

# 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

Second Edition  
January 2008



**The Coping Strategies Index  
Field Methods Manual  
Second Edition, January 2008**

**Authors: Daniel Maxwell**  
**Associate Professor, Feinstein International Center, Tufts University**

**Richard Caldwell**  
**Executive Director, TANGO International**

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Please email comments to:  
Daniel Maxwell, Feinstein International Center: [daniel.maxwell@tufts.edu](mailto:daniel.maxwell@tufts.edu)  
Richard Caldwell, TANGO: [richard@tangointernational.com](mailto:richard@tangointernational.com)

Bob Bell, Director, Food Resources Coordination Team (FRCT), CARE USA: [bellr@care.org](mailto:bellr@care.org)

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# **The Coping Strategies Index:**

**Field Methods Manual**

**Second Edition**

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Since 2003, the CSI has been widely used by the World Food Programme, CARE International and other non-governmental organizations and humanitarian agencies, governments, and researchers as an indicator of food insecurity in a variety of applications. During that time, several flaws were noted in the original methods manual, which this edition addresses. It also introduces new innovations since 2003.

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The Authors  
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## EXECUTIVE SUMMARY

### Overview

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 nine other African countries and several in the Middle East and Asia.

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—or *coping strategies*—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 not practical or timely.

The CSI can be used as a measure of 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.

### What's New in the Second Edition?

The 2003 manual treated the CSI solely as a context-specific indicator of food insecurity—as indeed it is. But over the intervening five years, users of the context-specific indicator noted certain behaviors appearing in every single application of the tool, implying that a handful of behaviors is much more universal than first thought. This resulted in an empirical test of the accumulated data on the CSI and similar kinds of indicators, to develop a different kind of CSI—one based only on these behaviors that tend to show up in every single instrument—to see if a more broadly comparative CSI could be developed that could help in other applications.

Research has confirmed that a “reduced” CSI, based only on these behaviors, correlates as well with other indicators of food security as the original, context-specific index. Since the reduced index is measuring the exact same behaviors in all cases, it has greater application in comparing across different contexts, and thus can be used in the comparison of the severity of crises and in the allocation and geographic targeting of resources. The second edition also includes a number of new suggestions on methodology and examples of many of the context-specific questionnaires developed since the first edition came out. It also describes some of the surveys in which the CSI has been used. All of these will help new users get a better idea of how to use the CSI. Lastly, the second edition includes an updated literature review on food security indicators more broadly.

# 1. OVERVIEW OF THE COPING STRATEGIES INDEX

## Introduction

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 is based on the many possible answers to one single question: “What do you do when you don’t have adequate food, and don’t have the money to buy food?”

The CSI requires some “up-front” work to ensure that all the potential answers to this question are known, and that it is adequately adapted to the 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.”

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.

## The Basic Logic 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 (Christaensen and Boisvert 2000).

There is a long anthropological tradition of considering coping strategies in the face of inadequate access to food (Davies 1996). Watts (1983) demonstrated a logic to the sequence of specific behaviors based on their reversibility and commitment of domestic resources. Modest dietary adjustments (eating less-preferred foods or reducing portion size) are easily reversible strategies that do not jeopardize longer-term prospects. More extreme behaviors (sale of productive assets) suggest more serious long-term consequences. Many researchers have noted that as food insecurity worsens, households are more likely to employ strategies that are less reversible, and therefore represent a more severe form of coping and greater food insecurity

(Corbett 1988, Devereux 1993). The CSI captures and systematizes this logic to reflect food insecurity at the household level

As noted above, 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 (Coates et al. 2006, Bickel et al. 2000, Maxwell et al. 1999). But people do not wait until an outright shortfall of food is upon them before they begin to change their behaviors. Thus changes in coping behavior not only reflect current status, they also reflect the best judgment of household decision makers about the foreseeable future—giving the measurement of coping behaviors some predictive ability too (Christaensen and Boisvert 2000).

Experience with the CSI has shown that, 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 needs, households can try to reduce the number of people that they have to feed by sending some of them elsewhere (for example, 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 others, 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

#### **Box 1. What Is “Household 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, the assets to which they have access, and uncertainty and risk (that is, vulnerability). Clearly, food security is about more than just how much people have to eat. Yet, having “enough” food to eat is the most important outcome of being food secure; while physiological requirements differ, people largely know whether they have “enough” or not.



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 3) 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, assets and consumption behaviors, the CSI is perfectly adequate as a *rapid indicator* of household food security (Christaensen and Boisvert 2000, Maxwell et al. 1999).

## 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, as shown in the example in Figure 1.

Three main points underpin the CSI. First, the answers to the general question must be based on *the right list of coping behaviors*. This is a key principle of constructing the CSI. There is no point in asking people about strategies they do not use. Equally, care must be taken not to overlook strategies that *are* used locally. Specific coping behaviors vary depending on circumstances. The list must be adapted to local circumstances and practices. Second, *how often* are these specific behaviors used in the recent past (the recall period—see below). Third, *how "severe"* is each of these individual coping strategies considered to be? This information is collected from community-level focus groups and provides a weight for the perceived severity of each strategy.

The frequency of a specific behavior is weighted by the perceived severity of that behavior, and this is summed up across all the behaviors in the list that were derived for that location. This index results in a score that reflects current and perceived future food security status. Changes in the index provide a rapid indication of whether food insecurity is getting worse, or the situation is improving—a higher score indicates a greater level of coping, and hence increased food insecurity. The following sections show in detail how to construct the CSI, how to analyze the data that it generates, and how apply it in different situations.

## Uses of the CSI

The CSI has a number of applications. The most frequent has been in monitoring, providing a quick, current status indicator of the extent of food insecurity that is immediately useful for programmatic decision making. It has also been used in emergencies to monitor the impact of interventions, including food aid, on household food insecurity. Its third use (also in monitoring) has been as a food insecurity early warning indicator. Closely related to its application in

monitoring, the CSI has been used as an assessment tool, and to help guide household targeting of food assistance. Lastly, the CSI has been used as an indicator of longer-term changes in food security status. The main focus of this manual is on monitoring food insecurity, but the basic design of the tool is the same for the various other applications mentioned above. 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.

## 2. CONSTRUCTING THE COPING STRATEGIES INDEX

### a. Step 1. Coping Behaviors: 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**

Over various applications of the CSI, a number of different individual coping behaviors have been identified in each of these categories. One such list is presented in Figure 1. This is a set of coping behaviors. Note that a different set of behaviors would likely apply in an urban setting. In a rural setting, an action such as consuming seed stock is a very serious indicator of food stress.

**Figure 1. A List of Coping Strategies<sup>1</sup>**

<b>1. Dietary Change</b>
a. Rely on less preferred and less expensive foods
<b>2. Increase Short-Term Household Food Availability</b>
b. Borrow food 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
<b>3. Decrease Numbers of People</b>
f. Send children to eat with neighbors
g. Send household members to beg
<b>4. Rationing Strategies</b>
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. Reduce number of meals eaten in a day
l. Skip entire days without eating

<sup>1</sup> This particular example came from the Kenya pilot study. Please note, however, that it is only an example. It is used to demonstrate the construction of the CSI throughout this section, for the sake of using a consistent example. It does *not* imply that this is the “right” set of individual behaviors—those must always be generated from the context in which the CSI is being used.

## Procedures for Deriving a Context-Specific List of Coping Behaviors

A list of coping individual coping behaviors can be established through focus group interviews with members of the local community. The same procedures can be used to develop a list of context-specific coping behaviors for other places as well. During the focus group interviews:

- Start with a list like the one offered in Figure 1, or something similar brainstormed in the context. There is a list of all the (appropriate) individual behaviors that have turned up in CSI questionnaires in Appendix 1.e.
- Find out which strategies people rely on in the study area when they do not have access to adequate food or enough money to buy food. If some of those on the list you start with don't apply, simply omit them.
- For each of the four general categories (labeled 1–4 in Figure 1) probe to find out if there are any other relevant local strategies that are not included in the list. If there are, add them to the list.
- Be sure that you only include consumption coping strategies (see Box 2).
- 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 might not indicate food insecurity).
- The list should be the *main* set of coping strategies—it doesn't need to include every single strategy mentioned (some are very rare), but should represent the consensus view of all the groups interviewed. Try to keep the list down to a feasible number (perhaps 12–15 at most).
- The list should not include any similar or overlapping coping strategies (i.e. different ways of describing the same basic behavior).

