FAO International Workshop on

"Food Security in Complex Emergencies: building policy frameworks to address longer-term programming challenges"

Tivoli, 23-25 September 2003

The Coping Strategies Index: A tool for rapidly measuring food security and the impact of food aid programmes in emergencies[1]

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Introduction

Measuring food insecurity is a costly and complicated exercise. In highly food insecure countries operational agencies need regular measurements for monitoring changes and for assessing the impact of food aid interventions. Often these interventions take place in emergency conditions. Time is limited, and field conditions do not permit lengthy and intensive data collection or analysis processes. Tools are needed that are quick and easy to administer, straightforward to analyze, and rapid enough to provide real-time information to programme managers. The Coping Strategies Index (CSI) is one such tool. It was developed in Uganda and Ghana but has been for early warning and food security assessment in several other African countries, including Kenya, Ethiopia, Eritrea, Zimbabwe, Zambia, Malawi and Burundi.

The Coping Strategies Index (CSI) is an indicator of household food security that is relatively simple and quick to use, straightforward to understand, and correlates well with more complex measures of food security. A series of questions about how households manage to cope with a shortfall in food for consumption results in a simple numeric score. In its simplest form, monitoring changes in the CSI score indicates whether household food security status in declining or improving. It is much quicker, simpler, and cheaper to collect information on coping strategies than on actual household food consumption levels. Hence, the CSI is an appropriate tool for emergency situations when other methods are simply not practical or timely.

The CSI can be used to measure the impact of food aid programmes, as an early warning indicator of impending food crisis, and as a tool for assessing both food aid needs and whether food aid has been targeted to the most food insecure households. During food aid needs assessments the tool serves to identify areas and population groups where the needs are greatest. It can also shed light on the causes of high malnutrition rates, which are often very difficult to identify. Finally, if coping strategies are tracked over a long period, CSI is useful for monitoring long-term trends in food insecurity.

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[1] This is a summary of a field methods manual (CARE/WFP, 2003) available from the Nairobi regional offices of CARE and WFP

Overview of the Method

“What do you do when you don’t have enough food, and don’t have enough money to buy food?”

The answers to this simple question comprise the basis of the CSI tool. There are two basic types of coping strategy. One includes the immediate and short-term alternation of consumption patterns. The other includes the longer-term alteration of income earning or food production patterns and one-off responses such as assets sales etc. While it is important to understand longer-term livelihood strategies in an emergency, research has shown that the management of short-term consumption strategies is an accurate indicator of food security.

Typically, food insecure households employ any of four types of consumption coping strategy. First, households may change their diet (switching from preferred foods to cheaper, less preferred substitutes). Second, to the household can attempt to increase their food supplies using short-term strategies that are not sustainable over a long period (borrowing, or purchasing on credit; more extreme examples are begging or consuming wild foods, or even seed stocks). Third, households can try to reduce the number of people that they have to feed by sending some of them elsewhere (anything from simply sending the kids to the neighbour’s house when they are eating, to more complex medium-term migration strategies). Fourth, and most common, households can attempt to manage the shortfall by rationing the food available to the household (cutting portion size or the number of meals, favouring certain household members over other members, skipping whole days without eating, etc.).

It will be clear that *all* these types of behaviour indicate a problem of household food insecurity, but not necessarily problems of the same *severity*. A household that does not eat for an entire day is evidently more food insecure than one that has simply switched consumption from rice to cassava. The basic idea is to measure the *frequency* of these coping behaviours (how often the coping strategy is used?) and the *severity* of the strategies (what degree of food insecurity do they suggest?). Information on the frequency and severity is then combined in a single score, the Coping Strategies Index, which is an indicator of the household’s food security status. It considers only the coping strategies that are important in a particular local context. In brief, monitoring whether the index rises or declines gives a rapid, real time indication of whether household food security in deteriorating or improving. An example is provided in Table 1. If used as a stand-alone indicator, it can provide a rapid indication of household food security status, as part of either early warning or assessment. If used in conjunction with a food aid end-use monitoring form, it can give a rapid indication of the impact of food aid.

A field manual has been developed in East Africa by CARE and WFP, and is available from the regional office of either agency (CARE/WFP, 2003).

Table 1: Consumption Coping Strategy Index (CSI)

In the past 30 days, if there have been times when you did not have enough food or money to buy food, how often has your household had to:	Relative Frequency					Severity Ranking	Score
	All the time? Every day	Pretty often? 3-6 */week	Once in a while? 1-2 */week	Hardly at all? <1 */ week	Never 0*/week		
a. Rely on less preferred and less expensive foods?							
b. Borrow food, or rely on help from a friend or relative?							
c. Purchase food on credit?							
d. Gather wild food, hunt, or harvest immature crops?							
e. Consume seed stock held for next season?							
f. Send household members to eat elsewhere?							
g. Send household members to beg?							
h. Limit portion size at mealtimes?							
i. Restrict consumption of adults in order for small children to eat?							
j. Feed working members of HH at the expense of non-working members							
k. Ration the money you had and buy prepared food?							
l. Reduce number of meals eaten in a day?							
m. Skip entire days without eating?							
TOTAL							

References

CARE/WFP (2003), *The Coping Strategies Index*: Field Methods Manual. Nairobi: CARE and WFP.

The Coping Strategies Index

A tool for rapid measurement of household food security and the impact of food aid programs in humanitarian emergencies

Field Methods Manual

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The Coping Strategies Index: Field Methods Manual

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1. Foreword

Measuring food insecurity is a costly and complicated exercise. In highly food insecure countries operational agencies need regular measurements for monitoring changes and for assessing the impact of food aid interventions. Often these interventions take place in emergency conditions. Time is limited, and field conditions do not permit lengthy and intensive data collection or analysis processes. Tools are needed that are quick and easy to administer, straight-forward to analyze, and rapid enough to provide real-time information to program managers

The Coping Strategies Index (CSI) is one such tool. It was developed in Uganda, Ghana and Kenya but has now been used for early warning and food security monitoring and assessment in at least seven other African countries.

The CSI measures behavior: the things that people do when they cannot access enough food. There are a number of fairly regular behavioral responses to food insecurity – coping strategies for short – that people use to manage household food shortage. These coping strategies are easy to observe. It is quicker, simpler, and cheaper to collect information on coping strategies than on actual household food consumption levels. Hence, the CSI is an appropriate tool for emergency situations when other methods are simply not practical.

The CSI can be used to measure the impact of food aid programs, as an early warning indicator of impending food crisis, and as a tool for assessing both food aid needs and whether food aid has been targeted to the most food insecure households. During food aid needs assessments the tool serves to identify areas and population groups where the needs are greatest. It can also shed light on the causes of high malnutrition rates, which are often very difficult to identify. Finally, if coping strategies are tracked over a long period, CSI is useful for monitoring long-term trends in food insecurity.

This manual describes the CSI tool and how to develop and use it. The manual is based on a collaborative research project, implemented by WFP and CARE in Kenya and other East African countries, with the generous financial support of the UK Department for International Development via WFP, The Bill and Melinda Gates Foundation, and CARE-USA.

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July 2003

2. What is the CSI and what does it do?

The Coping Strategies Index (CSI) is an indicator of household food security that is relatively simple and quick to use, straightforward to understand, and correlates well with more complex measures of food security. A series of questions about how households manage to cope with a shortfall in food for consumption results in a simple numeric score. In its simplest form, monitoring changes in the CSI score indicates whether household food security status is declining or improving.

The CSI has a number of potential applications in food security programming. The most obvious is **monitoring the short-term impact of food aid** on household food security in an emergency. In this application, the CSI tool is used in conjunction with a food aid end-use monitoring tool to track how much food aid a household has received over a period of time, and whether household food security has improved or declined over the same period. A second use is as a **food security early warning indicator**. Most early warning indicators do not yield household level information. Incorporating CSI as part of a system would give an indication of household access to food as well the more conventional 'availability' indicators such as rainfall, market, and food production information. A third application is as a **food security assessment tool**, which could also be used to help in **targeting food aid** to the most vulnerable households, and to **estimate food aid requirements**. Lastly, the CSI can be used as an indicator of **longer-term changes in food security status**. The CSI tool can be used for any of these applications, and the actual design of the tool is the same regardless of the application—what varies is the corollary information required, and the way in which the CSI tool is calibrated. This manual focuses on one particular application—the rapid monitoring of the impact of food aid in an emergency.

Why track the impact of food interventions? During the food security crisis that struck the Horn of Africa in 1999-2001, over two million tons of food aid was distributed in five Eastern African countries. During the crisis little was known about the direct impact of that food aid. A few evaluations have been carried out since the crisis, but very little information about impact was available during the emergency itself. Operational agencies need additional information, beyond the initial needs assessment, to adequately manage an emergency food aid intervention. Initial forecasts of target groups and their needs become unreliable as conditions evolve, often in unpredictable ways. Programmes cannot be responsive to underlying changes in food security conditions unless impact is monitored.

Many organizations, including CARE International and WFP have endorsed the SPHERE Guidelines to minimum standards in emergency response. Among other things, the SPHERE Guidelines state that every person affected by emergencies has the right to a minimum daily food intake of 2100 Kcal. But even when a full ration equivalent of 2100 Kcal is distributed, part of the food may be stolen, "taxed", sold or lost. It is therefore hard to know whether a programme is adhering to SPHERE standards.

The current practice of monitoring the impact of emergency programmes is mostly limited to observation of stress migration, infrequent one-off nutritional surveys, or ex-post evaluations, which are helpful in terms of capturing lessons learned, but do not provide relevant information to managers in real-time during an emergency. There is a lack of 'near real-time' and regular information on the food security impact of food aid during an operation. The Coping Strategies Index (CSI) described in this manual, is designed as a tool to provide such information.

The CSI requires some "up-front" work to ensure that it is adequately adapted to a local situation, but beyond this initial investment, it is quick to administer and easy to analyze and interpret. If collected with data on household food aid receipts and utilization patterns, the CSI provides managers with a tool to improve the management of an emergency food aid program in "real-time." With the information, managers can check the adequacy of the food basket, identify shortcomings in the targeting of food aid, and determine whether the food aid response is adequate to address the household food insecurity problem.

This manual describes the tool, and walks the reader through a step-by-step process that should enable a field manager to set up the CSI tool, adapt it to the local context, and use it to collect, collate and analyze information about household food security and food aid receipts, in order to improve the management of the program.

Box 1: What is "household food security?"

What is food security? Food security was defined years ago by the World Bank as "access by all people at all times to sufficient food for an active, healthy life." In practical terms, this encompasses the physiological needs of individuals; the complementarities and trade-offs among food and other basic necessities (especially health care and education, but others as well); changes over time in terms of people's livelihood strategies and the assets to which they have access; and uncertainty and risk (that is, vulnerability). Clearly, food security is about much more than just how much people have to eat. Yet, having "enough" food to eat is clearly the most important outcome of being food secure, and while physiological requirements differ, people largely know whether they have "enough" or not.

