appropriateness of activity on food security, time factor and accordance with which objective).

### C. Food Distribution Activities

This category includes free food distribution(emergency relief), food for work and food for recovery (re REST/Tigray).

Relief of acute food deficits, or food distribution, may be necessary to ensure food consumption in the very short run. In fact, in-kind food transfers to the needy from better-off family and community members is common in a number of societies. Food aid might be seen as a way of filling this role when local networks have broken down. There are significant differences, however, in the processes connected to each of these types of food provision. Locally-based food distribution can be assumed to have built-in socio-cultural mechanisms which limit the extent to which households can receive food, discouraging long-term dependence. Food provided from the outside, however, may not be able to develop similar control systems. Food distribution may thus lead to long-term dependence on outside assistance, discouraging investments in other productive

enterprises. In such cases, food distribution may in fact inhibit the longer-term development of food secure systems.

It is assumed that NGOs are ultimately interested in decreasing local dependence on food aid. How successful a project has been in decreasing longer-term dependence on food distribution through its other types of activities could therefore be a good indicator of improving food security. Thus, in areas where food distribution has been necessary, one might monitor changes in the number of project participants fully or partially dependent on food aid, as an indicator of food security. This measurement *must*, however, be reported together with information on what types of activities have replaced the need for food aid. Otherwise, the data might be seriously misleading; for example, decreases in the number of food aid recipients may be due to out-migration, or death.

#### D. General Development Activities

This category can be seen as a catch-all for activities not appearing in the other three categories. Included are activities to promote health, education and literacy, off-farm enterprise development, capital building, time saving and infrastructural development to name a few. Some of these activities may only have an indirect effect on food security (i.e. health, infrastructural improvements), while others may play a significant role in both current and long-term food security. Perhaps the most important activities in terms of food security in this category are those which promote off-farm employment. Particularly in areas where agricultural production is vulnerable to frequent drought, a common strategy for survival is the diversification of income sources. Project activities which improve the chances of people to gain local, off-farm employment, or start local income-earning enterprises, help families to diversify their income so as to become less vulnerable in the event of crop failure. It is particularly important to develop alternative sources of income for women, since they often hold the main responsibility for obtaining, preparing and distributing food between household members<sup>9</sup>. Literacy and education activities can be important for competing for jobs in the short term and long-term, and can thus be seen as an investment in future income-earning potential.

Reporting the increase in the number of literate and educated individuals by gender and socio-economic group would therefore be an indicator of investment in future food security. If it is possible to determine if these efforts have actually led to jobs and/or income increases for project participants, then this should also be reported. Where assistance is given to the development of commercial activities, the impact on food security might be measured by the number of men and women from food insecure households assisted, number of participants able

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<sup>9</sup>In fact, several studies have shown that income increases only have a significant impact on children's nutritional status when the income is earned by the women of the household, implying that *who* earns the money is more important than the amount earned.



to earn income during the hunger period (promoting annual income and consumption stability), or, alternatively, save income for the hunger period.

## 5.2. Indicators to assess the impact of project activities - general summary

After a rather complicated review of possible food security impact indicators, a reasonable question might be if there are any general food security indicators which might be used to assess the effect of a whole range of different project activities. We might suggest the following list (it should be noted that preferably a combination of two/three or more indicators should be applied):

- increase in the number of months food stores last (in households very dependent on own production):
- decrease in the number of months the hunger period lasts
- increase in yield level or production estimates e.g. measured in kg pr person
- increase in women's income and savings after harvest? (assuming their income is more important to food security)
- increase in the number of meals per day (where there has been a decrease)
- increase in herd numbers such that extra animals may be sold in difficult times (used as a buffer)
- improvements in infant mortality and child death rates (indicators of maternal and child nutritional status include effects of diseases)
- improved anthropometric measures (nutritional status, might include effects of diseases)
- improved availability of seed
- reduced food prices
- increased employment/real wage rates
- income diversification (increased security)
- crop diversification (increased security)

Some of these indicators are difficult to measure where as others are easily available just by asking different groups of people some simple questions. Examples of easily measurable indicators are *increase in the number of months food stores last* for people relying on crop production for their food supply, and *decrease in the number of hunger months*. for all groups of people including e.g. pastoralists. Again we would underline the importance of situation specificity (without context there is no meaning). The indicators should be adjusted to local conditions and to different households and groups of individuals *participating in project activities*. In the next sections, methodologies for how to measure the different indicators will be discussed.

