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## **Measuring Food Insecurity: Going Beyond Indicators of Income and Anthropometry**

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November 2003

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This publication was made possible through the support provided to the Food and Nutrition Technical Assistance (FANTA) Project by the Office of Health, Infectious Disease and Nutrition of the Bureau for Global Health at the U. S. Agency for International Development, under terms of Cooperative Agreement No. HRN-A-00-98-00046-00 awarded to FHI 360.

The opinions expressed herein are those of the author(s) and do not necessarily reflect the views of the U.S. Agency for International Development.

**Recommended citation:**

Coates, Jennifer, Patrick Webb and Robert Houser. *Measuring Food Insecurity: Going Beyond Indicators of Income and Anthropometry*. Washington, D.C.: Food and Nutrition Technical Assistance Project, FHI 360, 2003.

**Copies of the publication can be obtained from:**

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## **ACKNOWLEDGEMENTS**

This study was conducted by the Friedman School of Nutrition Science and Policy (FSNSP) at Tufts University. The authors would like to thank the Directors of Data Analysis and Technical Assistance, Inc., Zahidul Hassan and Mohammed Zobair, and their staff for their incredible technical and logistical contributions; Brett Gresham, Rachel Brumbaugh, and Rozena Begum at World Vision/Bangladesh for their collaboration in data collection and testing; and Beatrice Lorge Rogers of FSNSP, Mark Nord at USDA/ERS, Anne Swindale and Bruce Cogill at FHI 360/FANTA, and Edward Frongillo and Simeon Nanama of Cornell University for their helpful comments on the final report.

## ACRONYMS

ADP	Area Development Program
BRAC	Bangladesh Rural Advancement Committee
DAP	Development Activity Program
DATA	Data Analysis and Technical Assistance, Inc.
FANTA	Food and Nutrition Technical Assistance Project
FAST	Food Access Survey Tool
FGD	Focus Group Discussion
FIMVS	Food Insecurity Measurement and Validation Study
FSEI	Food Security Enhancement Initiative
FSNSP	Friedman School of Nutrition Science and Policy
GIR	Group Informant Rating
ICDDR,B	International Centre for Diarrheal Disease Research, Bangladesh
NGO	Non-Governmental Organization
PVO	Private Voluntary Organization
WVB	World Vision Bangladesh
WVI	World Vision, Incorporated
USAID	United States Agency for International Development

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## EXECUTIVE SUMMARY

The research for this report, conducted between 2000 and 2003 by the Tufts University Friedman School of Nutrition Science and Policy (FSNSP), tests the extent to which qualitative questionnaire approaches devised for use in the United States during the 1990s (with Tufts and Cornell involvement) can be adapted and enhanced for applications in diverse developing country settings.

There is strong demand among Title II-supported Private Voluntary Organizations (PVOs) and other agencies for a relatively simple, methodologically rigorous measure of ‘food security’ (particularly the ‘access’ dimension) that can be used to guide, monitor and evaluate operational interventions. Responding to this demand, the three-pronged objective of the research project was to: 1) develop and validate a measure of household food access based on locally recognized behaviors that reliably distinguish households facing different degrees of insecurity in developing countries, 2) test the Food Access Survey Tool (FAST) measure’s relationship to conventional indicators of food insecurity (typical proxies such as income, nutrition and food intake), and 3) test the measure’s application in a longitudinal exploration of its sensitivity to change related to program impact and secular trends.

The Food Insecurity Measurement and Validation Study (FIMVS) has been carried out in parallel with operational activities of World Vision/Bangladesh’s Food Security Enhancement Initiative (WV/B FSEI), a Development Assistance Program (DAP) supported by the United States Agency for International Development (USAID) since the end of 2000. Tufts FSNSP’s role has been to explore objective and subjective, quantitative and qualitative measures of food insecurity among a sub-sample of WV’s participant households, plus a control group. Through interactions with these households at several points over several years, the study elicited information from them about food and dietary perceptions and practices, as well as other quantitative indicators of socioeconomic and nutritional status. These data serve to augment WV’s own baseline and mid-term surveys, thereby allowing for both direct comparison with current monitoring and evaluation methods and the determination of whether the new food security questions are sufficiently sensitive to register impacts from the operational intervention itself. The research described here will lead to practical guidelines and tools that PVOs can use in assessing household food security for operational purposes.

The iterative process of addressing these goals breaks down into four distinct phases:

1. *Development of the prototype Food Access Survey Tool (FAST)*: Using the United States “food security core module” as a model<sup>1</sup>, extensive ethnographic research and concept testing was used to develop an experimental food security survey tool adapted to the Bangladesh context.

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<sup>1</sup>The US ‘food security core module’ is a validated set of 18 questions that collectively distinguishes individuals and households experiencing food insecurity related to insufficient quantity and quality of food, food procured through personally and societally unacceptable means, and a feeling of vulnerability to downturns in supply (Nord and Andrews 2002, Frongillo 1999, Frongillo et al, 1997).

2. *Round One Data Collection:* In early 2001 the prototype module was administered to a sample of 600 households randomly selected from among those villages chosen to participate in the WV/B FSEI baseline survey and control villages. Enumerators conveyed the prototype module to both the household head and the spouse, along with a “comparator indicator questionnaire” that collected data on demographics, anthropometry, morbidity, income sources, water and sanitation, assets, dietary intake, and food and non-food expenditure.
3. *Qualitative Interaction:* The second round of data collection, one year later, was used to interact more closely with a purposively selected sub-sample of 120 households in order to further explore the appropriateness of questions developed for the first round instrument and to generate additional insights to improve the validity and usefulness of the measurement tool. Issues of question interpretation, gender differences in perception, and the ‘experience of insecurity’ were explored using a variety of qualitative methods including focus groups, group informant ratings, food security timelines, and respondent debriefings.
4. *Round Three Data Collection:* The third round of data collection allowed for an examination of the dynamics of food security over time in the context of WV/B FSEI project activities and secular trends. The third round survey was implemented in February 2003, during which time each of the 600 households from Round 1 were revisited with the same quantitative questionnaire and food security module. In addition to these other components, WV/B’s FSEI reporting indicators were rolled into the survey instrument by replicating the wording and approach employed in their baseline and midterm surveys. The analyses presented in below also draw on baseline reporting indicators collected in 1599 households by the FSEI project.

Between each of these phases, qualitative data were mined for insights into the types of questions and specific wording that were most appropriate to distinguish households facing different degrees of insecurity. Additional questions were included and others excluded based on these explorations. Quantitative analyses, including inter-item correlations, principal component analyses, Chronbach alpha reliability analyses, and Rasch analyses conducted in collaboration with Mark Nord (USDA), were also used explore which questions in the prototype module “worked” well both individually and as a group. A nine-question set of FAST questions was created and tested against a battery of comparator indicators of household status (relating to poverty, malnutrition and food consumption). The FAST module’s stability against other indicators over time and its sensitivity to change relative to other comparators were tested using a variety of statistical approaches, including bivariate correlations, contingency tables, paired and independent t-tests, two-way repeated measures ANOVA and multivariate regression.

Conclusions from the overall research can be summarized as follows:

- This research has validated the household questionnaire approach as a viable, and indeed, extremely useful, tool for operational PVOs (and many others) to use in food security-related programming and evaluation. In the context of rural Bangladesh, nine questions on behavioral responses to food stress a) successfully characterize the problem of food insecurity, and b) succeed in ranking households along a continuum of experiences from immediate hunger to sustained food security.

- The nine question FAST module is significantly correlated with a) comparator indicators commonly used in the analysis of poverty and malnutrition, b) the food security status rating of each household as assessed by experienced enumerators, and c) indicators of food insecurity defined by World Vision (based on USAID reporting requirements).
- The statistical relationships observed between the FAST module and its various comparators were stable and remain highly significant over time. The module was found to be highly correlated with indicators used by WV/B in their baseline and mid-term assessments of impact relating to the USAID-funded FSEI Project. In addition, the changes in the FAST module index and its close correlate, the enumerator ratings of food insecurity, tracked significantly with changes in several of the common comparators, including measures of consumption, asset holdings, and dietary diversity.
- As a result it is possible to claim that this FANTA-supported research has effectively demonstrated that the approach to constructing a measure of hunger and food security (as used in the United States), can also be applied in a very different, developing country context. The module of nine questions constructed for use in Bangladesh ‘passes’ validation tests that were applied to the US module, and it is transparent in both its underlying concepts and the meaning of the questions used. The set of nine questions together have strong statistical properties that measure not only the prevalence of food insecurity, but also give an indication of its severity and how that may change over time. The research strongly supports the contention that the current theoretical construct of ‘food insecurity’ is a valid basis on which to design policy and project interventions aimed at overcoming that problem.
- While the validation study itself was time-consuming and elaborate, the adaptation of this approach to new settings should be relatively easy. For cost-conscious and survey skills-constrained PVOs the FAST approach to assessing food insecurity will be a viable option.
- That said, the FAST module does not substitute for more intensive food consumption and expenditure surveys or anthropometric surveys where those are required to answer specific questions relating either to poverty or nutrition. It cannot be used in place of surveys seeking information that guides an operational response—e.g. assessing hygiene in order to target a latrine-building intervention. This research demonstrates that the FAST module is a complement to more common measures either of nutritional status or of food production and marketing. In this sense, the FAST tool serves to address the multi-faceted ‘access’ dimension of food insecurity that until now was insufficiently measured using traditional indicators that typically captured only one particular aspect of the problem.

## 1. INTRODUCTION: OVERVIEW OF THE RESEARCH AGENDA

A major international symposium on measuring and assessing food deprivation and undernutrition was held in Rome in June 2002. Among the most important conclusions of that meeting of over 150 senior researchers and scientists was that, “no individual measure suffices to capture all aspects of food insecurity. A suggestion was made, widely endorsed by participants, that a suite of indicators is needed to cover the different dimensions of food insecurity.” (FAO/FIVIMS 2003).

Within such a suite of indicators it was widely argued that so-called ‘qualitative’ measures of hunger and food security are essential.<sup>2</sup> According to Eileen Kennedy (2003), “there is a clear demand worldwide for... simple, and rigorous methods to measure food insecurity and hunger. The emerging science devoted to developing context-specific, qualitative measures of food insecurity is responding to this demand.” That view is supported by Fajardo (2003), who notes that, “professionals place great hope in [new] methodologies. The measures are directly tied to people’s needs. [Thus] qualitative measures of food insecurity and hunger should be included in every effort to describe food security.” Similarly, Mason (2003) argues that a so-called ‘qualitative’ approach “would seem highly relevant—indeed overdue—especially if it is recognized that the issue of hunger goes beyond only energy intake itself”.

While food insecurity is a widely used concept, the number of researchers who have explicitly studied its measurement problems in a rigorous fashion is relatively small (see Chung *et al* 1997; Maxwell *et. al.* 1999). Those conversant with cutting edge techniques for assessing peoples’ *perceptions* of food insecurity and measures of the experience of hunger are even fewer. Moore *et. al.* (1999) recently noted that while their study of poor people’s own perceptions of well-being had begun by assuming that there was limited material it emerged that “there was even less material than we had expected.”

One reason for this is that international attention to ‘perceptions of the poor’ is only a recent addendum to the participatory development agenda (Chambers 1995; Hossain 1999; World Bank 1999). Despite much rhetoric about ‘listening’ to the poor since the 1980s, large-scale comparative analysis of qualitative information on hunger and poverty is a new undertaking for which new methodologies have had to be devised (Brock 1999; Moore *et. al.* 1999; World Bank 2001). Interestingly, while the focus of much recent work has been on the experience of poverty it has been found that “food insecurity is commonly central to descriptions of the experience of being poor.” (Brock 1999) That is, poor people in Slovenia, Egypt or Pakistan typically describe their experience of poverty (and fears associated with it) in terms of hunger, lack of food and anxiety relating to meeting future food needs (Tine 1992; World Bank 1999, 2001). However, it is not easy to measure anxiety, and few economists or nutritionists have training in psychometric theories or methods.

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<sup>2</sup> The terms ‘qualitative’ and ‘self-reported’ are misnomers that need to be put to rest. Practically all surveys of income, expenditure or asset ownership rely on ‘self-reported’ information, and unlike most ‘qualitative’ methods (such as ‘key informant ratings’ or ‘focus group feedback’) which are principally descriptive and cannot be standardized beyond a specified time and place, the results collected via measures of food insecurity related behaviors *are* quantified and analyzed using statistically rigorous methods. The FAST approach can be understood as a measure that assesses hunger by quantifying a range of household behaviors known to reflect food related stresses.

One approach to this measurement challenge has been ably demonstrated through the United States Department of Agriculture (USDA) “food security core module”, a validated set of 18 questions that collectively distinguishes individuals and households experiencing food insecurity related to insufficient quantity and quality of food, food procured through personally and societally unacceptable means, and a feeling of vulnerability to downturns in supply (Nord and Andrews 2002, Frongillo 1999, Frongillo et al, 1997). Derived from ethnographic interviews with a small sample of women in rural upstate New York, the “US food security core module” is underpinned by the notion that the experience of insecurity prompts predictable *behavioral responses* that are both observable and quantifiable in a way that “food insecurity” itself is not. Unlike conventional indicators, such as caloric adequacy and income, that represent proximal determinants of insecurity, this approach tries to capture, through recall and self-report, actions that are prompted by the insecurity itself – the symptoms rather than the cause.

The Food Insecurity Measurement and Validation Study (FIMVS) results reported here tests this approach to assessing food insecurity and hunger among roughly 600 mostly rural, poor households in Bangladesh.

The goals of the FIMVS study were to:

- Develop and validate a measure of household food access based on locally recognized behaviors that reliably distinguish households facing different degrees of insecurity in developing countries;
- Test the measure’s relationship to conventional indicators of food insecurity (typical proxies such as income, nutrition and food intake); and
- Test the measure’s application in a longitudinal exploration of its sensitivity to change related to program impact and secular trends.

Although iterative, the process of addressing these goals can be broken down into four distinct phases:

1. *Development of the prototype Food Access Survey Tool (FAST):* Using the United States “food security core module” as a model<sup>3</sup>, extensive ethnographic research and concept testing was used to develop an experimental food security survey tool adapted to Bangladesh realities.
2. *Round One Data Collection:* In early 2001 the prototype module was administered to a sample of 600 households randomly selected from among those villages chosen to participate in the World Vision, Bangladesh Food Security Enhancement Initiative (WV/B FSEI) baseline survey and control villages. Enumerators conveyed the 36-question prototype module to both the household head and the spouse, along with a “comparator indicator questionnaire” that collected data on demographics, anthropometry, morbidity, income sources, water and sanitation, assets, dietary intake, and food and non-food expenditure.

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<sup>3</sup>The US ‘food security core module’ is a validated set of 18 questions that collectively distinguishes individuals and households experiencing food insecurity related to insufficient quantity and quality of food, food procured through personally and societally unacceptable means, and a feeling of vulnerability to downturns in supply (Nord and Andrews 2002, Frongillo 1999, Frongillo et al, 1997).

3. *Qualitative Interaction:* The second round of data collection, one year later, was used to interact more closely with a purposively selected sub-sample of 120 households in order to further explore the appropriateness of questions developed for the first round instrument and to generate additional insights to improve the validity and usefulness of the measurement tool. Issues of question interpretation, gender differences in perception, and the ‘experience of insecurity’ were explored using a variety of qualitative methods including focus groups, group informant ratings, food security timelines, and respondent debriefings.
4. *Round Three Data Collection:* The third round of data collection allowed for an examination of the dynamics of food security over time in the context of WV/B FSEI project activities and secular trends. The third round survey was implemented in February 2003, during which time each of the 600 households from Round One were revisited with the same quantitative questionnaire and food security module. In addition to these other components, WV/B’s FSEI reporting indicators were rolled into the survey instrument by replicating the wording and approach employed in their baseline and midterm surveys. The analyses presented in below also draw on baseline reporting indicators collected in 1599 households by the FSEI project.

Between each of these phases, qualitative data were mined for insights into the types of questions and specific wording that were most appropriate to distinguish households facing different degrees of insecurity. Additional questions were included and others excluded based on these explorations. Quantitative analyses, including inter-item correlations, principal component analyses, Chronbach alpha reliability analyses, and Rasch analyses conducted in collaboration with Mark Nord (USDA), were also used explore which questions in the prototype module “worked” well both individually and as a group. A nine-question set of FAST questions was created and tested against a battery of comparator indicators of household status (relating to poverty, malnutrition and food consumption). The FAST module’s stability against other indicators over time and its sensitivity to change relative to other comparators were tested using a variety of statistical approaches, including bivariate correlations, contingency tables, paired and independent t-tests, two-way repeated measures ANOVA and multivariate regression.

What might PVOs like World Vision expect from this collaborative work? Like many organizations, World Vision is confronted with the problem of measuring the impact of Title II food aid-supported food security interventions. Their concerns relate to the need for measures of food insecurity that a) allow for more effective tailoring of food security interventions to the reality of food insecurity as experienced at the household level (that is, that go beyond a narrow focus on agricultural production, food stocks or child nutritional status), and b) that are less demanding on human and financial resources than conventional household consumption and expenditure surveys.

In recent years, such demand has been given expression by the fact that some PVOs started to simply translate the questions from the US “food security core module” and apply them to quite different, developing country contexts (Holben 2000; Nord et. al. 2003). While this may meet the demand for ‘cheaper’ alternatives, it does not meet the demand for acceptable measures that are built on insights into the local nature and experience of hunger. For that concern to be addressed a validation of the approach to generating module questions is required in contexts of

severe food deprivation rather than food plenty (e.g. the United States). Unfortunately, as noted by Kennedy (2003), “most of the research on qualitative measures of food security...has, to date, emerged primarily from industrialized countries” including the Russian Federation (Welch et. al. 1998) and Canada (Tarasuk and Beaton 1998). That “validation is needed” (Mason 2003) within poor developing countries has driven the current research agenda.

The following sections elaborate the iterative process of developing and testing a contextually valid experiential measure of food security in Bangladesh. The report begins by reviewing the study design and methods of each phase of module development and data collection. This section is followed by a presentation of principal findings associated with: 1) question meaning and interpretation, 2) quantitative testing of module responses, 3) comparisons between the FAST and other indicators of food security, poverty, and malnutrition, and 4) the FAST module indicator’s sensitivity to change in food security due to program impact and secular trends relative to other comparators. The final two sections discuss limitations of the FIMVS and propose next steps and suggestions for further research.

## 2. STUDY DESIGN AND METHODS

### A. Formulating the Prototype FAST Module (Phase 1)

In the hunt for ‘alternative’ measures of food insecurity there has been a convergence in the literature in identifying patterns of household behavior that reflect common responses to severe food constraints (Wolfe and Frongillo 2000; Kennedy 2003). The convergence represents a merging of the classic ‘household coping mechanisms’ work of the 1980s (e.g. Corbett 1988), the evolution of thinking on famine ‘vulnerability’ assessments during the 1990s (Davies 1996; Webb and Harinarayan 1999), and the more recent focus on consumption smoothing (reducing damaging variability in consumption not only seeking to raise aggregate consumption) as a valid goal in food security enhancement and poverty reduction (Holzmann 2001; Barrett 2002). Five major criteria underpin both the U.S. module questions and the FAST module tested in Bangladesh, and all five reflect current thinking on the concept of food insecurity:

- Sufficient quantity of food consumed;
- Sufficient quality of food (diversity, safety and familiarity);
- Security or predictability (anxiety over acquisition);
- Acceptability in acquisition (social norms are not transgressed); and
- Food Security for all individuals (while ‘households’ are typically the preferred unit of measure for assessing food security, differences in experiences and understanding of food stresses exist between children and adults, between individuals and households as a whole, and between men and women).

How does one address these complex concepts with just a few questions? In the U.S. context the measurement instrument for food insecurity was developed through in-depth qualitative study of the experiences of low-income women. A similar process was adopted for Bangladesh: Firstly, fundamental concepts were explored and discussed with many local collaborators with a view to determining the overall framework for questionnaire design and question wording. Very useful at this point was discussion with staff at the Bangladesh Rural Advancement Committee (BRAC), which was designing its own food security survey with help from Cornell University and the International Center for Diarrheal Disease Research/Bangladesh (ICDDR/B). Tufts FSNSP staff in collaboration with BRAC’s research division elaborated topics and language. Based on an interview guide that assisted in developing key words and ideas, Nusrat Choudhury of BRAC tested a first draft of the questionnaire in peri-urban Dhaka. (The interview guide and a transcript of one of the exploratory interviews are included as Attachment 1).

The language was further modified based on in-depth interviews in the Chittagong Hill Tracts conducted by Heli Uusikyla, an anthropologist working for WFP who had conducted her doctoral research among rural women in Bangladesh. As part of her own research she was exploring the words used to express hunger and food insecurity, social meanings and patterns of meal taking, dietary patterns, and coping strategies in rural parts of the country. She field-tested a revised version of the Tufts FSNSP core questions (including focus group interaction on the language and questions) and made invaluable comments and new inputs to the process. It should be underscored that the five conceptual dimensions of food insecurity noted above were strongly supported in most instances as being relevant to Bangladesh.

Efforts were also made to search for recent research and literature on food insecurity and hunger in Bangladesh, though few current activities were identified which focused explicitly on conceptual and perceptual dimensions of food insecurity. Recent research on food security in Bangladesh falls into four main categories; namely, works dealing with:

- Macro food supplies, cereal production trends, and national food policies (e.g. Ahmed *et. al.* 2000; Menon *et. al.* 2000; WFP 2001; Rosegrant and Hazell 2001);
- Vulnerability to exogenous shocks (e.g. Del Ninno and Dorosh 1998; Del Ninno and Roy 1999; Rashid 2000; Zalik 2000);
- Debate over measurement parameters for poverty, welfare and nutrition (e.g. Ravallion and Sen 1996; Wodon 1997; Bouis and Novenario-Reese 1997; Greeley 1999); and
- Qualitative and individual level experiences of hunger, poverty, and disempowerment, the most useful of which include Uusikyla (2000, 2001), Khare (1992), Hashemi and Schuler (1993), Balk (1994); Chen and Mahmud (1995); Schuler *et. al.* (1997), Husain (1998), Zaman (1996), and Halder (2000).

Insights and wording were drawn from these various sources and applied to the prototype questionnaire design where appropriate.

Interaction with PVOs (particularly World Vision and CARE) was important in allowing for feedback on simplicity, acceptability (transparency of concepts), and the feasibility of the questions being considered. The prototype food security module was also intensively discussed with personnel at USAID/Bangladesh, the World Food Programme (WFP), and with staff of a local Bangladeshi research firm called Data Analysis and Technical Assistance, Ltd. (DATA) who were contracted to implement the survey. DATA's three senior managers have, collectively, over 40 years of experience in conducting food security-related research in Bangladesh, and their 'full service' company provided invaluable assistance at every stage of the process<sup>4</sup>.

Close interaction was also maintained throughout with individuals at USDA who have extensive experience of the US food security measurement activity (Mark Nord and Gary Bickel); with partners in this research undertaking at Cornell University (Ed Frongillo) and FHI 360 (Anne Swindale and Gilles Bergeron in particular); and with other researchers in this field, including Dan Maxwell (CARE/Kenya), Robin Wheeler (WFP/Kenya), Eileen Kennedy (ILSI), John Hoddinott (IFPRI), and David Tschirley (MSU).

