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FOOD SAFETY AND VALUE ADDED
PRODUCTION AND MARKETING
OF TROPICAL CROPS

Title: Assessing the Degree of Food Insecurity in the Dominican Republic: A Pilot
Project

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ASSESSING THE DEGREE OF FOOD INSECURITY IN THE DOMINICAN REPUBLIC: A PILOT STUDY

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ABSTRACT

The concept of food insecurity at the household and individual levels has been an area of extensive research in the late 1980s by individual researchers and public agencies. This work culminated in the development of the US Food Security Survey Module (FSSM), which is now seem to be the standard methodology of determining household food's security status, at least in countries with developed economies. One of the purposes of this study is to adapt the FSSM in the context of a less developed economy, and thereby assess the prevalence of food insecurity and hunger. The module was administered as a pilot in a household survey of 110 low-income families in the Dominican Republic. This study found that 93% of the respondent were food-insecure, some more so than others, and the percentage increasing as a higher degree of food deprivation was considered. A relatively small proportion of the food-insecure (20%) reported food insecurity without hunger. Households which experienced hunger—moderate and severe— represented 74% of the entire sample and 80% of the food-insecure group. Among those who were insecure with hunger, 59% faced severe hunger. Child hunger was reported by 89% of households with children. Only seven percent of the household were found to be food-secure, with no or minimal perception and experience of food hardship during the reference period. Finally, this Pilot Study may give us the opportunity to validate and modify the FSSM for assessing the degree of food insecurity in the Dominican Republic and in developing countries in general.

Keywords: Food Security Survey Model, Food Insecurity, Survey, Low income families

Introduction

In spite of the long period of economic growth and relatively low unemployment that characterized the Americas over the previous decade, food insufficiency and hunger continue to affect the majority of the population in Latin America and the Caribbean (FAO, 2002; DePalma, 2001). As food insufficiency is recognized to pose long-lasting challenge to nutrition, health and social policy, researchers both at public and private institutions have recently exhibited renewed and growing interest in its measurement at the household and individual levels (Bickel et al. 1999, 2000; Carlson, et al. 1999; Olson, 1999; USDHHS, 1993; Girvan, 2001; FAO, 2003).

Most of the recent research on the subject uses food insecurity as a core indicator of the deprivation of basic food needs. The concept of food insecurity at the household and individual

levels has been an area of extensive research in the late 1980s by individual researchers and public agencies. This work culminated in a report by the Life Sciences Research Office of the Federation of American Societies for Experimental Biology, published in 1990, in which food (in) security and hunger were conceptualized as follows:

Food security is defined as "Access by all people at all times to enough food for an active, healthy life. Food security includes at a minimum: (1) the ready availability of nutritionally adequate and safe foods, and (2) an assured ability to acquire acceptable foods in socially acceptable ways (e.g., without resorting to emergency food supplies, scavenging, stealing, or other coping strategies)." Food insecurity, on the other hand, refers to "Limited or uncertain availability of nutritionally adequate and safe

foods or limited or uncertain ability to acquire acceptable foods in socially acceptable ways." Hunger, which is viewed as a severe stage of food insecurity, is defined as "The uneasy or painful sensation caused by a lack of food. The recurrent and involuntary lack of access to food. Hunger may produce malnutrition over time Hunger ... is a potential, although not necessary, consequence of food insecurity." (as cited in Bickel et al. 2000, p. 6).

Subsequent to the release of the aforementioned report, a national benchmark measure of food security was developed and tested in order to estimate trends in household food insecurity in the United States. This process involved designing survey instruments with a view to "obtaining information on a variety of specific conditions, experiences, and behaviors that serve as indicators of the varying degrees of the severity of the condition" (Bickel et al. 2000, p. 9). The set of standardized food security questions thus determined gave the basis for what has come to be known as the Household Food Security Scale.

