A Manual for The Food Needs Assessment:

Conceptual Framework and Software Documentation

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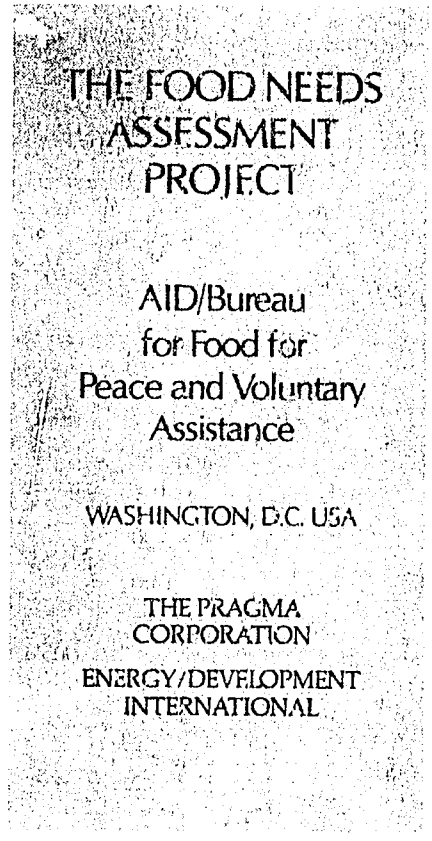
VERSION 2.0



A MANUAL FOR FOOD NEEDS ASSESSMENT:

CONCEPTUAL FRAMEWORK AND SOFTWARE DOCUMENTATION

for Version 2.0
October 1988

by

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Foreword

In 1984, the Bureau of Food for Peace and Voluntary Assistance (FVA) of AID completed the initial design of its food gap analysis methodology. The immediate purpose was to provide more and better information to decision makers involved in food aid program design in USAID missions and food aid allocations in AID/Washington. The key attributes of the FVA methodology for food needs assessment are summarized below:

- o It gives USAID missions and AID/Washington an early indication about the adequacy of food supplies for the coming year.

- o It standardizes requests for food aid and other AID programs to improve food security through the application of a consistent, conceptually sound methodology.

- o It enables comparison of food supply and demand information across years within a country and across countries, and it offers results comparable with those of other institutions, such as FAO, that are engaged in food needs assessment.

- o It organizes a database of complex historical and current food system information for presentation, analysis and storage.

- o It provides commodity-specific information on food supply and utilization in situations of limited or incomplete data.

- o It includes a simpler, menu-driven template (included on the diskettes accompanying this manual) that automatically generates summary reports and graphs and enhances the ability of the analyst in the field to explain and present results to decision makers.

In funding this continuing effort, FVA has come to realize that food needs assessments can have much broader application than simply determining the food aid needs for the coming year. The food system in most developing countries accounts for over 60 percent of gross national product and national income. Agriculture production, processing and marketing employ the majority of the population, and incomes are closely aligned to current food availability. A clearer and more precise understanding of these countries' basic food supply and demand situations is therefore needed before sound food aid strategies, as well as general development strategies, can be adopted by host governments and donors. In short, quality food needs assessments, which are updated and improved each year, provide USAID missions, AID/Washington and host governments with a greater appreciation for a country's most basic economic development problems and solutions.

As we enter the 1990's, greater knowledge of food systems will be needed to address the structural problems leading to hunger and malnutrition. This manual and software will assist in efforts to enhance food security by improving the information base on which our development programs rest. The methodology presented in this manual has been updated and streamlined and includes a number of improvements that permit its use in a wider array of country situations. We also believe that the analytical techniques are explained more clearly and logically, and accordingly, we hope it now will be easier to learn to use the methodology. We encourage the reader to use the material and share it with colleagues.

Acknowledgements

This manual represents the efforts of many people and groups over several years. The personnel of the Program and Policy Management Section of the Bureau of Food for Peace and Voluntary Assistance in AID have supported and encouraged the efforts. Of particular note are Barry Riley, Jon O'Rourke and Tom Ross, who have promoted the project and carefully reviewed the many drafts of this manual. Patricia Rader, formerly with FVA, has been among the project's strongest advocates and continues to extend the understanding of food gap analysis in the Africa Bureau of AID.

Many USAID mission staff members have used earlier versions of the software, and their comments and reports have been both insightful and supportive. Peter Newhouse and his staff at the Global Information and Early Warning System of FAO provided comments and support to the revisions and their continued cooperation is appreciated. The ongoing dialogue with USDA/ERS, particularly Ray Nightingale, has provided all parties involved with a better understanding of food gap analysis.

Earlier versions of the software and manual were written by Laura Tuck, formerly of the International Science and Technology Institute Inc., and her contribution to our understanding of food needs assessments can not be underestimated. She has also assisted in the review of the current manual and her useful suggestions have been incorporated. Gary Robbins drafted parts of the manual and assisted in training and analysis. The revision to the software was carried out by Jeff Kahn of E/DI. Asif Shaikh of E/DI and Mohammad Fatoorehchie and Dina Towbin of the Pragma Corporation have participated in many aspects of the revisions.