Discussions with these research partners focused both on individual questions as well as on the appropriateness of the instrument as a whole. These interactions helped to improve the relevance of cultural and context-specific assumptions inherent in the questions, to establish the likelihood of sufficient variability across responses, and to ensure the suitability of response options. For example, a potential question about the availability of cash to purchase fuel wood had to be dropped since this was not in fact a common constraint since cow dung and even leaves are used even if wood cannot be obtained. Also dropped was wording to the effect that a family might meet social convention by feeding an unexpected visitor even if that left insufficient food for the

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<sup>4</sup> All three began their careers as IFPRI staff and they have contributed to much of the food and agriculture research conducted in the country during the past 15 years.

next day—this was deemed unrealistic because if food is in short supply only a token ‘meal’ is offered to a guest. By contrast, many local food items representative of distress periods were added at this point at the suggestion of rural focus group participants, such as sweet potatoes (*mishiti alu*), water lilies (*shalu*) and the boiled water from cooking rice (*bhater mar*).

Based on this initial ethnographic and collaborative work, more than 30 potential questions were developed, fine-tuned, screened, and incorporated into a prototype FAST module in preparation for the second phase of the study (See Attachment 2, Prototype FAST module).

## **B. Round 1 Data Collection (Phase 2)**

### **“Comparator Indicator Questionnaire” Development**

With a view to comparing traditional indicators of food consumption, poverty, and malnutrition against results of the experimental FAST measure, a questionnaire was developed to collect information on household income sources, morbidity, hygiene and sanitation, food expenditure, non-food expenditure, assets, dietary intake, and anthropometry.

The design of the ‘comparator indicator questionnaire’ was built on established best practice (see Swindale and Ohri 1999; Deaton and Grosh 1998; Hoddinott 1999), and, like the FAST module, was drafted and then extensively revised prior to pre-testing. Questions were corrected with an eye to avoiding common pitfalls in survey design; double-barreled and leading questions were eliminated, ambiguous wording was changed and items that could not be interpreted clearly were removed. Additional changes and adjustments ensured that the largely generic household survey was adequately adapted to context, particularly in relation to questions on income sources, assets, and food/non-food expenditure response options.

The complete survey instrument was then divided into two parts: one for implementation by female enumerators to women, and the other for use by male counterparts for mainly male respondents. Female enumerators were instructed to interview the wife of the household head (or female household heads), asking questions on demographics, anthropometry, literacy, food consumption, and the complete FAST module. Male enumerators interviewed male household heads or other adult males, posing questions on the remaining quantitative sections of the survey as well as the entire FAST module. The logic for applying the FAST module to both husbands and wives was to enable a useful comparison between male and female experiences of food insecurity within the same household.

Prior to enumerator training, two experienced male/female pairs were selected to conduct a pre-test of the entire survey instrument in *Saturia Upazila* in *Manikganj* District (three hours from Dhaka). Test households were purposively selected in that respondents were familiar to the research team from previous surveys and could be relied on to provide good post-test feedback regarding survey questions. Tufts FSNSP staff and personnel from DATA reviewed each question and response in detail with the enumerators, soliciting suggestions and making revisions as necessary which were taken into account during the translation phase.

Questionnaire translation was performed by senior DATA personnel who had been involved in the questionnaire's development and early testing. Their involvement was critical to ensure that the essential meaning of English terms was conveyed as precisely as possible in Bangla. All corrections and modifications were made in the Bangla version of the questionnaire, which was subsequently back-translated to English after the commencement of the fieldwork.

### **Training and Testing**

Enumerator training was conducted for eight days (and some nights) in the DATA offices as well as at field-test sites. Enumerators were active participants in the training process, asking clarifications, flagging potential problems, and making suggestions for improvement to the survey instruments. These sessions characterized all future interactions with enumerators who continued throughout to apply their considerable experience towards the betterment of both process and product. Most of the enumerators had been involved in several prior research activities; many were educated to the post-graduate level; and all had concentrated their studies on food and nutrition policy, agriculture, economics, or other relevant subjects (such as sociology).

After receiving an overview of the study objectives, enumerators were given a 'refresher' course on survey protocols, the sample methodology, and procedures to be adopted in the field. Each question in the questionnaire was reviewed individually and thoroughly discussed. Although female enumerators were responsible for collecting food consumption information the men were also carefully trained in 24-hour food recall methodology so as to assist in the interview process if necessary. In addition, both male and female enumerators were trained in anthropometric assessment. Given the unstable political environment in which the survey was conducted additional messages were conveyed regarding safe and appropriate conduct in the field during "hartal days" (national strikes).

During the long training process, the interviewers developed a shared understanding of the intent of FAST module as a whole, as well as of the significance of individual questions. While reviewing the ideal interview approach, trainers emphasized the nuances of question wording and the importance of eliciting accurate responses. As the module attempts to capture 'average' food security status over to previous year, the enumerators were requested to carefully reconstruct a twelve-month recall period for each question, guiding the respondent through the year using locally-relevant temporal markers, such as the *boro* harvest, Ramadan or *Kurbani Eid*. While time-consuming, pre-tests based around the construction of timelines (and using piles of *jujube* fruits to represent behavioral frequencies) suggested that this approach was essential for accuracy.<sup>5</sup>

Enumerators were also trained to assess, and provide a rating of food security for, each household. The rating was recorded after completion of both the quantitative questionnaire and the hunger questions. Enumerators were instructed to base their assessment on the totality of information gained (verbal, visual, measured) during their time with each family. The rating

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<sup>5</sup> Without memory joggers respondents were sometimes prone to careless answers or to reporting their current situation as opposed to conditions during the prior twelve months.

categories (food secure, food insecure without hunger, and hungry) were defined during training and a lengthy discussion of the rationale for placement in one of these categories took place during pre-test debriefings and feedback sessions. Enumerators were also asked to provide a written rationale on each questionnaire supporting their rating. Supervisors and the field manager sought to assure that male and female enumerators working together in the same household made independent rating decisions. This was important since the degree of consistency of such ratings across genders needed to be explored.

A full pilot test was initiated on the seventh training day once the enumerators and supervisors were completely familiar with the questionnaire. The pilot test was undertaken in Dhamrai *Upazila*, Dhaka District. Twenty-two trained enumerators, equal male and female pairs, interviewed one household each. The pilot test served not only as a final check of the questionnaire, but also as an opportunity to evaluate and provide feedback on the performance of the enumerators. Following the test day, a quality check was performed of each completed survey, and problems were reviewed before the group and with each individual making any errors in data collection.

## **Sample Design and Survey Implementation**

### *World Vision Baseline Sample*

Three months prior to the start of the FIMVS Round 1 survey, the WV/B Food Security Enhancement Initiative prepared to commence their activities in sixteen *upazilas*, or subdistricts across Bangladesh. Local World Vision staff were oriented and trained by a consultant from WV headquarters to collect baseline data related to the reporting indicators that the organization had developed for assessing progress in its program activities.

Using a standard population proportionate to size (PPS) approach, the sample frame included the cumulative population of all villages in the sixteen *upazilas* in which the WV/B FSEI was to be implemented (Dunford, 2000). The PPS method automatically weights villages according to their population size relative to total, thereby increasing the probability that larger villages will be selected over smaller ones. Thirty-eight villages were selected randomly from the list. Each of the 38 villages was mapped and divided into equal segments of 40 households. From this map, one segment was chosen randomly and *all* households within the segment boundary were interviewed. The total sample size of the initial study was 1599 (Dunford, 2000).

WV/B's baseline (and subsequent evaluation) data were intended not only to be useful to the organization in managing and evaluating project implementation, but also to Tufts University FSNSP in furtherance of the FIMVS. To achieve the third study objective of testing the FAST module's sensitivity to change in food security due to program impact, the study was designed so that half of the FIMVS sample was randomly drawn from World Vision baseline villages (since the baseline households themselves could not be retraced), and the other half selected from comparable control areas. This procedure is detailed below:

### *FIMVS Sample*

To draw the FIMVS Round 1 sample, the WV/B baseline survey villages were stratified into three geographic regions (“north” “central” and “south”), and five villages were randomly selected from each stratum.<sup>6</sup> A group of 300 households was randomly selected from the sub-sample of FSEI initial baseline clusters. An additional 300 control households was selected randomly from administrative areas adjacent to each FSEI location. Given the smaller sample size, the survey covered fifteen intervention and fifteen control villages with twenty households in each cluster.

Control villages were chosen using a multi-stage, PPS sampling procedure based on 1991 census data<sup>7</sup>. First, a list was compiled of *upazilas* bordering intervention areas, which were stratified by region<sup>8</sup>. Fifteen *upazilas* (five from each region) were randomly selected from this list using the self-weighting PPS method. One union was randomly chosen from each of the selected *upazilas*, then one village from each of the chosen unions was selected based on PPS method and census information. For both intervention and control areas, the final stage of the cluster sample replicated the initial WV/B baseline survey approach, using a mapping method to randomly select segments of 20 households at the village level. (See Attachment 3 for a map of the survey sites).

The survey was implemented by four enumerator teams, each consisting of six enumerators and one supervisor dispatched to the various sites. Local WV/B FSEI and Area Development Program (ADP) staff assisted the enumerators in locating the baseline survey cluster villages and in other survey logistics. The Tufts FSNSP Research Coordinator and DATA staff paid supervisory visits to each team, sometimes more than once, performing quality checks and engaging with the enumerators in informative discussions about the strengths and weaknesses of the survey instrument.

Questionnaires were edited and re-checked first in the field and subsequently in Dhaka prior to data entry. All data entry and subsequent analysis was performed in SPSS 10.0. Anthropometric data was processed using Epi Info™.

### **C. Qualitative Interaction with Sub-sample (Phase 3)**

The primary aim of the this phase of the FIMVS, which commenced one year after the first round of data collection, was to explore nuances in respondent interpretations of FAST module questions while also identifying items that did not perform well in Round 1 due to respondent confusion, a lack of variability in responses, or poor inter-item correlation. Respondents were asked to help in improving the module itself by engaging in ‘debriefing sessions’ either singly or in focus groups. During such interactions respondents were able not only to provide feedback on

<sup>6</sup> It proven impossible to re-visit identical households used in the original FSEI baseline since the ID codes and names were lost when the hard copy questionnaires were prematurely disposed of.

<sup>7</sup> Bangladesh Bureau of Statistics. “Bangladesh Population Census, 1991: Community Series,” Dhaka: BBS, 1996.

<sup>8</sup> The possibility that program effects might “leak” into adjacent *upazilas* was considered, but found to be only a small risk (due to the targeted nature and limited scale of operations). What is more, the use of adjacent *upazilas* considerably reduces travel time between control and intervention areas while also improving comparability across *upazilas* (in terms of level of food security and economic development).

the appropriateness of language used and questions asked, but also to suggest alternative wording and questions. The following criteria were applied in sub-sample selection:

- Each food security category (as determined by the female enumerator rating from the baseline study) was to be equally represented;
- The sub-sample was to be drawn from locations in which the distribution of households across the three categories was roughly equivalent; and
- The number of household clusters was to be minimized so as to allow for in-depth interaction. This contrasts with Round 1 where the sample was selected to optimize wide geographical representation.

These criteria lent themselves to a purposive sampling procedure, wherein eligible *upazilas* were pre-identified and all baseline households located in the *upazila* clusters were revisited. The final sub-sample comprised 120 households in seven village clusters located in *Moksedpur*, *Phulpur*, *Shatikira*, and *Faridpur* districts in the North, Center and Southern regions.

A number of instruments were developed or modified for the sub-sample study:

- A broad “comparator indicator” questionnaire (which included two days of diet recall);
- The revised FAST module;
- A debriefing questionnaire in which respondents elaborate on their interpretation of hunger module questions (including differences by gender);
- Group Informant Rating (GIR) and Focus Group Discussion (FGD) guides; and
- A Community Questionnaire.

The qualitative question guides were developed during a three-day “formative research trip” to a village in *Halughat*, a World Vision intervention *upazila* from the baseline study in the North of Bangladesh. With the assistance of senior DATA managers GIR and FGD exercises were pre-tested with male and female participant groups. A facilitator guide was subsequently elaborated. Two pre-tests (one for the quantitative instruments and a separate one for the qualitative guides) were conducted in *Saturia upazila* prior to the formal training.

The training of fourteen experienced enumerators (six male/female pairs plus two supervisors) was conducted over a period of fifteen days. The training focused on underlying concepts of the food security module, the appropriate delivery of questions, and on how to debrief after the formal interview. Four enumerators with prior experience in qualitative research were trained to facilitate separate focus groups and group rating exercises. The supervisors were designated to administer community-level questionnaires on top of their other duties. Two days of pilot testing were required to ensure enumerator proficiency with the multiple instruments and determine the most appropriate sequencing of components.

Male/female enumerator teams joined forces to complete one village at a time. This approach alleviated some of the enumerators’ burden by allowing supervisors to fill in gaps where necessary and to rely on each other for logistical support. The teams resided together during the survey, which also allowed for fruitful exchange of insights while providing time for cross-

checking of completed questionnaires. The Field Coordinator and two senior DATA managers spent time supervising in three of the four target *upazilas*.

The data from the qualitative interactions were transcribed in Bangla from tape recordings and translated into English by DATA senior staff assisted by a bilingual Bangladeshi masters-level student. The data from the quantitative instrument was entered into SPSS 10.0.

#### **D. Round 3 Survey (Phase 4)**

The third round survey was implemented in February 2003, during which time each of the 600 households from Round 1 was revisited.

After these first two rounds of FAST module administration, in-depth cognitive testing, statistical analysis, and revision, the module in preparation for the Round 3 survey had changed from its initial form, having been iteratively improved during the course of its development. Yet to address the third research goal, the third round questions needed to mirror those in the first round to ensure that detected changes in food security incidence were valid and did not derive instead from slightly nuanced differences in question wording and delivery.

With these issues in mind, prior to the third round survey, each question in the FAST module was carefully reassessed to ensure its comparability to the set of questions that comprised the module at baseline. In some cases, two versions of a question were included in the third round: the first replicating the baseline question and the second serving as a closely related, yet ‘better’ or more ‘valid’, means of eliciting a desired type of response. Finally, two entirely new questions, related to the acceptability of food acquisition and consumption, were tested and incorporated into the third round instrument.

As in the first round survey, the enumerators were trained for approximately twelve days in question meaning and delivery and proper survey protocols, including informed consent, to be adopted in the field. One pre-test and one pilot test of the survey instrument ensured that all questions were properly translated and understood by respondents and enumerators alike. Enumerators were observed for their ability to deliver each question appropriately and to accurately record the responses. Finally, debriefings after the pilot test allowed for a free exchange of feedback and suggestions for question modification.

A supervisor for each team of six enumerators was responsible for all quality control and for making contact with local officials. In addition, the Tufts FSNSP investigators and local research firm directors supervised many of the data collection sites. Enumerators worked in pairs for one month, with the male enumerator interviewing the male respondent regarding domains in which men are typically more familiar (e.g. household expenditures). The female enumerator asked questions to the female respondent about female-related household responsibilities (eg. food preparation and consumption). As in the first round, both male and female respondents completed the FAST module questions. Attrition, where neither the original respondents nor other adult males/females could be re-interviewed, was six percent, or 35 households. The most commonly reported reasons (usually by neighbors) for their attrition were urban migration and the dissolution of households due to a death of the household head.

Table 1 provides information on the links between the Tufts FSNSP and WV/B data collection pathways (including their temporal sequencing), while Table 2 offers an overview of data types that are comparable.

**Table 1: Comparison of Key Characteristics of Bangladesh Data Sets Used in Report Analyses**

Data Set Name	Objective	Date of Implementation	Sample Approach	Sample Size
World Vision/B Baseline	Collect baseline information on WV reporting impact indicators in areas slated to receive FSEI activities	October-November, 2000	<ul style="list-style-type: none"> <li>Two-stage cluster sample</li> <li>38 villages in 16 FSEI upazilas</li> <li>40 HHs in each village</li> </ul>	1599
World Vision/B Midterm	Collect data to assess progress against impact indicators in FSEI areas (not nec FSEI beneficiaries)	October-November, 2002	<ul style="list-style-type: none"> <li>Two-stage cluster sample</li> <li>30 villages in 15 FSEI upazilas</li> <li>32 HHs in each village</li> </ul>	960
Tufts FSNSP /FANTA R1	Collect baseline data on food security comparators and FAST module to examine interrelations. Data collected from FSEI and control areas.	March-April, 2001	<ul style="list-style-type: none"> <li>Stratified random sample (intervention households)</li> <li>5 villages selected randomly from WV baseline sample villages in each of 3 geographic regions.</li> <li>15 villages in 11 FSEI upazilas.</li> <li>20 HHs in each intervention village</li> <li>15 control villages of 20 HHs in 15 upazilas (selected randomly by multi-stage cluster sampling from upazilas adjacent to each intervention region).</li> </ul>	600
Tufts FSNSP/FANTA R2	Qualitative explorations of FAST module, including cognitive debriefing sessions to identify and improve questions and approach.	March-April, 2002	<ul style="list-style-type: none"> <li>Purposive sample</li> <li>Each food security category (as determined by the female enumerator rating from the baseline) was equally represented;</li> <li>7 villages in 4 upazilas from north, center, south</li> </ul>	125
Tufts FSNSP/FANTA R3	Data collected at FSEI midterm in intervention and control areas used to assess change in FAST module relative to FS comparators.	March-April, 2003	<ul style="list-style-type: none"> <li>All households sampled in 2001 were revisited. 33 HHs could not be interviewed.</li> </ul>	556

**Table 2: Comparison of Data Sets by Data Items Relevant to FAST Module Change Analyses**

	Tufts FSNSP/FANTA FIMVS DATA				WV/Bangladesh Data			
	Round 1		Round 3		Baseline		Midterm	
	Project	Control	Project	Control	Project	Control <sub>1</sub>	Project	Control <sub>1</sub>
World Vision Impact Indicators			X	X	X		X	
Food Security Comparators	X	X	X	X				
FAST Module	X	X	X	X			X	
Enumerator FS Rating	X	X	X	X			X	

<sup>1</sup>World Vision/Bangladesh did not collect data from a control group at either their baseline or midterm surveys.

### 3. Results: Insights into the Meaning and Interpretation of FAST Questions

Since the ‘direct measure’ of food insecurity is based on self-reported behavior it is often assumed that respondents’ perceptions of the experience of food insecurity are fully reflected in their answers. As Brock (1999) puts it, less tangible aspects of food insecurity “emerge from the words people use to describe their experiences.” According to Rahman (1991), capturing perceptions is critically important to broader development since “the perception of a community about itself and its ability to deal effectively with vulnerabilities...can make a significant difference in [its] ability to improve its material base or social institutions.”

However, the assumption that perceptions are adequately captured either through self-reporting or even through observed behavior is difficult to test. Stress, anxiety and ‘insecurity’ are often assessed by medical professionals in hospitals or refugee camps in terms of the impact on nutritional outcomes of acute ‘life events’ such as death in the family, major sickness, or conflict trauma (Schneider and Hebuterne 2000; Spiegel and Salama 2000; IFRCRCS 2001).<sup>9</sup> Anthropologists and psychologists have long recognized that perceptions affect both personal interpretations of past experiences and reported anticipated outcomes (Jochim 1981; Deyo 2000; Block and Webb 2001). This is important where a self-reporting tool to measure food stress is concerned. Yet the assessment of perceptions in the context of *chronic* hunger or food insecurity is in its infancy. As Lozano et. al. (1999) put it, “there is little research examining the relation between hunger and attitudes.” According to Tierney (1999) such research is important because “the beliefs people hold about risk are typically used in social sciences to explain behavioral outcomes, such as the actions people take to protect themselves against hazards. However, such perceptions might more usefully be studied as dependent variables; that is, by focusing on where ideas about risk come from in the first place.”

While the current research is not designed to assess these psychological dimensions in great depth it was recognized even before Round 1 that careful cognitive testing was needed to only to ensure clarity in the interpretation of responses but also to understand how respondents interpret hunger within a larger context of anxiety, stress, and insecurity--the ‘unseen’ elements of hunger not easily proxied by observable parameters.

Thus, following Alaimo et. al. (1999) and Derrickson and Brown (2002) interviewer teams engaged respondents in the sub-sample in formal and more informal conversations to explore meanings of individual questions as well as respondents’ understanding of the answers that they gave. This extended cognitive testing has been crucial to the reformulation of certain items and the dropping of others.

Numerous issues have arisen as a result of the in-depth interaction, many of which will require further consideration. A few of the more important issues are raised here (examples of additional considerations are included in Attachment 4):

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<sup>9</sup> Engle et. al. (1996) suggest that ‘vulnerability’ itself can be defined as an “individual’s predisposition to develop...behavioral ineffectiveness or susceptibility to negative development outcomes that can occur under high-risk conditions.”

## A. Food Cultures

Great care is needed in ensuring that religious or cultural practices do not distort responses to questions that should be appropriate to *all* households. That is, local food habits/preferences need to be well understood in order to be able to interpret the validity of questions relating to food behaviors. In one survey village Moslems consider the consumption of crustaceans to be an extreme sign of food distress (carrying connotations of ‘unclean’ habits), while some non-Moslems consume crustaceans on a daily basis without any sense that this is an inferior food. There is no apparent (visual) difference between such households so misinterpretation of food norms can hugely distort the interpretation of responses relating to food groups consumed, total value of foods, or ‘unusual’ foods consumed.

## B. Food Preferences

Closely linked to food culture issue are food preferences that make it difficult to identify ‘icon foods’ (the consumption of which might be a marker of distress). While so-called ‘inferior’ foods are often used in intervention programs as a means of reducing leakage to less poor households it is becoming clear that the concept of ‘inferior’ can be quite localized. For example, sweet potato (*mishti alu*) and wild water lily (*shaluk*) were identified in the pre-testing phase as foods typically only eaten by people facing food stress. In fact, almost ten percent of households reported consuming sweet potato at least once a year because they like the taste (two percent reported eating it at least a couple of times each month). By contrast, almost 100 percent of households denied ever eating water lily even during times of major flood or famine. Other potential distress markers also failed once their local specificity was assessed in more detail. For example, a river plant called *Gom Bhaja* is only consumed if one lives close to a river where it can be harvested and therefore is not easily used as a food marker beyond such localities. The same applies to *Bonn Kochu* (wild taro) a “famine food” suggested by Bruce Currey (1984). While 95 percent of respondents in this sample said that they “never” consumed *Bonn Kochu*, five percent report at least sometimes eating it, but only when it is available—a constraint that relates to location, season and price substitution effects. In other words, as stand-alone markers none of these foods works well. No single item has yet been found that could be used to represent food distress for the entire sample, all of the time.

## C. Dietary Balance

While it is already known that the term “balanced meal” (used in the US food security module) does not have an easy translation in many developing country contexts an attempt was still made to construct a question aimed at assessing respondent understanding of food quality and diversity. In *Jatia* village, *Phulpur upazila*, a focus group was conducted with households representing the “food insecure without hunger” category as rated by enumerators the prior year. While several of the participants defined their perception of a good (‘full stomach meal’) in terms of satiety or quantity of food consumed relative to other meals in the day, others considered a meal incomplete (hence not a ‘full stomach meal’) if it did not include meat, fish or dal. Furthermore, there were differences across food security categories. For example, households from the ‘food secure’ group stated that a full stomach meal has to include ‘big fish’, the insecure without hunger group argued that a good meal can include fish of any size, while the

hungry households proposed that a meal would be good if it contained dried fish. In other words, in this (relatively wealthy) village dietary quality appears to be contained within the construct of food adequacy or sufficiency.