The Household Food Security Scale measures, using a single numerical value, the extent of household food insecurity and hunger as perceived, experienced and described by respondents. The scale is used to classify respondents into one of the following four categories, each representing a range of severity: food secure, food insecure without hunger, food insecure with moderate hunger, and food insecure with severe hunger.

Although the construction of the scale reflects and underscores the importance of household financial resource constraint as the ultimate cause of food insecurity/hunger, the scale by asking about household conditions, events, behaviors and subjective reactions provides more comprehensive information about the sense, occurrence and degree of food deprivation than can be known through traditional income and poverty measures.

The food security instruments and scale have also been employed and tested by a

number of researchers who studied the prevalence of food insecurity and hunger in the U.S. among various segments of the population including mother-headed families, children, the elderly, food-stamps recipients, ethnic Minorities, recent immigrants, and other potentially vulnerable groups (Kasper et al. 2000; Polit et al. 2000; Himmelgreen et al. 2000; Carlson et al. 1999).

The purpose of this paper is to adapt and implement the U.S. Food Security Survey Module in the context of the Dominican Republic and thereby assess the prevalence of food insecurity and hunger in a selected community in the country. To our knowledge, this study is the first to adopt the FSSM instrument to assess household food security status in the Dominican Republic.

The Study Site and Sample

The survey was administered in a small and relatively poor community, Las Tablas, in municipio of Bani in Peravia province in the Dominican Republic. It is located at the Southwest part of the country, about 47 miles from the capital city, Santo Domingo (Figure 1). Although any community within the country could have been chosen, Las Tablas has features that attracted this pilot work: 1) It is relatively very poor and rural, 2) has a clear demarcation for survey sampling, and 3) has a convenient transportation route for enumeration.

This community has 193 households and almost 900 people, with almost equal gender ratio (453 female and 447 male). One hundred and ten (110) households were randomly selected for this study, representing more than 50% of households in the community. Using a grid of three streets, families from every other household were selected for interview. However, 10 to 14 households were included in the final sample although their spatial locations did not fit either the grid or the 'every other households' definition. Most of the households surveyed are families with children which accounted for 93% of the respondents. Family size ranges between one and ten, although a typical family in the sample has less than five members.



Figure 1: Map of Dominican Republic

The Concept and Measurement of Food Insecurity

Since the Food Security Measurement Project was established in 1992, as a result of Congressional Act of the National Nutrition Monitoring and Related Research (Act, 1990), the U.S. Department of Agriculture (USDA), and Health and Human Service (DHHS) have been developing a national standard of measuring food insecurity and hunger through the national nutrition monitoring system (USDHHS, 1993). As indicated earlier, one of the outcomes of the joint efforts of these two Federal Departments in this area has been the Food Security Core Survey Module (FSCSM) which is now accepted as a standard method of measuring household food insecurity and hunger in the United States as well as Canada (Bickel et al. 2000; Tarasuk et al. 1999; USDA, 1998). The U.S. Department of Agriculture, for example, has been monitoring the national food security and hunger status using the FSCSM since 1995 (USDA, 2000).

The food-security module is a survey-based method that was developed to provide a numerical food security scale by describing and

assessing the food security status of a given population and/or household using a 12 month reference period (i.e. preceding 12 month data). The scale is developed from household direct responses to a series of 18 questions about food security conditions and experiences (see table 1). A brief review of the nature and implications of these questions is in order (see Bickel et al. 2000 for details). First, out of the 18 items in the survey, three ask about the food situation of the entire household, seven about the experiences and behaviors of adults and the remaining eight questions pertain to children and are, hence, answered only by households with children.