### Box 2. Principles for Including Consumption Coping Behaviors in the CSI

While there are many kinds of coping behaviors, only certain kinds of consumption-related behaviors belong in the CSI: Ask each of the following questions about each identified behavior

- Is it related specifically to food consumption?
- Can it be done readily—today or tomorrow? –(consumption coping can be adopted readily)
- Is it reversible? Consumption coping can be reversed when it is no longer needed.
- Can the behavior be used continuously or is it a one-off strategy? Consumption coping can be utilized as needed—they aren't one-off activities.
- Can a “no” answer be easily interpreted? (For instance, many attempts to create a CSI questionnaire have included a question about asset sales. But 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. Selling assets may indeed be used to fund food consumption, but is not appropriate for the CSI because it isn't reversible, it can only be done once, and it isn't possible to interpret a “no” answer. Information about asset sales may be required for other purposes, but it can't be logically incorporated into a CSI questionnaire).

## b. Step 2. Frequency: Counting the Frequency of Strategies

Research has demonstrated there is always a trade-off between the *representativeness* of a set of answers and the *accuracy* of those answers. A longer recall period generally provides information that is more representative of typical behavior, but the longer the recall period, the less accurate the memory of respondents about their actual behaviors. Experience with the CSI and other food consumption recall questionnaires indicates that about a week is the longest time that people remember their behaviors accurately, hence questions here are on the basis of a seven-day recall period.<sup>2</sup>

Taking the list of individual behaviors developed in Figure 1, the main question becomes how often, in the past seven days, a household had to rely on each individual coping behavior.

**Figure 2. Consumption Coping Strategy Responses (CSI)**

Behaviors: In the past 7 days, if there have been times when you did not have enough food or money to buy food, how many days has your household had to:	Frequency: Number of days out of the past seven: (Use numbers 0 – 7 to answer number of days; Use NA for not applicable)
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. Reduce number of meals eaten in a day?	
l. Skip entire days without eating?	

### Procedures for Developing the Frequency Questionnaire

1. Note the way in which the question is worded. Repeat the main question for each behavior, to remind the respondent that the question is referring to times when they did not have enough food or enough money to buy food. Be sure the question includes the recall period.
2. Note that you are always asking about some time period beginning from today and counting backwards (i.e., “the last seven days” not “the past week,” or “last week”). People get confused if you are not specific about this.

<sup>2</sup> The first edition of the CSI Manual used a 30-day recall period and relied on relative frequencies of the answers. For reasons of recall accuracy, these guidelines have shortened the recall period and ask for specific numbers of days that individual behaviors were practiced.

3. If a respondent answers “all the time,” be sure to clarify if that means each day for the past seven days, and if so, record the answer as seven. If s/he says “never,” be sure to clarify if this means zero days, and if so record the answer as zero. If it is something that the household never does, a “not applicable” answer should be given.
4. Scoring the results is explained below.

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 diverse 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 column to record the frequency with which people are forced to rely on these strategies or behaviors.
- A code for a “not applicable” answer. Note that a “not applicable” answer doesn't change the score for the CSI, but it does enable other kinds of analysis.

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 severity of the individual behaviors.

### **c. Step 3. Severity: Categorizing and Weighting the Strategies**

The CSI tool relies on counting coping strategies that are not equal in severity. Different strategies are “weighted” differently, depending on how severe they are considered to be by the people who rely on them. The frequency answer is then multiplied by a weight that reflects the severity of individual behaviors. Finally, the totals are added. The simplest procedure for doing this is to group individual coping behaviors according to similar levels of severity and assign a weight to each group, from lowest (least severe) to highest (most severe). A range of weights from one to four usually works well.<sup>3</sup>

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 indicate 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 Step 1.

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<sup>3</sup> Again, this represents a change from the first edition of this manual. In the first edition, several different methods of weighting were suggested, and more complex instructions were offered about which method to select. In fact, analysis has shown that results vary little with different methods of weighting, so this edition opts for the simplest method—a simple ordinal ranking of one to four, weighted in the same manner.

In fact, it is possible to ask the same focus groups to first help 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.

### **A Simple Procedure for Grouping Strategies of Similar Severity**

- 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 least 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 on an insufficient number of focus groups risks errors in the analysis.
- Although there is no hard and fast rule on how many focus groups is “enough,” a minimum of six to eight is recommended for each 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.

The example from the Kenya pilot study is provided in Figure 3. Note that a total of twelve focus groups were consulted in this case. Some groups ranked everything into four severity categories, some insisted on five categories. In the end, the analysts had to reduce all behaviors to the same number of severity categories, relying on the rules outlined above.

**Figure 3. Example of Coping Strategies Grouped and Ranked by Focus Groups\***

Strategy	Focus Group Ranking for Each Individual Behavior												Ave.	Consensus Ranking
	FG1	FG2	FG3	FG4	FG5	FG6	FG7	FG8	FG9	FG10	FG11	FG12		
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 members 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. Reduce meals	1	1	2	1	1	1	1	2		-	3	1	1.2	1
l. Skip days	4	4	3	3	4	4	4	3	4	4	3	4	3.7	4

\* Data from Kenya Pilot Study (Garissa District)

Several things should be noted about Figure 3:

- The individual strategies listed have been grouped into four categories, where 1 indicates the least severe category; 4 indicates 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 and 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.

#### **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 Step 3. Both are straightforward procedures.



## Procedures for Assigning Scores for Relative Frequency

Recall that the frequency is a measure of how many days in the past week a household had to rely on the various coping strategies—ranging from “never” (0) to “every day” (7). That frequency score is then multiplied by the severity weight. The simplest method of weighting the strategies is that 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.

It is critical to ensure that the values for both the frequency and the severity influence the CSI score in the same way. That is the higher the frequency, the higher the score; and the greater the severity the higher the severity weighting. Note that if you don’t score both the same way (i.e., if you scored one of them in an increasing scale and the other in a decreasing scale), you would get very confused results that would not be valid for any analysis.

## Procedures for Assigning Scores for the Severity of Coping

- 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.
- Assuming that there are four severity categories, use the severity weighting of 4 for the most severe category; 3 for the next-most severe category; 2 for the next; and 1 for the least severe category of individual behaviors. If respondents insist on a different number of categories, use the same principle—the principle of severity weighting is the important thing, not the number of categories, although three is probably the minimum number of categories.
- 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 Figure 4, using the above examples, and weighted according to the procedures given above.

**Figure 4. Actual Example—Calculating a Household CSI Index Score**

In the past 7 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:	Raw Score	Severity Weight	Weighted Score = Frequency X weight
<b>(Add each behavior to the question)</b>			
a. Rely on less preferred and less expensive foods?	5	1	5
b. Borrow food, or rely on help from a friend or relative?	2	2	4
c. Purchase food on credit?	1	2	2
d. Gather wild food, hunt, or harvest immature crops?	0	4	0
e. Consume seed stock held for next season?	0	3	0
f. Send household members to eat elsewhere?	1	2	2
g. Send household members to beg?	0	4	0
h. Limit portion size at mealtimes?	7	1	7
i. Restrict consumption by adults in order for small children to eat?	2	2	4
j. Feed working members at the expense of non-working members?	0	2	0
k. Reduce number of meals eaten in a day?	5	2	10
l. Skip entire days without eating?	0	4	0
<b>TOTAL HOUSEHOLD SCORE</b>	Sum down the totals for each individual strategy		<b>34</b>

Figure 4 is an actual example of a household from the Kenya Pilot Study. Below are details for how it was scored.

- Question (a) “In the past 7 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 that this household had done that five out of the previous seven days.
- The severity weighting for this particular behavior is 1.
- So the weighted total recorded for the answer to Question (a) is 5 (5 x 1).
- For Question (b) the frequency was two days out of the previous seven and the severity weighting was 2, so the weighted total is 4.
- 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.

### 3. USING THE COPING STRATEGIES INDEX

#### a. Interpreting the CSI Score

As you can see, the hypothetical household in Figure 4 has a CSI score of 34. What does this tell us? By itself, not 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.