Why do we measure at the household level, when we know there are intra-household inequities? There are well-known inequities of food distribution within households. Yet, for better or worse, households are the social institution through which most individuals get access to food, and except in the most dire of emergencies, food distributions are targeted to households, so a household level measure in required for impact. In fact, inequitable distribution within households is one form of coping, though not all household inequity is a form of coping. The CSI will pick up inequitable distribution of food within the household, but other tools are required to gain insight into distribution patterns at this level.

Note: Household measures are not appropriate for individually targeted interventions such as supplementary and therapeutic feeding, and while CSI scores may give some indication of households with malnourished children, further screening is required at the individual level for these interventions—the CSI is not the appropriate tool for screening for these interventions.

The main focus of the manual is on monitoring the impact of food aid in emergencies, but the basic design of the tool is the same for the various other

applications mentioned above. A number of computer programs are provided with the enclosed CD-ROM that enable the user to get started quickly, rather than having to develop questionnaires and databases from scratch. It should be underlined, however, that the tool does need some "up-front" work to ensure that it is accurately adapted to the local operating environment. With a little care to these details, the CSI will rapidly generate the information needed to improve the effectiveness and efficiency of food operations in an emergency.

3. What is the basic idea of the CSI?

"What do you do when you don't have enough food, and don't have enough money to buy food?"

The answers to this simple question comprise the basis of the CSI tool. The acquisition of food and the provision of adequate nutrition to one's children are among the most basic of human endeavors. In general, people respond to conditions under which they do not have enough to eat, and various means of "coping" is what people have to do when they do not have enough—the more people have to cope, the less food secure they are. Household decision-makers (usually, though not always, women) organize the resources at their disposal to limit the short-term effects of not having enough to eat. People generally know how much is "enough" and seek the best options for ensuring that they eat enough. People start to change their consumption habits when they anticipate a problem. They don't wait until food is completely gone.

There are two basic types of coping strategies. One includes the immediate and short-term alteration of consumption patterns. The other includes the longer-term alteration of income earning or food production patterns, and one-off responses such as asset sales. While it is important to understand longer-term livelihood strategies in an emergency, research has shown that the management of short-term consumption strategies is an accurate indicator of acute food security (see References 2, 4 & 5).

Typically, food insecure households employ four types of consumption coping strategies.

- First, households may change their diet. For instance, households might switch food consumption from preferred foods to cheaper, less preferred substitutes.
- Second, the household can attempt to increase their food supplies using short-term strategies that are not sustainable over a long period. Typical examples include borrowing, or purchasing on credit. More extreme examples are begging or consuming wild foods, immature crops, or even seed stocks.
- Third, if the available food is still inadequate to meet the needs, households can try to reduce the number of people that they have to feed by sending some of them elsewhere (sending the kids to the neighbors house when those neighbors are eating).
- Fourth, and most common, households can attempt to manage the shortfall by rationing the food available to the household (cutting portion size or the number of meals, favoring certain household members over other members, or skipping whole days without eating).

It will be clear that *all* these types of behavior indicate a problem of household food insecurity, but not necessarily problems of the same *severity*. A household where no one eats for an entire day is clearly more food insecure than one where people have simply switched from consuming rice to cassava. The basic idea is to measure the **frequency** of these coping behaviors (how often is the coping strategy used?) and the **severity** of the strategies (what degree of food insecurity do they suggest?). Information on the frequency and severity is then combined in a single score, the Coping Strategies Index, which is an indicator of the household's food security status. It considers only the coping strategies that are important in a particular local context.

From the discussion of household food security in Box 1, it is clear that there are other factors besides just short-term food consumption that must be considered in assessing food security. These include longer-term livelihood strategies, labor opportunities, alternative income generating strategies, levels of physical and financial (and other) assets, and one-off asset sales or bartering. Unfortunately, it is rarely possible to collect all this data in an emergency. The Kenya Pilot Study (See Appendix 1) collected data to control for all these factors, and still found that the CSI itself was both an accurate reflection of current food security status at the household level, and a good predictor of future vulnerability. The CSI works because households tend to use both consumption coping strategies *and* longer-term strategies to ensure that they have enough to eat. Although a complete analysis of household food security would require a detailed understanding of livelihoods and assets, the CSI is perfectly adequate as a *rapid indicator* of household food security (see also References 2, 4, and 5).

4. How does the CSI work?

A set of simple questions can be developed to capture people's basic consumption-related coping responses to inadequate access to food in a given culture or location, and shown in the example from rural Sierra Leone in Box 2.

The questions should be based on ***the right list of coping behaviors***. There is no point in asking people about strategies they do not use. This will confuse the results (this is discussed in detail in Section 5.a). Equally we must be careful not to overlook strategies that *are* used locally. There is no universal set of coping strategies: The list must be adapted to local circumstances and practices. Second, we want to know ***how often*** these strategies have been used in the recent past (the last month, for example). It is difficult for households to remember the number of coping strategies used over a long period. If people can't remember the exact number, they may be able to provide a relative frequency ("every day," "quite often," "rarely," "never," etc.). This method has been shown to work just as well—and for a much longer and more representative recall period (see References 4 and 5). Third, we want to know ***how "severe"*** each of these individual coping strategies is considered to be. This information is collected from community-level focus groups and provides a weight for the perceived severity of each strategy (see discussion in Section 5.c).

Box 2: A List of Questions About Coping Behaviors
In the past 30 days:
1. How many days have you had to eat food that you would not prefer because you do not have, or do not have money to buy the preferred food?
2. How many days have you had to borrow food, or buy food on credit because you do not have, or do not have money to buy food?
3. How many days have you had to rely on wild foods, or harvest immature cassava?
4. How many days have you had to consume seed stock?
5. How many days have you had to leave your children to beg, scavenge, or fend for themselves?
6. How many days have you had to ration portion size because you do not have enough food, or do not have money to buy food?
7. How many days have you had to restrict your own consumption to make sure the children get enough to eat because you do not have, or do not have money to buy food?
8. How many days has your family had to go the whole day without eating?

The weighted scores are combined into an index that reflects current and perceived future food security status. Changes in the index provide a rapid indication of whether food security is improving or deteriorating (Section 5 describes in detail how this can be done). When used in combination with an end use context monitoring (early warning) indicators, and food aid end-use monitoring tools, the CSI provides an accurate indication of the way in which household food security is responding to food aid interventions (Section 8 describes these applications).

Previous research has shown that the CSI is a good proxy for food intake (caloric adequacy), as well as food budget shares (the proportion of income that households devote to food purchase), food frequency, income status, and the presence or absence of a malnourished child in the household (References 2 and 4). Box 3 presents findings for how well the CSI correlates with accepted indicators of food security. The Kenya Study demonstrated that the CSI also picks up changes in household conditions as a result of emergency food aid operations, and correlates well with other food security indicators.

Box 3: Correlation of CSI with other Food Security Indicators (Pearson's r)

Indicator	CSI (Entire)	CSI (Rationing strategies only)	Kcal per adult per day	Food share of household budget	Income (per capita expenditure)	Height for Age z-score of child
CSI (Entire)	1.000					
CSI (Rationing strategies only)	0.910**	1.000				
Kcal per adult per day	-0.082*	-0.138**	1.000			
Food share of household budget	0.195**	0.144**	0.164**	1.000		
Income (per capita expenditure)	-0.220**	-0.215**	0.374**	-0.497**	1.000	
Height for Age z-score of child	-0.108**	-0.104**	0.033	-0.118**	0.146**	1.000

Data Source: Reference 4

* Correlation Significant ($p < 0.05$)
** Correlation Significant ($p < 0.01$)

The CSI is clearly negatively correlated with caloric intake—that is, lower caloric intake correlates strongly with higher reported levels of coping. Since the CSI measures a variety of behaviors, some of which indicate an absolute food shortfall and some of which indicate actions taken to increase food availability in the short term, the CSI gives even stronger results when measuring only the rationing strategies in the CSI (the behaviors that indicate an absolute shortfall). As noted in Box 3, the negative correlation between caloric intake and a CSI made up of only rationing strategies is more significant. The correlation is also negative with income and nutritional status for the same reason.

5. Constructing and using the CSI tool

a. Step 1—Coping Strategies: Getting the right list for the location

The first step in the design process is to identify the locally relevant coping strategies in the study area. As mentioned above, these fall into four basic categories:

- **Dietary change**
- **Short-term measures to increase household food availability**
- **Short-term measures to decrease numbers of people to feed**
- **Rationing, or managing the shortfall**

Box 4: A Generic List of Coping Strategies
1. Dietary Change
a. Rely on less preferred and less expensive foods?
2. Increase Short-Term Household Food Availability
b. Borrow food, or rely on help from a friend or relative?
c. Purchase food on credit?
d. Gather wild food, hunt, or harvest immature crops?
e. Consume seed stock held for next season?
3. Decrease Numbers of People
f. Send children to eat with neighbours?
g. Send household members to beg?
4. Rationing Strategies
h. Limit portion size at mealtimes?
i. Restrict consumption by adults in order for small children to eat?
j. Feed working members of HH at the expense of non-working members?
k. Ration the money you have and buy prepared food?
l. Reduce number of meals eaten in a day?
m. Skip entire days without eating?

Over various applications of the CSI, a fairly standard set of coping mechanisms has been identified in each of these categories. This list is presented above in Box 4. This is a generic list: Not all strategies mentioned would be used in all places. For example, using the little money available for purchasing prepared foods is largely an urban strategy, which probably doesn't occur often in rural contexts, whereas consuming seed stock is a very serious indicator of food stress only in areas where farming is practiced. The list in Box 4 should not be taken as a comprehensive list of all coping strategies encountered in any situation, but it serves as a good starting point for a key informant interview or focus group discussion.

Procedures to derive a context-specific list of coping strategies

The list is established through focus group interviews with members of the local community. During the interview:

- Starting with a list like the one offered in Box 4, or something similar brainstormed in the context, find out which strategies people use in the study area. If some of those on this list don't apply, simply omit them, and add others not on the original list.
- For each of the four general categories (labeled 1-4 in bold in Box 4) probe to find out if there are any other relevant local strategies that are not included in the list presented in Box 4. If there are, add them to the list.
- Be sure that you only include consumption coping strategies (See Box)
- You should repeat the exercise for several focus groups to ensure that the list reflects a broad opinion. Make sure that the focus groups include women, who usually know more about household consumption patterns than men do.
- Make sure that the coping strategies are used in times of scarcity, and are not just a normal way of operating (for example, purchasing food on credit from a trader may be a standard practice in many places, and by itself does not indicate food insecurity).
- The list should be the *main* set of coping strategies—it doesn't need to include every single strategy mentioned, but should represent the consensus view of all the groups interviewed. Try to keep the list down to a feasible number (probably fifteen or less).

What is a Consumption Coping Strategy?