To the many unnamed users of the software--past, present, and future--your experiences, insights, suggestions and reports will both justify our efforts and encourage us to continue to improve the methodology and reporting of food needs. The manual and software are subject to revision and your comments are welcome.

(The revisions and production of the manual and software were carried out under AID contract No. OTR-0000-C-00-72323-00 to the Pragma Corporation.)

Chapter 1

Introduction

1.1 Scope and Purpose

This manual describes the FVA Food Needs Assessment (FNA) methodology for assessing the aggregate food needs of a country or region. The methodology presented in the manual is based on the well tested and familiar food balance sheet approach used by USDA, FAO and many others. The strengths and weaknesses of the food balance sheet approach in general and this methodology in particular are discussed in Section 1.3 of this chapter.

The data obtained using this methodology are particularly useful in programming food aid. Food aid programming, however, is not the only use for this information. The information generated by the FNA is intended to assist decision makers in determining the aggregate level of commodity shortfalls or surpluses so that action can be taken. Often, the action necessary will consist of additional, in-depth investigations of particular issues brought to light by the food needs assessment. This manual and accompanying template represent a first step in closing the information gap. The manual provides the basic tools for a food needs assessment and includes:

- A conceptual framework with the food supply and utilization system described in a series of equations.
- Alternative approaches to use the equations where data may be from various sources or are incomplete.
- Worksheets for carrying out an assessment without a computer.
- Instructions for conducting a computer-based assessment with the Lotus software.

1.2 How to Use This Manual

The manual is divided into four main sections. Chapter 1 details the scope and purpose of the manual with specific reference to the use of the aggregate food balance sheet; Chapter 2 is the conceptual framework that describes and organizes the equations of a food needs assessment and covers production, stocks, imports, exports, and consumption; Chapter 3 documents the accompanying Lotus-based software (Version 2.0) for carrying out an assessment; and the final section includes appendices useful for completing an assessment.

Equations of the FNA

The FVA methodology is designed to estimate the food surplus or deficit for specific commodities. It does this by analyzing four critical variables: total food requirements, net domestic production, net change in stocks, and net imports, which are discussed in detail in Chapter 2 of the manual. This section also describes the type of general information necessary to begin an assessment.

Worksheets

The manual provides the user with the specific equations involved in food needs assessments and offers alternative methods to calculate each variable. The worksheets in Appendix A have been developed to illustrate the equations discussed in Chapter 2 and to enable the analyst to carry out an assessment without a computer. By carefully recording the information for each commodity on the worksheets and by choosing the desired analytical method, the analyst can complete an assessment without using a computer. The worksheets are also useful as a reference guide in training with or

without a computer as the equations are presented in a logical sequence. It is suggested that copies be made of the worksheets to retain the originals in good order.

The Lotus Template

The extensiveiy revised Lotus template can be used in conjunction with the worksheets or as an alternative to the hand-written sheets. The template is available on diskette with an accompanying Quick Reference Guide. The extensive documentation and equipment requirements are detailed for both the hardware and software in Chapter 3. To assist the user, the software is menu-driven with embedded help or "explain" screens available at the touch of a key. The reader is encouraged to use the Lotus template as it offers speed and convenience and reports the information in easily understood tables and graphs. In addition to the documentation for the software in Chapter 3, examples of generated reports and graphs have been reproduced. Refer to the examples as they illustrate the types of information generated by the software.

Sources of Information

It is often heard that data are just not available or of sufficient quality to carry out meaningful assessments. While it is acknowledged that data are often limited in developing countries, the situation is definitely improving and will improve even further by active sharing of information and techniques. Users of the manual and software are encouraged to include other analysts in their work wherever possible so that the information gaps will become more apparent and solutions will be sought.

Typically, much of the information necessary to carry out an assessment is available from government or international organization reports. To assist the user, the manual describes alternative sources of information whenever possible. In addition, several appendices provide conversion factors such as milling extraction rates and energy contents of foods to assist the user in situations where local values are not available.

The methodology is flexible in that it provides alternative methods of calculation for most variables. This flexibility allows the analyst faced with conflicting information to "test" data obtained from various sources. In addition, the analyst in a data-scarce situation is not forced to use one standard option for determining variables.

For example, if the domestic production for maize is estimated by the agricultural ministry using the area harvested times average yield method and the national cereals board uses a combination of sampling and remote sensing methods, both sources of the production data can be entered in the assessment. Although one data source must eventaally be selected to carry forward, the methodology allows for sensitivity analyses using different data sources. (Of course, sensitivity analyses are facilitated when using a computer.)

Refugee or Displaced Populations

The FVA methodology does not directly cover situations in which estimates of food needs are required for a special population group such as refugees or supplementary feeding programs. A simple and direct approach is presented in Appendix J, which describes the basic calculations used by many organizations. In this approach, the number of affected people is multiplied by a per capita allowance of food. WFP, FAO, UNHCR, among others, provide guidelines for setting these rations and the analyst is referred to these agencies for specific details.