Second, three of the 18 questions are follow-up questions, which elicit information on the frequency of a previously stated event (Q 8a, Q 12a and Q 14a). Third, the survey questions were designed and administered in three stages, the first stage serving as an internal

screeners to the next stage of questions.¹ Fourth, responses would be recorded as affirmative when respondents chose, as the case may be, "yes," "often true," or "sometimes true" as an answer to the food-insecurity question they were asked. Fifth, while the 18 questions as a whole are used to derive a measure of food security status, as a sub-group they are designed to capture four kinds of food-insecurity situations or events. Thus, affirmative responses to Q2 and Q3 would indicate an "anxiety or perception that the household budget or food supply was inadequate." An agreement with Q4, Q5 and Q6 amounts to perceiving "that the food eaten by adults or children was inadequate in quality." In affirming Q8, Q8a, Q9, Q10, Q11, Q12 and Q12a, households are reporting "instances of reduced food intake, or consequences of reduced intake, for adults." Likewise, "instances of reduced food intake or its consequences for children" would be apparent when Q7, Q13, Q14, Q14a, Q15 and Q16 are affirmatively answered (Bickel, et al., 2000, p. 24).

The responses to these survey questions are combined into a single measure called the household food security scale.² Based on the scale scores, households are classified into four categories: food secure, food insecure without hunger, food secure with moderate hunger, and food insecure with severe hunger. A description of each follows as it appears in Bickel et al. 2000, pp. 11-12.

Food Secure— Households show no or minimal evidence of food Insecurity.

Food Insecure without hunger— Food insecurity is evident in household members' concerns about adequacy of the household food supply and in adjustments to household food management, including reduced quality of food and increased unusual coping patterns. Little or no reduction in members' food intake is reported.

Food insecure with hunger (moderate) — Food intake for adults in the household has

been reduced to an extent that implies that adults have repeatedly experienced the physical sensation of hunger. In most (but not all) food-insecure households with children, such reductions are not observed at this stage for children.

Food insecure with hunger (severe) — At this level, all households with children have reduced the children's food intake to an extent indicating that the children have experienced hunger. For some other households with children, this already has occurred at an earlier stage of severity. Adults in households with and without children have repeatedly experienced more extensive reductions in food intake.

Adaptation of the US FSSM

As mentioned, the primary objective of this study is the adaptation and translation of the U.S. Food Security Survey Module (FSSM). The FSSM is now accepted as a standard method of measuring household food insecurity and hunger in United States as well as Canada. Our interest here is to adopt the FSSM in culturally and economically distinct country such as the Dominican Republic. Note that in order to use the U.S. FSSM in the context of culturally and economically different countries, such as the Dominican Republic, one must modify the major and subset items in all the parts/stages of the instrument in socially and culturally sensitive manner (Nord, et al. 2002). Hence, the questions administered in the Dominican Republic Food Security Pilot Survey were first taken from those in the U.S. Food Security Survey Module (Bickel et al. 2000). These questions were then translated into Spanish not only as in Harrison et al. (2003) for use in the United States but also, and more importantly, taking into consideration the colloquial Dominican Spanish. The questions were then pre-tested under a focus group environment, and the results were fed into the final survey instrument.

The standard U.S. food security scale is developed based on 18 item core module questions and the current population survey (CPS) with 12 month reference period data. However, it can be adjusted for other shorter reference periods (Bickel et al. 2000). Since this research project is focused on populations that are prone to frequent and severe range of food insecurity and hunger, we used a 30 day reference period. The relevant questions in the

¹ Thus, respondents would be asked the second-stage questions if they affirmatively answered any one of the first stage questions. Likewise, stage 3 questions would be posed only to households who provided at least one affirmative response to questions in the second stage

² The scale is normally not affected by hunger due to voluntary dieting or fasting since food insecurity and hunger are the result of lack of money or other relevant resources to obtain food as implied in the 18 questions (Bickel et al. 2000).

FSSM were modified and, pre-tested using a focus group from within the study site.

The study was carried out in steps. The first step was an explorative exercise – i.e. explored and learned how selected households in the Dominican Republic describe their food situations. This was carried out in a focus group format with in-depth and open –ended questions/discussions in which ten women participated. The results from this activity were then used to make appropriate changes/adaptation to the Food Security Survey Module prior to implementing it in Las Tablas, Dominican Republic. Note, however, neither the content nor the focus of the core questions of FSSM changed.