The difference between a "consumption coping strategy" and a "livelihood coping strategy" is defined by the following questions:

- Is it related specifically to food consumption?
- Can it be done quickly and readily (today or tomorrow)? (Consumption coping can be done quickly).
- Is it reversible? (Consumption coping can be reversed when it is no longer needed).
- Can the behavior be used continuously or it is a one-off strategy? (Consumption coping can be utilized as needed—they aren't one-off activities).
- Does it depend on the initial asset holdings of a household? (Asset sales may be related to consumption, but is not considered a consumption coping strategy per se because it isn't reversible and can only be done once. (For instance, if no asset sales were recorded in a household interview, it might be because the household didn't need to, or it might be because the household had none to sell).

b. Step 2—Frequency: Counting the relative frequency of strategies

Research has found that the best way to assess the frequency of coping strategies is not to count the number of times a household has used them, but to ask a household respondent for a rough indication of the relative frequency of their use over the previous month. Precise recall is often difficult over a long period of time, but asking for the relative frequency provides adequate information. A typical example (based on the same set of questions as Box 4) is presented below in Box 5.

There are various ways that a relative frequency count can work—this one asks roughly what proportion of the days of a week people have had to rely on various strategies.

Box 5: Consumption Coping Strategy Responses (CSI)					
In the past 30 days, if there have been times when you did not have enough food or money to buy food, how often has your household had to:	Relative Frequency				
	All the time? Every day	Pretty often? 3-6 */week	Once in a while? 1-2 */week	Hardly at all? <1 */ week	Never 0*/week
a. Rely on less preferred and less expensive foods?					
b. Borrow food, or rely on help from a friend or relative?					
c. Purchase food on credit?					
d. Gather wild food, hunt, or harvest immature crops?					
e. Consume seed stock held for next season?					
f. Send household members to eat elsewhere?					
g. Send household members to beg?					
h. Limit portion size at mealtimes? i. Restrict consumption by adults in order for small children to eat?					
j. Feed working members of HH at the expense of non-working members?					
k. Ration the money you have and buy prepared food?					
l. Reduce number of meals eaten in a day?					
m. Skip entire days without eating?					

Procedures for developing a relative frequency tool

1. Note the way in which the question is worded at the top—the same kind of question should be developed and it should define the recall period.
2. The relative frequency categories should be worded such that they can easily be described in greater detail if needed. For example, in Box 5 each relative frequency is described in terms of the number of days in an average week over the past 30 days in which a given strategy had to be used.
3. Note that you are always asking about some time period beginning from today and counting backwards (i.e. "the last thirty days" not "the past month," or "last month"). People get confused if you are not specific about this.
4. One category should be "all the time" and one category should be "never." The intermediate categories can be changed around according to conditions and the amount of detail required. In general at least five relative frequency categories are recommended, as the example in Box 5 shows.
5. In using the tool, the question at the top should be repeated for each of the strategies on the list, and the appropriate relative frequency box should be ticked.
6. Scoring the results is explained below in Section 5d.

You now have the basic tool you need to conduct a household survey using the CSI. It should contain the following elements:

- A set of coping strategies or individual behaviors that represents the consensus of a diversity of groups in the community, location or culture, which people rely on when they don't have enough food and don't have enough money to buy food.

- A set of relative frequency categories to record about how often people are forced to rely on these strategies or behaviors.

In order to conduct the analysis of the CSI, however, you need a few more pieces of information. The first is a way to "weight" the individual strategies or behaviors.

c. Step 3—Severity: Categorizing and weighting the strategies

The CSI tool relies on counting up coping strategies that are not equal in severity. Different strategies are 'weighted' – multiplied by a weight that reflects their severity before being added together. The simplest procedure for doing this is to simply group the strategies according to similar levels of severity and assign a weight to each group.

A simple procedure for grouping strategies of similar severity

The severity of coping strategies is, to some extent, a matter of perception. While not eating for a whole day or consuming the seed stock set aside for the next planting season undoubtedly constitute severe coping behaviors in nearly any culture, some strategies would be looked on as perfectly normal behavior in some places—and as great sources of shame (and therefore to be practiced in the most extreme circumstances) in other places. An example is borrowing food. In some places this is not significant, but elsewhere it could be indicative of destitution or very severe food insecurity. Hence nothing should be assumed about the severity of a given strategy in a given location or culture. Instead, a series of focus group discussions should ask questions about the perceived severity of all the coping behaviors that end up on the list generated using the procedures in Section 4.a. In fact, it is possible to ask the same focus groups to first help to brainstorm the list, and then to discuss severity (though it is sometimes useful to have separate discussions so that the list of coping strategies or behaviors is established and agreed first—a process that requires several focus groups). Then the exercise below is carried out to establish the severity of each strategy or behavior.

- The first step is to try to group the strategies into categories that are of roughly the same level of severity. Since this task is carried out with different groups, it is useful to impose some structure from the outset. For example, one could divide them into four different categories: very severe, severe, moderate, and not severe.
- It is always easiest to establish the extreme types of coping strategy, so ask the group to select the most severe and least severe individual strategies first.
- Then ask if there are other individual strategies that are more or less the equivalent of these two in terms of how severe they are perceived to be. When those two extreme categories are established, it is easier to group the remaining behaviors into intermediate categories.
- This must be done with enough groups representing enough diversity within the location or culture to ensure that a reasonable consensus has emerged. Weighting the individual strategies wrongly will result in errors in the analysis.

Box 6: Example of Coping Strategies Grouped and Ranked by Focus Groups*

Strategy	FG1	FG2	FG3	FG4	FG5	FG6	FG7	FG8	FG9	FG10	FG11	FG12	Ave.	Consensus Ranking
a. Less Preferred	1	1	1	1	1	1	1	1	1	1	1	1	1.0	1
b. Borrow	2	2	2	2	2	3	2	2	2	2	2	2	2.1	2
c. Buy on Credit	2	2	1	2	1	3	-	2	2	2	2	3	1.8	2
d. Wild Foods	5	5	3	3	3	4	4	4	4	5	4	4	4.0	4
e. Eat Seed Stock	-	-	3	3	3	4	2	3	4	2	4	4	3.2	3
f. HH Eat Elsewhere	-	-	2	2	2	1	3	2	2	3	2	3	2.2	2
g. Beg	5	5	4	4	3	3	2	4	4	5	5	5	4.1	4
h. Limit Portions	1	1	1	1	1	1	1	1	1	1	1	1	1.0	1
i. Restrict Adult Intake	3	2	2	-	-	2	3	1	3	-	-	2	2.7	3
j. Feed workers	3	3	2		2	2	3	1	3	3	3	2	2.3	2
k. Street Food	-	-	-	-	-	-	-	-	-	-	-	-	-	-
l. Reduce Meals	1	1	2	1	1	1	1	2		-	3	1	1.2	1
m. Skip Days	4	4	3	3	4	4	4	3	4	4	3	4	3.7	4

* Data from Kenya Pilot Study (Garissa District)

- Although there is no hard and fast rule on how many focus groups is "enough," a minimum of 6-8 is recommended for the culture or location, with the main different social groups represented. Again, women are likely to be the most knowledgeable informants, but men should be consulted as well.

Several things should be noted about Box 6:

- The individual strategies listed have been grouped into four categories, where 1 = the least severe category; 4 = the most severe, and 2 and 3 are intermediate.
- Twelve different focus groups were consulted about their perceptions of the severity of the various individual strategies. There was not complete consensus except that limiting portion size was the least severe; skipping entire days or begging were the most severe.
- However, a quick glance will indicate that there was fairly good consensus on the severity of most of the strategies.
- In general, the consensus ranking should be a whole number that is the most frequent response.

While the method described above works fine, a more sophisticated way to group the coping strategies is described in Appendix 5.

d. Step 4—Scoring: Combining frequency and severity for analysis

To be able to conduct an analysis of the results of CSI, two more pieces of information are needed. The first is a means of scoring the relative frequency; the other is a means of scoring the weights you just derived in Section 5.c. Both are very straightforward procedures.

Procedures for assigning scores for relative frequency

Recall that the relative frequency categories were rough measures of how many days in a week a household had to rely on the various coping strategies—ranging from "never" to "every day." The simplest means of scoring these results so that you obtain a quantitative measure for frequency is to take the mid-point of the range of days in each category, and assign that as the value for the category. Thus Box 7 depicts the way numeric values were assigned for relative frequency in the Kenya Pilot Study.

Box 7: Assigning numeric values to relative frequency

The relative frequency categories….				
All the time? Every day	Pretty often? 3-6 */week	Once in a while? 1-2 */week	Hardly at all? <1 */ week	Never 0*/week
are scored according the mid-point value of the range of each category:				
7	4.5	1.5	0.5	0

Procedures for assigning scores for the severity of coping

To use the simple method of weighting the strategies described above, the group severity ranking and the weighting is the same. That is, all the least severe strategies are weighted 1, the next group is weighted 2, etc. and the most severe category is weighted 4,

An important procedural note: Make sure that the values for both the relative frequency and for severity influence the CSI score in the same way or "pull in the same direction."

- The simplest way to think to think of this is to remember that the higher the CSI raw index score, the more *food insecure* a household is. That means that, first, the more often any coping strategy is used, the higher the score should be for that individual strategy; and second, the more severe a strategy is, the higher the weight should be for that whole ranked group. The examples given above illustrate this.
- Scoring the other way round–i.e. more days = a *lower* relative frequency score, and increased severity = a *lower* weighting, then the higher the CSI score, for more food secure a household would be. While in some ways this is a more appealing measure, it is counter-intuitive for field workers and analysts to assign a lower number for more days, and a lower number for greater severity, so it is best to avoid this.

- But note that if you don 't score both the same way (i.e. if you scored one of them in and increasing scale and the other in a decreasing scale), you would get very confused results that would not be valid for any analysis.
- It is important to remember that ***the CSI as described here is a measure of food insecurity***—the higher the score, the greater the food insecurity.

Now you have all the pieces you need to collect the information and analyze it. A complete example (based on an actual household from the Kenya Pilot Study) is given in Box 8, using the above examples, and weighted according to the example given above.

Box 8: An actual example—Calculating a household CSI index score

In the past 30 days, if there have been times when you did not have enough food or money to buy food, how often has your household had to:	**All the time? Every day**	**Pretty often? 3-6 */week**	**Once in a while? 1-2 */week**	**Hardly at all? <1*/week**	**Never**	**Raw Score (Box 7)**	**Severity Weight (Box 6)**	**Score = Relative Frequency X weight**
Relative Frequency Score (Box 7)	**7**	**4.5**	**1.5**	**0.5**	**0**			
a. Rely on less preferred and less expensive foods?		X				4.5	2	9.0
b. Borrow food, or rely on help from a friend or relative?			X			1.5	4	6.0
c. Purchase food on credit?			X			1.5	4	6.0
d. Gather wild food, hunt, or harvest immature crops?					X	0	8	0
e. Consume seed stock held for next season?					X	0	6	0
f. Send household members to eat elsewhere?				X		0.5	4	2.0
g. Send household members to beg?					X	0	8	0
h. Limit portion size at mealtimes?	X					7	2	14.0
i. Restrict consumption by adults in order for small children to eat?			X			1.5	6	9.0
j. Feed working members of HH at the expense of non-working members?					X	0	4	0
k. Ration the money you have and buy prepared food?					X	0	N.A.	-
l. Reduce number of meals eaten in a day?		X				4.5	2	9.0
m. Skip entire days without eating?					X	0	8	0
TOTAL HOUSEHOLD SCORE	Sum down the totals for each individual strategy							**55.0**

Box 8 is an actual example of a household from the Kenya Pilot Study. For a complete explanation of how the scoring works, see this same example in Appendix 2.