#### **D. Dietary Diversity**

Considerable time was spent in the attempt to define a ‘food groups consumed’ question by adapting the Indian and Chinese food pyramids and basing questions around a visual representation of Bangladeshi coins (some of which show food items on a silver coin—chicken, fish, fruit and a vegetable). So far these attempts have had limited success because of the difficulty of communicating ideas of nutritional balance in the context of widespread energy deficiency. While many households understand that a diversity of foods is ‘desired’ this may be because it reflects wealth rather than nutrition knowledge. More research is needed on food substitution, as well as on diversity within (not just across) food groups in order to construct questions about desired consumption paths once a caloric threshold has been reached.

#### **E. Hunger Versus Want**

Use of common terms does not guarantee common interpretation. Just as Studdert et. al. (2001) found that the term “hunger” in a questionnaire was considered embarrassing and almost offensive in parts of Indonesia, the term ‘hunger’ can have multiple meanings in Bangladesh. Extended interaction with sub-sample households allowed for an exploration of nuances in terms such as *akla* and *durvickha*, suggested by Currey (1984) as different terms for “hunger scarcity” (the first relating to a short-term problem, the second to a more chronic, structural condition). For example, according to households in the *Haluaghat* region there is no difference between the terms—locally they are synonymous. They use both terms to mean short shocks (such as droughts or floods) and a different word to define lean times unrelated to shocks (*obhab*, meaning ‘want’ or penury linked to health problems or lack of employment income). In other localities the terms are used roughly as described by Currey (1984). Thus, the temptation should be avoided to build generic terms relating to the outcome under consideration (hunger) into the questionnaire since those words themselves contain different meanings to different people.

#### **F. The Trajectory of Food Insecurity**

According to Sarlio-Laehteenkorva and Lahelma (2001) “the association between past and present economic disadvantage [and] food insecurity...is poorly understood.” There are three main reasons for this: first, most studies of food insecurity and hunger are cross-sectional in nature; second, recall of past behavior is notoriously difficult to measure and validate; third, disentangling recent experience from current status is problematic—especially where questions about food security are based on recall over twelve months. Interaction with the sub-sample households allows for an exploration of this key issue: are respondents answering module questions based on what they feel today, what they believe was the case over the last year, or how they think things are becoming? Already there is a sense that most households do respond as required—averaging conditions over the previous twelve months regardless of whether things are likely to improve in coming months. However, the effect of short time-bound shocks (positive or negative) on twelve-month recalls requires further investigation. For example, six

households interviewed in Round 2 (of the 125) had ‘lumpy’ non-food expenses that greatly exceeded not only their reported Round 1 disbursements but also those of all other households in the sub-sample. Closer scrutiny revealed that this resulted mainly from one or two large expenses, such as a wedding, dowry, purchase of a new rickshaw, a motorcycle, or veterinary treatment for a sick cow. These big-ticket items represented 90 percent (on average) of non-food expenditure and up to 95 percent of their total expenditure, including all outlays for food. The potential for windfall, investment or catastrophic expenses to distort trends has to be examined more closely; since there is no ‘normal’ baseline year where food security is concerned the relative starting point (prior conditions) for differing households has to be controlled for. Whether the food security trajectory can be characterized as a line running from A to B, or as part of an arc (be it converse or concave) matters greatly to expected outcomes.

### **G. The Gendered Perspective**

It has been argued by Monello and Mayer (1967) that “men appear to experience hunger [differently] than women...in a more specific physical way.” It is also suggested that men describe hunger differently than women (Rime and Giovanni 1986; Macht 1999). This has important implications for a self-reported statement about hunger that seeks to reflect conditions for entire households. The US module, for example, was formulated with the explicit purpose of “understanding hunger from the perspective of women who had experienced it and to construct and evaluate indicators to measure hunger directly in similar populations”, namely, women (Radimer et. al. 1992). Most cross-cultural applications of the US core module approach have also only interviewed women (Welch et. al. 1998; Maxwell et. al. 1999; Derrickson and Anderson 1999; Studdert, et. al. 2001). This raises a question about potential gender (or status) bias in module responses. Does what mothers (not even ‘women’ but ‘mothers’) say about household experiences accurately reflect what others in the same household perceive and experience? This is an important issue that must be explored further. However, it is possible to report the following:

- The overall the rate of concordance in answers (men and women responding independently with the same answer to the same question) was high: male and female respondents agreed 81 percent of the time;
- There was more divergence of opinion in food secure households (23 percent disagreement) than in hungry households (ten percent disagreement). It seems that the behavioral options that are open to a given household the more chance there is of disagreement since both spouses may be engaged in many types of income diversification, social capital building or coping strategies. It may also reflect an increasing independence of women (more work outside the home, separate incomes) in more prosperous households (an hypothesis to be tested);
- The closest agreement in responses related to questions about group experiences (such as number of meals eaten on a typical day—almost perfect agreement). The largest divergence in responses related to questions about cash (purchase of snacks, borrowing money, using money for food instead of something else); this is probably because such actions are not

always visible to everyone and may not even be discussed with the spouse because such decisions may not fall in the female domain; and

- There was also large disagreement between men and women on what constitutes ‘good food’ (*bhalo mondo*) which suggests that this difference needs to be clarified before the next round—do women believe they are preparing fine dishes while men secretly wish for a different menu? This in itself would have implications for a choice of questions about ‘balance’ and quality in the diet.

## H. Cultural Assumptions about Maternal Buffering

There remains some uncertainty about whether a “child not eating for entire days” is recognized in local terms as the ‘worst case scenario’. While the US module takes it for granted that adults accept that restricted food consumption for children is worse than for adults, and to be avoided at all costs, this is a tricky assumption to export. Recent studies of intrahousehold food distribution raise questions about the universal applicability of concepts such as maternal ‘equity’ in food distribution. For example, Wasito et. al. (2002) report that during the 1997/98 crisis in Indonesia, “the nutritional status of mothers remained relatively unaffected while the nutritional status of children deteriorated.” While in China (Wei et. al. 2002) and Myanmar (Thwih and Yhoun-Aree 2002) it has been argued that a “contributions rule” is more applicable in explaining food allocations than ‘nutritional need’ or ‘equity’; that is, individuals who make greater contributions to the family receive a higher percentage of the family’s food.” Both such possibilities have surfaced during discussions with survey households in Bangladesh.

For example, when asked “who normally gets the most full-stomach meals”, some families answer “I know that I must keep food for my children even if I have no food at all”, but others say “the son who pulls the rickshaw”, or “those who go outside to work get the most”. One female respondent stated that “if our husbands don’t get food how would they get for the next meal?” This is *not* to suggest that feeding children is a low priority for any mother or that adults will selfishly feed themselves while starving their child. However, children skipping meals may be one, among many, adjustments that households make to ensure their survival, especially where that survival depends on the continuing ability of an income earner to earn that income. Would a ‘contributions rule’ change the nature or sequence of questions in the hunger module? This has to be answered through further study.

## I. A Food Security Continuum?

Do local people understand the conceptual construct that categorizes households into groups along a continuum from of a state of food insecurity with hunger to one of food security?<sup>10</sup> There are indications that such a conceptualization may not be fully shared by all households concerned. In-depth discussion suggests a characterization of insecurity as a many-headed beast—one that sees gains in one area of life simultaneous to losses in another. For example,

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<sup>10</sup> It might be pointed out that ‘food security’ is not alone in being defined in terms of relative states along a continuum. For example, according to WHO (2001) “iron status can be considered as a continuum from iron deficiency with anaemia, to iron deficiency with no anaemia, to normal status with varying amounts of stored iron.” This conceptualization is similar to that of food security with, versus without, hunger.

while floods can destroy certain assets and inhibit income streams, they are also widely seen as enhancing long-term productivity (through the silt deposits on farm-land) and potentially enhancing security (where *char* river banks shift in favor of landless people).<sup>11</sup>

Similarly, losses in food consumption can sometimes be accepted for a while if balanced by gains in access to assets or other investments. Interestingly the idea of a continuum is not typically compared against a ‘threshold’. Few households feel that once they cross a certain point they become ‘secure’; the fact that a single death in the family can plunge a family from self-reported food security into insecurity reemphasizes the fragility of life in an environment characterized by multiple risks to life and livelihood. What is more, some households in focus groups did express the idea of relative insecurity (“what makes me different from my neighbor?”) rather than a sense of absolute insecurity based on the notion of ‘a day without food’. For example, during one group informant rating exercise in *Haluaghat* participants were asked why they had categorized households as they had done. In several cases, the fact that a family had a daughter nearing marriageable age (hence soon needing a dowry) or had a quickly growing family was sufficient cause to rank a household as more insecure today than they had been a year earlier. In one case a household was rated a more food secure because the daughters of the household had recently been married. In another group exercises participants had some trouble in deciding whether a household was food secure or a category lower. They recognized that the household head owned his land and also had a paying job. However, many participants argue that he was not really secure because he had only recently obtained the job (with a local PVO) and only two years earlier had been forced to mortgage some of his land. The final consensus of the group was to classify that particular household head as insecure—his recent past carrying more weight in their minds than his current status.

Thus, while the idea of a composite index of food insecurity is attractive, whether a continuum best describes food security rankings and whether rankings are locally understood in absolute terms (against a threshold) rather than relative (to all other households in the community) remain open questions.

## **J. Supply Constraints Inhibit Access to Resources**

A draft question about “borrowing money at high interest rate” was problematic when it was realized that “high interest” is a relative concept. However, it has since become clear that the definition of interest rate is perhaps not the biggest issue with such a question. Two items in the hunger module were dropped from the Round 3 module; namely, questions asking about borrowing money from moneylenders (whatever the interest rate), and selling or mortgaging assets in order to buy food. It was found that there is very little variability in responses to such questions: roughly 99 percent of respondents said they ‘rarely’ or ‘never’ do either. But this is not because they did not *want* to borrow or sell. The problem with these questions relates to constraints on the supply side.<sup>12</sup> Wealthy households are unlikely to seek to borrow at high

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<sup>11</sup> New lands are created as well as destroyed each year in the large rivers and estuaries. Where land is scarce and labor bondage the norm, the creation of new farms after floods can be a boon to the formerly landless despite the threat that these lands may also one day disappear again.

<sup>12</sup> Of course this is similar to the issues of households only consuming certain types of ‘big fish’ is they live close to big water bodies.

interest or sell assets. But poorest households desperate to borrow or sell they are unlikely to be *able to*—borrowing is constrained because they lack collateral and few lenders will lend to them, while selling assets is constrained either because they have few assets to sell or few assets of value to a buyer. To be useful a module question must be universal such that all households have the same potential to answer it. It is now clear that these two questions do not meet that requirement.

#### 4. QUANTITATIVE TESTING OF MODULE RESPONSES

The determination of whether prototype module items were useful and valid was a process that iterated between, 1) a reliance on respondent and key informant feedback to generate insights of the type outlined in the previous section, and 2) a variety of quantitative approaches, including frequency distributions, bivariate correlations, PCA and Chronbach Alpha analysis, and Rasch modeling, to test for sufficient variability, logical distributions across food security status (as rated by the enumerators), and intra-item consistency, order of severity etc.

A Principal Components Analysis (PCA) was conducted on the 30 or so items that had been implemented in the first survey round and did demonstrate variability in response. Three factors were derived from the rotated matrix--groupings of question responses (or 'items') that correlated well with each other and were distinct from other sets of items. The first factor of eleven items had a high reliability coefficient (Chronbach Alpha) of 0.885, and explained 47 percent of sample variance.<sup>13</sup> The eleven items (in the order they appeared on the questionnaire) are as follows:

1. The family ate few meals per day on a regular basis;
2. Obligated to eat wheat instead of rice (when rice would have been preferred);
3. The adult respondent (where not the main working adult) personally skipped entire meals due to a lack of food in the household;
4. The respondent adult personally went without food for an entire day (because there was insufficient food in the household);
5. The main working adult sometimes skipped entire meals (due to an insufficiency of food in the household);
6. There were times when food stored in the house ran out and no cash to buy more;
7. Worried frequently about where the next meal would come from;
8. Needed to purchase rice frequently (because own production or purchased stores ran out);
9. Took food (usually rice or lentils in kind) on credit from a local store;
10. Needed to borrow food from relatives or neighbors to make a meal (making ends meet on a day-to-day (hand-to-mouth) basis); and
11. Needed to borrow food in order to meet social obligations (to serve a meal to guests or relatives).

A few clarifications are in order. First, these eleven questions were drawn by the principal components analysis from the full set of 30 or more items tested in Round 1—they were not applied as a discrete set in the sequence listed above in the first round of data collection.

Second, as hoped for the eleven items cover a range of elements of the food security concept. For example, while some questions relate to a lack of food in *quantity* (food stores depleted, restrictions on how many meals can be consumed each day, adults reducing food consumption or skipping meals), others relate to food preferences or *quality* (lack of choice in grain consumption), issues of social *acceptability* or stigma (taking credit in-kind from shop keepers,

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<sup>13</sup> This Alpha value is almost identical to the 0.9 level reported by Radimer et. al. (1992), and compares well with the 53 percent of variance explained by the first factor in their PCA. Kendall et. al. (1995) report a somewhat lower Alpha of 0.84 for their item measure of household food insecurity.

being obliged to borrow food to meet social obligations), and anxiety or *insecurity* (worrying about where the next meal will come from).

Third, none of the questions relate specifically to children. In fact, the only question that competes for a spot in the first factor relates to “infants skipping entire meals”. This is such an extreme eventuality that only three percent of households answered this question, compared with less than one percent in the US and six percent in a separate sample of households from Bangladesh (Table 3). It should be underscored that while the households in the current sample are poor and food insecure by any international standards they were not purposively selected to represent the worst case or ‘ultra poor’ conditions.<sup>14</sup> The issues involved in defining a separate food security scale for children are addressed by Nord and Bickel (2002), and the role of child-specific questions in Bangladesh under conditions of more extreme distress needs to be further explored.

Fourth, while strongly inter-related as a group the individual items had differing degrees of statistical correlation on a one-to-one basis. The weakest correlation (although still statistically significant at the  $p < 0.01$  level) was between ‘borrowing food to serve guests’ and ‘having to eat wheat instead of rice’, a correlation of 0.27. The majority of other items were correlated at a level exceeding 0.5, rising to 0.73 in the case of the association between ‘respondent adult skipping entire meals’ and ‘food stores running dry and there being no cash to purchase more’. Despite these strong two-way correlations it should be remembered that the set as a whole works much better than any individual items in describing, and hence identifying, food insecure households (more on this below).

Fifth, a *second factor* derived by the PCA included only three items, namely:

1. The family frequently ate ‘big fish’ (such as carp or *hilsha*). This is seen as a sign of wealth although it has to be noted that habitation close to large rivers increases the prevalence of this behavior;
2. The family typically eats meat as part of an ordinary meal (i.e. not including meals prepared specially for festivals or holy days); and
3. The family frequently prepares *bhalo mondo*, or ‘good’ food (in the local understanding of meals that are rich and satisfying).

All three items relate to food quality. They work well as a set in defining food insecure households, but much less well than the first eleven items already discussed. A third factor included items that do not function well, such as borrowing cash from moneylenders or selling or mortgaging valuables. As noted above, these reflect behaviors that require willingness on both

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<sup>14</sup> The 600 Bangladeshi households referred to in Webb et. al. (2002) and in Nord et. al. (2002b) are different from the 606 households referred to here. The former represent a purposively sampled group of ‘absolute poor’ (mainly female-headed) households associated with the BRAC/WFP micro-credit activity. Those are distinct from the households involved in World Vision interventions and the current FANTA research. While the World Vision activities are largely located in regions considered to be food insecure not all households in such districts experience the same degrees of deprivation. It should be recalled that Radimer’s (1992) sample of 32 women in New York State was not a random sample for the US population; the women were identified through welfare agencies as people relying to some degree on public assistance.

sides of the transaction—the fact of not selling assets may mean either ‘no need to sell’ or being ‘unable to find a buyer’. The underlying processes are quite different.

Sixth, while eleven questions were initially identified, the current module applied in the third round eliminated two additional questions based on further insights gleaned from the second round of qualitative interaction and statistical testing<sup>15</sup>: Though the nine retained questions in the third round module appear to capture much of the same conceptual ground as the full eleven, the remaining analyses presented here distinguish between the Round 1 set of module responses (the “FAST 11”) and the Round 3 set (the “FAST 9”). The FAST 9 survey instrument is included as Attachment 5.

Another approach to validating the internal consistency of FAST module’s characteristics uses the Rasch measurement model. Rasch is a non-linear factor analysis based on item response theory—an analytical approach that underpins the construction and validation of the US food security measurement activity. The initial Rasch analysis, conducted by Mark Nord of the United States Department of Agriculture (responsible for analyses of the US food security module), showed that “the statistical assessments indicate that ... [the module questions] measure a common underlying phenomenon and do so with sufficient sensitivity to provide reasonably precise and reliable measurement of household food security” (Nord et. al. 2003).

**Table 3: A Comparison of Responses to Food Security Questions in the U.S. and Bangladesh**

	United States (2000)	Bangladesh (2001) <sup>1</sup>	
		World Vision	BRAC/WFP
<u>Anxiety Issues</u>	15.1	36.3	71.9
• Worried food would run out and no money to buy more			
<u>Adult Issues</u>	5.4	23.0	52.8
• Adult skipped meals			
• Adult did not eat entire day	1.0	1.2	2.3
<u>Child Issues<sup>2</sup></u>	0.6	3.4	6.2
• Child skipped meals			
• Child did not eat entire day	0.2	0.3	0.0

Source: Nord et. al. (2002), Tufts FSNSP/World Vision/FANTA survey data (2002).

- 1 The 600 World Vision households are those included in the current analysis—poor but not purposively selected to represent the truly destitute. By contrast, the 606 BRAC/WFP households represent participants in a micro-credit and food aid intervention explicitly targeted towards the ultra poor (see Webb et. al. 2002).
- 2 In the US measure a child is defined a 0 to 17 years. In the Bangladesh surveys a child was defined as being 0-5 years. This difference is important in interpreting the outcomes.

<sup>15</sup> The two questions related to the main working adult sometimes skipped entire meals and the need to borrow food in order to meet social obligations (to serve a meal to guests or relatives).

Although the Rasch approach proved useful for identifying and weeding out poor items, (for example, one of the questions asked about buying *chanachur* and other snacks -- it was found that this question was more weakly related to the food insecurity of the household than the other questions, apparently because it is a common behavior poorly correlated with the severity of hunger), it should be noted that the technique does not establish the external validity of the module and does not provide a purely quantitative method for determining cut-points for defining food security or hunger. The approach and its cut-points produced food security prevalence estimates quite different from the enumerator assessments discussed in the next section (71% from Rasch approach versus 42.3% based on interviewer assessment). The figure seems to match more closely to our female interviewer assessment of the prevalence of households without hunger (69% per Rasch versus 69.6% per enumerator rating)<sup>16</sup>. Bickel et al (2000), in discussing the use of the categorical variable in the US food security module, point out that “each of the specific boundaries used to identify categories of the food security status variable could be debated”. The implications of the differing quantitative versus qualitatively derived cut-points in Bangladesh needs to be explored (and debated) further in conjunction with Mark Nord and others well-versed in the intricacies of the Rasch method. Meanwhile, Bickel et al (2000) conclude that, “As long as the boundary is defined and measured consistently, one can be reasonably sure that an increase or decrease in the percent of households classified in a category represents a true increase or decrease in the number of households experiencing that general level of food security or hunger”.

Unlike the PCA, which does not enable the ordering of questions by severity, the Rasch analysis does generate a severity ranking based on the frequency of item responses. For the purpose of the analyses presented in the following sections, the sequence of the severity of *individual* behaviors is not considered quantitatively (though the prototype module ordered questions according to hypothesized severity based on ethnographic accounts). That is, the “FAST 11” and “FAST 9” indices used in this report were calculated by totaling the number of “affirmative”(dichotomized) responses to achieve a raw score in which a higher score indicated a greater degree of food security.

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<sup>16</sup> Unless otherwise indicated, the female (rather than the male) enumerator ratings of food security status are used exclusively throughout this report. As described in the following section, the ratings were not statistically correlated by gender of enumerator; the degree of concordance between male/female ratings was quite high. Thus, for the sake of time and space, the female enumerator rating was chosen for the current analyses, as there were fewer cases of the male FAST module response and the male enumerator rating.

## 5. THE FAST MODULE VERSUS COMPARATORS

There has been a growing effort in recent years to make food security ‘indicators’ more reflective of the multifaceted nature of development problems. Building on the broad acceptance gained during the 1970s of the Physical Quality of Life Index (Morris 1979) and its successor, the Human Development Index (UNDP 2001), measures of poverty and food insecurity have increasingly rejected unitary proxies and embraced more nuanced composite measures. For example, Morris et. al. (1999) suggest a ten-item expenditure composite as a proxy for income and a ‘rural asset score’ (based on ownership of various categories of consumer durables and productive assets) as a viable proxy for wealth. Tschirley et. al. (2000) also test a set of 39 variables (that includes assets owned, diversity of commodities produced and sold, and income sources) that can act as a combined proxy for total household income. Similarly, Zeller et. al. (2001) use a multidimensional composite for ‘poverty’ that combines 34 measures of human capital, dwelling conditions, value of assets and food deprivation. In each case, the authors argue that composite variables are conceptually more credible than single indicators and that they correlate well with chosen benchmarks.

But this raises the question of what a ‘benchmark’ actually represents. Just as income, expenditure and wealth are common proxy measures for a conceptual construct called ‘poverty’ there are many possible proxies and comparators for ‘food insecurity’.<sup>17</sup> The food security concept is built around food availability, access and utilization, as well as the potential risks that can compromise all three (Webb 2001). Each element of the concept can be proxied individually using any number of generic indicators or in terms of combined variables.

Based on an analysis of data from five countries Haddad et. al. (1994) argue that “relatively simple indicators perform well in locating the food and nutrition insecure”.<sup>18</sup> For example, Zeller et. al. (2001) define ‘the proportion of clothing expenditures in total household expenditure’ as a benchmark for poverty, arguing that clothing expenditure is one component that remains stable over time while increasing proportionally with household spending. By contrast, Christiaensen and Boisvert (2000) measure food vulnerability against an absolute calorie consumption threshold. Maxwell et. al. (1999) compare their indices of food ‘coping strategies’ with per capita expenditure, caloric consumption shortfall (<80% of 2,230 kcal/AEU/day), and the presence of stunting in children under three years of age. Ali and Delisle (1999) relate coping strategies to dietary adequacy and food stores in the household. Chung et. al. (1997) define their “benchmark indicators of food insecurity” as caloric inadequacy (<70%), severe stunting in children under five years, and clinical measures of micronutrient deficiencies.<sup>19</sup> And while Morris et. al. (1999) do not seek to measure composites against a

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<sup>17</sup> Zeller et. al. (2001) argue that hunger is an “unambiguous measure of poverty”...without elaborating on how ‘hunger’ can be unambiguously assessed.

<sup>18</sup> The authors define “perform well” in terms of ‘overlap’ of more than 33.3% (the percent of households in the lowest expenditure tercile which also fall into the lowest calorie adequacy tercile), and an absolute t-value greater than 1.96 (signifying an overlap is significantly different from 33.3%).