1.3 The Food Balance Sheet

The food balance sheet, in use by organizations and governments around the world, simply compares aggregate food requirements with aggregate food availability. The difference between the two is the "food deficit or surplus" or the "food gap." While the general approach to constructing a food balance sheet is similar among organizations, slight differences exist in terminology and equations. To the maximum extent possible, the FVA methodology has been standardized with other commonly-used methodologies, most notably the Global Information and Early Warning Systems (GIEWS) of FAO.

The food balance sheet should be seen as the first step in understanding the food situation of a country or a region. Once the aggregate analysis has been completed, the analyst will have the answer to one important question: Is there enough food in the country (province, etc.) to feed the population at a given level? Once this critical, preliminary question has been answered, in-depth analyses of specific issues revealed in the FNA can begin.

An alternative method to calculate food needs is known as the enumeration approach. This approach attempts to count the number of people needing food aid and multiplies this number by some consumption requirement. This approach is useful in some circumstances, especially when food aid requirements are restricted to a specific group--refugees, urban residents of a specific province, etc. (Appendix J provides de-

tails of this approach.) The main weakness in enumeration is that it usually does not factor in all of the components of the food equation: domestic production, stocks and commercial imports. For this reason, it may not provide an understanding of the overall food situation. It does, however, target the needy recipients of aid, something that the balance sheet approach does not do.

The following sections describe the evolution of the FVA methodology, as well as its advantages and limitations.

Background to the Methodology

The evolution of this methodology reflects the changing needs of people concerned with food aid programming and enhancing food security for developing countries. The methodology was developed by AID from existing "balance sheet" methodologies created for use during the 1984 drought in Africa. Its original application was in emergency situations, quantifying national and regional food production shortfalls and estimating the requirements for exceptional assistance. The emphasis was expanded to include assessment of food availabilities and requirements in non-emergency situations.

The methodology was then adapted to reflect a greater diversity of diets in and out of Africa. This was a significant development because many existing methodologies had focused only on cereals and excluded the important contribution of roots and tubers, pulses and other commodities to the diet.

The next stage in the application reflected non-emergency situations such as shortages in only one commodity combined with surpluses in others or long-term structural or chronic shortfalls in production. The utility of the methodology in identifying and quantifying trends in consumption and production was then more fully recognized. The methodology was extended further to reflect situations of overall surpluses caused by too much food aid.

Advantages of the Methodology

The methodology described in this manual was developed to offer users an organized series of steps that arrange food supply and utilization data into relevant statistics. The use and adaption by analysts in the field of the existing methodology has enhanced our understanding of food needs as well as improved the level of reporting. Those experiences have led to a revision of the methodology reflected in this manual and the accompanying Lotus template.

Users of the methodology will have information about the adequacy of food supplies for the coming year, usually on a nationwide level. This information can tell analysts and the policymakers whether additional food should be brought into the country in order to keep the population at some standard level of consumption. While additional, disaggregate information is likely to be required if a food gap is identified, the food needs assessment is the logical first step.

The food needs assessment is usually carried out on a national or aggregate level, it has the potential to be used at the regional, local, or even household level depending on available information.

The methodology provides the analyst with an organized collection of useful information. It should be recognized, however, that the methodology reveals only a part of the food and agricultural situation of a country. The next section describes some of the limitations of the balance sheet approach used in the methodology.

Limitations of a Balance Sheet

The methodology is based on the aggregate analysis of the food supply and utilization situation. As described above, an aggregate analysis is an essential first step in identifying a food need for a region or country. Once an aggregate food need (or food surplus) has been identified, additional resources may be allocated to determine the extent, location, and so on.

Analysts may be faced with reports of increasing numbers of vulnerable groups in certain regions of the country affected by food shortages yet the methodology may indicate adequate aggregate food availability. Another common situation is adequate food availability but persistent chronic malnutrition in the country. These experiences describe the limitations of an aggregate analysis in reflecting the food availability and utilization situation at the smallest unit, the individual, the household, the community, etc. It simply tells you whether there is enough food in a country to feed the population at a specified level, not who needs the food or where the food should flow within the country.

The aggregate approach does not address issues related to the household's ability to have access to and to acquire food. Food availability at the aggregate or national level will have no relevance to the household unable to purchase it due to lack of cash, distance to the storage facility or inadequate roads. These constraints are important determinants of hunger or food insecurity that may not be reflected in statistics handled by the methodology. It is important, therefore, to consider the food security picture at individual, household, local, regional, national, and even international levels

when trying to understand the total food system. The methodology is a necessary, but not sufficient, step for gaining an understanding of the system. It is useful to apply the methodology at the most disaggregated level of analysis, but often data constraints limit the application at a regional, provincial or village level.