## 6.0 Recommendations to NGOs on how to go about choosing food security and monitoring and project impact indicators

This section offers step-by-step guidelines on how NGOs and their collaborative partners might go about choosing indicators for monitoring food security and measuring project impact on food security. Specifically, we try here to transform the concepts presented in the earlier sections of the report into a workable process which NGOs can go through with their projects in the field. This is a difficult since each NGO has its own *modus operandi* in the field, some working through their own staff, while others working through local organizations or government ministries. Likewise, some organizations have good access to detailed information about the local population, while others have only a more general understanding. Thus, any methodology for use in the field must be flexible enough to deal with the differences between organizations, and different levels of local information.

To get the most out of the findings of this study, we recommend NGOs follow all of the general steps listed below. During this process, some NGOs may discover they have a good deal of the information required for certain aspects of the process. This is, of course, an advantage, and may save some time in the field. You may find, however, that following the complete process will be a good cross-check for data which may have been collected some time ago under different socio-economic and natural conditions.

If implementation of the entire process is beyond the current capacity of the organization, it is possible to implement fewer steps. As a minimum, we recommend implementing step A: *identifying food secure and insecure households* in order to differentiate between different categories of people in the target group, and then proceeding directly to step D: *choosing indicators which can measure the impact of activities on food security*. This will contribute to a much improved understanding of the impact of project activities on food security, as well as lead to improved project reporting on the extent to which project activities have been able to attain the SSE goal of improved food security. The more steps that are implemented, however, the better the project's understanding of the local food security situation will be. When such information is linked to a project monitoring system, it can greatly assist in the development of appropriate strategies and interventions concerning longer-term food security.

The time required for completing the process will vary depending on the size of the project area, the extent of activities, the approach chosen and the implementing organization. If project staff are not familiar with the approach chosen, i.e. Participatory Rural Appraisal (PRA), then additional time is needed for staff training.

In general, the process of choosing indicators presented below involves the following four steps:

- A) identifying food secure and insecure households
  - according to local definitions of food security
  - by category i.e. socio-economic or ethnic groups
- B) determining the food security situation for different groups
  - what do they do in a normal year, or did in a secure year?
  - what do they do in a bad year?
  - how vulnerable are different groups to future bad years or shocks?
- C) identifying sets of indicators for monitoring the general food security situation
  - which indicators can tell us when food security is worsening in different households
- D) choosing indicators which can measure the impact of activities on food security

Upon the completion of the above, NGOs need to go through a final step of integrating the chosen indicators into their monitoring and reporting systems.

During the above described process, the NGOs and their collaborative partners might also assess how appropriate and important their project activities are regarding addressing the food security issues.

## 6.1 Four steps in defining indicators

### A) Identifying Food Secure and Insecure Households

The objectives of this step are:

- to find out which households are food secure and insecure, according to the local population
- identify categories of households which may differ in terms of food security
- identify simple output indicators<sup>10</sup> to measure general food security

Method: Food security ranking by 3-4 key informants (same technique as wealth ranking<sup>11</sup>)

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<sup>10</sup>Explained in detail in section 4.1.

<sup>11</sup>Wealth ranking is a specific tool used in PRA to rank households in the community according to wealth. Rather than being based on 'outsiders' definitions of wealth, this tool allows the ranking to follow local definitions and perceptions of wealth. We propose this tool can be used for classifying food security as well.