Interpreting the CSI score

As you can see, the hypothetical household in Box 8 has a CSI score of 55. What does this tell us? By itself, the score doesn't tell us much. If you glance at the actual results, you can see that the household depicted actually has fairly moderate levels of food insecurity—none of the most severe coping behaviors are noted, and only moderate levels of most of the others.

But just looking at the CSI score itself for a moment, this household has a score of 55. While the number itself doesn't mean much, if another household has a score of 80, we could state fairly unambiguously that the household with a score of 55 is *less food insecure* (i.e. more food secure) than the household with a score of 80, provided that they are both from the same community, location or culture for which this CSI tool was adapted.[1]

More to the point, however, is that if the household in the example has a score of 55 in July of a particular year, a score of 76 in September of that year, and a score of 92 in November of the same year, we could state unambiguously that that household's food security status is getting worse. If on the other hand, we noted that an intervention (in this case, emergency food assistance) had begun in that area, and the household in the example was receiving food aid, we would want to watch very carefully what happens to the CSI score. If it improves (i.e. if the CSI score decreases) and nothing else significant changes (i.e. there has been no new harvest, etc.), it would be fairly good evidence of a positive impact of the emergency food assistance.

Examples of this will be discussed in further detail in Section 8. First, we need to review and assess some methodological points about how you would actually go about collecting the information discussed above.

A more sophisticated analytical procedure: standardizing the CSI scores

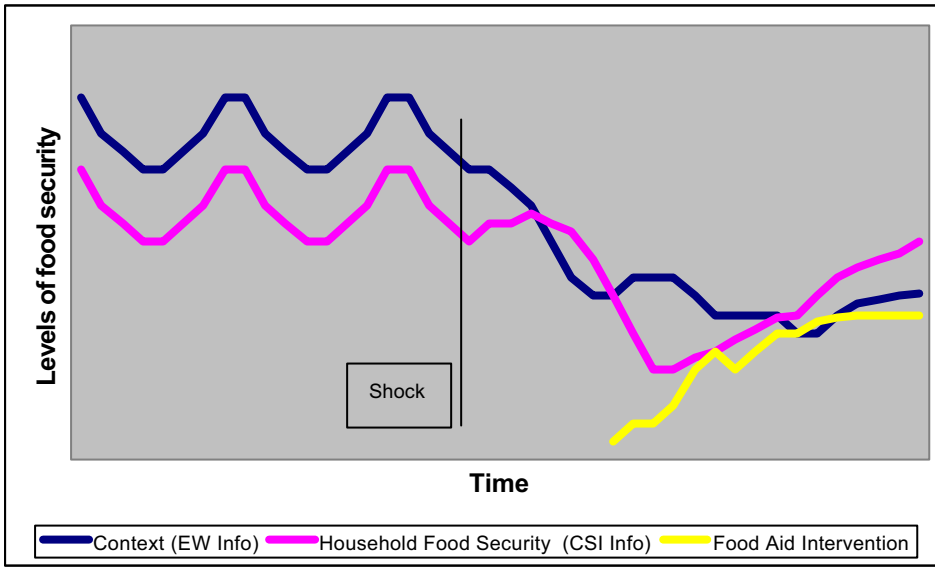
CSI scores can be standardized for a given location, by using a computerized linear normalization process. This makes the data easier to work with, but in field applications where either the equipment or skills aren't available it isn't necessary to standardize results in order to use them for monitoring or for other applications of the CSI.

e. Step 5—Analysis: Correlating CSI with other information

To be able to measure the impact of an emergency food intervention, information must be available about the intervention (food aid receipts) for the same households and from the same general location (early warning information). Information from CSI can be correlated with both, over time, to show the relationship between the overall food security context (early warning information), household food security (CSI information) and the effect of an emergency food intervention (household food aid receipts information). A hypothetical example is depicted in Box 9.

[1] At this point, there is no firm evidence about whether raw CSI scores can be directly compared across different locations. For the safest results, caution should be exercised in making comparisons of raw scores that are not from the same locations or culture for which a specific application is prepared.

Box 9: Relationship of Early Warning, CSI and Food Aid Information



The dark blue line depicts Early Warning information, which shows some seasonal variation in the overall food security situation during "normal" times. The pink line depicts the household food security situation as measured by CSI (actually, the line depicted is the inverse of the CSI, since as you recall, the CSI is a measure of food insecurity). The CSI information roughly mirrors the overall situation. A shock (a drought, or conflict, etc.) occurs which has an immediate effect on early warning indicators, and has a lagged effect on the household situation, which eventually becomes serious enough that an emergency food intervention is mounted. At first, the food intervention has little impact on the household situation, but eventually begins to improve short-term household food security. After a while, the overall situation begins to improve as well.

The analysis in Box 9 represents some kind of average figure for an affected community or district. CSI can be used to generate this kind of information. But CSI can also be used to provide disaggregated information about targeted and non-targeted households, or to provide information about particularly vulnerable groups. In that way it can provide much more specific information than what is depicted in a general way in Box 9. The trend analysis shown in Box 9 is a depiction of information in time lines that are projected onto the same graph. In actual usage, the analysis would be more likely to be a simple correlation between CSI information and food aid receipt information, or between CSI and early warning (EW) information, at different points over time. Examples of this kind of analysis are given in Appendix 1 from the Kenya Pilot Study.

6. Notes on data collection and analysis

Entire books are written about field methods of collecting information. This section is just a very brief review of a few pertinent issues.

a. Applications

The CSI as it has been developed can be applied in two primary ways. The first is as part of a **quantitative household survey**, in which exactly the same questions are asked of each household so that results are comparable at the household level (and averages are comparable at higher levels such as location, district, etc.). This is the way in which the examples noted above are intended to be used, and it is the *only* way in which the tool can be used to track impact at the household level (which is important for most applications of the tool).

However, depending on the objectives of the monitoring, the CSI can also be adapted as a **qualitative tool** (applicable to Participatory Rapid Appraisal or PRA). As you will have noted, there is some amount of qualitative PRA work involved in getting the CSI tool adapted to a local situation anyway. If need be, the tool itself can be used in focus group discussions in which community averages are the topic of the discussion, rather than individual household scores. In that case, the CSI tool can be used in conjunction with a proportional piling exercise to obtain the relative proportions of groups in the community relying on various coping strategies. While more difficult to disaggregate, (which means it can't be used to check on household targeting, etc.) using the CSI as a PRA tool does give some level of information about the average impact at the village or community level, and can be a useful cross-check on household level information. This is spelled out in greater detail in Appendix 3.

Emergency affected communities can also use the CSI tool in community-based preparedness or to monitor emergency response. In such applications, the qualitative tool is probably more useful, since it is primarily a discussion tool rather than a survey tool. See Appendix 3 for further explanation.

b. Sampling

To use the CSI tool as part of a household survey, you will have to select a sample. Again, entire books are written about sampling, but two main principles are important in selecting a sample that will enable you to draw conclusions about the population you want to track in monitoring an intervention:

- First, the sample has to be large enough that it is a fair representation of the population.
- Second, each household in the population has to stand the same chance of being selected into the sample.

Obviously, when monitoring impact in an emergency, it will be difficult to obtain a perfect sample: there will rarely be a pre-existing sampling frame; population size may not be known; there may be few easily identifiable clusterings within the

population and the size of these may not be known; pre-existing information about means and standard deviations of critical variables are unlikely to be known; etc. In brief, it will be very difficult to devise a sampling scheme that would achieve high statistical precision—and yet the whole purpose of monitoring is to make inferences about the impact of food security for a population based on collecting information from a sample of that population. So a few "rules of thumb" are in order.

- At its most basic level, the CSI should be used with whatever end-use monitoring of food aid is already on going. In the absence of baseline CSI data, this type of information will be difficult to interpret at first, but should at least provide basic information about whether food security is improving or deteriorating.
- A preferable approach would be to conduct a baseline survey, along with surveys sometime during the course of the intervention and a final evaluation. The monitoring just described above would provide much more useful information if larger, probability sampling were used to establish baseline and interim levels of household food security.
- If the baseline/mid-term/final survey approach is used, a sample should be selected that, at a minimum, consists of 20 clusters, selected randomly from within the entire area in which the CSI is being administered, with a random sample of 20 households within each cluster.
- If used in conjunction with the "baseline/mid-term/final" approach, CSI is ideally suited to a sentinel site approach to monitoring, in which certain sites or locations are selected for more intensive monitoring on a purposive basis (though samples within sites should still be random).
- In addition, CSI can be added on to nutritional surveys or other baseline or evaluation information collecting activities.

It should be noted that for purposes of statistical rigor and the ability to draw inferences, the 20X20 cluster approach is the **minimum** acceptable sample size. Other forms of sampling may yield some indicative information, but not statistical significance. More details, including various sample sizes and strategies for baseline, mid-term and final surveys, as well as information about how to select households in the absence of a proper sampling frame, are presented in Appendix 4.

c. Respondents

Once you have selected the appropriate households, you also need to find the right respondent within the household. The best person to ask about coping is the person in the household that is in charge of preparing food and seeing to it that members eat. Usually, but not necessarily always, that person is the senior female member of the household—typically the wife, the mother, or female head of household. However, there are cases of households that do not have such a member, or there may be another person in the household who is responsible.

In extreme emergencies, households may be broken up, and the notion of a "household" may require modification. In general, households are usually defined in terms of the group of people who eat together or eat from the "same pot."

d. Some miscellaneous concerns

Other information

While this manual is just about the CSI, you will need other information as part of a household questionnaire as well. At a minimum, you will need information to **identify the specific household** in the analysis—usually at least information about the location, village or cluster, and a household identification number of some sort. If the information is being used for on-going monitoring, you will need the date on which this particular information was gathered about this household so you can track changes over time. And chances are that you will need information about the **demographics** of the household: at a minimum size of the household, but also the sex of the head of household, perhaps age, sex and educational achievement of all members, etc. The extent of the information to be collected depends on the overall objectives of the monitoring, but at a minimum household size is required, and sex of household head is a common way to disaggregate results.

To track the impact of food aid, obviously, you will need information about not only food security status (from CSI) but also about the receipt and end-use of **food aid**. Additionally, contextual information (early warning information) is also useful. Section 7 goes into these kinds of information in more detail.