While a score of 34 by itself doesn't mean much, if another household has a score of 55, we could state fairly unambiguously that the household with a score of 34 is *less food insecure* (i.e. more food secure) than the household with a score of 55, provided that they are both from the same community, location, or culture for which this CSI tool was adapted.<sup>4</sup>

It is also possible that two households can have the same CSI score, but are using different behaviors to maintain the corresponding level of food security. One household could be employing multiple behaviors at a relatively low frequency, and another household could be employing fewer but more severe coping strategies. This does not happen very frequently because, as research has shown, households will tend to employ the less severe (and more reversible) strategies first, such as switching to less preferred foods, before they adopt more severe strategies such as enduring entire days without eating or harvesting immature crops.

CSI data is more powerful if it is analyzed and interpreted over multiple time periods, among multiple locations, and/or across specific groups (sub-populations). For example, if a household has a score of 55 in July of a particular year, a score of 76 in September of that same 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. We could also look at the change in specific coping behaviors that are being employed over this time period and determine how severe the situation is for this particular household. CSI data from individual households is usually aggregated by sub-group or location to reveal information on the food security of different classifications of households or households in different locations.

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), it would be fairly good evidence of a positive impact of the emergency food assistance. The CSI can also be used to compare recipient and non-recipient groups.

#### b. Analysis: Correlating CSI with Other Information

##### Triangulation (Cross Checking)

The CSI has been shown to correlate well with other measures of food security (such as dietary diversity, caloric intake, or nutritional outcomes) as well as with determinants of food security

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<sup>4</sup> 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 location or culture for which a specific application is prepared.

such as income, food budgets, and asset data. The strength of the relationship between the CSI and such indicators has been tested in over fourteen studies. With measures of food frequency or dietary diversity, meal frequency, and caloric intake the correlations are largely negative (as would be expected, meaning that as the CSI increases the related variable decreases) and statistically significant. Similarly, the correlation is negative and significant with measures of assets, and correlates positively (as expected) with percent of expenditure devoted to food. This confirms earlier studies indicating that the CSI is significantly correlated with other measures of consumption adequacy, and equally well correlated with measures of assets and expenditure (Maxwell et al. 1999).

### **Convergence (Confirming)**

However, the correlation with many of these indicators, while statistically significant, is not always robust. So where possible, the use of more than one indicator of food insecurity is recommended (i.e., the CSI with dietary diversity or WFP's Food Consumption Score indicator). This not only permits "triangulation" of findings, it deliberately uses indicators that capture different elements of the complex notion of food insecurity. This enables convergence of findings, providing greater confirmation of food security status.

### **Explanation (Using with Other Analyses Such as Nutritional Status)**

The CSI is a proxy for food security, and can thus be utilized as a variable in a simple regression analysis of nutritional status for a quick check of the extent to which food insecurity is the major contributing factor to poor nutritional status (particularly when combined with a few simple indicators of health status and caring practices).

## 4. TWO DIFFERENT KINDS OF CSI FOR DIFFERENT APPLICATIONS

The CSI was originally developed to capture the nature of the behavioral response to food insecurity in a given context. The individual behaviors identified and enumerated are likely to be specific to that context, and both the behaviors themselves, and the relative severity of individual behaviors, vary significantly from location to location, and from culture to culture. Because the CSI was developed as a context-specific indicator however, there has always been a caveat that findings were probably only locally applicable as well, and it has been criticized for being relatively unhelpful in comparative analysis (Kennedy 2002). However, field workers have noted in surveys that several of the individual behaviors that the CSI measures recur across different contexts, suggesting that a version of the CSI could be constructed that would permit a broader comparative analysis.

Recent research has shown that the CSI as described above can be reduced to a simpler set of behaviors that are more “universal” in nature without significantly impacting the ability of the index to reflect food security.<sup>5</sup> Reviewing individual surveys revealed that there was indeed a core set of behaviors that were common across all the studies and that seemed to follow a relatively similar order of frequency and severity. This “reduced” CSI uses the five most common behavioral changes in response to food shortages. While it accurately reflects the food security status of households, it does not reveal as much detailed information about the range of food insecure households. It does, however, facilitate the comparison of food security across various strata by normalizing the behaviors and severity scores that are used to create the index. Thus, there are two different indices that can be created with the routine collection of CSI data, the “context-specific” CSI and the “reduced” CSI.

### a. The Original (Context-Specific) CSI

The context-specific CSI is the index as described in detail above. This index can be created using location-specific behaviors and, if desirable, location or group-specific severity scores.

Some behavioral changes, such as harvesting and consuming crops before they are fully mature, are location-specific and confined to certain groups. Urban households have different options than rural households, and fishermen have different options than farmers. The context-specific CSI is developed based on local contexts and can yield very detailed information about the food security situation.

Thus, the context-specific CSI uses a set of coping strategies that are location- or group-specific behaviors, and which will add understanding of localized food security situations. But this set includes five behaviors that can be employed by any household, anywhere. The context-specific CSI has value in identifying the most vulnerable households for *household* targeting purposes, but is not very useful for *geographic* targeting purposes unless the areas being compared are very similar.

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<sup>5</sup> It should be noted that the only rigorous test of this observation has been conducted with data from Sub-Saharan Africa only, although the instrument has been used elsewhere, and the same behaviors show up in those surveys as well.

## b. The Comparative (Reduced) CSI

The reduced CSI has been developed to be used to compare food security across different contexts. It is a sub-set of the context-specific CSI, but is calculated using a specific set of behaviors with a universal set of severity weightings for each behavior. Thus, the reduced CSI uses a standard set of five individual coping behaviors that can be employed by any household, anywhere. The five standard coping strategies and their severity weightings are:

- eating less-preferred foods (1.0),
- borrowing food/money from friends and relatives (2.0),
- limiting portions at mealtime (1.0),
- limiting adult intake (3.0), and
- reducing the number of meals per day (1.0).

Extensive research has demonstrated that the “reduced” CSI reflects food insecurity nearly as well as the “full” or context-specific CSI, and thus can be used as a food security measure across different contexts. Using the example in Figure 4, the reduced CSI score for the same household would be calculated as shown in Figure 5, with a resulting CSI of 28. Whereas the results in Figure 4 are useful in comparing that household with others in its specific location, those in Figure 5 are applicable in comparing across different contexts.

The reduced CSI is less valuable in identifying the most vulnerable households in a given location because it contains less information—particularly extreme behaviors that may flag greatly increased levels of food insecurity. But it is very useful for comparing across crises or *geographic* targeting because it is measuring only the same set of behaviors.

**Figure 5: An Actual Example—Calculating a Reduced Household CSI Score**

In the past 7 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:	Raw Score	Universal Severity Weight	Weighted Score = Frequency X weight
<b>Relative Frequency Score</b>			
a. Rely on less preferred and less expensive foods?	5	1	5
b. Borrow food, or rely on help from a friend or relative?	2	2	4
c. Limit portion size at mealtimes?	7	1	7
d. Restrict consumption by adults in order for small children to eat?	2	3	6
e. Reduce number of meals eaten in a day?	5	1	5
<b>TOTAL HOUSEHOLD SCORE—Reduced CSI</b>	Sum down the totals for each individual strategy		<b>28</b>

## 5. APPLICATIONS OF CSI: INFORMING DECISION MAKING

### a. Quantitative and Qualitative 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 or district). 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). The CSI can be used as a stand alone monitoring device, but frequently will be used as one module of a more in-depth questionnaire. Some of the complimentary tools that might be used with the CSI are described below.

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 detail in Appendix 2.

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. Early Warning and Food Security Monitoring

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 food production, but don't directly reflect the issue of 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 the norm for a given location, adjusted seasonally, so that there is some idea of the range of SCI scores above which the situation is clearly deteriorating (note such a range should not be reduced to a “cut-off” point, and any range is probably situation-specific).

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 “current” and a “leading” indicator (that is, it gives information about both current and future status). Christaensen and Boisvert (2000) reported that the CSI was a better indicator of future food consumption than either current income or current caloric intake. Having CSI information already on hand greatly enhances both analytical capability of early warning, and the timeliness of response.