- 1) Ask each informant to rank the villagers according to their level of food security. You might ask, for example, which households had enough food to eat for the whole year, or were the best-off that year? It must be clear that it is not only food grown, but also food bought or received as gifts. Ask the informants to put the households into three categories: food secure, variably food secure, and food insecure. It is important to ask the informants the criteria they used to categorize the households to get an idea of how they define food security and insecurity.
- 2) Choose informants from different groups of people in the village i.e. ethnic groups, economic strata, and be sure there are both men and women informants, since they might have different perceptions as to who are food secure and insecure.
- 3) Ask the informants to do this exercise at least twice - once to determine general food security status during a normal or good year, and again to determine food security status during a bad year, and then ask how the current year compares. This will give you an idea of not only which households are currently food insecure, but also which are vulnerable.
- 4) Ask the informants to choose a few simple indicators of general food security which the project can check, possibly annually, or over longer periods, to monitor food security trends in the project area. Some examples of output indicators are given in table 4.1.

#### B) Determining the Food Security Situation for Different Groups<sup>12</sup>

The objective of this step are:

- to gain an understanding of food security in an historical sense
- to gain a picture of the activities of different groups in good and bad years
- to try to determine the vulnerability of certain groups

Method: Focus group interviews<sup>13</sup> and in-depth interviews with men and women in different categories

- 1) Ask a group of older villagers to develop an historical overview of their village, recording all important events relating to food security and insecurity.

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<sup>12</sup>This step is based on information found in section 4.0.

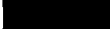

<sup>13</sup>Focus group interviews are defined as interviews with a groups of people which have been chosen to represent a specific strata of the community, i.e. women, elders, children, ethnic groups, rich, poor etc. This is in contrast to regular or open group interviews, where anyone may participate.

- 2) Ask each group to develop activity calendars where they distinguish between the following:
- activities which they "normally" do, or did in the past when times were better (including coping strategies for hunger season and strategies which led to accumulation and investment)
  - activities which they now must do every year to guarantee food security.

Example of an activities calendar for dryland cultivators in Mali<sup>14</sup>:

For food secure households in good years (or in the past):



ACTIVITIES	SEASONS											
	Harvest			Cold			Dry			Rainy		
	O	N	D	J	F	M	A	M	J	J	A	S
First purchase of cereal if short												
Return of migrants												
Millet cultivation												
Wells dug												
Early maturing varieties sown												
Preparation for next agricultural cycle												
Repairs to housing, etc.												
Fields manured by pastoral herds												
Departure of young males on migration												
Vegetable gardening												
Sale of millet to meet other cash needs												
Investment of surplus in animals												
Bartering millet for milk/rice												
Others' rice harvest												
Own millet harvest												

	= Principal activities to guarantee food security
	= Secondary activities (to build-up reserves)

<sup>14</sup>After Davies 1993. Examples of agro-pastoral and trans-humanance calendar are given in appendix 2.

In food insecure households in bad year (or current year)<sup>15</sup>:

ACTIVITIES	SEASONS											
	Harvest			Cold			Dry			Rainy		
	O	N	D	J	F	M	A	M	J	J	A	S
Sale of personal goods												
Few migrants return												
Search for work on others' fields												
Millet cultivation												
Search for credit for food, seed												
Sale of small stock												
Cereals purchased on market												
Wood cutting for sale to buy food												
Some bartering of millet for milk												
Harvesting wild foods												
Migration to the south for subsistence												
Early departure for rice harvest												
Own millet harvest												

	= Traditional activities
	= Adaptive activities (coping strategies now depended on)

- Develop a labor activity calendar which shows who does which activities when, distinguishing between women, men, old, young, girls, boys, extra help from outside household etc. (this can be done through the use of symbols). This calendar should go into more detail than the general activity calendar, i.e. specifying the seasonal distribution of labor within millet cultivation. Note that there is often a redistribution of labor within households when times get difficult. An example of a labor activities calendar is given in appendix 3<sup>16</sup>.

### 3) Determine the degree of vulnerability of households

Determining the different levels of vulnerability of households will help you understand the points at which households lose their ability to ward-off a full-blown food crisis. This involves setting up a list of activities and assets which act as buffers against having to resort to coping strategies. Thus, the more buffers a household has, the less vulnerable it is to sudden shocks or crop failures. The activities and buffers can be grouped according to whether they potentially contribute to the household's total resources (like production, income, gifts etc.), or whether they potentially reduce, exploit, or demand household resources (like consumption, state taxes, social obligations). The following is an example of an

<sup>15</sup>Ibid.