Other information needed will depend on the objectives of the use of the CSI tool. The primary purpose being described in this manual is monitoring the impact of food aid in emergencies, but as noted, CSI has many other applications.

The "learning effect" and respondent recall

As with any information gathering technique that relies on respondent recall, there is the possibility that recall information is not accurate, or that the respondent will realize that it may be in his or her interest to "recall" more "coping" than actually took place—in order to ensure that his/her household remains on the targeted list for food distribution. For this reason, the general recommendation is that the tool not be used repeatedly with the same sample of households—the same procedures should be used in the same communities, but a new sample of households should be selected for each round. Household information is still obtained, and community averages and variances can be looked at over time. But the "learning effect" is minimized at the level of the individual respondent.

Other methodological concerns

- As with any data collection enterprise, crosschecking information for accuracy and completeness in the field is critical.
- The CSI tool can be used as a qualitative application as well, and working with both qualitative and quantitative information in the same monitoring plan offers a quick cross check on validity.
- Be careful to rule out other possible causes of changes in food security status before attributing changes to a food aid intervention. Seasonality must always be factored in, as should other changes in general food security status (a harvest, changes in prices, changes in labor opportunities, etc.)

7. Corollary information required for a complete analysis

a. End use monitoring

In its most basic application as an impact-monitoring tool, the CSI *must* be used in conjunction with some means of measuring the receipt and usage of food aid—often referred to as an end-use monitoring form, or a post-distribution monitoring form. An example of such a form is provided in Box 10 (and more examples are provided on the CD-ROM that contains Appendix 6).

Box 10: Receipt and end use of food aid

	Grain	Pulses	Oil	Supp*
How much food aid (kgs.) has your household received in past month?				
How much food aid (kgs.) of that was: consumed?				
sold?				
"taxed?"				
spoiled?				
stolen?				
given to others?				
fed to livestock?				

*Supp = Supplementary Foods

In the past six months, how many times has your household received food aid?		
	Yes	No
Did you have to pay anything to receive food aid?		

	Distribution	Chief	Friends	Other: _____
Of total food aid consumed, how much of the food (kgs.) aid did you get from:				

	Day	Month	Year
When was the last distribution you received?			

For the purposes of making a comparison with the CSI, two main indicators are necessary from an end-use monitoring form. First, the **total amount of food consumed**, since that is actually the additional food that reached household members as a result of the emergency intervention. The second is the **total amount actually received** by the household, even if was not directly consumed. Food that was allocated to the household but which didn't actually reach it (either because it was stolen, taxed, spoiled, etc.) should be deducted from the total allocation to get the amount that reached the household. Both of these measures should be correlated with household food security status as reflected by the CSI. If the food aid

is reaching the intended households that were targeted by the intervention, in sufficient quantities, then over time, the CSI should decline, reflecting improved food security status. By checking the CSI in recipient and non-recipient households over time, the accuracy of the targeting mechanism can also be checked.

b. Early warning monitoring

If the CSI is incorporated into monitoring even before an intervention is begun, as part of an early warning or food security information system, CSI can also be compared with other (non-household) indicators of the general food security situation. It should be stressed, however, that while most of the indicators tracked in an Early Warning System are "leading indicators" (indicators that note a potential problem before it arises) the CSI is both a "concurrent indicator" and a leading indicator (that is, it gives information about both current and future status).

8. Applications of CSI: Informing decision making

Box 9 (in Section 5.e) depicts a hypothetical example, but it illustrates several analytical applications of CSI to making informed decisions about program management. There are at least four different ways in which CSI can improve the decision-making and management of an emergency food intervention.

a. The impact of food aid interventions

The impact of food aid interventions is a major application for CSI. CSI is depicted in Box 9 on page 17 to measure the depth of household food insecurity, and to check to see whether or not an emergency intervention has the desired impact (both qualitatively and quantitatively). Note that at first, the food aid intervention has no impact on falling levels of household food security—probably because the magnitude of the response is too small compared to the magnitude of the emergency. However, as the intervention is stepped up, it eventually does have some effect on the household food security situation that eventually climbs back to the "normal" level (although note that "normal" here does not necessarily equate with "adequate").

b. Timing of food aid interventions

If incorporated into Early Warning Systems (EWS), The CSI can provide household level information that complements other information, and gives an accurate picture of the household situation—often a component lacking in EWS. This would enable a much more timely intervention, because most EWS information has to do with rainfall, crop production, prices, and markets—all of which are related to household food security, but don't accurately reflect the extent to which human beings are getting access to adequate food. Incorporating CSI information into EW information has the added advantage of providing baseline information for the CSI—so that program managers have a target level of household food security, as indicated by the CSI tool, which an emergency intervention should aim to restore. If enough information is collected, an analyst can get an idea of roughly what level of CSI score represents an "adequate" level of food intake (but note that this kind of "cut-off" point is probably situation specific; depends on how the individual coping behaviors have been weighted; and is best thought of as a range, not a discreet cut-off).

c. Targeting of food aid interventions

Although not depicted in Box 9, the CSI tool can be used to measure household food security both in households that are targeted for an emergency intervention and those that are not, and can be used to tell whether the targeting mechanism is working or not. This analysis would be greatly enhanced if CSI information was available before the emergency intervention, since it would then be possible to determine the extent of the impact of the shock or emergency on targeted and non-targeted households, and the extent to which non-targeted households were rendered food insecure by the impact of the shock itself. If checking the efficiency of targeting (rather than monitoring impact) is the chief objective of using the CSI tool in an emergency, additional information will be required on the livelihood strategies and assets of given households, so that targeting criteria can be cross-checked and to provide a control for checking on targeting efficiency (an example is provided in Appendix 1 on the Kenyan Field Study).

d. Timing transitions and the redesign of interventions

If the example in Box 9 were extended in time to depict the end of the effects of the shock, the CSI information could be used to inform program managers when it is time to phase out the emergency intervention, or transition to a different kind of intervention—and could track the impact on household food security of making that transition. Since information would be known about household food security levels, it would help managers decide whether a food-for-work intervention of a cash-based intervention would be more appropriate, or whether some different kind of intervention altogether is called for. At the moment, little of this information is routinely available to program managers.

9. Other applications of CSI

a. An early warning indicator

The advantages of incorporating CSI into Early Warning Systems have already been discussed. CSI gives the added dimension to early warning of household level food security information—which is often lacking in many EWS. Having CSI information already on hand greatly enhances both analytical capability of early warning, and the timeliness of response.

b. A long-term food security indicator

Though intended here as an indicator of relatively short-term food security status, the CSI tool could be used to track the impact on household food security on longer-term interventions (i.e. development projects and programs) in addition to short-term (emergency) interventions. The only consideration to be aware of is that the CSI is sensitive to short-term changes such as seasonality, or the effects of shocks, however major or minor. So if being used to track long-term interventions, just make sure that short-term influences such as seasonality are factored out of the analysis (for example, by making sure that a baseline survey and an impact evaluation survey are conducted at the same time of the year/harvest cycle, etc.).

c. A food aid needs assessment tool

The CSI can be used in conjunction with other methods to estimate the requirement for food aid, but the CSI needs to be calibrated. To use the CSI for this purpose, all of the procedures outlined in this manual are valid and should be followed first, but several additional, subsequent steps are required as well. After adapting the CSI to local conditions and ensuring that it is adequately capturing changes in the food security of the population being monitored, the relative changes seen in the CSI scores must be calibrated to absolute and relative needs for levels and timing of food assistance. Detailed procedures for how to do this have not yet been developed, because the tool must be adapted to a local context.

This can be accomplished by piloting the CSI alongside the current assessments (Food Economy, etc.) you are using to determine food aid needs and calibrating changes in the CSI with your assessment results/determination of food aid needs. If, for example, other methods have identified particularly vulnerable groups who require immediate food assistance, a quick cross-check with the CSI tool can yield an average score for that context that could be used as a cut-off point for determining which households need food aid among other groups in the same general location or context. Note that it is impossible to use the CSI for needs assessment purposes without doing this, because there is no pre-existing basis on which to assign a cut-off. Once this has been accomplished, however, the CSI tool could be used for making further estimates without doing the other, longer and more costly assessment and to determine which groups need food aid and when. To determine changes in food aid needs, follow-up assessments incorporating CSI would be performed at intervals indicated by cross-referencing early warning and baseline livelihoods information and indications from previous CSI assessments. After a series of CSI assessments have been performed in a given area, the CSI determination of food needs can potentially be calibrated with the CSI determination of food aid program impact.

d. Using CSI with other food security indicators and approaches

Although CSI has been developed separately from the **Food Economy Approach** developed by Save the Children-UK and others, it is compatible with the FEA approach, which takes coping strategies into account. In fact, CSI appears to complement FEA rather well, because it closes some gaps in the information cycle—particularly the rapid monitoring of impact—to which FEA is not particularly well suited. As noted above, if used in conjunction with FEA to assign average scores to groups requiring food assistance, rapid CSI assessments can actually to some extent take the place of longer, more involved FEA assessments.

As noted, the CSI tool is compatible with—and indeed will help agencies to hold themselves accountable to—**SPHERE Minimum Standards**. However, it should be noted that the SPHERE minimum standards with regard to emergency food interventions are measured in calories per person per day. CSI does not measure caloric intake (only a very detailed and expensive consumption survey can do that). However, when used in conjunction with a food aid end-use monitoring form, CSI can tell whether or not a targeted household received enough food to constitute a 2100 Kcal per person per day ration, and whether that was "adequate" in terms of the coping behaviors of the household in question. In many—perhaps most—

emergency circumstances, households are either not targeted for a complete ration (2100 Kcal for *all* members for the *entire* month), or else there simply aren't enough resources to permit this kind of blanket coverage, even if the circumstances call for it. Under these circumstances, the CSI will first help to target the most vulnerable cases; and second, provide the kind of impact information program managers need to advocate to donors for higher levels of resource allocations.

The CSI is compatible with—and indeed was developed to complement—**nutrition surveys**. Nutrition surveys give the best information about the status of individual human beings (usually children under the age of five years, though measuring adult nutritional status is also possible). However, nutrition surveys themselves provide little information about causal factors unless complemented with other information—and the information required deals mainly with food security and health status. Using the CSI in conjunction with a nutrition survey provides information about food security status—and can be complemented with questions about health information (see the Kenya Pilot Study questionnaire for an example).