Where possible, complementary information, such as nutritional status and health data should be used to confirm or support trends, and researchers should collaborate with others engaged in information gathering and interpretation to make best use of the methodology. AID funds several projects that generate information on food needs, including the Famine Early Warning System (FEWS) and the Cornell Nutritional Surveillance System Project (CNSP). International agencies (e.g. FAO, UNICEF) may be useful adjuncts to the information generated by the FVA methodology.

Finally, the methodology does not analyze the ability of the country or region to absorb food aid. Generally termed "absorptive capacity," it is the ability of the port and internal transport system as well as the administrative and management system to import, to transport and to distribute food aid to consumers. Attention to absorptive capacity is important for certain types of food aid, especially emergency food aid. Consideration should also be given to the absorptive capacity for other imports, including food and non-food commercial imports.

Food needs assessments are an important, indeed essential, first step in understanding food security requirements. The analyst is encouraged to examine the system of food security by identifying the linkages from food availability to consumption and its various outcomes. Furthermore, the extension of the analysis to include trends in supply and utilization can be a valuable step in forecasting likely situations amenable to policy initiatives. With the clear understanding that food aid programming can be an important, though not single, component of enhanced food security, the next chapter describes the elements of a food needs assessment.

Chapter 2

The Conceptual Framework

2.1 The Food Balance Equations

As mentioned in the discussion above, the food balance simply compares the availability of food with the requirement for food in order to determine the food surplus or deficit. Table 2-1 shows the current year food balance sheet used in the FVA methodology.

The Key Equations

The four key equations in the current year food balance sheet are included in the boxes below. The remainder of this chapter will break each of these four basic equations into component equations. For convenience, each equation is discussed in detail in the text and also presented in summary boxes. At the end of the chapter, all of the equations discussed are duplicated.

Population
× Per capita requirement
= **Total consumption requirement**

To determine the total amount of food required by a given population in the current year, the methodology multiplies the current population by some per capita requirement. This per capita requirement can be determined in a number of ways; the most common method used in the FNA is the "historical average," or "status quo" method where food balance sheets are developed for at least five historical years in order to determine the average amount that was consumed by each person during that period. (See discussion below on the use of the historic base period in the FNA.) This average amount consumed is then multiplied by the current year population to determine the total consumption requirement. It should be stressed that the historical average is only one of the options available for determining the per capita requirement (see Section 2.3 for a discussion of the other options.)

Net domestic production
− Net change in stocks
− Total food exports
= **Domestic food supply**

The next major section of the food balance sheet is the calculation of the domestic food supply. This is the amount of food available in the country through domestic production and stocks, after any exports.

Table 2-1

CURRENT YEAR FOOD BALANCE	
Year of Analysis 19__	COMMODITY
Per capita consumption (UNMILLED kg/year) × Population (thousands) = Total consumption requirement	
Gross domestic food production Total non-food use = Net domestic food production	
− Net change in stocks	
Total food exports	
= Domestic food supply	
Total consumption requirement (from above) − Domestic food supply (from above) = Import requirement	
Total commercial food imports	
× FOOD DEFICIT (UNMILLED) × Milling extraction rate (m e r) = FOOD DEFICIT (MILLED)	

Total consumption requirement
− Domestic food supply
= **Import requirement**

The import requirement is simply the difference between the first two equations - the consumption requirement less domestically available supplies. Establishing the import requirement allows the analyst to determine how much of the total amount of food required by the population can be met with domestic supplies and how much needs to be brought into the country from outside.

Import requirement
− Commercial food imports
= **Food deficit**

Finally, the food deficit can be calculated by subtracting commercial imports from the import requirement. It should be pointed out that food aid is not included in the current year food balance equations. Instead, the bottom line - the food deficit - could be seen as the food aid need. Of course, there is no guarantee that a food deficit will be covered completely by food aid.

Current vs. Historical Year Balances

As alluded to above, a historical data set can be developed to assist in estimating key variables in the current year balance. The most important of these variables is the historical average per capita consumption, although historical trends and averages also can be useful in calculating current year production, exports and commercial imports. In all cases, the use of historic trends or averages is only one of the options available to calculate these variables. If historical data are not available and the analyst has access to other means of calculating each variable, a food needs assessment can be carried out without building a historical data series.

The balance sheets used for the historic and current year assessments differ slightly (see Table 2-5 or Appendix A for a comparison.) Basically, the purpose of the historic balance - "the bottom line" - is the determination of per capita food utilization or the **apparent consumption of food**. Conversely, "the bottom line" in the current year assessment is the food deficit, i.e., the amount of additional food needed to keep the population at some level of consumption during the upcoming year.

The section below describes the preliminary decisions that must be made before starting an assessment. The discussion then returns to the four key equations listed above.

2.2 General Parameters

The methodology allows the analyst to tailor the assessment to fit the specific situation in each country or region, taking into account the fact that populations have differing diets, countries have differing crop calendars, grain mills operate at differing levels of efficiency, etc. These and other key variables must be defined before starting the assessment. Table 2-2 on the following page shows the summary report for the general information section.