Data Analysis and Results

The data analysis of this study followed strictly the steps and procedures outlined by the authors of the U.S.FSSM (as revised in 2000). This includes coding and converting survey responses into data and classifying households into the relevant food security status level categories. This section presents and describes the findings of the study.

*Household Food Security Scale Questions:
An Overview of the Responses*

The responses to food security scale questions administered in Las Tablas are summarized in table 1 where the standard survey questions and the percentage of sampled households affirming them are recorded. Referring first to the full sample, 86% of the respondents worried that their food would run out before they got money to purchase more. The corresponding figure for those who indicated that the food they bought didn't last is 84%. A larger proportion of the respondents viewed the quality of their food as inadequate. Thus, in nine out of every 10 households, adults felt that they couldn't afford to eat balanced meals and had to feed their children a few kinds of low-cost food. In three quarters of the sample, adults cut the size of their meals or skipped meals; and 79% of them did so for at least three days during the month. In eight out of every 10 households, adults ate less than they felt they should, although this figure dropped by nine percentage points when asked if they ever were hungry but did not eat. Three out of every ten households reported weight loss for lack of food. A smaller proportion did not eat for a whole day, 91% of them three or more days during the month.

Table 1: Household Food Security Items: Affirmative Responses by Child Status

QN*	In the last 30 days:	Affirmative Responses (%)**		
		Full Sample	Households with: Children	No Children
Stage 1 Questions				
Q2	Worried whether food would run out.	86.4	87.1	82.4
Q3	Food bought just didn't last.	83.6	82.8	88.2
Q4	Couldn't afford to eat balanced meals.	92.7	92.5	94.1
Q5	Relied on only a few kinds of low-cost food to feed the children.	88.2	88.2	N/A
Q6	Couldn't feed the children a balanced meal.	88.2	88.2	N/A
Stage 2 Questions				
Q7	The children were not eating enough.	79.6	79.6	N/A
Q8	Adult(s) in the household cut size of meals or skipped meals.	75.5	76.3	70.6
Q8a	Adult(s) cut or skip meals, 3 or more days.	60.0	61.3	52.9
Q9	Ate less than felt he or she should.	81.8	81.7	82.4
Q10	Hungry but didn't eat.	72.7	71.0	82.4
Q11	Lost weight because there wasn't enough food.	31.8	35.5	11.8
Stage 3 Questions				
Q12	Adult(s) did not eat for a whole day.	20.9	24.7	00.0
Q12a	Adult(s) did not eat for whole day, 3 or more days.	19.1	22.6	00.0
Q13	Cut size of child's meals.	66.7	66.7	N/A
Q14	Child skipped meals.	60.2	60.2	N/A
Q14a	Child skipped meals, 3 or more days.	46.2	46.2	N/A
Q15	Child hungry but couldn't afford more food.	61.3	61.3	N/A
Q16	Child did not eat for a whole day.	9.7	9.7	N/A

- Notes: * QN denotes the serial number of the questions as they appear in the Household Food Security/Hunger Survey Module.
 ** Figures represent percent of the relevant sample.

Events of reduced food intake and consequences thereof for children were relatively fewer, albeit sizeable. Two-thirds of the relevant sample cut the size of children's meals, while three out of five households reported the incidence of children skipping meals. Three-quarters of the households in which children had to skip meals for lack of food did so for three days or more in the course of the month. Instances of hunger among children were reported by 60% of families with children. Fewer cases of children not eating for whole day were reported.

Disaggregating the sample into households with and without children reveals that the two groups affirmed the survey items at different rates. Families with children expressed agreement with six of the ten common questions at a higher rate than household with no children. The difference is particularly striking with respect to weight loss and the instance of adults not eating whole day. On the other hand, a greater proportion of households with no children indicated that their food supply did not last and that they were hungry but did not eat (Q3 and Q10). The pattern of responses regarding access to balanced meals and adequate amount of food (Q4 and Q9) was essentially the same.

Household's Food Security Status: Who is Food Insecure?