### **c. Food Security Assessment and Targeting of Interventions**

The CSI can be used in conjunction with other methods to assess food insecurity and to estimate the requirement for food aid. However, the CSI is not appropriate as a stand-alone tool for this purpose. Its main application in assessment is to provide triangulation or verification of other indicators, to get a more nuanced overall analysis of household food insecurity. Because each CSI indicator is specific to its context, there is no designated cut-off point in a CSI scale below which a household would be considered “food secure” and above which it would be considered “food insecure.” But it can be used in cross-sectional analysis to determine which households are better off and which are worse off, and what the correlates of these two kinds of households are. This will be important in assessment, and particularly in household targeting. If monitored over time, the CSI can also help to distinguish transitory and chronic food insecurity – a necessary distinction in assessments.

#### **Household Targeting**

If households are targeted by an administrative targeting mechanism, the CSI can be used to assess the validity of the targeting criteria. Those households fulfilling the targeting criteria should have a higher CSI score than those that do not (note that this must be pre-intervention CSI information). If a quick cross check shows that this is not the case, it is strong evidence that the targeting criteria are wrong, and that the intervention is not really being targeted to the most food-insecure households. Likewise, in a qualitative application to be used in conjunction with a community-based targeting system, the CSI can be utilized to cross check against wealth ranking or other mechanism used by the community or the relief committee to determine the eligibility of individual households. For this kind of application—whether qualitative (in the case of community-based targeting) or quantitative (in the case of administrative targeting)—the context-specific CSI should be used, since the comparison among households will be within the location in which the CSI was developed.

#### **Geographic Targeting**

The comparative (reduced) CSI was developed from the original (context-specific) CSI precisely to be able to compare across different contexts or even different emergencies, to enable policy makers to have some idea of the relative severity of different crises or compare the severity of



the same crisis in different locations. Among other things, such a comparison is useful for the geographic targeting of emergency assistance.

## **Timing**

Clearly, an early warning/monitoring system that uses the CSI can give a clear signal that household food insecurity is increasing, and provide this information in adequate time to enable a rapid response. Evidence shows that people begin to ramp up their coping behaviors well in advance of actually facing an outright shortfall in food for consumption. CSI information can also be used to inform program managers when it is time to phase out the emergency intervention, or transition to a different kind of intervention. If used in a regular monitoring system, the CSI can track household food security status, to help guide the timing of programmatic transitions. Since information would be known about household food security levels, it would help managers decide whether a food-for-work intervention or other recovery intervention would be more appropriate. At the moment, little of this information is routinely available to program managers.

## **d. Monitoring and Evaluation of Interventions**

### **Emergency Interventions**

The impact of food aid interventions is a major application for CSI. Because the CSI can pick up relatively short-term changes in behavior, it can provide information on the way in which food assistance (or other emergency intervention aimed at addressing food insecurity) has or has not had the intended impact. Because it can provide this information rapidly, it can be used as a program management tool for monitoring and evaluation. To do this with food aid, it is necessary to use the CSI with a Post-Distribution Monitoring or End-Use Monitoring tool (see Appendix 1, the section on individual coping behaviors, for an example). Correlating receipt of (and actual consumption of) food aid with changes in the CSI score will provide managers with real-time information about the impact of food aid.

### **Long-Term Interventions**

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 of longer-term interventions (i.e., development projects and programs) in addition to short-term (emergency) interventions. Be aware that the CSI is sensitive to short-term changes such as seasonality, or the effects of shocks, however major or minor. If being used to track long-term interventions, ensure that short-term influences such as seasonality are factored out of the analysis (for example, by conducting a baseline survey and an impact evaluation survey at the same time of the year/harvest cycle, etc.).

## **e. Use in Conjunction with Other Tools**

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. This gives the analyst some sense of the main causes of a nutritional problem, which a nutrition assessment alone usually does not do.

As noted, the CSI can be used as a part of a Post Distribution Monitoring system—specifically with an end-use form for food assistance—to provide information about the impact of food aid.

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## APPENDIX 1. NOTES ON COLLECTING AND ANALYZING INFORMATION

### a. Sampling

To use the CSI tool as part of a household survey, you will need to select a sample. 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 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.

For purposes of statistical rigor and the ability to draw statistically-supported inferences, it is strongly recommended that no less than 20 clusters of 20 households each are used (20 X 20 cluster approach) for a sample size no smaller than 400 households. Smaller sample sizes or other forms of sampling may yield some indicative information. However, the estimates derived

will be too imprecise to be useful and are unlikely to be adequate to support statistical inference.<sup>6</sup> 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.

## Further Notes on Sampling<sup>7</sup>

Sampling refers to any time 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 relies on a more subjective determination of the degree to which a sample “represents” the larger study population. Choosing 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.

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<sup>6</sup> Statistical inference is the ability to infer something about the larger population ( $N$ ) from which the sample ( $n$ ) was taken on the basis of probability theory.

<sup>7</sup> The remainder of this section on sampling methods comes from the first edition, and was written by Greg Collins.

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, as shown in Figure 1.

**Figure 1. 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.

**Figure 2. 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 three above, or 6 in this example) by the number of clusters needed (let us say we require two 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 two times and village C can be selected up to three 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.

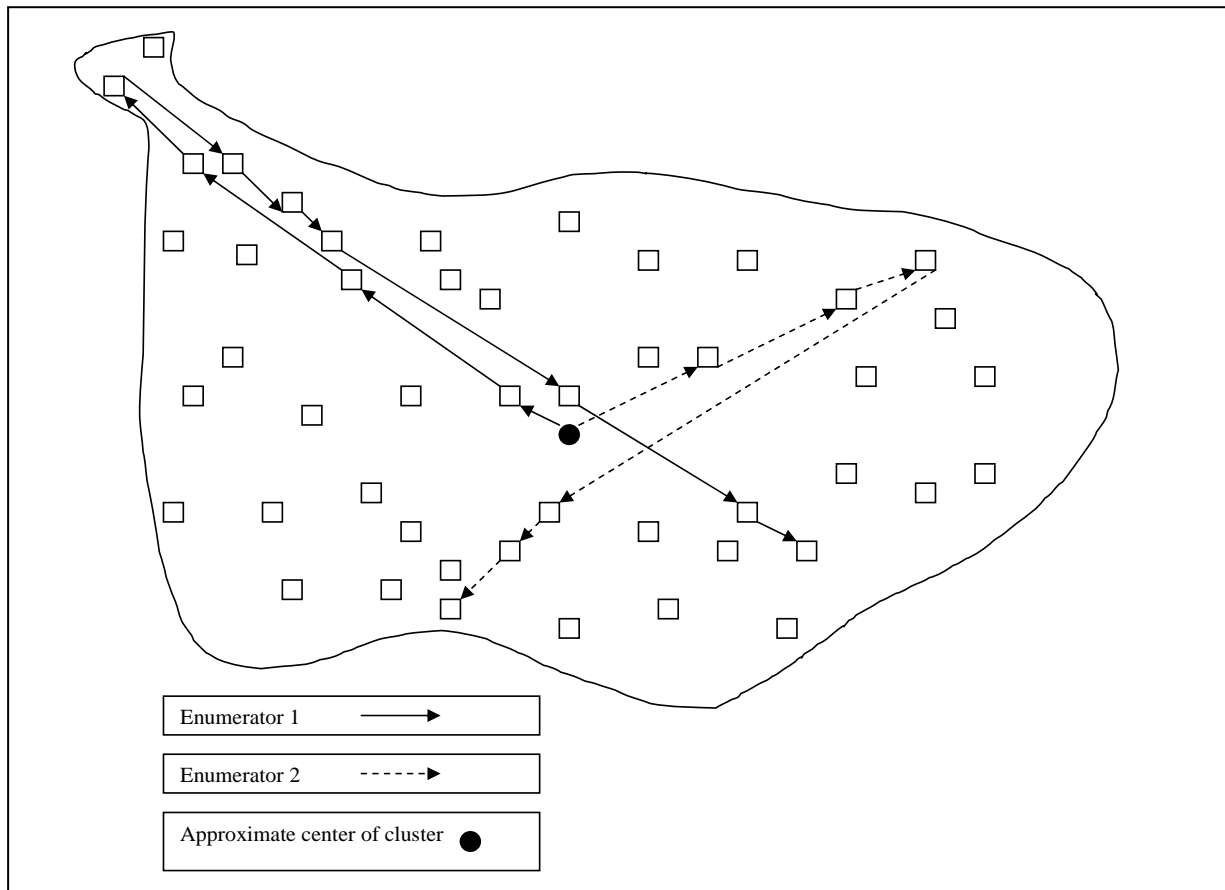
Step 1—using key informants, locate the center of the cluster.