The Period of Analysis

The analysis of the current situation usually requires a knowledge of the supply/utilization situation in previous years. In the past, five years typically has been chosen as the base period. In some cases, the analyst may want to use a historical period other than the previous five years or may want to eliminate one or more of the years in the base period if, for example, food supplies were exceptionally large or small. If a strong case can be made that an accurate picture of the current situation can not be derived by looking at the previous five years, the base period can be adapted.

There is some question as to whether five years represents an adequate base period for a food needs assessment. On one hand, it can be argued that a longer base period, which has more observations, is better for establishing trends. The opposite position is that a base period longer than five years can mask recent trends. The FNA has settled on a five-year base period, which does not have to be chronological. If the analyst feels strongly that a longer base period is necessary, both the computer template and the pencil-and-paper worksheets can be adapted easily.

The next decision to be made is which twelve month period to define as a year. While this issue sounds simple, it is often a matter of dispute and confusion.

Data needed for the assessment are likely to appear in terms of calendar years, fiscal years (of the country being analyzed, as well as the U.S. or third countries), crop years or marketing years. It is important to select one twelve month period and adjust all data to fit that period. For example, import and export data gathered from Ministries of Finance or Commerce usually are recorded by the government's fiscal year.

U.S. food aid is provided on the U.S. government fiscal year, while population may be calculated on a calendar or a fiscal year. Each variable must be converted to the same twelve month period. This conversion process can be difficult. If monthly data are available, the months included in the "year" can simply be adjusted. In most cases, however, monthly data will not be available, so rough estimates will be necessary. For example, if the assessment is being carried out on a calendar year and import data is available on the government's July/June year, the analyst may choose to divide the government's data into halves and combine half of each split year into calendar years.

A case can be made for selecting any of the above "years." The particular choice is not as important as the consistent application of the same period to all data. One recommended solution is that a "consumption year" be defined; that is, the twelve months in which the level of consumption is of interest. This is often defined as the period from the main harvest in the country up to - but not including - the following year's harvest. For example, if maize is the primary commodity in a country's diet and the harvest begins in May, the consumption year might be defined as May through April.

If the consumption year is selected as the period of analysis, the best time to conduct the assessment is usually as soon as reliable information on the major harvest is available. Depending on the crop assessment capabilities in the country, this may be more than a month before the crop is actually harvested, during the harvest or a month or so after the harvest is completed. The assessment can be easily updated, so it is best to conduct a preliminary assessment as early as possible.

Commodity Selection

The next issue is to choose which commodities to include in the analysis. The rule of thumb is to try to capture 75% of the total diet, although this figure is somewhat arbitrary. Ideally, the entire diet could be included although, practicaliy, this is impossible in most countries because of diversity in diets and/or lack of data on relatively minor commodities.

On the whole, the more commodities that are included the better and more accurate the analysis, although diminishing returns set in at some point. The extra effort involved to collect data for commodities which account for a small portion of the diet may not be worth the relatively small improvement in the understanding of the overall food needs situation. The availability of data often will constrain the choices.

Often, the most readily available information is on cereals, which leads some analysts to include only cereals on their food balance sheets. While cereals are the most prevalent commodity in the diets of many countries, in other countries they are less significant. The FVA methodology allows and encourages the inclusion of non-cereal commodities such as roots and tubers, milk, meat, oils and pulses but recognizes that the data simply are not available in many countries. The spreadsheet version provides for up to ten commodities, five cereals and five non-cereals. If a more detailed analysis is desired, separate worksheets could be developed for each group of commodities.

Base Commodity Equivalent

For food aid programming purposes, it is often necessary to add or compare commodities of different energy density or caloric content. To do this, the FVA methodology converts commodities into a Base Commodity Equivalent by using calories as the "common denominator." (Another measure such as grams of protein could be used; calories are chosen because energy is generally regarded as the limiting factor in the diet.)

The Base Commodity is defined as the most important commodity in the diet. Because each commodity in the diet provides a different amount of energy, it is not valid to compare commodities on a straight tonnage basis. For example, one ton of wheat provides a different amount of energy than a ton of maize, which is different from a ton of cassava.

To convert a commodity - wheat for example - into its Base Commodity Equivalent, the volume of

Table 2-2

GENERAL PARAMETERS	
Country of Analysis	
Analyst	
Date	
PERIOD OF ANALYSIS	**POPULATION**
Consumption year (mo./mo)	Current year
Current year 19__ or 19__	Base year 1 (t-1)
Base period 19__ or 19__	Base year 2 (t-2)
19__ or 19__	Base year 3 (t-3)
19__ or 19__	Base year 4 (t-4)
19__ or 19__	Base year 5 (t-5)
19__ or 19__	
TECHNICAL COEFFICIENTS	**COMMODITY**
Base commodity equivalent (b.c.e.) Caloric equivalent (calories/UNMILLED kilogram) ÷ Caloric equivalent of the base commodity = Base commodity equivalent (b.c.e.) coefficient (.00)	
Milling extraction rate (m.e.r.) (.00)	

wheat is multiplied by the caloric value of a ton of wheat, and then divided by the caloric value of a ton of the Base Commodity, sorghum for example. The result is a quantity of wheat, in sorghum equivalent terms. While the caloric contents of most grains do not differ markedly, the use of the Base Commodity Equivalent is especially important when comparing non-grain crops with grains.