Item frequencies across households described above are useful, individually and as a sub-group, to assess the various manifestations and events of food deprivation. However, we need the aggregate value of these frequencies across the survey questions for each respondent to determine the extent and severity of food insecurity. Accordingly, a measure of food security scale value was derived on the basis of affirmative responses as per USDA's guideline. The sample was then classified into the four categories of food security status, as shown in table 2 and the accompanying figures.

A glance at the full sample in table 2 shows that seven percent of the respondents are food-secure, with no or minimal perception and

experience of food hardship during the reference period. The overwhelming majority (93%) are food-insecure, some more so than others, and the percentage rising as a higher degree of food deprivation is considered. A small proportion of the food-insecure (20%) had access to food just enough to avoid hunger. Food insecure households with hunger—moderate and severe—represented 74% of the entire sample and 80% of the food-insecure group. Out of every five households more than two suffered food deprivation that would be characterized as severe hunger. Roughly half of these households reported instances of an adult skipping or cutting meals, or having gone hungry whole day at least once during the reference month.

It appears that families with no children are more food secure than those with children. The experiences of different groups of households also varied with respect to the degree of food insecurity. Households with no children had a substantially higher incidence of food insecurity without hunger and with moderate hunger than households with children. However, all cases of severe hunger occurred in families with children among whom 52% experienced it.

Presented in Table 2 is also a measure of food insufficiency, which is based on the pattern of responses to the first screening question of the Food Security Scale Survey. Respondents are categorized as food insufficient if they "sometimes" or "often" did not have enough to eat. Although this measure is known to be weaker and conceptually less encompassing than the food security measure, it is nonetheless juxtaposed for comparative purposes and as a complementary indicator of food hardship. According to this indicator, most of the survey respondents are food insufficient. The average figure for the full sample of 80% contrasts to the 93% who felt food-insecure as gauged by the pattern of their responses to the 18 survey questions. In sum, most of the surveyed households faced food insecurity, the majority with hunger.

Table 2: Food Security and Sufficiency

Category and Outcome (%)	Full Sample	Households with:	
		Children	No Children
Secure	7.3	6.5	11.8
Insecure	92.7	93.5	88.2
without hunger	19.1	16.1	35.3
with moderate hunger	30.0	25.8	52.9
with severe hunger	43.6	51.6	00.0
Food Insufficient	80.0	81.7	70.6
Sample Size	110	93	17

Note: Figures (except those in the last row) represent percentages of the relevant sample size.