<sup>16</sup>The labor activities calendar in Appendix 3 is a general example, and not developed specifically for Mali.

already filled out chart from one of the systems in Mali, which gives a total of ten buffers for secure households, and zero for the most vulnerable<sup>17</sup>:

	Measures of Vulnerability			
	Secure households		Vulnerable households	
Sources of household resources (entitlements)	Activities and conditions ensuring high resilience (easy bounce back)	Buffers reducing sensitivity to shocks	Activities and conditions with low Resilience	Lack of buffers (High sensitivity to shocks)
Production	More than 1 year's food needs met by primary production  Capacity to accumulate/invest from secondary production	Up to 1 year's buffer against primary productive failure  Diversification into savings from secondary production	Structural food gap (primary production doesn't meet food needs)  Secondary production to fill food gap	No buffer against primary productive failure  No buffer against secondary productive failure
Exchange	Low market dependence or guaranteed purchasing power  Favorable terms of trade	Limited vulnerability to rising cereal prices	High market dependence, or no guaranteed purchasing power  Unfavorable terms of trade	Highly vulnerable to rising cereal prices
Assets	Capacity for accumulation	Ability to liquidate assets progressively (i.e. sell excess animals)	No capacity for accumulation	No assets to liquidate, or too rapid liquidation of those few that are available
Coping	Coping strategies used only in times of food stress	Coping strategies are bottom-line safety nets	Coping strategies used every year	Coping strategy use cannot be intensified
Adaptation	Little or no adaptation	Adaptation could be pursued	Adaptation is intense	No or very limited options for intensifying adaptation

<sup>17</sup>After Davies 1993.

Demands on household resources	Secure households		Vulnerable households	
	Activities and conditions ensuring high resilience (easy bounce back)	Buffers reducing sensitivity to shocks	Activities and conditions with low Resilience	Lack of buffers (High sensitivity to shocks)
Consumption	Adequate annual consumption (defined by locals, sufficient intake all year, good nutritional status)	Good health, adequate nutritional status at start of crisis	Inadequate annual consumption (regularly reduced/adjusted intake, low nutritional status)	Poor health, low nutritional status at start of crisis
Claims	Extensive reciprocal ties	Calls on claims are for others' surplus, not basis of subsistence (so likely to be met when needed)  State call (taxes, school fees, health fees etc.,) can be met easily	Reciprocal ties have broken down or are exploitative	Calls on claims erode the basis of others' existence  State call cannot be met without increasing vulnerability
Livelihood protection	Investment in future food security	Future security in present livelihood system	Limited or no investment in future food security	Future vulnerability

### C) Identifying Sets of Indicators for Monitoring General Food Security<sup>18</sup>

The objectives of this step is:

- to analyze the information from the first two steps to develop a set of food security indicators for each category of households, which can be monitored by the local population and project staff.

Method: Focus group discussions, in-depth interviews

- 1) Ask the group members to place indicators into three groups; early, intermediate, and late indicators (this relates to the coping strategies: early to late responses to food shortage/crisis, re p. 12: stage I-III, early phase of coping to the latest phase which will be permanent migration).

Indicators can, for example, be the start of specific activities identified in the activity calendars, such as the need to harvest wild foods. Indicators can also

<sup>18</sup>This step is based on information found in section 4.0.



be changes in a household's vulnerability, such as a breakdown in reciprocal ties in the form of diminished access to gifts from other family members.

- 2) From this list, choose the type and number of indicators which the project has the capacity to monitor, but which still give a reasonably accurate picture of the changing food security situation.
- 3) Determine simple measures of these indicators, either directly, or through proxies, which can be incorporated into a monitoring system. Use the measures presented in the tables in section 4.0 as examples.