10. References

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11. Appendices

1. **A brief sketch of the Kenya Pilot Study**
2. **Illustrated calculations of the CSI from the Kenya Pilot Study**
3. **A brief description of the qualitative (PRA) application of the CSI tool**
4. **Further notes on sampling**
5. **More sophisticated methods of weighting the CSI**
6. **Additional tools and computer applications (on diskette)**

Appendix 1: A brief sketch of the Kenya pilot study

Background

The Coping Strategies Index (CSI) was found through long-term research studies to reflect current food security status accurately, and was also found to be a good predictor of vulnerability to future food insecurity (Maxwell et al., 1999; Christiaenson and Boisvert, 2000). However, these studies were conducted with plenty of time available for data collection and analysis, and policy recommendations following data collection by more than a year. Despite the fact that one of the key advantages of the CSI is its relatively simple and rapid format, it was unknown whether it was applicable to the tracking of food security emergencies or emergency interventions. Measuring either the impact of emergencies themselves on food security, or the impact of interventions in emergencies, has mostly been limited to infrequent nutritional surveys, or expensive ex-post evaluations. WFP and CARE International collaborated to design and implement a pilot study of the CSI in Kenya to test the its applicability to tracking food security emergencies, and the impact of food aid interventions in emergencies. The study was managed jointly by WFP and CARE. Field work was supervised by Dekha Sheikh.

Objectives

The objectives of the Kenya Pilot Study were:

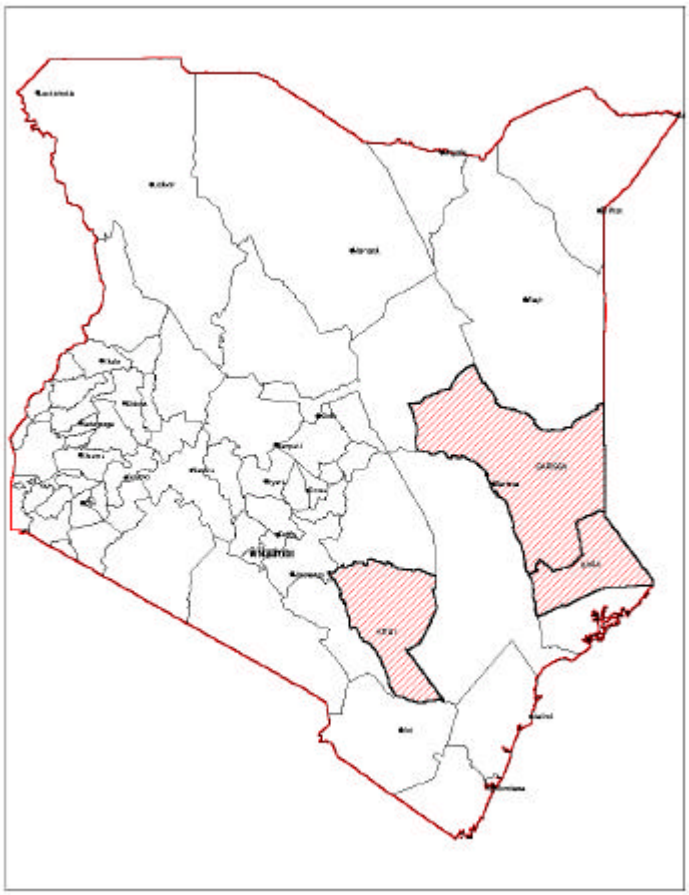
1. To test the CSI against other measures of food security
2. To test whether changes in coping behaviors correspond to changes in the environment that affect food security (early warning indicators)
3. To test whether the index responds to the intervention of food aid.

Methods

The study was carried out in two districts of Kenya—a pastoral area (Garissa district) and a marginal rain-fed agricultural area (Kitui district). Both were affected by the 1999-2000 drought and subsequent WFP Emergency Operation (EMOP). Map 1 shows the locations of the study.

A questionnaire was designed to capture a full range of food security and livelihood indicators, including the CSI (See Research Questionnaire on CD-ROM) and the CSI was designed and implemented as described in this manual. Random samples were selected from the same clusters in each district over three rounds, at different points during the EMOP. Both qualitative and quantitative data were collected and analyzed. Thus data were generated that permitted a cross sectional analysis, and to a limited degree, permitted tracking of changes over time.

Map 1: Kenya (Garissa and Kitui Districts Highlighted)



Results

Three hypotheses resulted from the objectives:

1. The CSI correlates significantly with Food Frequency, asset ownership, income and other measures of livelihood security.
2. The CSI correlates significantly with changes in early warning indicators.
3. The CSI picks up the impact of a food aid intervention.

Bi-variate and multi-variate analysis was carried out to test these hypotheses. Table 1 shows the results of the bi-variate correlation between the CSI and a food frequency measure, intended to be an alternate measure of food security. The table is broken down by Survey Round and District.

Table 1. Correlation of CSI and Food Frequency Indicator (Pearson's r)

District	Rd1	Rd2	Rd3
Garissa	-0.204**	-0.379**	-0.435**
Kitui	-0.307**	-0.457**	-0.434**

** p < 0.01 (Two-tailed test)

Bearing in mind that the CSI is a measure of food insecurity (the higher the score, the greater the level of household food insecurity), these results strongly confirm that the CSI and Food Frequency indicators were picking up the same trends in terms of household food security, which tends to confirm part of the first hypothesis (correlation of CSI to other food security indicators).

Multi–variate analysis was conducted using the CSI as the dependent variable. Independent variables include location, asset ownership, income sources, non-consumption coping strategies (asset sales, alternative income sources, expenditure reduction, migration, etc.), as well as the receipt and timing of food aid.[2]

Table 2 shows the regression coefficients and significance levels for all these variables. The upper number is the coefficient; the lower number is the standard error. Starred coefficients indicate a statistically significant relationship.

Asset ownership is negatively associated with CSI, which stands to reason—more assets would imply both a higher level of wealth generally, as well as a greater capacity to cope with a shock without it necessarily affecting food security. CSI was positively but weakly correlated with different kinds of income, including agriculture, livestock and labor, but negatively correlated with the number of income sources. This indicates that all kinds of incomes were affected by the drought (note that both an agricultural and pastoral area were included in the sample—analyzing the results separately for each district would likely have sorted out the differences between livelihoods systems). But it also means that the greater the level of livelihood diversity, the greater the household's capacity to withstand shocks.

Many of the other non-consumption strategies were correlated (at varying levels of significance) with the CSI. This is an extremely important finding, because it implies that various kinds of coping tend to co-vary. This suggests that the limited set of consumption coping strategies that can be easily measured with the CSI are an accurate reflection of other kinds of coping going on at the household level, and the substantial additional information collected in the pilot study on non-consumption strategies need not be collected to have an accurate picture of the level of coping at the household level. In other words, this finding implies that the CSI is an adequate stand-alone indicator. All this evidence tends to support hypothesis 1.

[2] This analysis was conducted by Greg Collins.

Table 2. Regression Analysis of CSI[#]

Variable		Model 1	Model 2	Model 3	Model 4	Model 5
Garissa District	Coefficient	0.402***	0.019	0.015	0.110	0.110
	Standard Error	(0.042)	(0.060)	(0.088)	(0.087)	(0.085)
Radio Ownership		-0.424***	-0.364***	-0.331***	-0.272***	-0.275***
		(0.043)	(0.043)	(0.044)	(0.043)	(0.041)
Land Ownership		0.258***	0.211***	0.197***	0.199***	0.179***
		(0.051)	(0.051)	(0.052)	(0.050)	(0.048)
Sum of Assets		-0.061***	-0.073***	-0.068***	-0.079***	-0.065***
		(0.012)	(0.012)	(0.014)	(0.014)	(0.013)
Survey Round One			-1.018***	-0.998***	-1.099***	-0.610***
			(0.065)	(0.065)	(0.064)	(0.069)
Survey Round One x Garissa (interaction)			0.994***	1.006***	1.101***	0.582***
			(0.076)	(0.076)	(0.075)	(0.080)
Received Food Aid			0.215***	0.168**	0.154**	0.150**
			(0.050)	(0.050)	(0.049)	(0.047)
Agricultural Income				0.137	0.219**	0.198**
				(0.078)	(0.075)	(0.073)
Livestock Income				0.104*	0.118**	0.145**
				(0.044)	(0.045)	(0.044)
Artisan Income				0.173***	0.190***	0.171***
				(0.048)	(0.046)	(0.045)
Number of Income Sources				-0.155***	-0.183***	-0.182***
				(0.028)	(0.028)	(0.027)
Sold Small Ruminants					0.378***	0.304***
					(0.073)	(0.070)
Sold Shoats x Garissa (interaction)					-0.228*	-0.190*
					(0.090)	(0.087)
Sold Poultry					0.332***	0.282***
					(0.062)	(0.059)
Distress Migration					0.148	0.290*
					(0.128)	(0.125)
Move due to Insecurity					-0.297*	-0.335*
					(0.136)	(0.132)
Receive Gifts					0.348***	0.269***
					(0.052)	(0.051)
Children Drop out of School					0.346***	0.315***
					(0.040)	(0.038)
Cut Food Expenditure						0.572***
						(0.048)
Cut Health Expenditure						0.213***
						(0.037)
Cut Social Expenditure						0.136**
						(0.040)
Constant		3.501	3.777	3.942	3.764	3.170
		(0.063)	(0.064)	(0.099)	(0.096)	(0.100)
r-squared		0.138	0.208	0.217	0.276	0.331
n		2946	2946	2946	2946	2946

[#] The CSI was log-transformed prior to analysis to ensure a normal distribution of the dependent variable. Coefficients are therefore expressed in log-transformed units, not CSI units. Households with a zero score on the CSI were not included in the analysis.

* $p < 0.05$
** $p < 0.01$
*** $p < 0.001$

Confirming hypothesis 2 would require substantially more data than were collected in the Kenya Pilot study. In fact, the EMOP was already well underway before the pilot study could be put into the field and food aid operations were being curtailed in Kitui before the study ended. Further studies that incorporate CSI as an early warning indicator will be needed for a full confirmation of the ability of CSI to pick up the onset of an emergency.

Food aid is positively associated with CSI in all the models in which the relationship was tested—at first glance a counter-intuitive finding. However, given the negative relationship between assets and the CSI, this would imply that the food aid that was received was accurately targeted on households that needed it, but that the amounts received were not adequate for the needs of those receiving it. The variable being analyzed is the binomial (receipt of food aid or not)—it is not a quantitative measure of per capita food aid receipts. In Garissa District, 88% of all households had received food aid during Round 1, 68% of households in Round 2, and 66% of households in Round 3. Yet the mean amount of food aid per capita received at the household level was between 5.1 kgs. / person and 7.5 kgs. / person (a full food basket is considered 15 kgs. / person per month). Given the other factors mentioned above, this evidence would tentatively support hypothesis 3.

Discussion

While further research is required to fully test the hypotheses laid out in the Kenya Pilot Study, the study generally support the hypothesis that the CSI can be used to provide information for managers of emergency operations, in real time, during an emergency. The indicator adequately captures the elements of current food security, perceptions of vulnerability, and broader patterns of coping.

The manual of which this brief report is a part is intended to enable managers of food aid operations to put this indicator into widespread usage. Currently, CSI has been put into use in five East African countries and three Southern African countries, by CARE, WFP, and other agencies providing food aid.