<sup>19</sup> It should be pointed out that in their study of northern Iran Omidvar et. al. (2002) recently found that “no relationship was observed between serum retinol and other dietary variables.” The authors note “serum retinol levels did not differ according to BMI or for anemic versus non-anemic subjects.” This study joins the accumulation of evidence that clinical and anthropometric measures of nutrition are only weakly related to other outcomes of concern to policymakers, and hence should be treated with great care when used to proxy poverty or food insecurity.

benchmark they assess how well a ten-item set of expenditure items mirrors total expenditure on all items (the assumption being made that expenditure is a valid proxy for income).

The important point here is that most of these ‘indicators’ or ‘benchmarks’ could be placed on either side of the analytical equation; they can (and often do) serve either as determinants of the condition under consideration, or as representing the condition. It is widely accepted that the absence of any gold standard measure of food insecurity argues for a cross-referencing of indicators and methods (a convergence of evidence approach) rather than use of a single benchmark used to proxy a (non-existent) gold standard.<sup>20</sup> That is the approach adopted here. A range of indicators that ‘perform well’ in defining at least parts of the food insecurity problematic are included in the analyses below.

### **A. The FAST Module against Enumerator Assessments**

The early validation work on the US module relied heavily on interviewer ratings or expert opinion as a basis for assigning US households to different categories of food insecurity with, or without, hunger (Radimer et. al. 1992; Kendall et. al. 1995; Frongillo 1999). While interviewer ratings can be considered ‘subjective’, it is worth recalling that practitioner ratings are widely used in medical and psychological fields either as stand-alone assessments or as reference points against which to compare self-assessments of pain, wellbeing or ill health (Green and Reid 1996). For example, psychological studies of personal ‘satisfaction’ face the same problem of being unable “to test systematically respondents’ self-ratings against objective indicators”, and therefore rely either on scale constructs (using item response theory) or professional evaluation as an external benchmark (Bowling and Windsor 2000).

As discussed in the ‘Study Design and Methods’ section, enumerators were trained to assess, and provide a rating of food security for, each household. An enumerator rating was recorded after completion of both the ‘comparator indicator’ questionnaire and the FAST questions.

Enumerators were instructed to base their assessment on the totality of information gained (verbal, visual, measured) during their time with each family. The rating categories (food secure, food insecure without hunger, and hungry) were defined during training and a lengthy discussion of the rationale for placement in one of these categories took place during pre-test debriefings and feedback sessions. Enumerators were also asked to provide a written rationale on each questionnaire supporting their rating which was discussed with supervisors and other research staff with a view to consistency and replicability.

It was shown using Round 1 data (reported in Webb et. al. (2002)) that enumerator ratings were:

- Significantly correlated ( $p < 0.01$ ) with each question of the prototype FAST module individually;
- Significantly correlated with the prototype FAST module as a whole (all questions together) with a coefficient of 0.73, significant at the  $p < 0.01$  level;
- Significantly correlated with indicators commonly used as food security proxies; and
- Not correlated by gender of enumerator (i.e. no strong bias appeared in the ratings of male enumerators versus female enumerators).

The findings from Round 3 confirm the strong statistical relationships noted previously. In fact, the correlation between enumerator rating and 9-question FAST module used in 2003 was even stronger –  $r=0.86$  (rather than 0.73),  $p<.01$  than the correlation in 2001. Although this strong correlation may partially be explained by the fact that the rating was done by enumerators after administering the FAST module, it was apparent from numerous enumerator debriefings that the influences on their ratings were not from food security questions alone. They nearly always claimed to have based their decisions on a combination of physical impressions of the household environment, information told to them ‘off the record’ by respondents, answers to the ‘comparator questionnaire’ (eg. assets and expenditure) and responses to the FAST module. Where possible, supervisors also cross-checked the enumerators’ judgments based on physical impressions alone (an independent rating). The consistency of these results suggests that the enumerator rating, itself, stands up to close scrutiny as a viable ‘benchmark’ for these food security assessments, and that the FAST module is well correlated with ‘expert opinions’.

## **B. The FAST Module Against Conventional Comparators of Food Security, Poverty, and Malnutrition**

The early validation work on the U.S. module using enumerator ratings was subsequently bolstered by analyses that sought evidence that the derived item scale was statistically correlated with other traditional measures of food security. For example, Hamilton et. al. (1997) compared responses to U.S. module against other kinds of data collected by statistically representative national surveys. They showed that being classified as ‘food insecure’ by the US module is (as expected) negatively correlated with food expenditure per capita, as well as energy intake per capita.

Similarly, a number of recent attempts to define ‘alternative’ indicators of food insecurity have validated their studies against a range of benchmarks, some of which are also used to assess the strength of the FAST module. For example, Maxwell et al. (1996 and 1999) derived a food-based coping strategy index in urban Ghana that was found to be significantly correlated with food share in total household expenditure (0.19\*\*), and total expenditure per capita (-0.22\*\*) <sup>21</sup> Referring to the Ghana work, Maxwell et. al. (2002) comment that, “previous research has demonstrated a significant statistical correlation between the Coping Strategy Index and other common indicators of food security.” In other words, ‘validation’ is in this case accepted on the basis of statistical significance of correlates (even when their coefficients are quite low).

In the present study the prototype FAST module and the female enumerator ratings were significantly correlated with the comparators used in Ghana <sup>22</sup>. In Round 1, the FAST module was correlated with food share in total household expenditure at -0.41\*\*, and with total expenditure per capita at 0.44\*\*--both much stronger coefficients than in the Ghana case. In Round 3, the same relationships held: the FAST module (now 9 questions) was found to be correlated with food share in total household expenditure at -0.24\*\*, expenditure tercile at 0.41\*\*, and with total expenditure per capita at 0.24\*\*--a lower coefficient than in Round 1 but still strongly significant.

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<sup>21</sup> \*\* denotes correlation significant at  $p<0.01$ .

As shown in Tables 4-7, other common measures of ‘poverty’ and ‘food insecurity’ also correlated well, some even better, with the FAST module as applied in 2003. All of the comparators found to be significantly correlated with FAST (and the enumerator rating) in Round 1 were still correlated in Round 3. Some relationships weakened slightly, including land ownership (with a smaller coefficient in Round 3 than in Round 1), but most either remained significant at the same, or higher, level. An additional variable added to Round 3--food stocks held--was also found to be strongly correlated with the FAST module (at 0.32\*\*).

While Maxwell et. al’s work (1996; 1999; 2002) did not compare his food security indices against measures of production or asset holdings, the studies by Cornell University in Burkina Faso (Nanama and Frongillo 2002), Bhattacharya (2003) in India, and IDS/SCF (2002) in Ethiopia did include comparators such as land owned, assets held and food stocks. In the Burkina case it was found that a set of food security questions similar in design to the Bangladesh FAST module was significantly correlated with livestock assets owned, fertilizer inputs used, and total staple food produced. Similar findings apply to India and Ethiopia. Bhattacharya’s (2003) study in northern Tribal districts of Chhattisgarh state (formerly part of Madhya Pradesh) looked at participatory ‘hunger ranking’ exercises which classified families as ‘never hungry’ along a continuum to ‘often/always hungry’. The strongest correlates of hunger are reported as land asset holdings (and, conversely, landlessness), and livestock holdings (particularly draught and milking animals), although unfortunately the statistical significance of the association was not reported. While in Ethiopia, a composite “destitution index” was compared against a range of measures of livelihood and food insecurity (IDS/SCF 2002).<sup>23</sup> It was found that along with “number of meals consumed in the worse month of the previous year” (one of the concepts embedded in the FAST module), the strongest associations were with land and livestock owned, although again the statistical significance of such relationships was not tested, or at least not reported.

Tables 4 and 5 show that in Bangladesh significant correlations are found between the FAST questions and land owned as well as assets owned (all at the  $p < 0.001$  level). In fact, in Round 1 productive assets (ploughs, sewing machines, etc.) and non-productive assets (fans, jewelry, TVs, refrigerators) were both strongly correlated with income/expenditure measures as well as the FAST module. In Round 3, a simple measure of assets owned that does not distinguish between productive and non-productive assets is also significantly correlated at the 0.44\*\* level with the FAST module<sup>24</sup>.

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<sup>23</sup> Note that in this case indicators of food insecurity are being used to ‘validate’ an index of “destitution”.

<sup>24</sup> Some of the asset categories recorded in the “comparator indicator questionnaire” in Round 1 were inadvertently omitted from the Round 3 instrument, requiring a recalculation of the assets variable for comparison between rounds.

**Table 4: Correlations Among Poverty Proxies and FAST Module Items, Round 1 (2001)**

	FAST(11) <sub>1</sub>	FS rating <sub>2</sub>	Total HH Exp	Exp. Tercile	Land Owned	Clothes Exp	Prod Assets	Other Assets
	(Correlation coefficients)							
FAST(11) <sub>1</sub>	1.0							
Enumerator Food Security Rating <sub>2</sub>	-.73**	1.0						
Total HH Exp.	.44**	-.47**	1.0					
Exp. Tercile	.42**	-.45**	.94**	1.0				
Land Owned	.57**	-.51**	.43**	.40**	1.0			
Clothes Exp	.36**	-.38**	.46**	.42**	.28**	1.0		
Prod Assets (#)	.38**	-.35**	.32**	.30**	.48**	.23**	1.0	
Non-Prod Assets	.62**	-.62**	.64**	.60**	.59**	.41**	.42**	1.0

Source: Tufts FSNSP/World Vision/FANTA survey data (2001).

\*\* Correlation is significant at the .01 level (2-tailed).

1. Household responses to the 11 question FAST module
2. Household categorization according to female interviewer assessments.

**Table 5: Correlations Among Poverty Proxies and FAST Module Items, Round 3 (2003)**

	FAST(9) <sub>1</sub>	FS rating <sub>2</sub>	Total HH Exp	Land	Clothes Exp (p.c.)	Assets (#)	Food Stores
	(Correlation coefficients)						
FAST(9) <sub>1</sub>	1.0						
Enumerator Food Security Rating <sub>2</sub>	-.86**	1.0					
Total HH Exp. (p.c.)	.24**	-.25**	1.0				
Land Owned	.33**	-.36**	.20**	1.0			
Clothes Exp (p.c.)	.35**	-.37**	.30**	.29**	1.0		
Assets (#)	.44**	-.48**	.22**	.34**	.46**	1.0	
Food Stores	.32**	-.29**	.47**	.39**	.18**	.22**	1.0

Source: Tufts FSNSP/FANTA survey data (2003).

\*\* Correlation is significant at the .01 level (2-tailed).

1. Household responses to the 9 question FAST module
2. Household categorization according to female interviewer assessments.

Assessing FAST against food-related comparators, Table 7 shows that Round 3 responses to FAST questions are significantly correlated with food share in total expenditure at  $-0.24^{**}$  (which compares favorably with the  $0.19^{**}$  reported from Ghana by Maxwell et. al. 1999). As in Round 1 (Table 6), FAST in Round 3 is most strongly correlated with total imputed cost of food consumed, total food expenditure per capita, number of unique foods consumed, and number of food groups consumed (proxies for dietary diversity).

Where nutritional outcomes are concerned Table 8 confirms that which has been shown elsewhere; namely, that anthropometric status correlates poorly with conventional food security and poverty indicators (Maxwell et. al. 1999; Chung et. al. 1997; Zeller et. al. 2001). For example, while wasting in children 0 to 12 years is significantly correlated both with stunting and underweight none of these is strongly correlated either with the interviewer assessment or the eleven item module responses. Indeed, the variable defined as ‘any child malnutrition’ (the presence of any child classified as wasted, stunted or underweight) is not statistically correlated in this sample with comparators such as number of food groups consumed ( $-.064$ ,  $p<.184$ ), or meeting 80 percent of caloric need ( $-.007$ ,  $p<.888$ ); nor it is significantly correlated with a ‘food secure’ category derived from answers to the eleven item module (2-tailed test  $p<.088$ ).

Similarly, while stunting in children under twelve is weakly correlated with clothing expenditure ( $-.15$ ,  $p<.003$ ), land ownership ( $-.13$ ,  $p.013$ ) and non-productive assets ( $-.154$ ,  $p,.001$ ), it is *not* statistically correlated with other factors such as expenditure tercile, unique foods consumed, calorie ratio or share of food in total expenditure. Indeed Table 9 suggests that the pattern of nutritional outcomes is too complex for malnutrition to be used as a simple (single) proxy for either food security or poverty. While adult BMI levels are significantly lower in hungry households than in food secure households (although there is no significant difference between adult men and women in these households). Child anthropometry varies considerably by age and gender with no clear pattern of increasing severity linked to the food security categorization. While there are of course links among nutritional outcomes, expenditure patterns, and food consumption restrictions, anthropometric measures are unpredictably correlated with other comparators in both rounds.

Indeed, conclusions so far on the ‘stability’ of statistical relationships over time between the FAST module, enumerator rating and other comparators are that, i) correlations are very stable—most remain significant at the  $p<0.01$  level across both rounds of data collection despite some expected variability in coefficients; ii) the ranking of significant correlators remains mostly stable--the highest coefficients in 2001/2002 remain among the highest in 2003; and iii) there remains strong consistency in statistical relationships between FAST and the Enumerator Rating over time.

**Table 6: Correlations Among FAST Module Items and Food Security Proxies Relating to Food Consumption, Round 1 (2001)**

	FAST (11) <sub>1</sub>	FS rating <sub>2</sub>	Food Share <sub>3</sub>	Food Exp./cap	Food Value <sub>4</sub>	Food Groups	Unique Foods	Calorie Ratios <sub>5</sub>	Met 80% Needs <sub>6</sub>
(Correlation coefficients)									
FAST 11 <sub>1</sub>	1.0								
Enumerator Food Security Rating <sub>2</sub>	-.73**	1.0							
Food Share in Exp. <sub>3</sub>	-.41**	.38**	1.0						
Food Exp. Per Capita	.16**	-.48**	-.12**	1.0					
Value Foods Consumed <sub>4</sub>	.52**	-.53**	-.29**	.45**	1.0				
# Food Groups	.35**	-.39**	-.14**	.32**	.47**	1.0			
# Unique Foods Consumed	.42**	-.42**	-.19**	.35**	.56**	.81**	1.0		
Calorie Ratios <sub>5</sub>	.23**	-.28**	-.04	.33**	.06	.32**	.36**	1.0	
Meet 80% of Needs <sub>6</sub>	.15**	-.20**	-.02	.27**	.07	.22**	.22**	.70**	1.0

Source: Tufts FSNSP/World Vision/FANTA survey data (2001).

\*\* Correlation is significant at the .01 level (2-tailed).

1. Household responses to the 11 question FAST module
2. Household categorization according to female interviewer assessments.
3. Food as a share of total household expenditure
4. Imputed value (cost) of all foods consumed (home produced as well as purchased)
5. Aggregate calorie availability within the household as a share of imputed 'need' (according to household demographics)
6. Did the household exceed 80 percent of caloric requirement based on 2200 kcal/capita/day.

**Table 7: Correlations Among FAST Module Items and Food Security Proxies Relating to Food Consumption, Round 3 (2003)**

	FAST(9) <sub>1</sub>	FS rating <sub>2</sub>	Food Share <sub>3</sub>	Food Exp/cap	Food Value <sub>4</sub>	Food Groups	Unique Foods
	(Correlation coefficients)						
FAST (9) <sub>1</sub>	1.0						
Enumerator Food Security Rating <sub>2</sub>	-.86**	1.0					
Food Share in Exp. <sub>3</sub>	-.24**	.22**	1.0				
Food Exp. Per Capita	.34**	-.38**	-.11*	1.0			
Value Foods Consumed <sub>4</sub>	.40**	-.41**	-.07	.75**	1.0		
# Food Groups	.40**	-.39**	-.15**	.23**	.19**	1.0	
# Unique Foods Consumed	.44**	-.44**	-.15**	.26**	.21**	.82**	1.0

Source: Tufts FSNSP/FANTA survey data (2003).

\*\* Correlation is significant at the .01 level (2-tailed).

1. Household responses to the 9 question FAST module
2. Household categorization according to female interviewer assessments
3. Food as a share of total household expenditure
4. Imputed value (cost) of all foods consumed (home produced as well as purchased) per capita

**Table 8: Statistical Correlations Among Module Items and Nutritional Outcomes, Round 1**

	FAST (11) <sub>1</sub>	FS rating <sub>2</sub>	Wasting <sub>3</sub>	Underweight	Stunting
(Correlation coefficients)					
FAST (11) <sub>1</sub>	1.0				
Enumerator Food Security Rating <sub>2</sub>	.77**	1.0			
Any Wasting <sub>3</sub>	-.01	.05	1.0		
Any Underweight	-.12*	.06	.33**	1.0	
Any Stunting	-.14**	.15**	.55**	.05	1.0

Source: Tufts FSNSP/World Vision/FANTA Survey data (2001).

\*\* Correlation is significant at the .01 level (2-tailed).

\* Correlation is significant at the .05 level (2-tailed).

1. Household responses to the 11 question FAST module
2. Household categorization according to female interviewer assessments.
3. Child anthropometry relates to children aged less than 12 years at -2 SDs of reference population. The 'any malnutrition' variables are calculated on a household basis and thus do not reflect means across individuals.

**Table 9: Descriptive Statistics on Nutritional Outcomes by Food Security Category (Female Interviewer Assessment) and by Eleven Item FAST Module**

	<u>11 Item FAST Module Rating<sup>1</sup></u>		<u>Enumerator FS Rating</u>		
	Food Secure	Food Insecure	Secure (No hunger)	Insecure	Hungry
<u>Adult</u>					
Female BMI	19.8	18.4	20.1	18.8	18.3
Male BMI	19.6	18.5	19.8	18.9	18.4
<u>Children (boys)</u> (mean Z scores)					
Weight-for-Age					
2-5 years	-2.1	-2.2	-2.1	-2.0	-2.2
5-10 years	-1.9	-2.1	-1.8	-1.9	-2.3
Weight-for-Height					
2-5 years	-1.5	-1.4	-1.6	-1.3	-1.5
5-10 years	-1.3	-1.5	-1.3	-1.3	-1.6
Height-for-Age					
2-5 years	-1.5	-1.9	-1.3	-1.7	-1.9
5-10 years	-1.5	-1.7	-1.4	-1.6	-1.9
<u>Children (girls)</u>					
Weight-for-Age (Z scores)					
2-5 years	-2.1	-2.2	-1.9	-2.3	-2.1
5-10 years	-1.8	-2.1	-1.9	-1.7	-1.9
Weight-for-Height					
2-5 years	-1.2	-1.4	-1.1	-1.3	-1.4
5-10 years	-1.3	-1.5	-1.4	-1.4	-1.5
Height-for-Age					
2-5 years	-1.8	-1.9	-1.9	-2.0	-1.6
5-10 years	-1.4	-1.4	-1.5	-1.3	-1.6

Source: Tufts FSNSP/World Vision/FANTA survey data (2001).

1. Based on a median split in the distribution of households according to the number of affirmative answers given to the 11 questions.

**Table 10: ‘Stability’ of Statistical Relationships: Correlations between the FAST module, Enumerator Rating, and other Comparators, Round 1 and Round 3**

	FAST (9)		Enumerator Food Security Rating	
	Round 1	Round 3	Round 1	Round 3
Total HH exp/capita	.26**	.24**	-.31**	-.25**
Land Owned	.35**	.33**	-.36**	-.36**
Clothes/shoes exp/cap	.27**	.35**	-.34**	-.37**
Assets owned	.48**	.44**	-.53**	-.48**
Food Stores	.28**	.32**	-.28**	-.29**
Expenditure tercile	.39**	.41**	-.48**	-.43**
Food Share in Expenditure	-.38**	-.24**	.39**	.22**
Food Exp/capita	.19**	.34**	-.28**	-.38**
Value Foods Consumed	.41**	.40**	-.47**	-.41**
# Food Groups	.33**	.40**	-.38**	-.39**
# Unique Foods Consumed	.39**	.44**	-.46**	-.44**
# Kids w/ Low WAZ	-.14**	-.18**	.14**	.18**
# Kids w/ Low WHZ	-.16**	-.04	.15**	.04
# Kids w/Low HAZ	-.18**	-.19**	.16**	.17**

Source: Tufts FSNSP/FANTA survey data (2001); Tufts FSNSP/FANTA survey data (2003).

\*\* Correlation is significant at the .01 level (2-tailed).

N.B. The FAST module correlations for Round 1 have been recomputed according to responses to the 9 questions used in Round 3 so as to be appropriately comparable (rather than using responses for the 11 question module previously reported in Webb et. al. 2002)

**Table 11: Cross Correlation Matrix of Selected Indicators of Poverty, Food Insecurity and Malnutrition**

	FS rating <sup>1</sup>	FS11 <sup>2</sup>	Any Stunting <sup>3</sup>	Exp. Tercile	Shoes/Clothes	Non-Prod. Assets	Unique Foods	Food Exp.	Meet 80% RDA
(Correlation Coefficients)									
Enumerator Food Security Rating <sup>1</sup>	1.00								
FAST (11) <sup>2</sup>	.730**	1.00							
Any Stunting <sup>3</sup>	-.153**	-.137**	1.00						
Expenditure Tercile	-.446**	-.421**	.080	1.00					
Spending on Clothing	.383**	.363**	-.147**	-.420**	1.00				
Non-productive Assets	.616**	.615**			.409**				
Unique Foods Consumed	.421**	.421**	-.154**	-.600**	.282**	1.00		1.00	
Food in Share of Total Exp.	-.376**	-.405**	-.081*	-.440**	-.412**	.504**	1.00	-.190**	1.00
Meet 80% caloric need?	.179**	.145**	.026	.025	.114**	.063	.216**	.023	1.00

Source: Tufts FSNSP/World Vision/FANTA survey data (2001).

\*\* Correlation is significant at the .01 level (2-tailed).

\* Correlation is significant at the .05 level (2-tailed).

1. Household categorization according to female interviewer assessments.
2. Household responses to the 11 question FAST module
3. For children aged less than 12 years at -2 or -3 SDs of reference population.

But what of combined variables? Table 11 suggests that the enumerator rating and FAST module indicator overlaps more strongly with comparators of poverty, food access and nutrition outcomes than comparators do among themselves with each other. That is, the interviewer-driven food security rating has strong associations with a range of variables, including expenditure tercile, ownership of non-productive assets, unique foods consumed, and share of expenditure on clothing. The same group is significantly correlated (albeit at different levels) with the set of FAST questions.

The idea of composite variables lies at the root of work by Maxwell et. al. (1999) who developed a set of elaborately weighted indices derived from self-reported ‘food-seeking strategies’ in urban Accra (building directly on the US hunger module questions). Similarly, Ahiadeke et. al. (2002) elaborated on coping strategies during periods of stress in Accra, finding that a single indicator of ‘reliance on purchased street foods’ was highly correlated with negative food security outcomes, including income high food share in total expenditure. More importantly, they also considered a combined variable approach by identifying which households were *both* calorie inadequate (<80% household adequacy per adult equivalent unit) *and* spending more than 50 percent of total expenditure on food. The combined variable allowed for classification of households into four groups along a continuum from ‘food secure’ to ‘food insecure’. The authors found that no household in the poorest expenditure quintile (in the urban Accra sample) fell into the ‘food secure’ group, while none of the richest households were in the ‘food insecure’ group. The combined variable was therefore proposed as a viable benchmark for food insecurity.