At this point, it is helpful for project staff to see how project activities are related to changing phases of food security. This can be done by first making a complete list of project activities. Then, project staff can discuss which phase each project activity might be expected to address. For example, certain activities may address early phases of food security by building buffers i.e. increasing production and lengthening the period of food stored, or promoting savings, while others may be addressing later phases of food security, such as food distribution. Some activities can be expected to address several food security phases. In doing this, project staff get a much better picture of what the intended purpose of each activity is in terms of food security. It also may help for planning new activities where there are gaps in addressing food security, for example, in households intermediate phases.

#### D) Choosing Indicators Which Can Measure the Impact of Project Activities on Food Security<sup>19</sup>

The purpose of this step is:

- to determine which indicators give a good measure of the impact of project activities on food security

Method: Focus group interviews, discussions with key informants, project staff discussions.

- 1) In focus group interviews, ask people to assess how project activities have affected their food security situation. Make a note of their criteria for an improved food security situation. In this step, local people can directly provide information for choosing food security impact indicators. Through participatory methods we have the tools and techniques to enable people to share and analyze their knowledge of their own situation, to determine changing conditions and the causes for these changes.

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<sup>19</sup>Those who are limiting their reading to steps A and D, should in addition read the last paragraph in step C, which also relates food security to project activities.

- 2) From the assessment of impact by the participants, determine appropriate indicators and measurements of project impact on food security for each category of people. Tables such as those presented in section 5.0 can then be developed.

When assessing the impact of project activities it will be difficult to determine the real causes for the changes in the food security situation. Possible improvements might be due to other events than project activities or lack of improvements might be due to e.g. unfavorable climatic conditions or worsening macro-economic or political conditions rather than to unsuccessful project activities. It will also be difficult to assess what would have happened without the project and identifying causality. When applying participatory methods (e.g. PRA), however, we trust that people who live in an area have a comparative advantage in knowing and interpreting what has happened and why it has happened.

## 6.2 Integration of food security and project impact indicators in project monitoring systems

Once food security and project impact indicators have been identified, they must be integrated into existing project monitoring systems. Project staff must determine how often each indicator will be measured, and by whom. Monitoring of projects, however, is of no use if the information is not actively used to improve project activities. Project staff must link a system of response to the monitoring system which will allow appropriate actions to be implemented, intensified or discontinued as food security conditions change.

## 7.0 Conclusion

The purpose of this study is to provide ideas and tools for how to assess the effect of project activities through the use of appropriate indicators. It is assumed that an appropriate set of indicators might contribute to improving the impact of the projects as well as improving the quality of reporting.

This report is a first draft addressing the above purpose. It is up to the NGOs and their collaborative partners to assess to what degree we have been able to fulfill the purpose. Although we have collaborated with the NGOs in developing the report, we would have liked to work even more closely with the NGOs and their collaborative partners to assure that the proposed indicators and steps are appropriate and according to the needs and the capabilities of the NGOs. Because of the huge differences between the NGOs and their project activities, however, we decided to keep the focus of this phase at a more general level, and rather ask

the NGOs to respond to the initial work before attempting any further degree of detail.

Thus, the next step will be to present the report and to discuss its application together with the NGOs in various workshops and contact meetings. The report will then be revised according to feedback and comments we expect to get from the NGOs during this process of presentation and discussion.

If the NGOs are interested, a phase II of this food security impact indicator initiative could be implemented. A limitation of desk study indicator development is that you do not have direct contact with the ground, and it is therefore difficult to gauge the relative importance of different indicators. A phase II could attempt to adapt the indicators to a specific project and to implement the suggested steps in the field as a case study to learn how it works at project level and to revise accordingly. It is necessary to test how monitoring systems and indicators perform in the field. It is also important to remember that what works well in one situation might not be appropriate in another setting. There will always be a need to adapt the systems and the indicators to the situation in question and to the actual needs and activities.

We would like to encourage the NGOs and their collaborative partners to promote a process of bottom-up, participatory monitoring and assessment of food security indicators. This process should involve the targeted population, as well as front-line extension agents and/or project workers in identifying and assessing indicators as well as in designing systems. While this report might provide ideas and tools for possible indicators and steps of implementation, it is up to each NGO and project to decide on appropriate indicators for their particular project, and how they should be measured/assessed. We hope this report has helped spark an interest on the part of NGOs to explore new ways of addressing food security in their project areas.