Incorporating CSI into the routinely collected food security information of early warning systems will enable further testing of the hypothesis that it accurately picks up changes in household level behaviors, either before there is a perceptible change in human welfare indicators such as malnutrition, or in response to a food aid intervention. This kind of application is increasingly required, as populations in chronically vulnerable livelihood zones in countries such as Ethiopia are very quickly affected by shocks (such as drought) that used to be thought to trigger “slow-onset” emergencies.

Appendix 2: Illustrated calculations of the CSI from the Kenya Pilot Study

Box 8 is reproduced below as Box A.1, with a more in-depth explanation of the calculations. As will be noted, these calculations can easily be done by hand, or a computer can be programmed to calculate them.

Box A.1: An actual example—Calculating a household CSI index score

In the past 30 days, if there have been times when you did not have enough food or money to buy food, how often has your household had to:	All the time? Every day	Pretty often? 3-6 */week	Once in a while? 1-2 */week	Hardly at all? <1*/week	Never	Raw Score (Box 8)	Severity Weight (Boxes 6&9)	Score = Relative Frequency X weight
Relative Frequency Score (Box 7)	**7**	**4.5**	**1.5**	**0.5**	**0**			
a. Rely on less preferred and less expensive foods?		X				4.5	2	9.0
b. Borrow food, or rely on help from a friend or relative?			X			1.5	4	6.0
c. Purchase food on credit?			X			1.5	4	6.0
d. Gather wild food, hunt, or harvest immature crops?					X	0	8	0
e. Consume seed stock held for next season?					X	0	6	0
f. Send household members to eat elsewhere?				X		0.5	4	2.0
g. Send household members to beg?					X	0	8	0
h. Limit portion size at mealtimes?	X					7	2	14.0
i. Restrict consumption by adults in order for small children to eat?			X			1.5	6	9.0
j. Feed working members of HH at the expense of non-working members?					X	0	4	0
k. Ration the money you have and buy prepared food?					X	0	N.A.	-
l. Reduce number of meals eaten in a day?		X				4.5	2	9.0
m. Skip entire days without eating?					X	0	8	0
TOTAL HOUSEHOLD SCORE	Sum down the totals of for each individual strategy							**55.0**

- Question a) "In the past 30 days, if there have been times when you did not have enough food or money to buy food, how often has your household had to rely on less preferred and less expensive foods?"
- The answer was "pretty often" (which we had defined as occurring on 3-6 days of a typical week). In terms of scoring the relative frequency of this answer, Box 7 (in Section 5.d) notes that this answer is 4.5 (which is the mid-point of the range of 3-6). This is the number recorded for Question a. in the column for raw score (note that a computer can be programmed to record this answer for an answer code marked "pretty often").
- In Box 6 (in Section 5.c), the consensus ranking for this individual coping strategy ("eating less preferred and less expensive foods") was in the least severe group of strategies. In Box 9 (in Section 5.e), however, this entire group was assigned a weight of 2, based on focus group discussions about the severity of different categories of individual strategies.
- So the score for Question a. is the relative frequency score (4.5) multiplied by the severity score (2). So the total recorded for the answer to Question a) is **9.0**
- This procedure is repeated for each question—multiply the frequency score by the severity weighting and record the number in the final box of the row. Then the individual scores in the boxes are summed to the bottom of the form. Needless to say, for large surveys, it is better to do the calculations with a computer.

Appendix 3: A brief description of the qualitative (PRA) application of the CSI tool

Using the CSI tool as a qualitative tool gives a general picture of the frequency of coping at the community level. It can be used in conjunction with various Participatory Rapid Appraisal (PRA) methods, but in particular with a proportional piling exercise. It can be as simple or as sophisticated as is appropriate for the situation and information needed.

In its most basic form, the qualitative tool looks similar to the set of questions about individual coping strategies for the household survey, but rather than inquiring about the relative frequency of relying on those strategies at the household level, the question is about the relative proportions of households in the village or community. Beans or stones can be used by a group of informants to depict the proportions of households in the community that are regularly relying on a given strategy or behavior, as depicted below. If ten beans or stones are provided to depict the answer in each case, you will get rough estimates of the proportion of the village population in tenths (or 10% of the population) that rely on various coping strategies.

Box A.2
CSI PRA Application (Simple Version)

Because they don't have enough food or enough money to buy food, what proportion of households in this community have to:	**Proportion who do**	**Proportion who do not**
a. Rely on less preferred and less expensive foods?	OOOOOO	OOOO
b. Borrow food, or rely on help from a friend or relative?	OOO	OOOOOOO
c. Purchase food on credit?	OO	OOOOOOOO
d. Gather wild food, hunt, or harvest immature crops?	O	OOOOOOOOO
e. Consume seed stock held for next season?	-	OOOOOOOOOO
f. Send household members to eat elsewhere?	OOO	OOOOOOO
g. Send household members to beg?	OO	OOOOOOOO
h. Limit portion size at mealtimes?	OOOOOOO	OOO
i. Restrict consumption by adults in order for small children to eat?	OOOO	OOOOOO
j. Feed working members of HH at the expense of non-working members?	OO	OOOOOOOO
k. Ration the money you have and buy prepared food?	-	-
l. Reduce number of meals eaten in a day?	OOOOO	OOOOO
m. Skip entire days without eating?	O	OOOOOOOOO

This can be made a little more sophisticated by asking questions about relative frequency, rather than just the "yes/no" response depicted above.

Box A.3
CSI PRA Application (More Sophisticated Version)

Because they don't have enough food or enough money to buy food, what proportion of households in this community have to:	Proportion who frequently do	Proportion who only rarely do	Proportion who never do
a. Rely on less preferred and less expensive foods?	OOOO	OOOO	OO
b. Borrow food, or rely on help from a friend or relative?	OO	OOOO	OOOO
c. Purchase food on credit?	OO	OOOO	OOOO
d. Gather wild food, hunt, or harvest immature crops?	O	OO	OOOOOOO
e. Consume seed stock held for next season?	-	OO	OOOOOOOO
f. Send household members to eat elsewhere?	O	OOOO	OOOOO
g. Send household members to beg?	O	OOOO	OOOOO
h. Limit portion size at mealtimes?	OOOOO	OOO	OOO
i. Restrict consumption by adults in order for small children to eat?	OOOO	OOOO	OO
j. Feed working members of HH at the expense of non-working members?	OO	OO	OOOOOO
k. Ration the money you have and buy prepared food?	-	-	-
l. Reduce number of meals eaten in a day?	OOO	OOOO	OOO
m. Skip entire days without eating?	O	O	OOOOOOOO

The important point is to allocate the same number of stones or beans for each question, so that answers can be compared. This exercise can be a useful way of ensuring that the set of coping strategies is complete and accurate for the given location. It can also be used in conjunction with other, rapid appraisal or PRA methods to give a quick overview of the situation at the community level. It is less appropriate for tracking the impact of an intervention because it does not give any disaggregated information about vulnerable households.

Appendix 4. Further Notes on Sampling

Sampling refers to anytime a sub-set of the population (or other unit) under study is selected from the larger group (the entire population under study). By studying the findings from that sample (denoted as n) it is hoped that valid conclusions can be drawn about the larger population (denoted as N) from which the sample was taken. Sampling is commonly employed due to the expense and time associated with total enumeration of the population, as is done during a census.

Sampling methods can be broken into two broad categories—probability sampling and non-probability sampling.

Probability sampling methods rely on statistical theory as a basis for extrapolating findings among the sample population (n) to the larger study population (N). This is known as statistical inference. By contrast non-probability sampling does not utilize statistical theory to support inference from a sample population (n) to the study population (N), but rather relies on a more subjective determination of the degree to which a sample 'represents' the larger study population. The choice between which method to use depends on the intended use of the information and the importance placed on objective (probability sampling) versus subjective (non-probability sampling) determination of how the sample (n) represents the larger population (N).

Guidelines for probability sampling

The essence of probability sampling is that each unit of study (e.g. household, individual, child) in the study population for which the estimate is desired must have an approximately equal probability for selection and inclusion in the sample. In order to ensure that this critical criterion is met, an exhaustive sampling frame must exist or be created for the unit under study (in the case of the CSI, this unit is the household). A sampling frame is simply a complete list of all potential 'units of study' (e.g. households) in the population from which the sample will be taken.

Where a sampling frame does exist at the household level, number each household and select households from this list using a random numbers table. This is known as a simple random sample. The number of households needed is depicted below in the section entitled Sample Size and Clusters.

Cluster sampling

Where an exhaustive sampling frame does not exist for households, the next lowest aggregation of these units for which an exhaustive sampling frame exists must be used to select the sample. These aggregated units are often villages, but other appropriate aggregations may exist, especially for urban and/or nomadic populations.

The cluster sampling approach entails selecting clusters at the first stage of sampling and then selecting households from within these clusters during the second stage of sampling. To maintain the criteria that all households have an approximately equal probability of selection, clusters must be weighted according to size (e.g. large clusters have a higher probability of selection than small villages such that all

households, regardless of village size have an approximately equal probability of selection).

Known Cluster Size

Where cluster population sizes are available, these can be used to weight clusters. List each cluster and the cumulative population contained within the cluster.

For example:

Box A.4 Weighting Clusters		
Village (cluster)	Estimated number of households	Cumulative households sampling frame
Village 1	232	1 - 232
Village 2	546	233 - 778
Village 3	113	779 - 891

For this example use a random numbers table select numbers between 1 and 891 to choose clusters. If we require 3 clusters, choose 3 numbers randomly between 1 and 891. Let us say we have selected 439, 831, and 558. This would mean that we would take two clusters from village 2 (e.g. village/cluster 2 was selected twice) and one cluster from village 3.

Unknown Cluster Size

Where population sizes of clusters are unknown, key informants can be used to estimate the size of the clusters as big, medium, and small and clusters can be weighted with values of 3, 2, and 1 in the sampling frame.