Stating food needs in base commodity equivalent terms is useful for comparison across countries and dietary patterns. If some commodities are in surplus and others are in deficit, the comparison using a base commodity equivalent can provide an overall picture of the situation. Base commodity equivalent terms are also useful in programming food aid when the substitution of one commodity for another in the diet is feasible. Table 2-3 below shows the equation for converting the deficit into its base commodity equivalent.

Table 2-3

FOOD DEFICIT (BASE COMMODITY EQUIVALENT TERMS)	
YEAR OF ANALYSIS: 19	COMMODITY
Food [illegible] UNMILLED [illegible]	
• Base [illegible] Equivalent Ratio	
= Base [illegible] UNMILLED	

Milling Extraction Rate

Another important factor to consider when comparing different commodities is the milling extraction rate (M.E.R.). Many grains and other foods are eaten in some milled or processed form. For this reason, it is sometimes more appropriate to talk about food crops in **milled** form; i.e., the form in which they will be consumed. The amount of the whole grain (or seed, etc.) retained after the transformation process will differ between commodities. Polished rice, for example, has only about 60-70 percent of the weight of paddy rice, wheat usually retains around 70-80 percent when converted to flour, while other grains lose only a small amount.

The milling extraction rate, therefore, is the percentage of the whole grain left after the milling process. There are standard milling extraction rates published by the U.N. Food and Agriculture Organization for different commodities, although many countries have calculated their own rates based on local milling operations. If local milling extraction rates are not available, Appendix D provides general extraction rates.

Both FAO and USDA perform their analyses of cereals in UNMILLED terms, with the exception of rice which is presented as milled and not paddy. Always check all data by asking the question: Is the commodity presented in MILLED or UNMILLED terms? In addition, always specify on graphs and reports whether data are in unmilled or milled terms.

The revised FVA methodology allows the analyst to input data for both milled and unmilled commodities. Production data, for example, are entered as unmilled; stocks, exports and imports can be entered in either form. The spreadsheet and the worksheets convert all data back to unmilled form in the summary food balance; the final deficit is presented in both unmilled and milled forms.

Units

All quantities should be converted into the same units, usually metric tons. Data may be reported in a variety of units - kilograms, long tons, 90 kilogram bags, liters, etc. Any one of these units could be used, but all data must be consistent. Similarly, areas are usually measured in hectares, although acres or some local area measure could be used provided all data are treated consistently.

Consumption data are usually expressed as unmilled kilograms per commodity per person per year. Energy content is expressed as unmilled or milled calories per kilogram. Refer to Appendix B for the energy content of some commodities.

Population Figures

Annual population figures for the base period and the current year are needed for a food needs assessment. Population figures, which are often based on an earlier census and some population growth rate, usually can be obtained from the national census bureau or from international agencies such as the World Bank. Ensure that the growth rate used is current and other sources consider the census data reliable. This can be important where there are in- and out-migrations as well as other trends affecting population figures. Also choose a consistent point of reference such as the mid-year estimate of population. In addition to being used for determining the total consumption requirement, per capita production and consumption data provide useful information for comparing situations across years and across countries.

In some developing countries, large refugee populations pose an additional problem for estimating population. In general, newly arrived refugees receiving specially-targeted food aid do not need to be counted

in the aggregate food balance, but refugees consuming food from the same sources as the local population should be included (see Appendix J for the common methodology for refugee and target group feeding.) In other cases, there is significant leakage of food between refugee feeding programs and the local community so it may be more accurate to include both the refugee populations and the food aid targeted for refugees in the assessment.

Energy Contribution to the Diet

It is useful to know the importance of the commodities included in the assessment to the total diet, in terms of energy. As mentioned above, the target is coverage of 75% of the total diet, although this is impossible in many countries. The analyst should attempt to determine the percent of energy that is contributed by each commodity relative to the total diet. Note that this is not the actual intake of the selected commodities. FAO and USDA report these figures by country and if these are unobtainable, it is worthwhile to look for local food consumption surveys.

2.3 Total Consumption Requirement

In order to determine whether a food deficit or food surplus exists, it is necessary to estimate the amount of food required by the population. On the food balance sheet, the equation is as follows:

Per capita consumption
× Population
= Total consumption requirement

The amount of food necessary to meet the consumption requirement depends on the particular definition of "consumption requirement" employed by the analyst. "Consumption requirement" can be defined in several ways, as shown on Table 2-4: (1) the amount of food "typically" consumed by the population, which is known as historical average or status quo consumption method; (2) the amount of food necessary to assure some nutritionally recommended level of consumption referred to as the nutritional norm consumption method; or (3) the amount of food needed to support current trends in consumption, calculated using the trend analysis method.