That proposition was explored with the current data. A combined variable was constructed to identify households that are both calorie inadequate (not meeting 80 percent household caloric adequacy on a per capita basis) and allocating more than 60 percent of total expenditure on food. That composite results in 30.2 percent of the sample (181 households) being defined as ‘hungry’, compared with 30.3 percent (182 households) defined as ‘hungry’ using the female interviewer rating for the same sample. This surprising concordance warrants further examination. In future analyses these data will be used to assess, a) do other combined variables work in identifying households that are characterized by negative coping behaviours and negative outcomes?; and b) can combined variables be ‘tested’ for their potential explanatory power through more complex statistical analysis?

In terms of other combined variables another avenue to explore is the construction of a composite ‘food insecurity’ variable. That is, combining variables that relate directly to:

- *Food availability* (say, the monetary value of all foods consumed per capita, share of food in total expenditure, and food group diversity);
- *Food access* (total household expenditure level, current level of food in store, frequency of rice purchase);
- *Food utilization* (a ‘hygiene’ variable (type of latrine \* wash hands with soap after defecation?), and source of water); and
- *Vulnerability* (the elements that raise exposure to, or protect from, external shocks anywhere in the food system—possibly including non-productive asset stock (a measure of wealth), land owned (production security), and an index of income sources (income diversification).

### C. Project-Specific Indicators of Food Security

The World Vision/Bangladesh Food Security Enhancement Initiative (FSEI) Development Assistance Program (DAP) is implemented in sixteen *upazilas* located in some of the most food insecure regions of Bangladesh. The mandate of the five-year US\$80 million Title II-funded program is to address many of the primary underlying causes of food insecurity in the country, namely: low agriculture productivity, poor infrastructure and market access, scarcity of viable off-farm income sources, vulnerability to recurrent natural disasters, and lack of access and knowledge regarding safe options for drinking water and sanitation (Dunford 2000).

World Vision's multi-sectoral approach to tackling these problems includes the following activities (World Vision and World Vision/Bangladesh 2002):

- Providing agricultural extension through training and demonstration plots to introduce new technologies that are expected to increase yields;
- Vaccinating poultry and livestock to improve the viability of homestead microenterprise;
- Revitalizing community-level water and sanitation management committees to mobilize and train the community in optimal methods for improved hygiene;
- Creating participatory "Risk and Resource Maps" at the union level which assesses the likelihood of disasters against community-available assets for mitigating their impact;
- Developing disaster contingency plans with representatives from the *upazila* through the community level;
- Building schools that can be used concurrently as disaster shelters when necessary;
- Raising ground in flood-prone school and market areas;
- Improving roads to facilitate market access;
- Building and installing latrines and arsenic-free water systems to improve health and hygiene; and
- Channeling food resources to create additional employment opportunities for the poorest households.

During the early stages of the FSEI project, WV/B developed a monitoring and evaluation system that would both track progress in achieving program outputs and enable periodic assessments of how each of these outputs contributes to a series of intended impacts. As the broader goal of the project is to improve food security, the criteria driving the selection or adaptation of impact indicators from the list of "Title II Generic Performance Indicators For Development Activities" was that each should form a direct conceptual link to program outputs while still managing to capture some degree of progress in reaching that goal (Bonnard et al, 2002).

WV/B implemented its own baseline survey in October 2000 and commenced a comprehensive midterm evaluation two years later with a view to reporting to USAID the state of food insecurity in FSEI participating communities at time of project initiation, and the impact of the project activities on those indicators.

One of the challenges in evaluating FSEI impact with any indicator is related to the project's phased roll-out approach. At midterm, some project components have been more active in

certain villages than in others and some villages have not yet been reached at all. Though the FSEI will eventually target all villages in an *upazila*, at this stage the incomplete implementation and differential mix of activities across villages muddies the typical definition of “intervention group”. As a result, among fifteen villages participating in FSEI in which Tufts FSNSP conducted data collection (and those fifteen were common to both Tufts FSNSP and WV baseline data collection samples), four could be classified as having already had “substantial” intervention<sup>25</sup>. In the remaining eleven ‘intervention’ villages there was only partial or preliminary activity; in fact, little different from among fifteen non-FSEI (control) villages<sup>26</sup>.

With a view to assessing the degree of concurrence and consistency among the WV indicators and the FAST module, Round 3 of the Tufts FSNSP data collection included all of the WV reporting indicators as listed in Table 13. Around half of the WV indicators were found to be significantly correlated with the enumerator rating (of whether households fall into a food secure/insecure categorization). Table 14 does the same in relation to enumerator classification as hungry/not hungry<sup>27</sup>.

Another approach to looking at associations between WV reporting indicators and the FAST module was to create an aggregation of the World Vision reporting indicators. The reasoning was that a combination variable might be a better conceptual representation of overall food security in WV project areas than any one indicator on its own. Per this logic, indices were created by summing the household’s responses to each dichotomized indicator. The greater the score, the more indicators to which a household responded affirmatively, and the better off the household was likely to be. In all, three indices were created. The two indicators that applied only to farmers and the one variable applicable only to families of children under 36 months were necessarily excluded from Index1. The maximum value for Index1 is 14. Index2 includes two additional indicators applicable to farmers only and Index3 is comprised of all questions in Index1 plus one question applicable only to families with children <36 months. All three indices are normally distributed.

When the individual WV indicators are combined into these various indices it is found that the WV impact indices as a whole are significantly correlated with the enumerator rating and the FAST module at the  $p < 0.001$  level (Table 15). This represents confirmation that FAST captures a significant part of the problem that WV is seeking to overcome with its intervention, and that

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<sup>25</sup> ‘Substantial’ intervention was defined as having at least 5 ongoing activities, covering at least 3 sectors, and reaching at least 500 people.

<sup>26</sup> A major issue in dealing with the assessment of change related to *project impact* is finding “pure” controls in Bangladesh in which no development program activity is at work (Rezaul Karim et al, 2001). In fact, the activity of PVOs in Bangladesh is so ubiquitous that if one managed to identify such an “untouched” population of villages through purposive investigation, the sample would be inherently biased against villages that are even remotely accessible. **Table 12** presents data from the Tufts community level questionnaire demonstrating the number of PVOs working in each village at the time of the R3 survey and the types of activities in which they were engaged. The results suggest that there are an average of two to three other PVOs working in World Vision FSEI communities, and three PVOs operating in the average “control” community. Given the incomplete state of implementation by midterm and the challenge of separating FSEI program effects from other development work, for the purpose of this report we have explored overall change regardless of its cause as the more valid approach.

<sup>27</sup> For certain analyses, the 3 tiered enumerator rating was dichotomized to “secure vs. insecure” (food secure vs. food insecure w/o hunger + food insecure w/hunger categories) or “hungry vs. not hungry” (food insecure w/hunger vs. food insecure w/o hunger + food secure categories). This was done not only for simplicity in analysis but also to explore whether conceptual distinctions between these aforementioned groups are borne out by the data.

one would expect any change in the WV index or individual indicators to be tracked by FAST. As reported in Section 6 below this is precisely what transpired.

That said, Tables 13 and 14 also suggested that only half of the WV indicators serve to document the food access/adequacy aspect of food insecurity. Bonnard et al (2002) point out in their review of DAP progress against USAID's 1995 Food Policy Paper that "an important constraint in evaluating the food-security impacts of food availability and access interventions is the lack of meaningful and informative indicators. Most indicators chosen are not sufficiently informative for evaluating food-security impacts". They cite as one example the increased yields indicator used by WV, suggesting that food consumption may or may not result from successfully improving crop yield. It can also be argued that, i) eggs marketed, ii) diarrhea in last two weeks, iii) access to emergency supplies, iv) farmers using price information, v) milk marketed, and vi) number of income sources are indicators that do serve important functions in themselves (to document change relating to certain production-enhancement and marketing activities), but do not reflect food security in the sense being measured by FAST. In other words, not only do PVO monitoring and evaluation frameworks need to strengthen the link between "DAP intermediate results and household food security or coping strategies" (Bonnard et al 2002), but they require direct measures, like FAST, that can capture the overall project goal of improving food security access.

**Table 12: Non-World Vision PVO Activities in FSEI Implementation Villages and Controls**

	Substantial Intervention (n=4)	Partial Intervention (n=6)	Intended Intervention (n=5)	Control (n=15)
Mean No of PVOs working in each village	3.0	2.8	2.2	3.1
	(% of villages with each activity)			
Income generation activities	33.3	40.3	70.0	52.7
Health/FP	16.7	38.9	30.0	26.3
Water/sanitation	8.3	13.9	30.0	17.7
Adult education/literacy	0.0	0.0	10.0	1.3
Nutrition	8.3	0.0	20.0	14.1
Disaster Preparedness	8.3	0.0	0.0	3.3
Ag. Extension	8.3	4.2	36.7	20.6
Empowerment	8.3	18.1	40.0	19.1

Source: Tufts FSNSP/FANTA community survey data (2003)

**Table 13: World Vision/Bangladesh Reporting Indicators Classified According to Tufts FSNSP Enumerator Rating of Food Insecure/Secure, at Round 3.**

Indicator (% yes)	Food Insecure (%)	Food Secure (%)	
Eggs marketed >0	53.6	46.4	
Diarrhea in last two weeks	53.6	46.4	
Access to emergency supplies	53.8	46.4	
Number of Income Sources >2	60.0	40.0	
Farmers used improved practices	39.4	60.6	*
Milk marketed >0	41.7	58.3	*
Proper hand washing behaviors	48.3	51.7	*
Fish marketed >0	27.3	72.7	**
Access to safe H2O	45.2	54.8	**
Aware of contingency plan	65.5	34.5	**
Oilseed yield > 0	9.7	70.3	***
Legume yield > 0	16.3	83.7	***
Practice hygienic sanitation	25.0	75.0	***
Farmers used price information	42.7	57.3	***
Rice Yield (Improved Variety) >0	37.1	62.9	***
Sanitary latrine access	41.2	58.8	***
Food Groups Consumed >4	47.2	52.8	***

Source: Tufts FSNSP/FANTA survey data (2003)

\*Chi-square, p<.05, \*\* Chi-square, p<.01 \*\*\* Chi-square, p<.001

**Table 14: World Vision/Bangladesh Reporting Indicators by Tufts FSNSP Enumerator Rating of Hungry/Not Hungry, at Round 3**

Indicator (%yes)	Not Hungry (%)	Hungry (%)	
Number of Income Sources >2	60.0	40.0	
Access to emergency supplies	70.5	29.5	
Proper handwashing behaviors	73.4	26.6	
Farmers used price information	78.0	22.0	
Fish marketed >0	81.8	18.2	
Eggs marketed >0	71.5	28.5	*
Diarrhea in last two weeks	28.3	71.7	*
Milk marketed >0	72.6	27.4	*
Food Groups Consumed >4	77.3	28.5	*
Farmers used improved practices	86.6	13.4	**
Legume yield > 0	90.7	9.3	**
Aware of contingency plan	52.0	47.0	***
Sanitary latrine access	79.1	20.9	***
Access to safe H2O	80.7	19.3	***
Practice hygienic sanitation	87.0	13.0	***
Rice Yield (Improved Variety) >0	89.3	10.7	***
Oilseed yield > 0	100.0	0.0	***

Source: Tufts FSNSP/FANTA survey data (2003)

\*Chi-square, p&lt;.05 \*\*p&lt;.01 \*\*\* p&lt;.001

**Table 15: Correlations among FAST Module questions, Enumerator FS Rating, and Composites of World Vision Impact Indicators, Round 3.**

	FAST(9) <sub>1</sub>	Enumerator rating <sub>2</sub>	WV index1 <sub>3</sub>	WV index2 <sub>4</sub>	WV index3 <sub>5</sub>
	(Correlation coefficients)				
FAST (9) <sub>1</sub>	1.0				
Enumerator Food Security Rating <sub>2</sub>	.86**	1.0			
WV impact indicator Index 1 <sub>3</sub>	.36**	.35**	1.0		
WV impact indicator Index 2 <sub>4</sub>	.42**	.42**	.98**	1.0	
WV impact indicator Index 3 <sub>5</sub>	.25**	.25**	.94**	.94**	1.0

Source: Tufts FSNSP/FANTA survey data (2003).

\*\* Correlation is significant at the .01 level (2-tailed).

1. The 9 item factor from the FAST module questions
2. Household categorization according to female interviewer assessments.
3. Composite of World Vision FSEI impact indicators, questions applicable to all households
4. Composite of World Vision FSEI impact indicators, questions applicable to farmer households
5. Composite of World Vision FSEI impact indicators, questions applicable to households with children under 36 mos

## **6. THE DYNAMICS OF CHANGE IN FOOD SECURITY STATUS**

The recent international symposium on measuring undernutrition pointed to the need for “reliable and timely methods that measure [not only] the prevalence of hunger, food insecurity and vulnerability, [but that can also] highlight changes over time.” (FAO 2003) That being the case, was there “change” in food security status among Bangladeshi households between 2000 and 2003 that could be captured by the FAST module? The methodology and results elaborated below suggest a positive response to this question.

As described in the previous section, the process of developing the FAST module has been an iterative one. Yet, to satisfactorily explore change dynamics, the third round questions needed to mirror those in the first round to ensure that detected changes in food security incidence were valid and did not derive instead from slightly nuanced differences in question wording and delivery. Thus, in preparation for the third round survey, each question in the FAST module was carefully reassessed to ensure its comparability to the set of relevant questions that comprised the module at baseline. The “quantitative” portion of the questionnaire soliciting data on food consumption, expenditure, assets, anthropometry etc. for comparison to FAST module results was also carefully replicated to enable accurate assessments of change.

And change is seen, for example, in terms of the increase in the number of households responding positively to the questions on WV’s impact indicators. Table 16 shows improvement in practically all of the measures, and for 14 out of the 17 the change is highly significant. Similarly, when those same indicators are aggregated into WV indices (more representative of food security overall than each measure individually) the mean level also improved significantly between rounds 1 and 3 (Table 17).<sup>28</sup>

However, when looking at indicators more closely related to food security, (and not the results of specific project activities), the picture is less consistent. Table 18 presents means of common food security comparators at Round 1 and Round 3 and assesses the significance of the difference between rounds using paired t-tests. The results suggest that several of the comparator means, including arable land, total land, food share in total budget, and number of food groups and unique foods consumed, actually worsened significantly between rounds. Other indicators such as per capita food expenditure, the imputed per capita cost of all food consumed, and per capita spending on clothes and shoes improved significantly between rounds. The mean FAST module score stayed virtually the same.

Given that “substantial” project implementation as defined by World Vision was only completed in four of the fifteen intervention villages (60 households out of 600 in the sample), it is not surprising that improvements in food security and poverty indicators are not, by and large, seen across the board. What is most relevant to the current analysis is not the change in comparators, per se, but rather how well the FAST module follows what is happening both at an individual comparator level and against a global food security “benchmark”, such as the enumerator rating.

In order to examine how changes in comparator variables varied with changes in ratings of food security status made by the female enumerators, a variable was created to represent whether a

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<sup>28</sup> Recall that the FAST module is significantly correlated with the WV Indices at the  $p < 0.01$  level.

household was food secure in both rounds, insecure at both rounds or shifted positively or negatively (from security to insecurity and vice versa) between rounds. Table 19 shows the percentage of households that stayed the same, improved, or worsened over time according to this indicator. Mean values were then calculated for each comparator by rated food security status at Round 1 and Round 3. The repeated measures analysis of variance and the accompanying plots of the means allow us to examine whether or not any secular changes may have occurred and whether or not changes in food security status modify the influence of these ongoing trends.

Table 20 presents the results of the repeated measures ANOVA tests with change in female enumerator rated food security status treated as a grouping factor. The interaction term of 'round' by 'food security change status' was significant for six of the 13 comparator variables (productive assets, total expenditure, estimated per capita cost of all food consumed by the household, food expenditure, per capita spending on clothing/shoes, and FAST index score). Also, the interaction term approached significance for the number of unique foods consumed. Figures 1-4 present pictorial examples of mean comparator values by round and by change in enumerator food security status. The plots show that households rated as insecure in both rounds 1 and 3 were relatively low at R1 and remained low at R3. For most of the seven significant comparators, households that were rated as "secure" at both rounds tended to have higher mean comparator scores at R1 than other food security change groups and the mean values tended to be either higher or about the same at R3. Households that were shown by enumerators to become food secure in Round three showed increases in the mean comparator values, and households that became food insecure by R3 showed corresponding decrease in the comparator mean.

That other comparators showed change in the expected directions in relation to enumerator ratings, but did not achieve statistical significance, appears to relate either to differences in recall periods--dietary intake is 24 hours, food expenditure is 30 days, non-food expenditure is 60 days, FAST is one year--which arguably mask 'rates' of change in the different indicators when all mixed in together (due to lag time effects), or to the more 'structural' (less dynamic) nature of some comparators like land owned and child anthropometry.

Nanama and Frongillo (2002) use a related, but alternative method to test change in their food security module (developed in Burkina Faso using a similar process as the FAST in Bangladesh) against change in a host of comparators. In replicating their analysis, multiple regression was used to predict change in FAST score between rounds while controlling for the FAST score and the mean value of the comparator at Round 1. Table 21 presents bivariate and multivariate coefficients of the mean change in comparators with mean FAST change. The results of this exercise demonstrate that, in nearly every instance, change in the FAST indicator was significantly (and in most cases highly so) associated with changes in the comparator means. The indicator representing the percentage of total household expenditure devoted to food had a negative association with FAST, as expected, since the higher a household's food share, the less secure it is likely to be. According to this method, even shifts in productive land tracked mean change in the FAST score, though "total land" (including homestead area), was the one indicator that did not. The regression coefficients presented in Table 15 are comparable, though in some cases of slightly lesser magnitude, to those reported by Nanama and Frongillo. However, many

of the coefficients in the Burkina Faso study were not significant, possibly resulting result from the difference in sample size (126 cases in the Burkina Faso study versus 600 cases in the Tufts FSNSP sample).

These examinations suggest that the FAST module tracks very well with changes in many indicators of food security, in spite of the fact that, in this sample, the majority of the poor rural households are not dramatically changing their status overnight. Between Rounds 1 and 2 almost 60 percent of households (in the sub-sample of 125 households) remained in the same enumerator assessed food security category. Between Rounds 1 and 3 almost 80 percent of the more than 500 households remained in the same enumerator rated food security category. Even among WV intervention participants only eighteen percent shifted food security status between 2000 and 2003 (thirteen percent of those becoming more secure), while in the control group eighteen percent also changed their status—eighteen percent becoming more food secure.

However, while around one in six households were moving either up or down in food security status, as rated by the enumerators, this underestimates the true dynamism of individual households, since a great deal of movement also occurred *within* the food security classifications used by the enumerators. For example, Figure 5 shows that among the group of households that were food secure only in Round 1, some consolidated that position but others slipped. That is especially true of the ‘food insecure in both rounds’ group, which shows a lot of mobility between rounds in both directions. In other words, a household can improve by several points in the FAST module (distinctly improving their status) without yet actually moving out of the ‘hungry category’ into the ‘food secure’ category as rated by the enumerators. This is due to the fact that those that scored extremely low on the FAST module can show incremental improvement detected by the module but not by enumerators.

Similarly, not all households, or indeed communities, have room to “change”. Those households already at the top of the food secure category cannot, in fact, improve their rating as it is currently constructed, nor can those at the bottom of the ‘hungry’ category get any worse. For example, in one village (Jaso Para) 90 percent of households were rated food secure in Round 1 and this reached 100 percent in Round 2. By contrast, in Bhabukdia only 15 percent of households were rated as food secure in Round 1, rising to almost 30 percent in Round 3. Although Bhabukdia achieved a 100 percent improvement in its food security status it had a lot more room for improvement than did Jaso Para (whose 10 percent improvement is as impressive, but in a different way). This means that all assessments of ‘rates of change’ in food security status do need to control for initial condition in seeking to assess ‘change’ that can only occur within defined parameters. Indeed, Figure 1 indicates clearly that there was far less movement within the ‘food secure in both rounds’ than in the other groupings.

**Table 16: Households Reporting on WV Indicators in 2000 and 2003<sub>1</sub>**

	2000 (% yes)	2003 (% yes)	
Oilseed yield > 0	3.9	5.2	
Fish marketed >0	5.5	5.5	
Farmers used price information	35.4	72.5	
Hygenic sanitary latrine usage	1.6	17.0	***
Legume yield > 0	3.1	7.2	***
Aware of contingency plan	4.9	21.4	***
Access to safe H2O	5.8	40.4	***
Milk marketed >0	7.1	14.5	***
Eggs marketed >0	11.1	40.0	***
Rice Yield (Improved Variety) >0	16.6	35.0	***
Access to emergency supplies <sub>2</sub>	25.4	71.2	***
Hygenic sanitation	25.8	60.4	***
Farmers used improved practices	25.9	75.4	***
Diarrhea in last two weeks	27.7	13.2	***
Proper handwashing behaviors	32.7	55.0	***
Number of Income Sources >2	51.4	80.5	***
Food Groups Consumed >4	58.5	79.4	***

Source: World Vision/Bangladesh survey data (2000); Tufts FSNSP/FANTA survey data (2003)

\*\*\* Chi-square,  $p < .00011$ .

1. In 15 Villages where WV and Tufts FSNSP data collection overlaps
2. The World Vision baseline defined “emergency supplies access” according to both availability and tested accessibility of any items on a list of supplies during the most recent flood or cyclone. The Tufts FSNSP survey did not ask whether respondents had actually obtained supplies. Thus, some of the apparent increase in this variable may be due to slightly different wording in the two surveys.