Step 2—spin a pencil to determine the direction the survey team will walk to select households. 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.

Step 3—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.

**Figure 3. 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., lower 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 twenty 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 (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 over time 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.

**Figure 4. 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 data from the Ghana research as a basis for parameter estimates in the sample size calculation. Note that these calculations apply to the full (context-specific) CSI, not the reduced CSI. The latter will not result in comparable changes of magnitude in CSI scores.

#### *Sample Size for Simple Random Sampling (SRS) where an Exhaustive Sampling Frame of Households Exists*

The sample size for an SRS is half that of the cluster sampling approach (e.g., the cluster sampling entails a design effect of two, 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 in Figure 4, a CSI score of 48.37 derived from a sample may have a 95 percent confidence interval of plus or minus 5.31 CSI points.

Visually this can be expressed as:

43.06 ————— 48.37 ————— 53.68

For this example we are 95 percent 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 percent 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 (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 apply the required sample size and number of clusters to each stratum (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.

## **b. 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.”

## **c. Some Miscellaneous Methodological Concerns**

### **Other Information Requirements**

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, the size of the household, but also the sex of the head of household, and perhaps age, sex, 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. See the section below on examples of complimentary tools for details for using CSI in conjunction with food aid.

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.

## **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 gain access to food, and except in the most dire of emergencies, food distributions are targeted to households, so a household-level measure is 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 that 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 screening tool for these interventions.

## **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.).

#### d. Examples of Questionnaires and CSI Module Formats

A variety of formats for the CSI have been used to date. Below are several examples from recent or on-going studies. Note that many of these contain individual behaviors that are not appropriate according to the criteria for including consumption coping behaviors, outlined in Box 2 of the main text.

**Figure 5. CSI: UNRWA—West Bank Palestine**

Did you .....(read coping strategy).....during the last month? رتب خلال الشهر الماضي البنود وفق المعادلة اعلاه (استراتيجية التكيف من 0-7)	1. Every day (f=7)	2. Most days (f=5)	3. Half the time (f=3.5)	4. Several days (f=1.5)	5. Never (f=0)
1. Consume less quality & variety of food استهلاك غذاء أقل نوعية وتنوع					
2. Reduce the meal of adults in favor of children تقليل وجبات البالغين لصالح الاطفال					
3. Limit the portion of meal for all household members تقليل كمية الوجبة لكافة اعضاء الاسرة					
4. Reduce number of meals per day تقليل عدد الوجبات					
5. Purchase food on credit شراء طعام بالدين					
6. Send children to eat elsewhere ارسال الاولاد للاكل في مكان اخر					
7. Send children to work for food ارسال الاولاد للعمل من اجل الغذاء					
8. Regrouping of family members to save money الاكل الجماعي لتوفير المال					
9. Depend on aid from family and friends الاعتماد على المساعدات من الاهل والاصدقاء					

**Figure 6. CSI: UNRWA—West Bank Palestine**

Did you .....(read coping strategy).....during the last month days?	Yes	No
1. Use part or all of your life savings to purchase food استخدام جزء من المدخرات للحصول على الغذاء		
2. Sell any assets to purchase basic food items?(سيارة، ارض، مبنى، طعام)بيع اصول لشراء الطعام		
3. Sell any assets to invest in income activities?بيع اصل لاستثمار المبلغ لزيادة الدخل		
4. Reduce health and education expenses in order to meet food needs? تقليل الانفاق على الصحة والتعليم من اجل توفير احتياجات الطعام		
5. Take on a loan (credit) to purchase food الاستدانة بما يشمل القروض من اجل توفير الطعام		
6. Harvest immature crops حصاد محاصيل قبل الاوان		
7. Skip a loan payment التوجه للاستدانة		
8. Sell any durable goods		
9. Using in kind products		

**Figure 7. Food Security Survey—CARE Eritrea**

In the past 30 days, if there have been times when you don't have enough food or money to buy food, how often has your household had to:						
SN	Coping Option	Times per week				
		Every day	3-6 times/ week	Once or twice	Less than 1	Never
K1	Rely on less preferred and less expensive foods?					
K2	Borrow food, or rely on help from friends or relatives?					
K3	Purchase food on credit?					
K4	Gather wild food, hunt or harvest immature crops?					
K5	Consume seed stock held for next season?					
K6	Send household members to eat elsewhere?					
K7	Send household members to beg?					
K8	Limit portion sizes at mealtimes?					
K9	Restrict consumption of adults so children can eat?					
K10	Feed working members of HH at the expense of non-working members?					
K11	Ration the money you had and buy prepared food?					
K12	Reduced the number of meals eaten in a day?					
K13	Skip entire days without eating?					
K14	Sold jewelry or household items to purchase food?	Yes _____		No _____		
K15	Sold livestock or farm implements to purchase food?	Yes _____		No _____		

## e. List of (Appropriate) Individual Coping Behaviors

Below is a list of all the individual behaviors noted over the past several years that have been included in CSI surveys (those that do not fit the criteria listed in Box 2 of the main text are noted). They are listed by category in general order of increasing severity. Note that this list is provided for brainstorming and cross-referencing purposes only—it is **NOT** a format for a questionnaire.

**Figure 8. Generic List of Coping Strategies**

<i>Individual Behavior</i>	<i>Comment</i>
<b>1. Dietary Change</b>	
Rely on less preferred and less expensive foods	
Consume less variety of food	
<b>2 Increase Short-Term Household Food Availability</b>	
Borrow food from a friend or relative	
Purchase food on credit	
Depend on aid from outside the household	
Use part of savings to buy food	
<del>Send children to work for food</del>	Note 1
<del>Sell assets to buy food</del>	Note 1
Reduce health or education expenditure to buy food	
Skip a loan payment	Note 2
Gather wild food, hunt, or harvest immature crops	Note 3
Consume seed stock held for next season	Note 3
<b>3. Decrease Numbers of People</b>	
Send children to eat with neighbors	
Send household members to beg	
<b>4. Rationing Strategies</b>	
Limit portion size at mealtimes	
Restrict consumption by adults in order for small children to eat	
Feed working members of HH at the expense of non-working members	
Ration the money you have and buy prepared food	Note 2
Reduce number of meals eaten in a day	
Skip entire days without eating	

Note 1. This behavior does not meet the criteria for an appropriate indicator, because a “no” answer is not interpretable, and because the behavior is likely to be done once, not something that has scalable frequency.

Note 2. This behavior is more applicable to an urban or cash-market oriented household.

Note 3. This behavior is more applicable to a rural, food-producing household.

## f. Examples of Complimentary Tools

### End-Use Monitoring of Food Assistance

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 is provided below.

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 it 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 households 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.

**Figure 9. 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
Of total food aid consumed, how much of the food (kgs.) aid did you get from:				Other: _____
		Day	Month	Year
When was the last distribution you received?				

## APPENDIX 2. QUALITATIVE (PRA) EXAMPLE OF THE CSI

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 ten percent of the population) that rely on various coping strategies.

**Figure 1. CSI PRA Application (Simple Version)**

<b>Because they don't have enough food or enough money to buy food, what proportion of households in this community have to:</b>	<b>Proportion who do</b>	<b>Proportion who do not</b>
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. Reduce number of meals eaten in a day?	OOOOO	OOOOO
l. 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.