## 8.0 Literature on food security indicators

The following is a complete list of references used in the development of this report. An asterix (\*) has been placed by those references which are particularly relevant for those interested in reading further on the subject of food security:

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**Some participatory approaches which have developed since  
the 1970s (in alphabetical order)**

AEA	Agroecosystems Analysis
BA	Beneficiary Assessment
DELTA	Development Education Leadership Teams
D&D	Diagnosis and Design
DRP	Diagnostico Rural Participativo
FPR	Farmer Participatory Research
FSR	Farming Systems Research
GRAAP	Groupe de recherche et d'appui pour l'auto-promotion paysanne
MARP	Méthode Accéléré de Recherche Participative
PALM	Participatory Analysis and Learning Methods
PAR	Participatory Action Research
PD	Process Documentation
PRA	Participatory Rural Appraisal
PRAI'	Participatory Rural Appraisal and Planning
PRM	Participatory Research Methods
PTD	Participatory Technology Development
RA	Rapid Appraisal
RAAKS	Rapid Assessment of Agricultural Knowledge Systems
RAP	Rapid Assessment Procedures
RAT	Rapid Assessment Techniques
RCA	Rapid Catchment Analysis
REA	Rapid Ethnographic Assessment
RFSA	Rapid Food Security Assessment
RMA	Rapid Multi-perspective Appraisal
ROA	Rapid Organisational Assessment
RRA	Rapid Rural Appraisal
SB	Samuhik Brahman (Joint trek)
TFT	Theatre for Development
TFD	Training for Transformation

Source: Cornwall, Andrea; Irene Guijt and Alice Welbourne (1993).  
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TRADITIONAL SEASONAL CALENDAR OF ACTIVITIES  
FOR AGRO-PASTORALISTS

ACTIVITIES	SEASONS											
	HARVEST			COLD			DRY			RAINY		
	O	N	D	J	F	M	A	M	J	J	A	S
Animals on transhumance	■										■	■
Animals depart for rainy season pastures											■	■
Rice/millet cultivation <sup>1</sup>	■	■										
Manuring of fields				■	■	■						
Milk herds recovered and divided				■	■	■						
Dry season wells dug												
Bourgou cut for animals in dry season												
Purchase of small ruminants												
Sales of cattle	■	■			■	■						
Bartering milk for cereals	■	■			■	■						
Rice harvest <sup>2</sup>												
Millet harvest <sup>2</sup>	■											■