**Table 17: Baseline and Midterm Sample Means of “Aggregate Food Security” Indices Constructed from World Vision Reporting Indicators<sub>1</sub>**

	WV Baseline	FANTA/Tufts FSNSP Round 3
Index 1 <sub>2</sub>	3.0 ± 1.2 (n=567)***	5.5 ± 1.6 (n=268)***
Index 2 <sub>3</sub>	3.8 ± 1.2 (n=184)***	6.6 ± 1.6 (n=79)***
Index 3 <sub>4</sub>	3.6 ± 1.8 (n=371)***	7.4 ± 1.8 (n=118)***

Source: World Vision/Bangladesh survey data (2001); Tufts FSNSP FSNSP/FANTA survey data (2003)

\*\*\*Independent T-test, p<.0001

1. Collected from households in 15 villages common to both 2001 and 2003 data sets
2. Composite of World Vision FSEI impact indicators, questions applicable to all households
3. Composite of World Vision FSEI impact indicators, questions applicable to farmer households
4. Composite of World Vision FSEI impact indicators, questions applicable to households with children under 36 mos

**Table 18: Change in Common Comparator Means, Round 1 to Round 3**

	Round 1	Round 3	Difference	Significance
FAST (9)	6.2	6.0	-0.2	
Food Stores	158.1	186.8	28.7	
Productive assets	0.7	0.7	0	
Total expenditure (per capita)	995.3	973.2	-22.1	
Saris owned	5.1	5.5	.04	*
Productive land	89.1	77.0	-12.1	*
Total land	125.6	116.1	-9.5	*
Food Share	51.9	54.2	2.3	*
Food exp (per capita)	385.3	408.6	23.3	*
# Food groups	7.4	6.2	-1.17	***
# Unique foods	14.4	13.5	-.85	***
Cst of food consumed (per capita)	568.2	657.8	89.6	***
Spending on clothes/shoes (p.c.)	72.2	91.7	19.5	***

Source: Tufts FSNSP FSNSP/FANTA survey data (2001); Tufts FSNSP//FANTA survey data (2003)

\*paired t-test, mean change between rounds is significant at p =.05, \*\*p<.01, \*\*\*p<.001

**Table 19: Food Security and Hunger Classification by Female Enumerators at Round 1 and Round 3**

	Food Insecure at R3 %	Food Secure at R3 %
Food Insecure at R1	45.5 (n=254)	11.6 (n=65)
Food Secure at R1	6.3 (n=35)	36.6 (n=204)

Source: Tufts FSNSP/FANTA survey data (2001); Tufts FSNSP//FANTA survey data (2003) ; chi-square, p<.0001

**Table 20: Change in Comparator Means by Food Security Status**

	Round 1					Round 3					Sig. Int <sup>1</sup>	Sig. ME <sup>2</sup>
	Insecure R1&R3	Secure R1 only	Insecure R1 only	Secure R1 &R3	R1 Overall	Insecure R1&R3	Secure R1 only	Insecure R1 only	Secure R1 &R3	R3 Overall		
# Food groups	6.8	7.5	7.5	8.0	7.38	5.6	6.4	6.5	6.9	6.20		***
# Unique foods	12.6	14.9	14.7	16.5	14.4	11.9	13.8	14.6	15.2	13.5	p=.6	**
Saris owned	3.2	5.5	4.4	7.5	5.1	3.3	5.0	5.1	8.3	5.5		
Productive land	23.7	76.5	59.0	182.4	89.1	19.5	45.9	56.8	160.4	77.0		
Total land	43.8	112.1	82.2	226.6	125.6	36.5	92.1	80.6	214.1	116.1		
Food Stores	27.2	264.0	55.1	335.6	158.1	44.7	140.6	113.6	395.1	186.8		
Food Share	59.8	46.2	55.3	41.8	51.9	59.9	49.7	54.3	47.7	54.2		
Productive assets	0.5	0.9	0.7	0.9	0.7	0.5	0.5	0.8	1.0	0.7	*	
Total expend (p.c.)	627.0	888.7	841.7	1536.9	995.3	618.7	954.6	1420.1	1284.6	973.2	**	**
Cst of food consumed (p.c.)	430.0	595.5	525.9	748.9	568.2	477.6	535.8	745.9	875.1	657.8	**	
Food exp (p.c.)	329.5	391.2	364.1	460.7	385.3	318.0	303.8	462.6	522.2	408.6	***	
Spending on clothes/shoes (p.c.)	44.2	84.5	51.5	111.74	72.2	45.5	61.2	87.2	156.3	91.7	***	*
FAST (9)	3.9	8.2	5.9	8.6	6.2	3.6	6.0	8.3	8.6	6.0	***	

Source: Tufts FSNSP/FANTA survey data (2001); Tufts FSNSP//FANTA survey data (2003)

1. Repeated Measures ANOVA, interaction of food security level by time is significant at \*p =.05, \*\*p<.01, \*\*\*p<.001

2. Repeated Measures ANOVA, main effect (time) is significant at \*p =.05, \*\*p<.01, \*\*\*p<.001

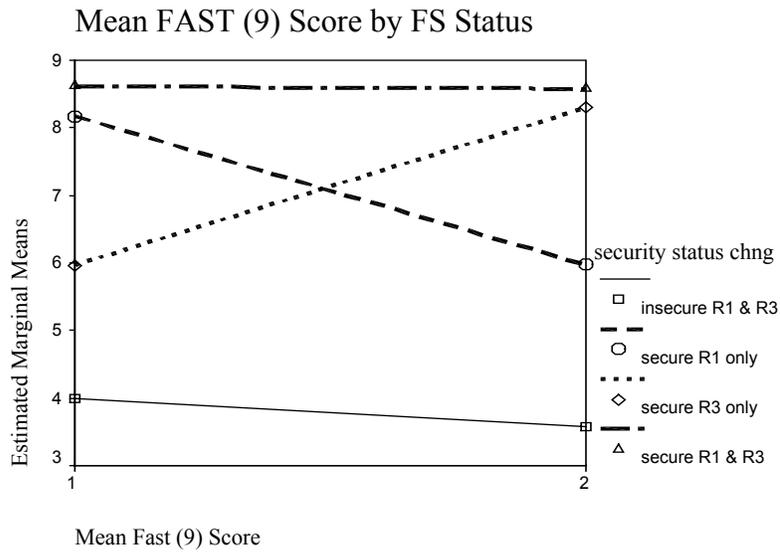
**Table 21: Correlation and Regression Coefficients of Comparator Variables Controlling for R1 FAST 9 Score and R1 Mean Comparator Value**

Indicator	Bivariate Correlation		Regression		
	Coefficient	Significance	Adjusted r <sup>2</sup>	Beta	Significance
# Food groups	.08	p=.06	.23	.27	***
# Unique foods	.09	*	.26	.27	***
Saris owned	.05		.21	.21	***
Productive land	.03		.19	.09	*
Total land	.05		.20	.06	
Food Stores	.05		.19	.16	**
Food Share	-.03		.19	-.11	*
Productive assets	.07		.18	.12	**
Total expend (p.c.)	.05		.20	.18	***
Cst of food consumed (p.c.)	.08	p=.06	.23	.20	***
Food exp (p.c.)	.08	p=.06	.21	.23	***
Spending on clothes/shoes (p.c.)	.10	*	.21	.22	***

Source: Tufts FSNSP/FANTA survey data (2001); Tufts FSNSP/FANTA survey data (2003)

\*p <.05, \*\*p<.01, \*\*\*p<.001

**Figure 1:**



**Figure 2:**

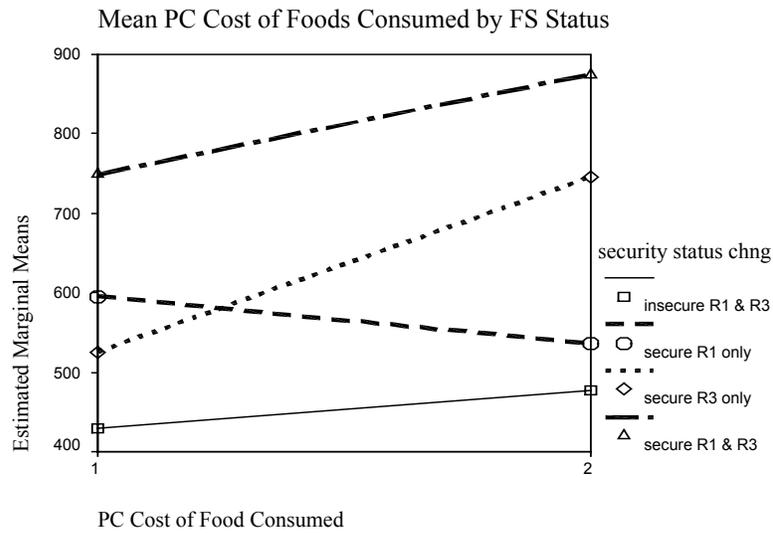


Figure 3:

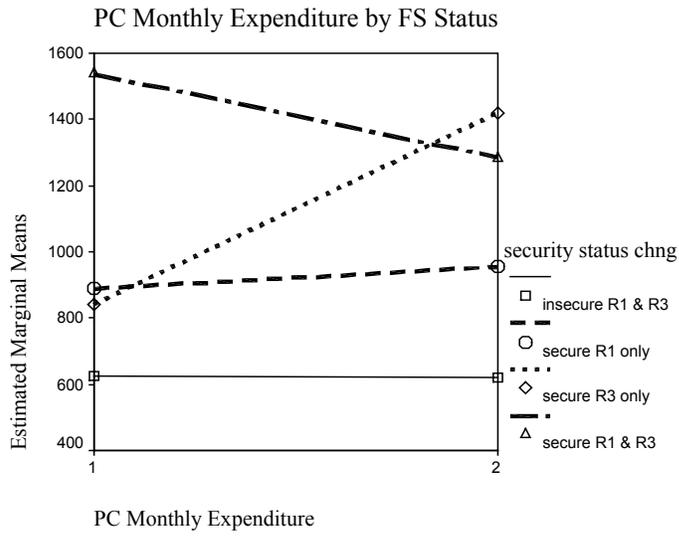
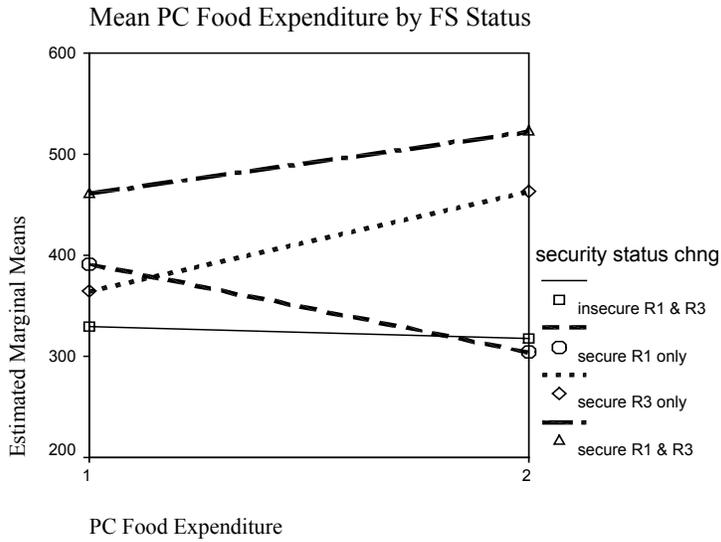
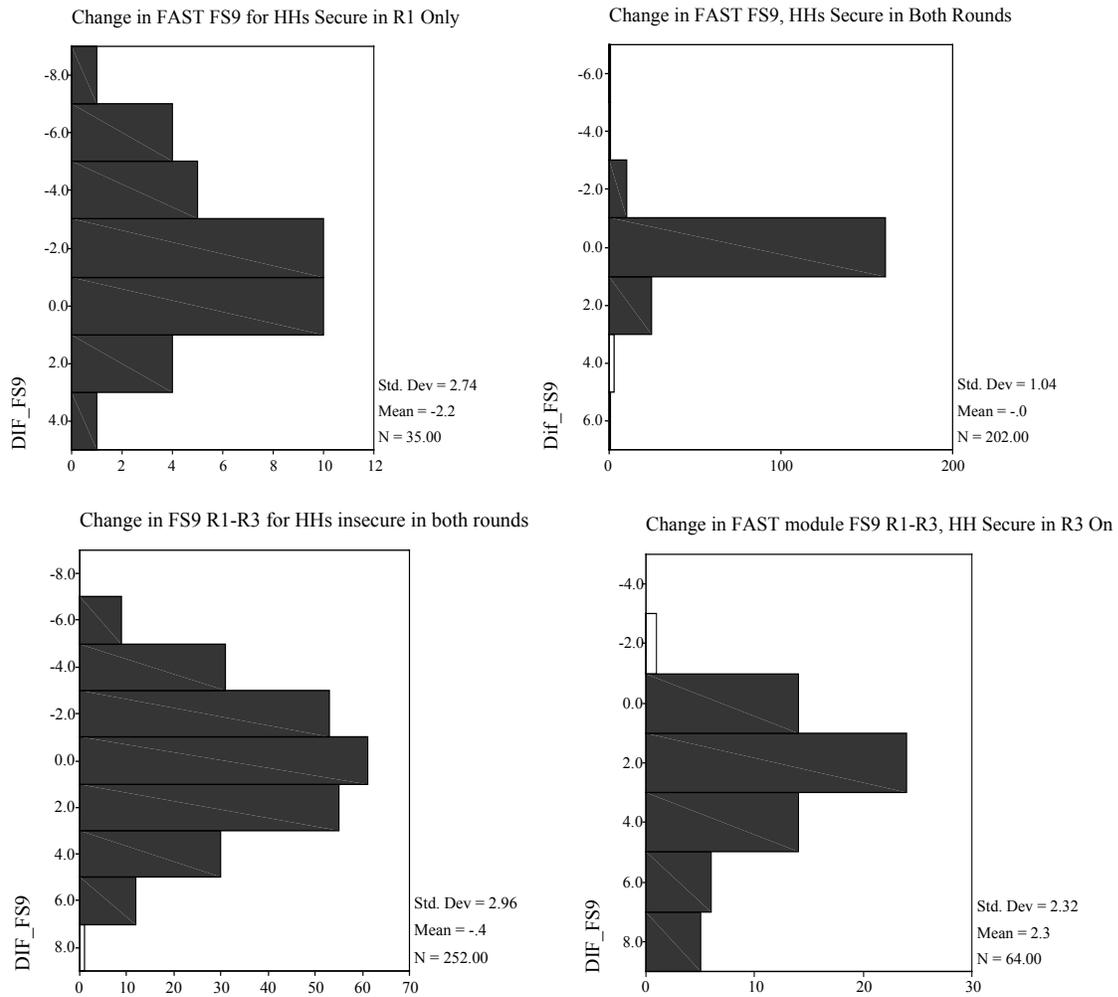


Figure 4:



**Figure 5: Histograms Showing FAST Module Change Over Time by Enumerator Rating of Food Security Status at R1 and R3**



Finally, a word about respondents' own perceptions of their food security trajectory. In making the case for incorporating qualitative perceptions of poverty into their operational definitions, a recent Poverty Reduction Strategy Paper Report (IMF 2001) argued that "the way populations view well-being, poverty, and their manifestations and determining factors dictates to a substantial degree how they behave and react in relation to public policy". In the same vein, understanding local perceptions of the experience of food insecurity is critical to defining a measure whose underlying assumptions are consistent with behaviors that result from, and perpetuate, these self-images. Food security measures grounded in people's own experiences, hopes, and fears, should have the ability to anticipate and measure responses to shifts in security better than those that are based on externally imposed, 'objective', criteria.

As part of the FIMVS process, group informant rating (GIR) exercises engaged village men and women in evaluating the food security status of their neighbors with an eye to comparing villagers' perceptions of food security in their community to enumerator ratings recorded during the Round 1 survey. The GIRs were performed in seven cohort villages according to the methodology prescribed by Bergeron et al (1998), which allows community members to pre-define the number of rating categories along with the characteristics of each. The ranking exercise results underscored an interesting dichotomy between the subjective and objective, the relative and the absolute.

For example, in the pre-test village of *Haluaghat*, female enumerator ratings (of one year earlier) had distributed 20 sample households almost equally across the three categories (food secure, insecure without hunger, and hungry). Comparison of households placed by villagers in the three GIR categories to the enumerator ratings produced almost identical results. By contrast, in the pilot-test community, *Singair*, the enumerators at baseline had rated almost all households in the cluster as "food secure". In this case, during the GIR villagers placed almost one third of these same households in the "food insecure with hunger" pile -- though the differences in "objective" characteristics of the top and bottom-most category were much smaller than in *Haluaghat*.

In both instances, villagers were categorizing sample households based on their *relative* insecurity (versus the enumerator rating which is much more an assessment of absolute status, albeit informed by knowledge of relative conditions in each village). The villages whose GIR ratings came closest to the enumerator ratings were therefore villages with an almost equal division of insecure with hunger, insecure without hunger, or secure households as defined by enumerators. Ultimately, the participatory methodology was much more useful as a springboard for exploring local concepts and behaviors associated with different degrees of food security than as a means to producing another comparator against which to validate the FAST module.

During the Round 2 and Round 3 surveys, respondents were asked whether they felt their situation had improved, stayed the same, or gotten worse during the prior twelve months. Respondents also described their predictions of the future – did they expect that things would improve for them in the coming year? These questions were asked in an attempt to assess individuals' perceptions of their own food security *trajectory* against the FAST module's indication of change between two twelve-month periods. Table 22 presents results of such a comparison. A variable signifying whether the household had worsened, improved or stayed the

same (as per the calculated change in enumerator ratings between Round 2 and Round 3) is shown in a crosstabulation with the respondent’s perceptions of their situation. The results, although limited to the 120 households in both the R2 and R3 surveys, suggest that concordance between the two measures is less than perfect. For example, 100 percent of the three households who worsened per the enumerator ratings also felt things had gotten worse for them. However, of those who were classified as staying in the same category by enumerators, 56.4 percent felt they had gotten worse. There was better agreement between those measured as improving per enumerator rating – 41.2 percent of these respondents felt things were on an upswing over the previous year.

**Table 22: Respondent Perceptions of Food Security Trajectory versus Change in Enumerator Rating Between Round 2 and Round 3.**

<i>“Would you say that things were better, same, or worse for you in the past 12 months than in previous year?”</i>			
	“Better”	“Same”	“Worse”
Worsened per Enumerator rating	0.0 (n=0)	0.0 (n=0)	100.0 (n=3)
Stayed Same per Enumerator rating	23.3 (n=21)	21.3 (n=20)	56.4 (n=53)
Improved per Enumerator rating	41.2 (n=7)	23.5 (n=4)	35.3 (n=6)

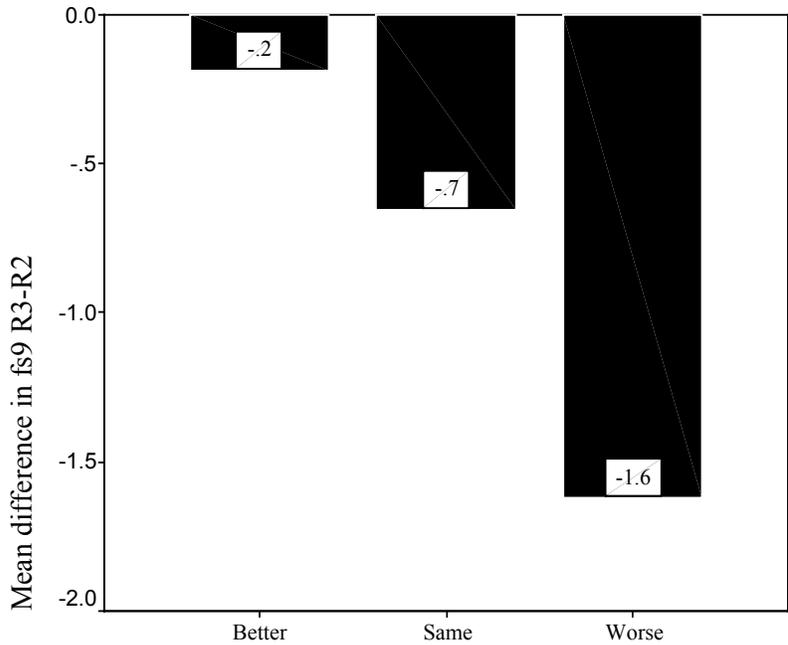
Source: Tufts FSNSP/FANTA survey data (2002); Tufts FSNSP/FANTA survey data (2003)

One possible explanation for the lack of strong correlation is the difference in assessments between relative and absolute conditions – continuum versus threshold.

With this in mind, the same respondent answers were compared to changes in the FAST score (depicted in Figure 6). The bar graph suggests that food security in the entire sample was getting a little worse (according to FAST), but those respondents who thought things had been “better” for them had gotten “less worse” than the others. Likewise, those who perceived things were getting “worse” did indeed shift more negatively in their FAST score than did the other two groups. However, frequency distributions of the FAST score by type of perception suggested that, of those who believed they were getting better, nearly 66.7 percent did not improve their module score. There was better agreement between those who thought things had stayed the same and their FAST score – 71 percent who thought things had stayed were the same as the year before scored the same on the FAST measure at both rounds.

One could argue from the results above that, without asking respondents about the *magnitude* of perceived change, comparisons among these three indicators are overly simplistic. We do not know from any of these measures, for example, what degree of change is meaningful to respondents themselves? Additionally, the question related to perceptions is more general than either of the food security comparators. It could be that the nature of the changes in reported by respondents is related only peripherally to food security.

**Figure 6: Change in FAST Score versus Respondent Perceptions of Change Between Round 2 and Round 3**



How were things for your family these past 12 months?

In sum, the findings reported in this section on Round 3 data as well as change between Rounds 1 and 3 support the conclusion that the FAST module functions very well in documenting the food security status of households (now tested for multiple years), as well as tracking certain elements of change over time. The latter, however, requires more analytical attention in order to tease out the importance of differences in recall periods, different kinds of change (elements that are dynamic versus those that cannot be expected to change much in a short period), the role of initial condition in determining a household’s ‘scope’ for change in food security status, and the importance of dynamic change within the FAST module that is not as easily captured by enumerator ratings.

## 7. DISCUSSION OF RESEARCH IMPLICATIONS AND LIMITATIONS

### A. Costs and Effort Issues

Given that scientific ‘validation’ of the approach to constructing a food security survey module was the central element of this research, working out the details of programmatic feasibility of adopting/duplicating this approach by PVOs in other developing country contexts—including the time, costs and intellectual inputs required to do the job properly – was beyond the scope of this paper. However, these priority issues will be addressed in a forthcoming set of operational guidelines. Attachments 6 and 7, Level of Effort Estimation and Project Budget, suggest that even the most rigorous validation approach, requiring three years and over 68 person months of effort, can be achieved on a relatively modest budget. The eagerness with which key collaborators and other experts embraced the mandate of this study, enabled us to harness their pro bono energy and expertise -- and to them, we are grateful. For PVOs adopting the ‘FAST’ approach, the good news is that much of the expense, time, (and tedium!) deriving from this study related to the collection and processing of detailed information on comparator indicators to use for validation has been accomplished. With the results of the FIMVS in hand, future in-depth investments by PVOs in that aspect of validation are not necessary.

### B. Limitations and Caveats

A few limitations to the analyses undertaken in this report should be reiterated here. One such constraint pertains to the objective of testing whether the FAST module manages to detect changes specifically due to *project impact*. Ideally, this approach would have involved assessing change in project areas according to a variety of indicators while comparing the magnitude of these changes to a set of control households. Two things have impeded the ability to fulfill these measures: the first, which was inevitable at the midterm stage of project evaluation, was the differential rate of implementation across villages in the sample. Because the FIMVS study was designed to be longitudinal for other important reasons, there was no option of limiting the Round 3 sample in advance of the survey to only villages that had received “substantial” program intervention. Therefore, though not unexpected, it challenges the FAST module to detect program-related changes where they are not likely to have occurred.

A second constraint to assessing program impact has to do with the lack of “pure” controls in Bangladesh. The limited information available to us related to activity of other PVOs in control areas suggests that an average of three PVOs are working in control communities, yet how these activities interact with the FSEI program is unknown. Given these limitations, it was necessary to adopt the approach of exploring change regardless of its cause at this round, in hopes that a fourth round of data collection could be repeated with the same households in 18 months time to coincide with the final impact evaluation of the FSEI. At that point, rather more evidence of project-related impact on food security should be measurable (though the issue of attribution of impact remains), and the effective tracking by FAST could be further explored.

A second limitation relates to the comparison of changes in the FAST module to other indicators that have been collected using different recall periods representing different time points. For example, the recall period is 24 hours for dietary intake, 30 days for food expenditure, 60 days

for non-food expenditure, and one year for FAST. Of course, these recall periods were mandated by the respondent's ability to remember detailed information with accuracy. However in comparing changes in these indicators to shifts in the FAST module, one should be aware that change between two 24-hour diet recalls collected one year apart, for example, may be less reliable, dynamic, etc. than change in a FAST module that captures the average food security experience of a household over twelve months. Additionally, we would expect certain 'structural' indicators like land owned, and even certain child anthropometry indicators, to be less dynamic and therefore less comparable to observed rates of change in FAST.