The relative merit of each method depends on the information available in country as well as the overall objective of the analysis. If the primary reason for undertaking a food needs assessment is to identify food aid levels necessary to maintain a standard of living, the historical average consumption may be the most appropriate yardstick. On the other hand, if the objective is to identify undernourished pockets within a given country and quantify food needs for targeted feeding programs, a nutritional norm may be the best starting place. Most organizations that assess food needs statistics on a regular basis (i.e., AID, FAO, USDA) use either the historical average or the nutritional norm. The most common approach used by AID is the historical average consumption. The trend analysis provides added flexibility in cases where consumption patterns for a specific commodity show a clear directional change. The decision on the appropriate method to determine the consumption requirement should be made after the type of information available is identified and the overall objective of the food gap analysis is clear.

Historical Average Consumption

This method projects the total consumption requirement by calculating average per capita consumption in previous years and multiplying it by the expected population in the current year. Also known as status quo consumption, this method yields the total amount of food necessary to maintain the current population at the level of consumption to which they have become accustomed in the past.

The first step in calculating the historical average consumption is to select a base period. As discussed in section 2.2 above, five years is the base period most commonly used in this analysis, although a longer period could be chosen. In some circumstances, it might be necessary to eliminate a year. For example, the fam-

Table 2-4

PER CAPITA FOOD CONSUMPTION	
YEAR OF ANALYSIS: 19	COMMODITY
(1) Historical (base period) average	
(2) Trend projection (a) Linear projection (b) Log linear projection (c) Other (specify) Per capita consumption (extrapolation)	
(3) Nutritional norm	
(4) Other	
Specify option (1), (2), or (4)	
PER CAPITA CONSUMPTION (UNMILLED KG/YEAR)	

ine year of 1984/85 is excluded in Ethiopia and the sixth historic year is included instead. In countries which face periodic emergency situations, it may be desirable to include all of the historical years in the analysis, assuming that such cycles are normal - some historic years were worse than the current year, while others were better.

Once an appropriate base period has been selected, the analyst must compile statistics on food consumption for each year in the historical period. Since data on total national food consumption are rarely available, it is usually necessary to estimate historical consumption by summing its constituent parts. Total national consumption is equal to domestic production, less non-food uses, less the net change in stocks, less exports, plus commercial and food aid imports (see Historical Food Balance on Table 2-5).

Each of these variables must be compiled for every year in the base period in order to estimate the total food consumed in each year. The total amount of food consumed is then divided by the population in the particular year to yield the per capita consumption for that year. Per capita consumption figures for all years in the base period are then summed and divided by the number of years in the base period, arriving at the **historical average.** When this historical average per capita consumption is mulitplied by the current year's population, the Total Consumption Requirement results.

For emergency food aid purposes, the average consumption figure is usually very important. While it is recognized that providing only enough food to meet past average levels of consumption may result in continued undernourishment for some of the population, enhancing the nutritional situation often is not realistic in emergency situations where starvation is a serious threat. The programming of food to meet the average historical consumption, therefore, only maintains status quo levels; it does not address the adequacy of these levels.

The average consumption approach based on historical trends does not attempt to represent the nutritional needs of a population. Using a nutrition-based approach, in which a desirable level of food intake is used as the basis for estimating total food needs, will be reviewed later.

What about the situation where the analyst knows that consumption is decreasing in one commodity (e.g. cassava) due to substitution or changes in preferences? A five-year average will not reflect this trend and there are various strategies employed to cope with this. The methodology allows the analyst to replace the base period average with a per capita consumption requirement figure determined through the trend extrapolation method.

Trend Extrapolation

A per capita consumption figure can be derived by examining historical trends in a population's consumption of a commodity. Many factors may affect a population's demand for a commodity, such as changes in consumer tastes, changes in a commodity's price (or relative commodity prices), increases or decreases in the population's income level, reforms in government policies or exchange rate changes, among others. In these cases, a historical average may present a misleading picture.

The analyst may want to use a trend extrapolation approach if per capita consumption for a specific commodity appears to be increasing or deceasing by a standard amount each year. A graph of historic levels of consumption might reveal these trends. One common situation, encountered in a number of countries in Africa and Latin America, is that per capita consumption of wheat (usually imported) shows annual increases, where per capita consumption of another commodity (often locally grown maize, rice, etc.) has declined annually. Conducting a food needs assessment using historical average levels of consumption will mask consumption trends for both commodities. Depending on available resources, the analyst may want to use a simple linear or non-linear extrapolation of historic trends or carry out a more sophisticated modelling exercise.