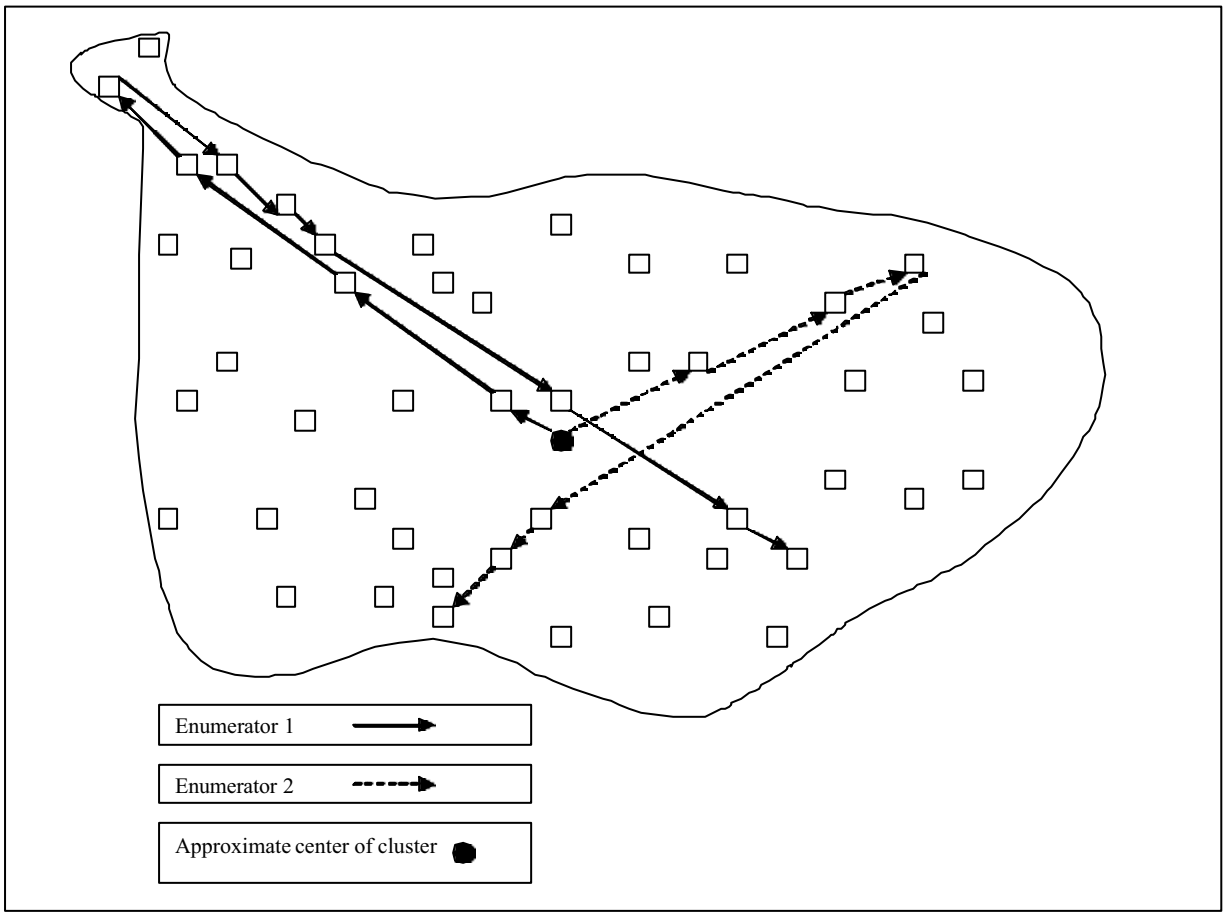
Box A.5: Sampling Examples		
Village (cluster)	**Size**	**Sampling Frame**
Village A	Medium	Village A
		Village A
Village B	Small	Village B
Village C	Large	Village C
		Village C
		Village C

Divide the total number of units in the sampling frame (column 3 above = 6 in this example) by the number of clusters needed (let us say we require 2 clusters). This yields a sampling interval of 2. Select a random start in the sampling frame (for this example let us say we selected the second unit of village A). We then add the sampling interval 2 in order to select the next cluster and we get the second unit of village C. Therefore, the first cluster will be village A and the second cluster will be village C. Note that once a cell in the sampling frame has been selected, it cannot be selected again. This is sampling without replacement. Clusters with multiple cells (e.g. village A and village C in the example) in the sampling frame can be selected more than once (e.g. village A can be selected up to 2 times and village C can be selected up to 3 times). In practice there will be many more clusters to choose from and more clusters needed to make up the sample (see Sample Size and Clusters below), but the concept is the same.

Selecting households within clusters

Once clusters have been selected, the UNICEF pencil spin method will be used to randomly select households within the cluster.

Step 1 – locate the center of the cluster using key informants
Step 2 – spin a pencil to determine the direction the survey team will walk to select households. Note if more than one enumerator is being used have each select a direction using the pencil spin method with no two enumerators walking in the same direction.
Step3 – Proceed in the direction of the pencil spin, selecting every other household to conduct the survey.
Step 4 – Continue doing so until the total number of households needed by each enumerator is surveyed
Step 5 – If the end of the cluster is reached and more households are required have the enumerator re-spin the pencil until it points in a direction back toward the village and continue selecting every other household for inclusion in the survey



Box A.6: Example of the UNICEF Pencil Spin Method of Household Selection

Sample size and clusters

Three options for sample size and the number of clusters are provided. The first option represents the ideal sampling approach. The second and third options represent a compromised approach and a minimalist approach respectively.

The compromised and minimalist options entail fewer clusters, representing cost savings associated with visiting fewer sites (e.g. less transport and logistics costs). The sacrifice of reducing the number of clusters is that the sample will have fewer sites representing the study population. Where there is a large degree of difference in experience related to the CSI measure between clusters, some of this heterogeneity will be lost.

It is imperative that no fewer than 20 clusters be used in the sample. If the cost of using the minimalist approach remains prohibitive, consider non-probability sampling (e.g. purposive or judgmental sampling) to gain a 'representative' sample. While this will lack the ability to make statistical inferences about the larger population from the sample, it is still likely to provide useful data for monitoring the impact of food distribution programs.

The compromised and minimalist approaches also entail smaller overall sample sizes (e.g. the number of households per cluster remains the same, but the number of clusters is reduced). The sacrifice of reducing the overall sample size (n) is that the minimum magnitude of detectable change between survey rounds is increased. In other words, the larger the sample size, the smaller the minimum magnitude of detectable change. This is important given that the purpose of impact monitoring is to gauge the change that occurs overtime in response to food distribution operations. However, the increased minimum magnitude of detectable change associated with the compromised and minimalist approaches will still provide a useful means of tracking meaningful change over time in the CSI score.

Box A.7
Three options for sample size and clusters for use in cluster sampling*

Approach	Number of Clusters	Number of HH within each cluster	Total sample size (n)	Minimum Magnitude of Detectable Change in CSI
Ideal	30	20	600	6.5
Compromised	25	20	500	7.0
Minimalist	20	20	400	8.0

* These were calculated using the previous data from the Ghana research as a basis for parameter estimates in the sample size calculation.

Sample size for simple random sampling (SRS) where an exhaustive sampling frame of households exists

The sample size for a SRS is half that of the cluster sampling approach (e.g. the cluster sampling entails a design effect of 2, doubling the sample size). Therefore, a sample size of 300 households should be randomly selected from the household level sampling frame.

Why use probability sampling?

Probability sampling allows for statistical inference at a known and quantifiable level of confidence or probability. Estimates are given in ranges, called confidence intervals, though they are often expressed as a point estimate. For the example, a CSI score of 48.37 derived from a sample may have a 95% confidence interval of +/- 5.31 CSI points.

Visually this can be expressed as:

43.06 —————— **48.37** —————— 53.68

For this example we are 95% confident that the true population CSI score is between 43.06 and 53.68 (e.g. in 95 out of 100 samples the true population CSI score will be contained within the sample's confidence interval). When making comparisons to other groups (or the same group at different points in time for impact monitoring) you will essentially be comparing confidence intervals. If they overlap, you cannot conclude that a difference exists. If they do not overlap, you can conclude that a difference *does* exist at 95% confidence.

The ideal sample size and clusters listed in the previous section will yield the narrowest confidence intervals, allowing for detection of smaller differences. The compromised and minimalist sample size and clusters listed in the previous section will yield wider confidence intervals (e.g. the minimalist approach will have wider confidence intervals than the compromised approach and the compromised approach will have wider confidence intervals than the ideal approach given the same mean and variance within the sample).

Stratification

Stratification is used when separate CSI estimates are desired for sub-groups within the study population. For example if your study population includes two districts, it may be desirable for each district to have a separate CSI estimate. We would then consider each district a 'strata' and applied the required sample size and number of clusters to each stratum (e.g. in this case districts).

Be certain that separate estimates are required before stratifying the sample. In the above example of two districts treated as separate strata, the sample size, number of clusters and much of the cost of the survey are doubled. For three strata, the sample size, number of clusters and much of the cost of the survey are tripled and so on. Therefore, be very critical before stratifying your sample, weighing the advantages and disadvantages, particularly cost and resources, against one another.

Appendix 5: More sophisticated methods of weighting the CSI

While the method of weighting described in Section 5c works fine for weighting the severity of individual coping strategies, for greater sensitivity, a more sophisticated way to group the coping strategies is to then weight the groups identified. The strategies were first ranked into relatively similar severity categories. If these rankings were used to weight the index, it would imply (to use the example in Box 6) that borrowing food was twice as severe as limiting portion sizes, begging was three times as severe, and eating seed stock was four times as severe (see example 1 in Box 7). In reality, this may not be the perceived relationship between the ranked groups. More sensitive results will be obtained if focus groups can not only rank the strategies, but also weight them. This is a rather conceptual discussion, so it helps to have some possibilities to help people talk about the weighting. The main possibilities generated by focus groups in the pilot research are as follows:

- A simple ordinal rank as described above
- A geometric progression in severity
- Largest gap not on the most severe end, but in the middle
- A clustering of groupings in the middle, but with gaps towards the extremes

Some examples are shown in Box A.8.

The pictures provided in Box A.8 also suggest the numeric value of the weights to be assigned to various individual strategies or behaviors. (Note that in Example 1, the weights appear to be 2,4,6,8, which is exactly the same relationship as 1,2,3,4—the black line in the example—the mathematical relationship in the same. This isn't true of the other examples). Box A.9 spells these out unambiguously. For this simple illustration, the first example from Box 9 is used (weighting is the same as the ranking of groups). The procedure is the same if one of the other weighting examples is used.

Box A.8: Examples of different ways to weight ranked groups of strategies

	Example 1 (The Simple Way)				**Example 2**			
	Ranked Groups				Ranked Groups			
	1	2	3	4	1	2	3	4
Relative Severity								
8								
7								
6								
5								
4								
3								
2								
1								
	Linear Relationship: Each group is incrementally more severe than the precious (weights are the same as ordinal ranks)				**Geometric Relationship: Each higher ranked grouping is twice as severe as the previous group**			

	Example 3				**Example 4**			
	Ranked Groups				Ranked Groups			
	1	2	3	4	1	2	3	4
Relative Severity								
8								
7								
6								
5								
4								
3								
2								
1								
	Bi-Polar Relationship: The less severe and more categories are similar in severity, but there is a big difference between the 2nd and 3rd groups				**Tri-Polar Relationship: The middle two categories are fairly similar in severity, but there is a big different between the 1st and the 2nd; and between the 3rd and the 4th.**			

Box A.9. Assigning weights to ranked groups, according to different examples

Examples (From Box A. 8)	**Weights for each ranked group**			
	1	**2**	**3**	**4**
1	2 (1)	4 (2)	6 (3)	8 (4)
2	1	2	4	8
3	2	3	7	8
4	1	4	5	8

Appendix 6: Additional tools and applications (CD-ROM)

Papers and Article Folder

- **Electronic Copy of Manual**
- **Reference articles**
- **Other supporting research and documentation**

Questionnaire Folder

- **The research questionnaire**
- **The basic field application questionnaire**
- **An example of a food aid end-use monitoring tool**

Data Entry Folder

- **Basic database in Access**