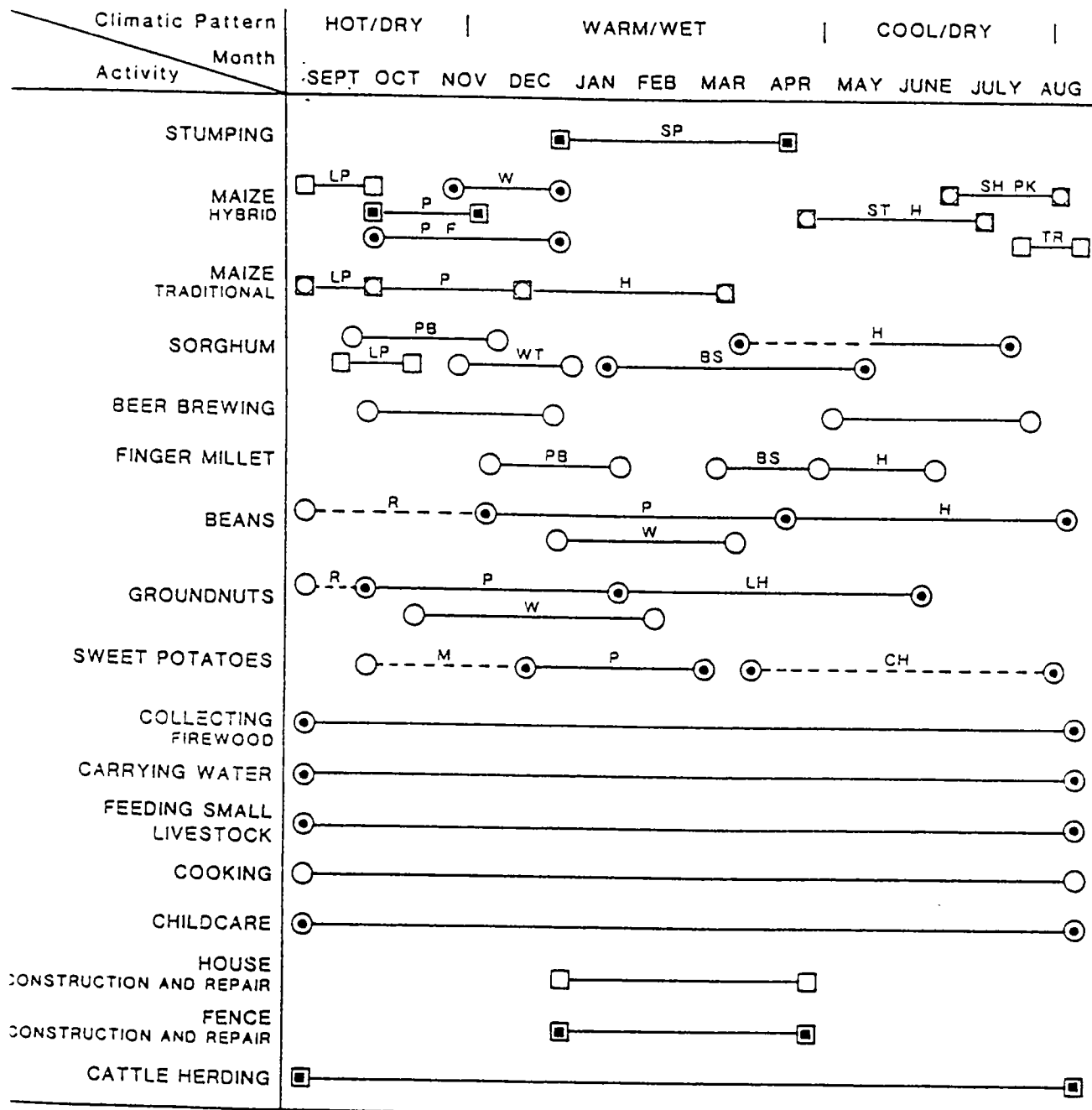
■ = Principal activities to guarantee food security  
 ■ = Secondary activities

TRADITIONAL SEASONAL CALENDAR OF ACTIVITIES FOR  
TRANSHUMANT PASTORALISTS

ACTIVITIES	SEASONS											
	HARVEST			COLD			DRY			RAINY		
	O	N	D	J	F	M	A	M	J	J	A	S
Milk herds to remain in villages for barter	■										■	■
Transhumance on drylands with rains	■										■	■
Preparations for transhumance								■				
Sale of animals if need to buy cereals								■				
Animals rented to cultivators for manure								■				
Establishment of fixed camps in the Delta												
Progression through the Delta		■	■	■	■	■						
Bartering milk for cereals		■	■	■	■	■						
Return from Transhumance				■	■	■						

■ = Principal activities to guarantee food security  
 ■ = Secondary activities





LEGEND

○	Female Adult	SP	Stumping (Pulling/digging stumps of trees out of fields)	BS	Bird Scaring (12 hrs/day)
●	Female Child	LP	Land Preparation	ST	Stocking (Cutting and stacking, "teepee style", stalks with grain still attached)
□	Male Adult	R	Ridging	L	Lifting
■	Male Child	M	Mounding	H	Harvesting
—	Continuous Activity	P	Planting	CH	Continuous Harvesting
--	Intermittent Activity	PB	Planting by Broadcast	SH	Shelling
		F	Fertilizing	PK	Packing
		W	Weeding	TR	Transporting
		T	Transplanting		

From: Feldstein, H.S., CB. Flora and S.V. Poats. "The Gender Variable in Agricultural Research." Women in Development Unit, International Development Research Centre, Ottawa, Canada. (IDRC-MR225e) (1993)