### **C. Next Steps**

A number of operationally useful steps can now be undertaken to build on the results that have been presented here, including

- Comparing directly with parallel research undertaken in Burkina Faso by collaborators at Cornell University, and jointly prepare a 'how to' manual for PVOs;
- Examining more closely how other 'alternative measures' of food insecurity (CSI, Hunger Ranking, Destitution Index, etc), differ from the FAST approach, in content, process, cost and rigor; and
- Seeking to embed the FAST questions into larger surveys (such as the national baseline for Bangladesh's proposed National Nutrition Programme, or in sentinel site surveillance systems (such as Helen Keller International's in Bangladesh) to examine on a population-wide basis how effectively the FAST module can work at national level, as in the United States.

Further analytical refinements are also to be desired, including:

- Addressing the issue of differences in recall periods, different kinds of 'change' over time (elements that are dynamic versus those that cannot be expected to change much in a short period), the role of initial condition in determining a households 'scope' for change in food security status, and the importance of dynamic change within the FAST module that is not as easily captured by enumerator ratings;
- Rerunning the Rasch analysis of internal consistency using only the 9 item module versus the 11 item module to assess any differences in ranking or significance;
- Further elaborating questions in earlier versions of the FAST module that more specifically address diet diversity and food quality issues;
- Exploring whether a combination of male and female enumerator rating together functions better than either alone (specifically in capturing a broader range of underlying concepts, as well as canceling out any potential gender biases in enumerator assessments); and
- Further exploring whether different forms and levels of intra-household food allocation make a difference in the determination of "household food security"—especially where there are differences in households with versus without children, differences in the status of women, or cultural differences relating to the primacy of children (priority/protected consumption for children versus adults when times are hard).

## **8. CONCLUSIONS**

Pelto and Freake (2003) recently argued that much research to date has focused on the “relationship of nutritional status to distal determinants, such as level of maternal education [or] household income. As a result the pathways or mechanisms through which these factors affect nutrition have largely remained black boxes. As the theoretical and analytic power of integrated models becomes more apparent to the social nutrition research community, we can expect to see an emergence of their application to contemporary issues, including...household food security.” The research reported here represents just such an application.

This FANTA-supported research has effectively demonstrated that

- The approach to constructing measures of hunger and food security (as previously validated for use in the United States) can also be used in a totally different, developing country context. The FAST module of nine questions constructed for use in Bangladesh passes all the validation tests that were applied to the US module, and it is transparent in both the underlying concepts and the meaning of the questions used;
- The module’s theoretical underpinnings were found to be essential to understanding hunger in Bangladesh, suggesting that the approach can be adopted elsewhere—and that the current understanding of food insecurity as a construct is a valid basis on which to design policy and project interventions aimed at resolving the problem;
- While the validation study itself was time-consuming and elaborate, the adaptation of the approach to new settings should be relatively easy. For cost-conscious and survey skills-constrained PVOs the FAST approach to assessing food insecurity will be a viable option; and
- But, the adoption of FAST should not be driven purely by a sense of cost-savings (“surveys on the cheap”). The validation research demonstrates that the FAST module is a complement to more common measures either of nutritional status or of food production and marketing. In this sense, the FAST tool serves to address the ‘access’ part of food insecurity that until now was poorly measured using traditional indicators.

Thus, as part of a ‘triangulation’ approach to understanding, measuring and then seeking to tackle food insecurity the FAST approach is not just useful, it is essential.

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## **ATTACHMENT 1.A.**

### **Interview Guide for Understanding Food Insecurity in the Context of Bangladesh**

#### **Eating and cooking patterns**

- What do the members in your household eat on a typical day? Start from when one first gets up and goes through the day.
- who usually prepares food for the household? Does anyone else help in cooking? Do you share cooking and/or meals with other households?
- when a meal is prepared, who eats together? Who eats first? Who next? Does everyone eat the same food? Who is conceived of as needing more food? Who is the most important? Different people's eating habit in terms of items and frequency (do men traditionally eat first, then children, then women? Is this changing?).
- do you eat meals outside of home? If so, where?
- how are decisions about food made in your household? (in terms of purchase, food item, distribution, etc.)
- how and from where do you generally get the food you eat? (home production, purchase, etc.) How do you generally get the water you drink? Are these sources reliable, safe?

#### **Ideas about good and adequate food**

- ask about local perceptions of “good” or “complete” food, in terms of dietary quality and healthiness as well as taste and tradition. See what counts more—quality or quantity, which can vary between times of food scarcity and availability. See if there is any discrepancy or gap between people's knowledge about balanced diet and nutrition learnt from popular media, government or NGO intervention and their own perceptions about complete and satisfying food.
- how often can you afford such a meal? Is there any difference from family to family?
- can you afford to feed your children the way you think you should?
- how often are you able to include fish or meat in your main meal? What kinds of meat/fish are considered good for health or considered as delicacy?

#### **Coping strategies in times of food scarcity (a)**

- in times of crisis (health, family situation, loss of job, problems with housing, etc.), what did you do? Who helped in times of crisis? (Family, friends, religious affiliation, social programs or food aid?)
- social or private services sought/used; why tried or not tried? How did you feel about getting help from others? (Social acceptability)
- what words would you have used to describe yourself during that time? (Assessment of one's situation, maybe look for common “concepts” than particular words, like “Waking up hungry”, “going to bed in empty stomach”, etc.).
- what are your worries regarding “not having enough to eat”? Do you think about it all the time?
- when you didn't (or don't) have enough money or resources to pay for everything, what did you do? Did you buy/cook different foods than usual? How did your meals change?
- have you ever had to choose between buying food and paying for other household expenses, because you didn't have enough money for both? If yes, what did you do? (Do you sell food items grown on your homestead for cash without using them for home consumption?)
- do you usually have to choose between buying food and buying medicine? What do you do in such a situation?

- what are the situation of those around you who are having difficulty getting enough food? What do they (usually) do? How do you feel about them and their situation?

**Strategies (b)**

- What are some of the things you do to make sure you always have enough to eat? Do you keep stores of food for the future?
- have these things changed over the last few years?
- is what you do to make sure you always have enough to eat different from what others do?
- does the community help you in any way?

**Concerns**

- what are the things that worry you in everyday life? How does getting enough food compare to these? Are there moments when other things are more important than food? What are those things and at what times?

**Understanding local views about food**

- How has your or your family's ideas about food been influenced by your parents, community, culture, religion, etc.? (maybe ask using different expressions)
- what kinds of food do you take or not take during illnesses? (hot/cold, etc.)
- what do you generally eat on festivals, such as Eid, Puja, weddings, etc.? (differences in food based on nutritional and health concerns and prestige and other social concerns).

## ATTACHMENT 1.B.

### Example transcript of interview based on interview guide: Interview No. 5 (Woman in her early 20s) in Mirzapur

*Do you have any children?*

Yes, just one child.

*How old?*

Six years old.

*A boy or a girl?*

A boy.

*What does your husband do?*

He is involved in agricultural work. {OCCUP}

*Do you have any land?*

Yes.

*Your own?*

Yes.

*How much?*

About half *paki* [a local unit of measurement for land]. {LAND OWNERSHIP}

I don't know how to calculate 'paki'. Could you give me the amount in terms of 'katha' or 'bigha', or decimal?

No, I am illiterate. I don't know these calculations. {EDUCATION}

*Do you have any land other than this homestead?*

Yes, the  $\frac{1}{2}$  *paki* I have been talking about is without this homestead.

*So, he [her husband] is in agriculture, right? Does he do anything else?*

No, just cultivation.

*Are you involved in anything else?*

What else should I do? {IGW}

*You are not involved with any NGO or anything?*

Yeah, I have started with one. {NGO MEMBERSHIP}

*Which one?*

[She mentioned a name that I could not follow].

*Is it like BRAC?*

Yes, it's like BRAC.

*What do they do?*

They give out loans.

*Have you taken any loans?*

Yes.

*How many?*

I have taken three loans. And, also paid off the installments. {BORROWING}

*Why did you take loans?*

For *dhan* [rice/paddy] business. {OCCUP}

*How long have you been married?*

Seven years.

*How old were you at the time of marriage?*

[confusion].

*I just need to know how old you are now ...*

It's been seven years since I got married.

*But, how old were you at the time of marriage? About 12/13?*

Yes, something like that.

*Have you ever gone to school?*

Yes. Till class three.

*Where is your natal home. Is it far from here?*

Yeah, it's kind of far.

*How far? Do you have to go by bus?*

No, you can just walk.

*Are your parents alive?*

My father had died. I have my mother. {SOCIAL SUPPORT}

*When you cook at your place, is it only your family who eats with you, or are there other people, like in laws who also eat with you?*

I have my mother in law.

*No, I meant, do you cook separately?*

Yes, separately.

*Whom do you cook for? For you, your husband and your son?*

Yes. {MANAGEMENT PATTERN}

*Is there anybody else who eats with you?*

No.

*Who else lives near your house?*

I have my brothers in law around here. {SOCIAL NETWORK}

*Do they all eat separately?*

Yes. Sometimes my mother in law eats with us. {MANAGEMENT PATTERN}

*How many times do you cook in a day?*

At around noon and again in the afternoon.

*Could you tell us the time?*

At around 11 and during the time of *Asr* in the afternoon. [*Asr* is the particular time of praying in the afternoon. It is usually around 4 pm]. {COOKING}

*What do you eat in the morning?*

*Muri* [puffed rice], etc. {BREAKFAST, MURI}

*Do you also eat 'panta' [stale rice], etc?*

Yes, we also eat that. {STALE RICE, BREAKFAST}

*Which one do you eat the most?*

We eat both. I don't like *muri* that much. {PREFERENCE}

*Then what do you eat?*

Rice. {RICE}

*Do you cook the rice in the morning? Or, is it the leftover from the night before?*

[She doesn't understand].

*I mean, is it rice that you eat in the morning, before lunch?*

We eat *muri* at the time and then have rice later. {MURI, BREAKFAST}

*What else do you eat?*

Curry. {CURRY}

*What kind?*

Fish, vegetables, etc. {FISH, VEGETABLES}

*Do you eat fish everyday?*

Not everyday. {FISH}

*How often, approximately?*

About 2/3 times in a week. {FISH}

*Do you buy fish?*

Yes, we buy. It's not really possible to catch fish.

*Do you buy all kinds of fish, or are there some other kinds that you catch?*

No, we buy all of them. {PURCHASED ITEM, FISH, CATCHING FISH}

*What about other things? Like, rice, 'daal', etc.?*

We usually have these at home. {STORAGE, PURCHASED ITEM, RICE, DAAL}

*Do you get these from your land?*

Yes. {LAND OWNERSHIP, PURCHASED ITEM}

*You don't have to buy these?*

No.

*What do you need to buy?*

I don't need to buy rice. Then, there are also some vegetables that we don't need to buy. {PURCHASED ITEM, RICE, VEGETABLES}

*What kinds of vegetables?*

For example, beans. There was also a bottle-gourd plant that's not there anymore. {VEGETABLES}

*So, at home you have beans and bottle-gourd. What else is there?*

Nothing else. We still have to buy *daal*. {DAAL, PURCHASED ITEM}

*What about leafy vegetables? Do you have to buy these as well?*

[She doesn't answer].

So, tell me specifically about the things that you need to buy.

Mostly we buy our vegetables.

*Some of them are produced at home. So, which ones do you buy?*

Bottle-gourd, potatoes, etc. {PURCHASED ITEM, VEGETABLES}

*How often does your mother in law eat with you?*

How can I say so specifically [laughing]?

That means it's not fixed.

No.

For example, who are going to eat with you at lunch today? Only you, your husband and your son?

My son is at his grandmother's place.

*When you have a meal, is it usually the kid who eats first, or is it your husband?*

It's the son who eats first. Then his father. I eat after that.

*You don't get to eat together?*

No. {EATING TOGETHER}

*So, the kids eat a lot of things other than rice, don't they?*

Yes, they eat a lot of stuff.

*Like what?*

Biscuits, oranges, etc. {CHILDREN, SNACKS, FRUITS}

*What do you eat other than rice? Throughout the day?*

*Muri* mostly. {MURI, SNACKS}

*What else do you eat?*

I eat rice.

*What do you eat other than rice?*

*Pitha* [traditional cake], etc. {RICE, SNACKS}

*Don't you have biscuits, and stuff like that?*

Yes, I do.

*Do the kids prefer this kind of things?*

Yes, it's the kids who like these things more. {CHILDREN, PREFERENCE}

*What else do the kids like to eat?*

They like to get things from the store all the time.

*Do you have any poultry?*

Yes, just two. {POULTRY}

*Do you eat eggs?*

Yes, we have them cooked. And my son eats boiled eggs.

*Does he eat eggs everyday?*

We usually don't have eggs much. For example, I cooked egg yesterday.

*Do you think you cook egg at least once a week?*

Well, sometimes, when possible, we have eggs 2/3 times a week.

*Other than that, the kid eats boiled egg, right? Don't you have eggs like that?*

Yes, I do to. {EGGS}

*Who eats more?*

The kids eat more. {CHILDREN}

*Does he like to eat, or is it you who forces him to?*

He's the one who wants to eat eggs.

*Aren't you going to send him to school?*

Yes, I am going to. But, he's too young. They [the school] are not going to enrol him yet.

*Which school are you talking about?*

I have decided to send him to BRAC school.

Does he want to go to school.

Yes, he really wants to. He bought two books and said that he would study at home [laughing].

*Does his father help him in his studies?*

Yes, a little bit. I can't.

*Can you read and write?*

Just a little bit. {EDUCATION}

*Okay, do you ever eat outside?*

Well, at some relative's place. {EATING OUT, SOCIAL NETWORK}

*What about shops or bazaars? It is the men who eat their more, isn't it? For example, does your husband eat outside?*

Yeah, when he goes outside. Otherwise he eats at home. {EATING OUT}

*Who goes to the bazaar for grocery?*

My son's father [her husband]. {BAZAAR}

*Do you tell him what to buy, or does he decide himself?*

He's the one who decides. I suggest things when he asks me. {PURCHASING DECISION}

*So, you have to buy some things, right?*

Yes.

*Among the things you need to buy, there are fish, 'daal', vegetables, etc., right?*

Yes, all this. {PURCHASED ITEM}

*What about during other seasons? For example, are you able to catch fish during monsoon?*

Well, if someone goes to catch fish. My husband doesn't. {FISH, CATCHING FISH}

*Where do you get fish from? Is there a pond?*

Yes, it's there [she indicates a place quite far].

*Is it yours?*

No, it's somebody else's.

*He doesn't catch fish there?*

No. He'll buy it when necessary. {CATCHING FISH, SOCIAL STIGMA}

*What kinds of fish do you buy?*

Silvercup, etc. {FISH, KINDS OF FISH}

*Do you get to eat meat?*

Yes.

*How frequently?*

About once a month.

*What kinds of meat are you talking about?*

Well, there's chicken and beef. {MEAT}

*For chicken, do you cook the ones you have at home?*

We cooked some from there.

*When do you cook meat?*

During Eid mainly. Also, when we have guests over. {MEAT, FESTIVAL FOOD, GUESTS}

*You know how a lot of people say how children should be fed. What do you think the kids should be fed?*

Bananas, oranges, etc. {CHILDREN, FRUITS}

*Can you get these for your kid all the time?*

When he [her husband] goes to the hat. I just have one kid. So, ...

*Yes, you just have one son ...*

He wants to eat so many things ...

*Things like what?*

Oranges, apples, etc. {CHILDREN, PREFERENCE, FRUITS}

*Can you always buy these?*

Well, his father buys for him.

*How frequently he buys like this?*

Well, like every 8 days. Otherwise, he's always eating "boi-beshati" [Same as *shadaipati*—meaning basically goods that one can buy from stores. Here, "snacks" bought from the store].

And, from the haat, he [her husband] brings these oranges, etc. {SNACKS, HAAT, FRUITS}

*But, you can't always get oranges. For example, you can't get them in the summer. What do you do then?*

Then, we have bananas, etc.

*Do you have banana trees at home?*

No, we mostly buy. {FRUITS, PURCHASED ITEM}

*Do you have a mango tree at home?*

There was one. We cut it off.

*Are there any other fruit trees?*

There's one *boroi* tree. There's also a jackfruit tree.

*Do you eat jackfruits?*

We just buy so many! {FRUITS, PURCHASED ITEMS}

*Okay, what do you do when someone is ill? Do you go to the doctor?*

Yes. For example, when I was ill that time.

*What happened at the time?*

I was having a fever.

*In times like these, when you have to spend a lot, what do you do? For example, you have the money but you have to spend it on medicine. What do you do then in terms of food?*

We always eat regularly.

*What if you have some financial problems? Do you borrow from anyone?*

Yes, from my grandmother. {BORROWING, SOCIAL SUPPORT}

*Is she rich?*

Yes, she has money.

*Do you have to borrow very frequently?*

No, I try not to take loans. {BORROWING}

*Did it ever happen to you that you couldn't manage three meals a day?*

We always eat three meals. When I was just married we had some problems.

*What did you do then? Did you eat the same way like you do now?*

We always ate the same way. How can one live without eating? {PAST EXPERIENCE, HARD TIMES, COPING}

*But, there was more hardship at the time, wasn't there? Did you have to get by without fish, meat, etc?*

No, we still had fish. {FISH}

*So, you have fish every 2/3 days, right?*

Right. Whenever my husband goes to the bazaar. {FISH, BAZAAR}

*How often does he go to the bazaar?*

Every 2/3 days. He buys most stuff on Friday.

*You know how a lot of people put aside an amount while cooking? Do you do anything like that?*

Yeah, you have to put aside a fistful. {MUSHTI}

*Do you do that?*

Yes.

*Do you use that rice later?*

We give that away to the "cooperative." {MUSHTI, SOCIAL SUPPORT}

*What do they do with the rice?*

They [the people at the cooperative] sell the rice. Then they redistribute the money. {RICE, SOCIAL NETWORK}

*To those who are more poor?*

No, it's us who participate in the cooperative. They distribute the money to us.

*So, you set aside a fistful of rice. And, then you give that rice to the cooperative?*

Yes, about 1 *poa* [a local unit of measurement].

*Then, do they re-distribute the rice or the money?*

Yes, they give away the money.

*How often do you give them rice?*

Every 8 days.

*So, the rice of all the participants is gathered, which is sold and then the money is given back to you?*

Yes, after a year. {SOCIAL SUPPORT}

*Could you tell us the amount?*

I heard it's about Tk. 200. {INCOME}

*So, you haven't received any money yet?*

I did it once. I received about Tk. 200-250 after one year. {INCOME}

*What is the name of the NGO?*

Oh, the "rice cooperative"? It doesn't have a name. {NGO}

*This is where you took loan from?*

No, this is in our own *para* [a small area consisting of a few houses].

*So, all of you did it yourselves?*

Yes, the women did it by themselves.

*And, the one you took loan from is separate?*

Yes.

*Okay, about the cooperative: Did it come from outside, or did you decide yourselves to establish something like this?*

We did it ourselves.

*Do you save anything else along with rice? For example, money?*

No! It's just rice.

*How long has it been here?*

Well, it's been about 2/3 months that I started it.

*Otherwise you don't do anything else to store rice?*

No.

*But, you grow your own rice, right?*

Right. {HOMEGROWN, RICE}

*Does your husband cultivate only rice, or is there anything else?*

He also cultivates mustard.

*Do you sell mustard?*

Yes. He cultivates rice both during winter and monsoon. In the winter, mustard is also added to rice.

{HOMEGROWN, RICE}

*So, when do you cook something good?*

Well, during Eid we cook *shemai*, meat, *polao* [fried rice]. {FESTIVAL FOOD, MEAL, POLAO}

*Not anytime other than Eid?*

Yes, at other times as well, when we have guests over. {GUESTS}

*Don't you cook for yourself?*

Yes.

*How frequently?*

Well, after some days.

*Can you be more specific?*

Well, for example, some days ago my son was circumcised [There's usually a circumcision ceremony in Bangladesh which is celebrated both in towns and in villages]. I cooked at that time. {FESTIVAL FOOD}

*Is it once a month?*

Yeah, once in a month. Also, when my son starts whining about it. {CHILDREN, PREFERENCE}

*What do you eat during illnesses?*

Well, we mostly eat fruits when we're sick. {ILLNESS, FRUITS}

*Do you have any restrictions regarding food when you're ill?*

Yes. For example, I can't even taste rice when I suffer from fever. I didn't eat anything for eight days.

{ILLNESS, RICE, TASTE}

*But, is there any restriction among yourselves about food?*

Well, we don't eat because we don't feel like it. There are no restrictions per se. {ILLNESS, PREFERENCE}

*Why do you suffer so much from fever?*

Yeah, I suffer a lot.

*Your health is not that good either ...*

Yes, once I had fever for a month. Then, at another time, I couldn't eat anything for eight days.