**Figure 2. CSI PRA Application (More Sophisticated Version)**

<b>Because they don't have enough food or enough money to buy food, what proportion of households in this community have to:</b>	<b>Proportion who frequently do</b>	<b>Proportion who only rarely do</b>	<b>Proportion who never do</b>
a. Rely on less preferred and less expensive foods?	0000	0000	00
b. Borrow food, or rely on help from a friend or relative?	00	0000	0000
c. Purchase food on credit?	00	0000	0000
d. Gather wild food, hunt, or harvest immature crops?	0	00	0000000
e. Consume seed stock held for next season?	—	00	00000000
f. Send household members to eat elsewhere?	0	0000	00000
g. Send household members to beg?	0	0000	00000
h. Limit portion size at mealtimes?	00000	000	000
i. Restrict consumption by adults in order for small children to eat?	0000	0000	00
j. Feed working members of HH at the expense of non-working members?	00	00	000000
k. Reduce number of meals eaten in a day?	000	0000	000
l. Skip entire days without eating?	0	0	00000000

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 3. EXAMPLES OF STUDIES

### a. The Kenya Pilot Study

#### Background

WFP and CARE International collaborated to design and implement a pilot study of the CSI in Kenya to test its applicability to tracking food security emergencies, and the impact of food aid interventions in emergencies. The objectives of the Kenya Pilot Study were:

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

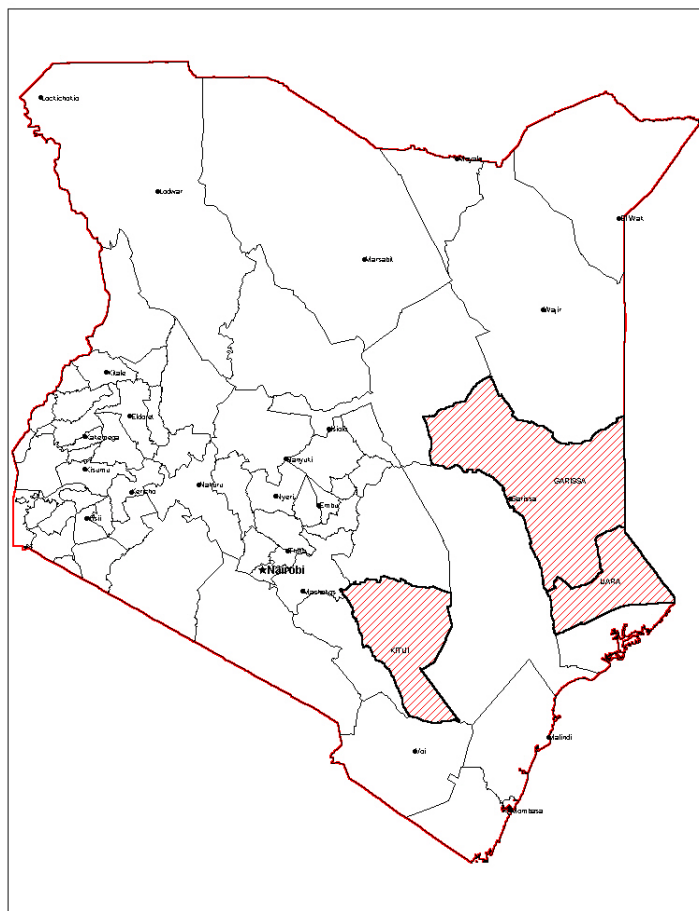
The study was carried out in two districts of Kenya—a pastoral area (Garissa district) and a marginal rain-fed agricultural area (Kitui district). Both were affected by the 1999–2000 drought and subsequent WFP Emergency Operation (EMOP). Figure 1 shows the locations of the study.

A questionnaire was designed to capture a full range of food security and livelihood indicators, including the CSI. 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.

#### Results

The CSI correlated significantly with food frequency, asset ownership, income, and other measures of livelihood security. The CSI correlates significantly with changes in early warning indicators. Bi-variate and multi-variate analysis was carried out to demonstrate this relationship. Figure 2 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.

**Figure 1. The Kenya Pilot Study**



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 (that correlated with 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.<sup>8</sup>

**Figure 2. Correlation of CSI and Food Frequency Indicator**

(Pearson's r)			
District	Round 1	Round 2	Round 3
Garissa	-0.204**	-0.379**	-0.435**
Kitui	-0.307**	-0.457**	-0.434**

\*\* p < 0.01 (Two-tailed test)

Asset ownership was 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.

Receipt of food aid was 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 was the binomial (receipt of food aid or not)—it is not a quantitative measure of per capita food aid receipts. In Garissa District, 88 percent of all households had received food aid during Round 1, 68 percent of households in

<sup>8</sup> This analysis was conducted by Greg Collins.

Round 2, and 66 percent of households in Round 3. Yet the mean amount of food aid per capita received at the household level was between 5.1 kilograms per person and 7.5 kilograms per person (a full food basket is considered 15 kilograms per person per month).

## b. The Accra Urban Food and Nutrition Study

The Accra Urban Food and Nutrition Study was the first to test the relationship between the CSI and quantitative measures of food consumption and food budgets. Though not in an emergency situation, the results of this study are important to understand the relationship between the CSI and other measures of household food insecurity. Summary results of that study are presented in Figure 3. For this analysis a complete CSI was used, and in an attempt to isolate the impact on daily consumption a different index was created that included only those elements of the CSI that relate to a shortfall in immediate consumption (the rationing behaviors). Note that this version of the CSI correlates better with daily caloric intake, but less well with food budget shares or income per capita. Not surprisingly, since the CSI is a household measure, neither correlate strongly with individual measures such as the nutritional status of children (but note that other elements of a typical nutrition study do).

**Figure 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: Maxwell et al. 1999

\* Correlation Significant ( $p < 0.05$ )

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

## c. The CHS Surveys

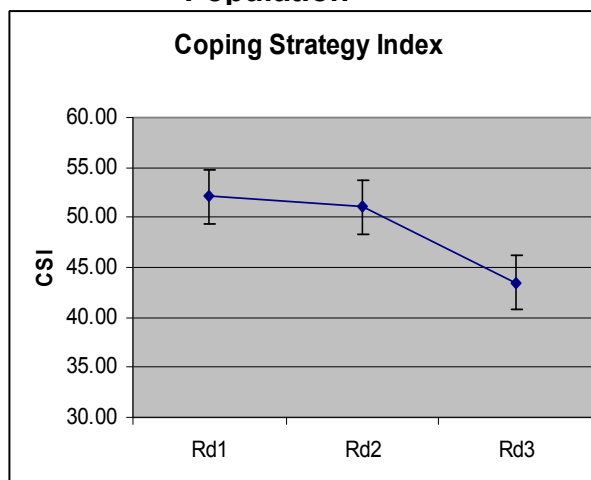
From 2002–2004, the World Food Programme (WFP) and the Consortium for Southern Africa Food Security Emergency (CSAFE) jointly implemented a food and livelihood security monitoring system in six countries in the Southern Africa region. A monitoring system, the

Community and Household Survey (CHS), was implemented to track changes in food security roughly every six months. Data below shows how the CSI informed knowledge of changes in food security after three rounds of surveys covering more than 12,000 households.

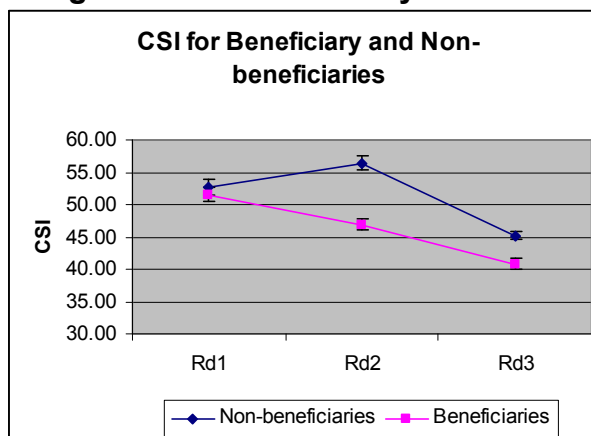
The CHS asked for information on a total of twelve commonly used coping strategies.<sup>9</sup> Each question used five relative frequency categories ranging between “every day per week” to “never.” The CHS collected information on the relevance of coping strategies among sample communities and determined the relative severity of each coping strategy. It then assigned a value of between one and four to each strategy—or a severity score—with one being the least severe and four being the most severe. To analyze the data, the frequency score recorded during the household surveys was multiplied by the severity score,<sup>10</sup> producing a single score for each strategy. This same procedure was repeated during each round of the CHS. Severity scores were recalibrated using results from eighteen focus groups.