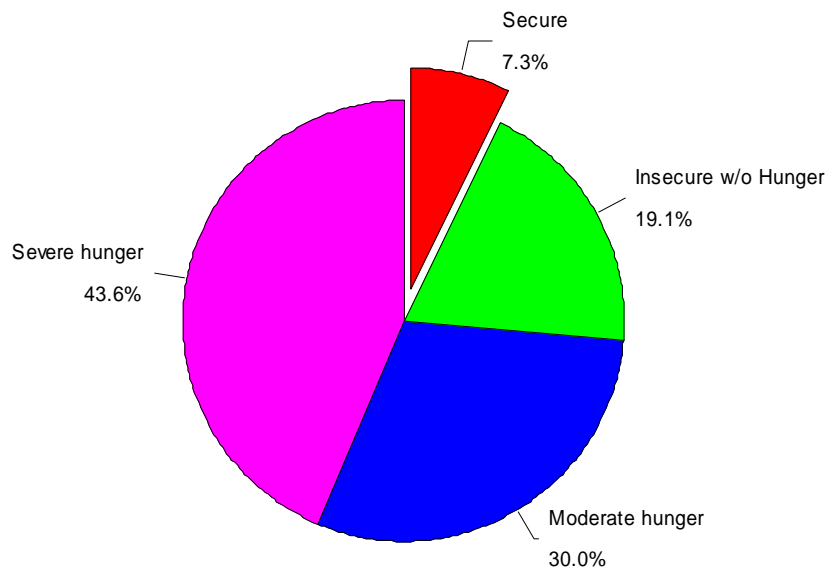


Figure 2: Household Food Security Status

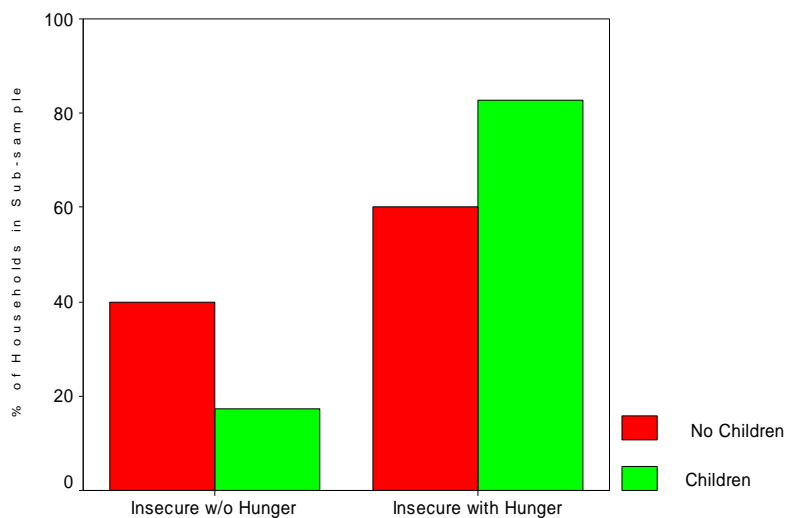


Figure 3: Degree of Household Food Insecurity Households with versus no Children

*The Prevalence of Food Insecurity: Child versus Adult Scale*³

Although the prevalence of “food insecurity with severe hunger” could provide a reasonable proxy measure for children’s hunger, there is a concern that it would underestimate its incidence. Supporting this view is the evidence of a considerable number of households with only moderate hunger who reported instances of hunger among children (Bickel, et al, 2000). This has led to the development of a new children’s food security subscale calculated from the responses to the eight child-referenced items in the survey that ask about the conditions and experiences of children.

Table 3: Food Security Status: Adult versus Child Scale

Category and Outcome (%)	Household Scale	Adult Scale	Child Scale
Secure	7.3	12.7	10.8
Insecure without hunger	19.1	20.9	26.9
Insecure with hunger	73.6	66.4	62.4
Sample Size	110	110	93

Table 3 compares the prevalence and degree of food insecurity between children and adults. It is clear from the table that in both cases, most of the respondents are food-insecure; and an increasingly greater proportion is affected by a higher degree of food insecurity. The prevalence rate of food insecurity is slightly (two percentage points) higher among adults than among children. The same relative magnitude is observed with respect to the incidence of hunger. On the other hand, food insecurity without hunger appears to be more common among children than among adults.

Conclusion

The primary purpose of this study has been to adapt and validate the U.S. Food Security Survey Module in the context of the

³ In the Dominican Republic, all persons up to the age of 14 years are considered children.

Dominican Republic and thereby assess the prevalence of food insecurity and hunger in a selected community in the country. The module was administered as a pilot in a household survey of 110 low-income families in the Dominican Republic.

This study found that 93% of the respondent were food-insecure, some more so than others, and the percentage increasing as a higher degree of food deprivation was considered. A relatively small proportion of the food-insecure (20%) reported food insecurity without hunger. Households which experienced hunger represented 74% of the entire sample and 80% of the food-insecure group. Among those who were insecure with hunger, 59% faced severe hunger. Child hunger was reported by 89% of households with children. Only seven percent of the household were found to be food-secure, with no or minimal perception and experience of food hardship during the reference period.

Finally, this Pilot Study could serve as the first step in addressing: *Could the FSSM used in the wealthy countries be appropriate to measure food security in Low-Income Countries such as the Dominican Republic?* From our experience during this pilot study, we would argue that the core FSSM instruments could easily be adapted to assess the food security status of households in countries with less developed economies, such as the Dominican Republic.

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