{ILLNESS}

*So, the doctor didn't say anything?*

Yeah, he does give medicines. He gave me a bottle of vitamins once. {ILLNESS, DOCTOR}

## ATTACHMENT 2

### Prototype Food Access Survey Tool (FAST) Bangladesh 2001 Section A: On Quantity and Quality Issues

A1. **How often in the past 12 months did your family eat meat as part of an ordinary meal (not a festival day)?**

[Quality]

*Interviewer: circle the letter giving the closest answer:*

1. Mostly (most days/weeks)
2. Often (a few times each month)
3. Sometimes (only a few times in the year – 7 to 12 times)
4. Rarely (only 1 to 6 times in a year)
5. Never

A2. **How many ‘square meals’ (full stomach meals) did your family eat each day in the past 12 months (not a festival day)?**

[Quantity]

*Interviewer: circle the letter giving the closest answer:*

1. Always (3 meals every day)
2. Often (3 at least a few times each week)
3. Sometimes (3 meals only a few times in the month)
4. Rarely (3 meals per day only a few times each year)
5. Never (we never ate 3 meals per day)

A.3 **In the past 12 months how often could you give your children money for *shadaipati* (not including festival days)? (snacks purchased outside of the home)**

[Quality]

*Interviewer: circle the letter giving the closest answer:*

1. Mostly (most days/weeks)
2. Often (a few times each month)
3. Sometimes (only a few times in the year – 7 to 12 times)
4. Rarely (only 1 to 6 times in a year)
5. Never

- A.4 **In the past 12 months how often did you purchase *chanachur* and/or other snacks (purchased from shops) for the family (not including festival days)?**

[Quality]

*Interviewer: circle the letter giving the closest answer:*

1. Mostly (most days/weeks)
2. Often (a few times each month)
3. Sometimes (only a few times in the year – 7 to 12 times)
4. Rarely (only 1 to 6 times in a year)
5. Never

- A5 **In the past 12 months how often did your family eat big fish (for example, carp, hilsha etc.)? (not including festival days)**

[Quantity]

*Interviewer: circle the letter giving the closest answer:*

1. Mostly (most days/weeks)
2. Often (a few times most months)
3. Sometimes (only a few times in the year – 7 to 12 times)
4. Rarely (only 1 to 6 times in a year)
5. Never

- A6. **In the last 12 months, how often did you have to eat wheat (or another grain) although you wanted to eat rice (not including when you were sick)?**

[Quality]

*Interviewer: circle the letter giving the closest answer:*

1. Never.
2. Rarely (only 1 to 6 times in a year)
3. Sometimes (only a few times in the year – 7 to 12 times)
4. Often (a few times most months)
5. Mostly (this happens a lot)

- A7 **In the past 12 months how often did you cook *bhalo mondo* (“rich food” such as *shemai*, *paish*, or *polao*)?**

[Quality]

*Interviewer: circle the letter giving the closest answer:*

1. Mostly (most days/weeks)
2. Often (a few times each month)
3. Sometimes (only a few times in the year – 7 to 12 times)
4. Rarely (only 1 to 6 times in a year)
5. Never

A8 **In the past 12 months how often did you eat any of the following foods because other food was scarce:**

*Interviewer: circle one letter for each food*

	<i>Never</i>	<i>Rarely</i>	<i>Some times</i>	<i>Often</i>	<i>Mostly</i>
Mishti Alu (sweet potato)	1	2	3	4	5
Bon Kochu (wild taro)	1	2	3	4	5
Shaluk (water lily)	1	2	3	4	5
Gom Baja (fried wheat)	1	2	3	4	5
Ata Gola Pani (Flour and water)	1	2	3	4	5
Bhatar Mar (rice starch)	1	2	3	4	5
Khud (broken rice)	1	2	3	4	5

A9 **In the past 12 months how often did you personally eat less food so that there would be more for the rest of the family?**

[Quantity]

*Interviewer: circle the letter giving the closest answer:*

1. Never.
2. Rarely (only 1 to 6 times in a year)
3. Sometimes (only a few times in the year – 7 to 12 times)
4. Often (a few times most months)
5. Mostly (this happens a lot)

A10 **If you ate less who did you 'sacrifice' for?**

[Quantity]

*Interviewer: circle the letter(s) giving the closest answer (there may be more than one answer):*

1. ***Spouse***
2. Infants (less than 5 years old)
3. Pregnant woman in the family
4. Working adult in the family (other than spouse)
5. Other children (older than 5)
6. Elderly parents/in-laws
7. Sick person

- A11 **In the last 12 months how often did you yourself skip entire meals so there would be more food for the family?**  
[Quantity]

*Interviewer: circle the letter giving the closest answer:*

1. Never
2. Rarely (only 1 to 6 times in a year)
3. Sometimes (only a few times in the year – 7 to 12 times)
4. Often (a few times each month)
5. Mostly (this happens a lot)

- A12 **If you skipped entire meals for whom did you ‘sacrifice’?**

*Interviewer: circle the letter(s) giving the closest answer (there may be more than one answer):*

1. Spouse
2. Infants (less than 5 years old)
3. Pregnant woman in the family
4. Working adult in the family (other than spouse)
5. Other children (older than 5)
6. Elderly parents/in-laws
7. Sick person

- A13. **In the last 12 months how often did you yourself not eat for an entire day? (Not counting Ramadan, upobas and sickness)**  
[Quantity]

*Interviewer: circle the letter giving the closest answer:*

1. Never
2. Rarely (only 1 to 6 times in a year)
3. Sometimes (only a few times in the year – 6 to 12 times)
4. Often (a few times most months)
5. Mostly (this happens a lot)

*Interviewer: if answer is 2-5, skip to question A15*

- A14. **If Yes, was this during flood times only?**                      Y        N        No Flood

A15 **In the past 12 months how often did your children eat any of the following foods because other food was scarce:** *Interviewer: circle one letter for each food*

	Never	Rarely	Some times	Often	Mostly
Mishti Alu (sweet potato)	1	2	3	4	5
Bon Kochu (wild taro)	1	2	3	4	5
Shaluk (water lily)	1	2	3	4	5
Gom Baja (fried wheat)	1	2	3	4	5
Ata Gula Pani (Flour and water)	1	2	3	4	5
Batar Mar (rice starch)	1	2	3	4	5
Khud (Broken Rice)	1	2	3	4	5

A16 **In the last 12 months how often did the infants (under 5) skip entire meals because there was no food? (*not including times when they were sick*).** [Quantity]

*Interviewer: circle the letter giving the closest answer:*

1. Never
2. Rarely (only 1 to 6 times in a year)
3. Sometimes (only a few times in the year – 7 to 12 times)
4. Often (a few times almost every month)
5. Mostly (this happens a lot)

A17. **In the last 12 months how often did the main working adult in your family skip entire meals because there was no food? (*not including times when they were sick*).**

[Quantity]

*Interviewer: circle the letter giving the closest answer:*

1. Never
2. Rarely (only 1 to 6 times in a year)
3. Sometimes (only a few times in the year – 7 to 12 times)
4. Often (a few times most months)
5. Mostly (this happens a lot)



**Section B: On Acceptability and Security Issues**

- B1. In the past 12 months how often did food stored in your home run out and there was no money to buy more that day?** [Insecurity]

*Interviewer: circle the letter giving the closest answer:*

1. Never—we always have enough money to buy food.
2. Rarely (only 1 to 6 times in a year)
3. Sometimes (only a few times in the year – 7 to 12 times)
4. Often (a few times almost every month)
5. Mostly (this happens a lot)

- B2. In the past 12 months how often did you worry about where food would come from? (Mathar bhitre koto chinta from food or money worries)** [Insecurity]

*Interviewer: circle the letter giving the closest answer:*

1. Never.
2. Rarely (only 1 to 6 times in a year)
3. Sometimes (only a few times in the year – 7 to 12 times)
4. Often (a few times each month)
5. Mostly (this happens a lot)

- B3. In the past 12 months what was the main reason that you were worried about not getting enough food?** [Insecurity]

1. Flood/Cyclone
2. Food prices
3. Sickness of family member
4. Debt
5. No regular cash income (job security)
6. Other \_\_\_\_\_

- B4. In the past 12 months, how often did your family purchase rice?** [Insecurity]

*Interviewer: circle the letter giving the closest answer:*

1. Never
2. Rarely (a few months in each year)
3. Sometimes (a few times in each month)
4. Often (every week)
5. Mostly (Every day)

- B5. **In the past 12 months how often did you borrow money from local moneylenders with interest?** [Acceptability]

*Interviewer: circle the letter giving the closest answer:*

1. Never.
2. Rarely (only 1 to 6 times in a year)
3. Sometimes (only a few times in the year – 7 to 12 times)
4. Often (a few times each month)
5. Mostly (this happens a lot)

*Interviewer: If answer is "1", go to question B7*

- B6. **If you *did* borrow, what was the most important thing you borrowed money for?**

*Interviewer: circle the letter giving the closest answer:*

1. Food
2. Dowry
3. Sickness
4. Clothing
5. School costs
6. Housing costs
7. Repay other loans
8. Travel (including seasonal migration)
9. Other \_\_\_\_\_

- B7. **In the past 12 months how often did you take food (rice, lentils etc.) on credit (or loan) from a local shop?**

[Acceptability]

*Interviewer: circle the letter giving the closest answer:*

1. Never.
2. Rarely (only 1 to 6 times in a year)
3. Sometimes (only a few times in the year – 7 to 12 times)
4. Often (a few times almost every month)
5. Mostly (this happens a lot)

- B8. **In the past 12 months how often did you have to borrow food from relatives or neighbors to make a meal?**

[Acceptability]

*Interviewer: circle the letter giving the closest answer:*

1. Never.
2. Rarely (only 1 to 6 times in a year)
3. Sometimes (only a few times in the year – 7 to 12 times)
4. Often (a few times almost every month)
5. Mostly (this happens a lot)

B9. **In the past 12 months how often did you borrow food to serve to *Attio Shojan* or *Kutum*?**

[Acceptability]

*Interviewer: circle the letter giving the closest answer:*

1. Never.
2. Rarely (only 1 to 3 times in a year)
3. Sometimes (only a few times in the year – 3 to 6 times)
4. Often (a few times most months)
5. Mostly (this happens a lot)

B10 **At the last *Kurbani* did your family seek *Kurbani* meat?** Y N  
[Acceptability]

B11 **In the past 12 months did you receive or seek *Jakat* or *Fitra*?** Y N

[Acceptability]

B12 **In the last 12 months how often did you have to use money that you needed to use for another purpose to buy food?**

[Acceptability]

*Interviewer: circle the letter giving the closest answer:*

1. Never
2. Rarely (only 1 to 6 times in a year)
3. Sometimes (only a few times in the year – 7 to 12 times)
4. Often (a few times most months)
5. Mostly (this happens a lot)

B13 **If yes, what would you have used the money for (if not for food)?**

*Interviewer: multiple response is possible*

1. Sickness/medicines
2. Dowry
3. Clothing
4. School costs
5. Housing costs
6. Repay other loans
7. Investment in assets
8. Travel (including seasonal migration)
9. Other \_\_\_\_\_

B14. **In the past 12 months how often did you have to sell or mortgage your own things in order to get food?**

[Acceptability]

*Interviewer: circle the letter giving the closest answer:*

1. Never
2. Rarely (only 1 to 6 times in a year)
3. Sometimes (only a few times in the year – 7 to 12 times)
4. Often (a few times most months)
5. Mostly (this happens a lot)

*Interviewer: If answer is “1”, go to question B18*

B15. **If yes, what did you sell or mortgage to get food?**

*Interviewer: multiple response is possible*

1. Farming equipment
2. Jewelry
3. Clothing
4. Radio/TV
5. Bicycle/cart
6. Sewing machine
7. Livestock
8. Other \_\_\_\_\_

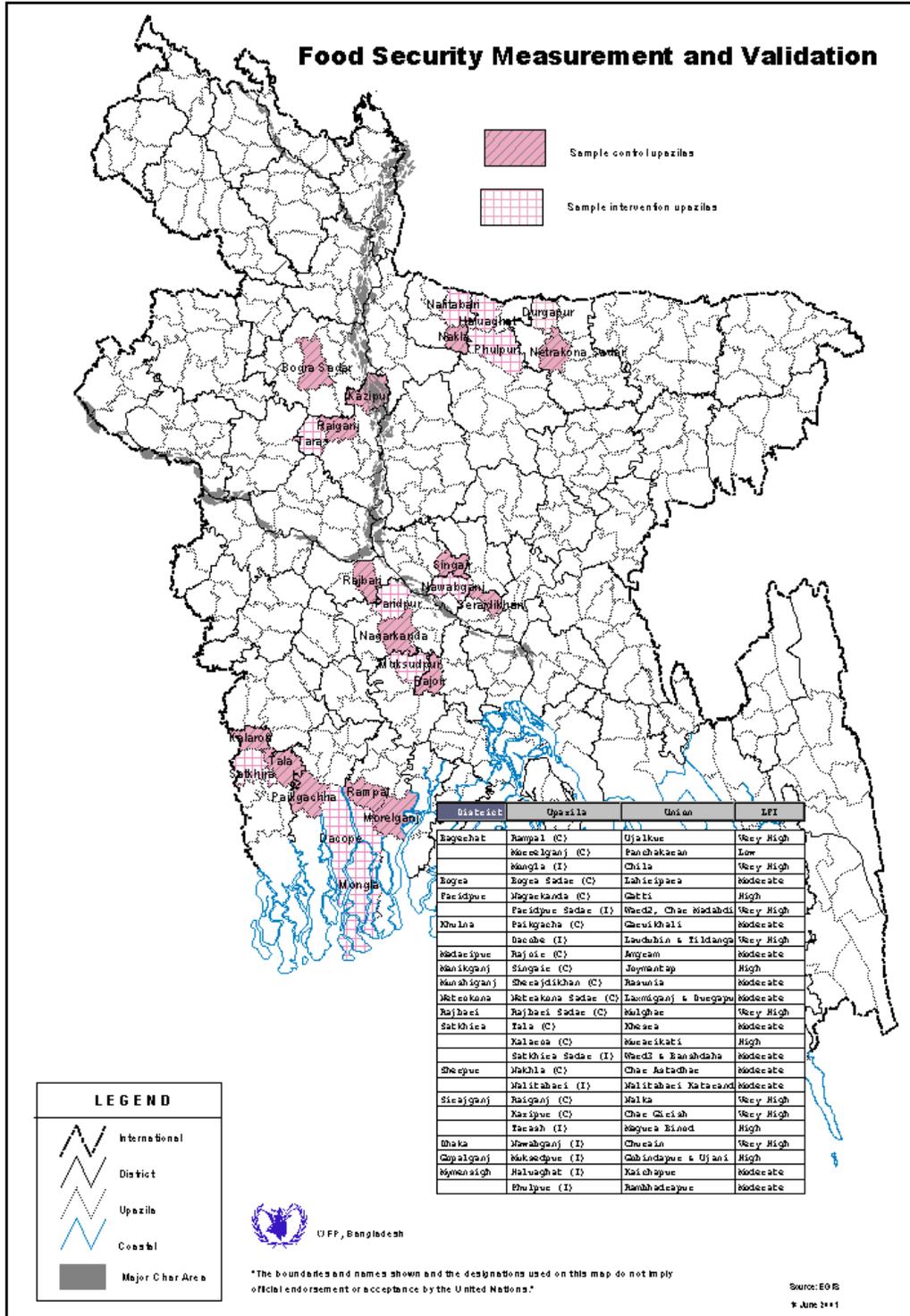
B16 **If Yes, was this during flood times only?**                      Y      N      No Flood

B17 **Based on answers to the above questions, in the enumerator’s opinion, this household should be classified as:**

1. Food secure
2. Food insecure without hunger
3. Food insecure with hunger

### ATTACHMENT 3

### Map of FIMVS Survey Locations



## ATTACHMENT 4

### A Sample of Issues Faced in Devising the FAST Module

- a. ‘Screening’ questions (akin to those used in the US core module to shorten the interview among food secure households) were identified for these Bangladesh contexts but not used as screeners at this stage of the research. We shall examine their value through the analysis and consider alternatives also later in the process.
- b. The word “some” was removed early on since to many people it carried a negative connotation rather than being neutral (e.g. “did you eat some small fish” was being interpreted as “did you eat insufficient small fish...”).
- c. The issue of defining ‘less desired’, or inferior foods, was highly complicated. Not only are diets quite varied across Bangladesh, almost every menu item or variant that was considered seemed to be a chosen (desired) food by someone, somewhere else. For example, *bhatar Mar* (rice starch—the liquid left over after cooking rice) was initially found (through field interviews) to represent a food consumed rarely, by very hungry people. The same applied to “rice with just chile and salt”. However, it was then found that some people eat rice starch or rice with chile and salt simply because they like the taste, so the item was dropped. Yet during pre-testing the enumerators found that in some areas this was indeed a key indicator of distress behavior engendered by food insecurity, so the item was put back on the form again. Since, no single, simple item (such as rice starch, or wheat) could be used to represent a hardship food for the entire sample a set of alternatives was established and this has been tested through the survey.
- d. Because of the complex ‘preference’ issues it was decided to add wording to many of the questions to make it clear that foods were eaten not by choice but “because other food was scarce.” This qualifier may or may not make interpretation of the preferences responses easier—something to be ascertained through the analysis and subsequent cohort work.
- e. Early on it seemed that some people are very selective about the rice varieties consumed for different purposes, such as holy days or social celebrations versus a normal meal versus the food given to someone very sick. It was assumed therefore that eating the ‘wrong rice’ on various occasions may have served as an indicator of distress (lack of choice). In-depth interviews showed that the assumption could not be generalized for whole populations since the act of varietal selection in consumption (which carries cost connotations) is a luxury that only applies above a given economic threshold. Most households do not engage in selective rice consumption as a matter of course.
- f. It was found that the English term ‘square meals’ was readily understood but had no ready Bangla translation—until the common term ‘full stomach meals’ was found.
- g. Similarly, consumption of ‘broken rice’ was considered as an indicator of food insecurity (since it is an inferior form of rice). This question became a candidate for exclusion from the questionnaire when it became clear that most households separate broken rice from a bag of

good rice and cook it separately (so, consumption of a dish of broken rice would not in itself distinguish wealth from poverty). However, it was left in after much discussion to allow us to examine its correlates among other variables.

- h. Numerous qualifiers had to be added to the questionnaire, including “not during festival days” (when consumption typically increases), “not when sick” (when rice may be rejected in favor of other ‘lighter’ grains), “not during the major floods” (when consumption typically decreases), and so on.
- i. Reference to borrowing money “at high interest rate” in order to be able to purchase food was dropped when it was clear that “high interest” is a relative concept—some people take loans at 50% interest, others at 300%, others a 15%. In such a circumstance is 50% “high”? This phraseology was replaced by “loans from a moneylender”, which carry a similar and accepted connotation.
- j. The practice of ‘skipping meals’ is central to the conceptual framework used. However, some families were found to skip a meal (at least the adults), not because there was no food in the house but because they were working to a weekly or monthly budget and did so in order not to exceed a monetary target set for themselves. The extent of such a practice will need to be carefully assessed.
- k. The term ‘big fish’ was commonly used to illustrate a desired food commodity—owing to its cost. However, asking if a family has eaten any ‘big fish’ in the past week can be misleading since 3 families together may share the cost of a single ‘big fish’ and each consume one third—thereby biasing the apparent frequency distribution. Habitation close to a big river also influences the likelihood of big fish consumption so locational parameters are important.
- l. When asking “if you (an adult) skipped a meal who did you sacrifice your share for?” (assuming it to be a child) there was great difficulty in eliciting a useful answer. The reason is that there is no perception of ‘sacrifice’ made for any one person. If an adult consumes less in one day than the entire household (*including* the person making the ‘sacrifice’) is relatively better off. Thus, a ‘sacrifice’ may be made on their own behalf. Alternative ways of addressing sharing (as opposed to sacrifice) needed to be found.
- m. If a household receives *kurbani* meat during major religious festivals (when wealthy families are expected to re-distribute 10% of their food to the poor), it might be assumed that they are among the most food insecure. However, ‘receiving’ *kurbani* meat is a passive event, and a food *secure* family can be given shared food without asking for it—again biasing the picture. Thus “seeking” *kurbani* meat was inserted. But even then it was realized that there is no equivalent for this particular Moslem food custom among Hindus (who are among the poorest in some communities).
- n. In some parts of the country most households (including the wealthy) typically eat only twice in a day, not three times. This calls for inclusion of geographic dummies to control for ‘normal’ rates of meal consumption rather than assuming a norm of 3, deviation from which represents hardship.

- o. It was found that the occasional purchase of snacks/sweet from a store (*chanachur*) is widely seen as a symbol of middle-class 'luxury'. Being able to do so regularly (especially for one's children) can represent a high degree of food security. The difficulty here is that it is more likely in urban/peri-urban locations so that even controlling for income there are likely to be locational biases to be accounted for.

## ATTACHMENT 5

### Nine Question Food Access Survey Tool (FAST) for Bangladesh

NUMBER	QUESTION	RESPONSE	RESPONSE OPTIONS
1	How often did you eat three 'square meals' (full stomach meals) a day in the past 12 months (not a festival day)?		<ol style="list-style-type: none"> <li>1. Mostly (3 meals each day)</li> <li>2. Often (3 at least a few times each week)</li> <li>3. Sometimes (3 per day 7-12 times this year)</li> <li>4. Rarely (3 per day only 1-6 times this yr)</li> <li>5. Never</li> </ol>
2	In the last 12 months, how often did you or any of your family have to eat wheat (or another grain) although you wanted to eat rice (not including when you were sick)?		<ol style="list-style-type: none"> <li>1. Never</li> <li>2. Rarely (only 1-6 times this yr)</li> <li>3. Sometimes (7-12 times this yr)</li> <li>4. Often (a few times each month)</li> <li>5. Mostly (most days/weeks)</li> </ol>
3	In the last 12 months how often did <i>you yourself</i> skip <u>entire meals</u> due to scarcity of food?		<ol style="list-style-type: none"> <li>1. Never</li> <li>2. Rarely (only 1-6 times this yr)</li> <li>3. Sometimes (7-12 times this yr)</li> <li>4. Often (a few times each month)</li> <li>5. Mostly (most days/weeks)</li> </ol>
4	In the past 12 months how often did <i>you</i> personally eat <u>less</u> food in a meal due to scarcity of food?		<ol style="list-style-type: none"> <li>1. Never</li> <li>2. Rarely (only 1-6 times this yr)</li> <li>3. Sometimes (7-12 times this yr)</li> <li>4. Often (a few times each month)</li> <li>5. Mostly (most days/weeks)</li> </ol>
5	In the past 12 months how often did food stored in your home run out and there was no money to buy more that day?		<ol style="list-style-type: none"> <li>1. Never</li> <li>2. Rarely (only 1-6 times this yr)</li> <li>3. Sometimes (7-12 times this yr)</li> <li>4. Often (a few times each month)</li> <li>5. Mostly (most days/weeks)</li> </ol>

NUMBER	QUESTION	RESPONSE	RESPONSE OPTIONS
6	In the past 12 months how often did you worry about where food would come from? ( <i>Mathar bhitre koto chinta</i> from food or money worries).		<ol style="list-style-type: none"> <li>1. Never</li> <li>2. Rarely (only 1-6 times this yr)</li> <li>3. Sometimes (7-12 times this yr)</li> <li>4. Often (a few times each month)</li> <li>5. Mostly (most days/weeks)</li> </ol>
7	In the past 12 months, how often did your family purchase rice?		<ol style="list-style-type: none"> <li>1. Never</li> <li>2. Rarely (once every few months last year)</li> <li>3. Sometimes (a few times each month)</li> <li>4. Often (every week)</li> <li>5. Mostly (every day)</li> </ol>
8	In the past 12 months how often did <u>your family</u> take <u>food</u> (rice, lentils etc.) on credit (or loan) from a local shop?		<ol style="list-style-type: none"> <li>1. Never</li> <li>2. Rarely (only 1-6 times this yr)</li> <li>3. Sometimes (7-12 times this yr)</li> <li>4. Often (a few times each month)</li> <li>5. Mostly (this happens a lot)</li> </ol>
9	In the past 12 months how often did <u>your family</u> have to borrow food from relatives or neighbors to make a meal?		<ol style="list-style-type: none"> <li>1. Never</li> <li>2. Rarely (only 1-6 times this yr)</li> <li>3. Sometimes (7-12 times this yr)</li> <li>4. Often (a few times each month)</li> <li>5. Mostly (this happens a lot)</li> </ol>
10	Based on answers to the above questions, in the enumerator's opinion, this household should be classified as:		<ol style="list-style-type: none"> <li>1. Food secure</li> <li>2. Food insecure without hunger</li> <li>3. Food insecure with hunger</li> </ol>

## ATTACHMENT 6

### Estimated Level of Effort of Key Contributors to Food Insecurity Measurement and Validation Study (Person Months)

	Initial Concept Exploration	Develop and Refine Questions	Survey Preparation and Training	Field Data Collection	Data Entry and Cleaning	Analysis and Reporting	TOTAL
Principal Investigator	2	2	1	0	0	4	9
Field Research Coordinator	1	3	8	5	3	9	29
Statistician	0.5	1	0	0	1	4	6.5
Bangladeshi Survey Research Firm	1	2	6	3	6	1.5	19.5
Anthropologist	1	0	0	0	0	0	1
Other collaborators	1	0.5	0	0	0	2	3.5
<b>TOTAL</b>	<b>6.5</b>	<b>8.5</b>	<b>15</b>	<b>8</b>	<b>10</b>	<b>20.5</b>	<b>68.5</b>

### Attachment 7: Food Insecurity Measurement and Validation Study Line-Item Budget (2000-2003)

Category	Amount
Tufts FSNSP Salaries and Benefits	\$ 145,984
Equipment	\$ 5,000
Survey Research Firm Subcontract	\$ 60,000
Other Direct costs	\$ 29,918
<b>Total Direct Costs</b>	<b>\$ 240,902</b>