Figure 4 shows the CSI aggregated over the six countries. The CSI was significantly lower during the third round of sampling, falling to an average of about 44 points per household. This decline in CSI was likely due to two factors, a general easing of the food security crisis as well as the positive changes brought about by food aid. This conclusion is supported by Figure 5, which shows a significant decline in the CSI for both beneficiary and non-beneficiary households. For both groups the decline between the Round 1 and Round 3 of the CHS was significant. There was also a significant difference between beneficiary and non-beneficiary groups in Round 2 and Round 3. Together, this evidence suggested that households in general

**Figure 4. CSI for the Sample Population**



**Figure 5. CSI Beneficiary**



<sup>9</sup> The coping strategies were: Limit portion size at mealtimes; Reduce number of meals eaten per day; Skip entire days without eating; Borrow food or rely on help from friends or relatives; Rely on less expensive or less preferred foods; Purchase/borrow food on credit; Gather unusual types or amounts of wild food / hunt; Harvest immature crops (e.g., green maize); Send household members to eat elsewhere; Send household members to beg; Reduce adult consumption so children can eat; and Rely on casual labor for food.

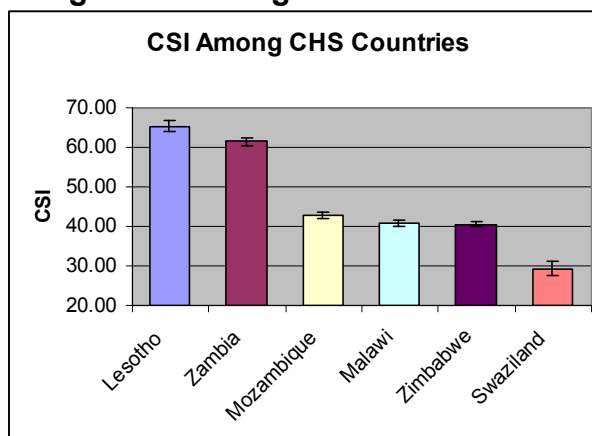
<sup>10</sup> The frequency value is on a scale of 1-5 and is a measure of the number of times per week that a household employs a given strategy while the severity value, also on a scale of 1-5, is a perception of how serious households view a given behavior (with 5 being the most severe).

were recovering from the food security crisis, but food aid facilitated beneficiary households to recover at a faster rate. The fact that in Round 2 and Round 3 the CSI was lower for beneficiary groups (that had higher initial levels of food insecurity) supported this conclusion and suggested that food aid even in the lean season (Round 2) freed households from relying as much on coping behaviors.

### Among CHS Countries

The average CSI varied significantly among the six countries surveyed (Figure 6). Lesotho and Zambia had significantly higher CSI means than the other four countries—Mozambique, Malawi and Zimbabwe all had the same mean CSI, while Swaziland had the lowest. However, the CSI in all countries fell significantly over the three rounds of the survey, with the exception of Swaziland, where the CSI actually increased from a mean of 20.3 in Round 1 to 36.7 in Round 3. Despite Swaziland's relatively small sample size, this increase in the CSI was statistically significant and triggered further investigation as to its causal factors.

**Figure 6. Average CSI**



### d. Post-Tsunami Recovery—Sri Lanka

The CSI was used as a food security indicator in a number of post-tsunami recovery programs. Figure 7 reveals the frequency of coping behaviors and their change over time for households in seven districts impacted by the tsunami. Many of the more severe behaviors, such as skipping entire days, gathering wild foods, and sending household members to eat elsewhere were not common practices during the two study periods. Most of the changes in CSI values that occurred between the two study periods came from decreasing the frequency of individual behaviors from many times per week to less than one day per week or never. The most common practices at the time of the end-of-project (EOP) evaluation were *using less expensive/preferred foods* and *purchasing food on credit*.

**Figure 7. Frequency of Coping Behaviors for Food Security by Baseline and EOP Study**

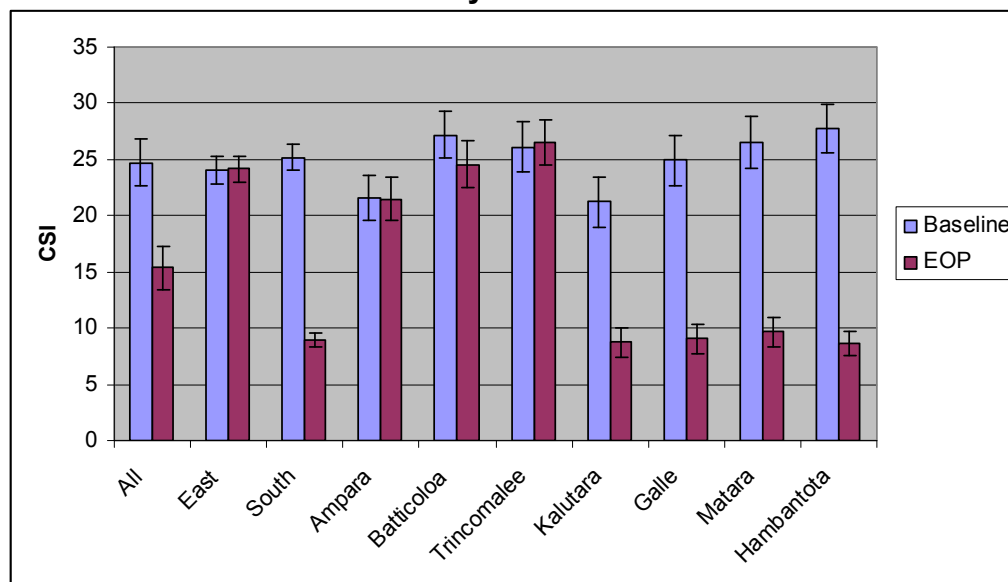
Period	Coping Strategy	Frequency				
		Never	< 1 day/ week	1–2 days/ week	3–6 days/ week	Daily
		Percent of households				
<b>Baseline</b>	Limit portion size at mealtimes	55.0	19.8	12.4	6.0	6.8
	Reduce number of meals/day	56.9	20.5	10.4	6.3	5.9
	Borrow food or rely on others	50.7	17.2	14.7	12.2	5.2
	Use less expensive/preferred foods	32.8	17.9	12.6	14.2	22.5
	Purchase food on credit	26.5	15.5	21.6	15.1	21.3
	Gather wild food	82.5	9.2	5.6	1.7	1.0
	Send HH members to eat elsewhere	69.0	13.2	8.8	6.1	3.0
	Reduce adult consumption	58.5	15.8	8.6	8.0	9.2
	Rely on casual labor for food	51.6	9.4	4.3	4.2	30.6
<b>EOP</b>	Limit portion size at mealtimes	61.1	16.0	17.9	4.2	0.7
	Reduce number of meals/day	66.0	13.5	16.0	3.7	0.9
	Borrow food or rely on others	64.4	16.0	15.1	3.9	0.7
	Use less expensive/preferred foods	46.1	18.6	21.3	8.7	5.3
	Purchase food on credit	53.7	14.2	20.1	9.3	2.7
	Gather wild food	80.2	5.7	10.6	2.8	0.7
	Send HH members to eat elsewhere	73.2	11.3	11.5	3.0	1.0
	Reduce adult consumption	71.0	11.7	12.1	4.6	0.6
	Rely on casual labor for food	70.6	5.5	7.6	4.7	11.5

Another way used to view the same data was to calculate the average score of the frequency. The scale used was 1 to 5, with 1 being “never” and 5 being “always.” As Figure 8 shows, no frequency averaged more than 3.0, and most were below 2.0. This means that on average, households were using these strategies less than one day per week or, at most, 1–2 days per week. The most common strategies in the baseline were to rely on casual labor, to purchase food on credit, and to rely on less expensive or less-preferred foods. These three strategies remained important in the EOP study, but as the data shows, the frequency of using any of the nine coping strategies declined following the baseline study (with the exception of gathering wild foods, which has remained about the same, and may be associated with seasonal factors).

**Figure 8. Mean Score per Coping Strategy by Study Period**

Coping Strategy	Baseline	EOP
Limit portion size at mealtimes	1.90	1.67
Reduce number of meals/day	1.84	1.60
Borrow food or rely on others	2.04	1.61
Use less expensive/preferred foods	2.76	2.09
Purchase food on credit	2.89	1.93
Gather wild food	1.30	1.38
Send HH members to eat elsewhere	1.61	1.47
Reduce adult consumption	1.94	1.52
Rely on casual labor for food	2.93	1.81

Each household has a coping strategy index which represents the weighted value of all nine behaviors. Figure 9 provides average CSI values for each study period by zone and district.<sup>11</sup> The data showed that food security remained an issue in the East, even as other indicators of recovery showed progress. Note that CSI values decreased significantly in the South—likely because income had recovered and households had the means to return to their normal diet behaviors. The CSI values in the East suggested that households had not been able to decrease the number or frequency of coping strategies associated with diet. This was consistent with economic recovery data showing households in the East with declining income and increased debt associated with non-productive expenditures.

**Figure 9. Comparison of Average CSI Values between the Baseline and EOP by District and Zone**

<sup>11</sup> The East was represented by Ampara, Batticaloa, and Trincomalee districts, while the South was represented by Kalutara, Galle, Matara, and Hambantota.



## APPENDIX 4. REVIEW OF LITERATURE: OTHER FOOD SECURITY INDICATORS

Many agencies implementing food security programs are constrained by the practical challenge of assessing needs, targeting interventions, and measuring their impact without a clear, concise method of distinguishing between food secure and food insecure populations (Webb et al. 2006). For decades, these agencies have worked to develop reliable methods of measuring and responding to trends in each of the “three pillars” of food security—availability, access, and utilization. Although much progress has been made on achieving a somewhat standard and reliable set of proxy indicators of food *availability* (food price hikes, lack of food in stores, etc.) and *utilization* (malnutrition, morbidity, disease outbreaks, mortality), the development of accurate indicators for measuring the impact of particular programs on food *access* has proven to be much more challenging (Webb et al. 2006, Swindale and Bilinsky 2006, Maxwell et al. 1999). This is due in part to the relatively large number of activities aimed at improving food access ranging from agricultural diversification, creation of market linkages, micro-credit associations, and other income or employment-generating activities. The establishment of a standard set of indicators is made even more difficult by the variety of social and economic contexts in which these activities are implemented (Swindale and Bilinsky 2006).

There are also considerable methodological challenges involved in the development of valid food access indicators. The process of determining and testing indicators is inherently complex given the fact that in order to accurately gauge food access, data on a variety of critical factors must be collected and analyzed. The primary factors that must be carefully considered in determining food security from an access perspective include: (1) access to sufficient amounts of food to ensure that people have enough food to meet basic energy requirements; (2) access to different types of food to ensure that household members meet basic nutrient requirements; (3) psychological dimensions relating to feelings of deprivation, restricted choice, or anxiety related to the quantity or quality of available food; and (4) the social or cultural acceptability of consumption patterns (Barrett 2002, Weismann et al. 2006).

Traditional measures of food access have relied on proxy indicators such as food consumption, household income, productive assets, agricultural productivity, food storage, and child nutritional status, each of which are presumed to be primary determinants or consequences of a particular household’s level of food security (Webb et al. 2006). Recently, more effort has been made to accurately assess dietary energy intake as a primary indicator of household access to food. In recent studies, dietary diversity and meal frequency have proven to be among the most common and valid indicators of nutrient adequacy and/or energy intake (Weismann et al. 2006, Dewey et al. 2005, Hoddinott and Yohannes 2002).

Typically, questions on each of these proxy measures are incorporated into comprehensive food security assessments in order to gauge household access to food among target populations.

Many of the most commonly used methods for measuring household access to food are derived from the United States Household Food Security Survey Measure (HFSSM) designed by Cornell and Tufts Universities in conjunction with the U.S. Department of Agriculture. The HFSSM is based upon eighteen questions regarding self-reported behaviors, attitudes, and coping strategies related to household access to food. Most importantly, the HFSSM provides a method of scaling

summarized responses to questions in order to determine distinct grades or categories of food insecurity (Webb et al. 2006, Coates et al. 2006, Weismann et al. 2006).

One relatively recent approach to measuring food access that shares certain characteristics with the CSI is the Household Food Insecurity Access Scale (HFIAS) developed by the Food and Nutrition Technical Assistance (FANTA) Project. Similar to the CSI, the HFIAS seeks to establish an easier, “more user-friendly approach” for measuring the access component of household food security (Swindale and Bilinsky 2006). Based on a process involving indicator validation studies in multiple countries and direct consultation with academic researchers, project implementers, and donors, FANTA identified three key domains of household access to food: (1) perceptions of insufficient quantity of food; (2) perceptions of inadequate quality of food; and (3) anxiety /uncertainty about whether the food budget or supply is sufficient to meet basic needs. The same process resulted in identification of two key indicators of household food access that form the basis of the HFIAS: household dietary diversity and months of inadequate household food provisioning. In order to gain information pertaining to these key indicators, FANTA devised thirteen questions to serve as the basis of the HFIAS as an “experiential food insecurity (access) scale” (Swindale and Bilinsky 2006, Frongillo and Nanama 2006). Following the second Food Insecurity Measurement Workshop in 2005, the HFIAS instrument was further narrowed to nine questions that allow establishment of continuous, categorical indicators of household food insecurity (Webb et al. 2006).

Feedback from the preliminary HFIAS studies, combined with direct consultation with implementing partners, suggests that household food access scales provide a valid and useful tool with which to target interventions, monitor food security, and evaluate the impact of project activities on food security at the population level (Coates et al. 2006, Swindale and Bilinsky 2006). Specifically, the experience gained through FANTA’s efforts to develop the HFIAS support the inclusion of questions relating to coping strategies in similar food access measurement tools. Likewise, other studies have verified the importance of collecting data on coping strategies involving reduction, redistribution, and/or reconfiguration of food consumption (fewer meals, reduced consumption among adults, reduced quality of foods) (Maxwell et al. 1999, Maxwell et al. 2003, TANGO 2004, DISI 2006).

Nonetheless, efforts to develop valid and practical scales of food security based on proximate indicators of food access have revealed a number of critical issues that warrant careful consideration. In different cultures, specific coping strategies do not always reflect the same severity of food insecurity nor are they equally acceptable to vulnerable households. This is due primarily to the fact that adopting certain coping strategies is often influenced by the availability or sustainability of the particular strategy, the household’s own commitment to future productivity, the level of asset ownership, the availability of information, the nature and degree of perceived risk, and the human capacity of household members to implement the strategies at their disposal (Coates et al. 2006). Thus, in order to arrive at a universally valid and sensitive scale of food security, adequate attention must be given to developing methods of translating or adapting measures from one culture to another (Swindale and Bilinsky 2006, Coates et al. 2006, Webb et al. 2006, Weismann et al. 2006).

Furthermore, due to the “statistical constraints of a single unidimensional scale,” important contextual details influencing the experience of household food insecurity are likely to be lost or discounted through data aggregation. Therefore, Coates et al. (2006) recommend that future

assessments of food access (food insecurity) maintain disaggregated data on a number of different domains and sub-domains (changes in consumption, anxiety about perception of household food shortages), and possibly consider the creation of subscales as alternative indicators of the various aspects of food insecurity as it is experienced by individual households. Similarly, due to different response patterns, it may not be feasible to establish universal cut-off points or thresholds between one category of food insecurity and another based solely on the affirmation of specific items or coping strategies as modeled by the HFSSM (Coates et al. 2006).

Researchers suggest that in order to arrive at a valid and replicable set of indicators for measuring household access to food, priority should be given to developing answers to the following questions (Webb et al. 2006, Swindale and Bilinsky 2006):

- How well do measures of household food insecurity developed for chronically food insecure areas capture the processes leading to, and experience of, acute food insecurity?
- What are the impacts of short-term shocks, such as major floods or earthquakes, on household behaviors that determine responses to food security questions?
- What is the best way to reflect the nature of household food insecurity (access) captured in each category (food secure, moderately food insecure, severely food insecure, etc.) and the different means by which particular households may have arrived at a particular level of food insecurity?
- Can cut-offs or thresholds between different categories reliably be based on the assumption that respondents in different social and economic contexts will consistently reflect a common perception of the severity of coping strategies?
- What is the best way to determine whether an individual's responses to survey questions is representative of the food insecurity experiences of all members of the household?
- Will households within each category but from different countries resemble each other sufficiently to allow valid comparison?

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