Modelling consumption figures based on per capita demand estimates derived from income projections and income elasticities of demand has been done by FAO and IFPRI, among others. It is still difficult to obtain reliable elasticity estimates for Africa, although the situation is improving. For further information on

Table 2-5

HISTORICAL YEAR FOOD BALANCE	
YEAR OF ANALYSIS: 19__	COMMODITY
Gross domestic food production - Total non-food use = Net domestic food production	
- Net change in stocks	
- Total food exports	
= Domestic food supply	
+ Total commercial food imports	
+ Food aid	
= Total food supply ÷ Population (thousands)	
= PER CAPITA CONSUMPTION (UNMILLED KG/YEAR)	

modelling consumption trends using elasticities and changes in GNP, the reader is referred to publications by FAO, IFPRI, and others.

Nutritional Norm

There are cases when another method to calculate the current year consumption requirement might be more appropriate than the historical average or the trend extrapolation alternatives. If the purpose of the analysis is to plan for targeted feeding programs to increase the current nutritional status of specific populations, the consumption requirement can be based on a per capita nutritional norm such as a recommended daily energy intake.

Some analysts use 100 percent of energy requirements as the target allowance (e.g. USDA) while others use 110 percent (e.g. IFPRI). Whichever is chosen, the total food needs are derived by multiplying the population estimate by the per capita nutritional requirement. Further adjustments can be made for the age and sex distribution as well as the activity levels of the population to better estimate the energy requirements. Be careful to consider the contribution to the diet of specific commodities before interpreting the level of food needs.

For example, the daily intake may be suggested on average to be 2,000 calories per person. This translates to 208 kilograms of cereal equivalents per person per year. If maize is 50 percent of all calories, then the nutritional based need for maize would equal 104 kilograms per year. Of course, the average consumption of calories underestimates the need for very active people and overestimates the need for children. As an average figure it also does not reflect the distribution of resources in that the poorest eat less and the wealthier are in excess. In many regards, this need based estimate of consumption is a crude statistic for general programming purposes and needs to be compared with the other approaches. It is useful, however, for project food aid programming.

Country-specific studies of nutritionally-recommended intake levels might be available from research organizations, Ministries of Health, etc., or publications of international agencies such as WFP, FAO or the World Health Organization. FAO is currently reviewing the guidelines for establishing national level energy requirements and will eventually make available a computer program that determines country-specific suggested intakes.

The FAO and WHO Consultative Group recommends allowances of energy based on age and sex for different levels of activity. A crude approximation of this approach to use for a guideline is a per capita allowance of 2200 calories/person/day or a per adult equivalent allowance of 2850 calories/person/day.

Per capita allowances reflect an average for all population groups. To determine the adult-equivalent allowance, the total population is converted using a standard such as two children equal one adult. These guidelines are demonstrative only; it is strongly recommended that the analyst check with local experts before attempting to estimate nutritional requirements.

It is useful to compare the historical average consumption with the nutritionally-recommended levels. Often, the gap between "normal" and "recommended" consumption is very wide and can serve as a preliminary indicator of the nutritional situation in the country. It can be pointed out that although food aid programming often will be designed to maintain an average consumption level, a much larger volume of food would be required to meet nutritional targets. It should be noted that USDA routinely includes "nutritionally-based" food requirements in its World Food Needs and Availabilities report, but it is the only major group doing so.

2.4 The Domestic Food Supply

The next major equation is the calculation of the domestic food supply; that is, how much of the total food requirement can be met through domestically available resources. The highlighted section of the current year food balance on Table 2-6 shows the components of the domestic food supply.

Table 2-6

CURRENT YEAR FOOD BALANCE	
Year of Analysis (y___)	COMMODITY
Per capita consumption (UNMILLED kg/year)	
x Population (thousands)	
= Total consumption requirement	
Gross domestic food production	
- Total non-food use	
= Net domestic food production	
+/- Net change in stocks	
+ Total food exports	
= Domestic food supply	
Total consumption requirement (from above)	
- Domestic food supply (from above)	
= Import requirement	
- Total commercial food imports	
= FOOD DEFICIT (UNMILLED)	
x Milling extraction rate (m.e.r.)	
= FOOD DEFICIT (MILLED)	

The equation for determining the domestic food supply is summarized below:

Net domestic production
– Net change in stocks
– Total food exports
= **Domestic food supply**

Net Domestic Production

Net domestic production is the amount of the harvest actually available for human consumption. After a harvest, a portion of the total production is not available for food use - either it is saved for seed for the next year, used for animal feed, used in industry or lost due to mismanagement, insects, rodents, etc. The equation is:

Gross domestic production
– Non-food uses
= **Net domestic production**

Gross Domestic Production. The first component to consider when assessing the domestic food supply is gross domestic production. This is the amount harvested or expected to be harvested in the 12-months identified as the period of analysis for the assessment. The distinction of "gross" refers to the entire harvested quantity, with no correction for any portion which may be lost later to non-food leakages (i.e. post-harvest losses, seed requirements, feed, etc.).

Estimates or forecasts of gross domestic food production can usually be obtained from government ministries or international agricultural organizations such as the FAO. Although post-harvest estimates provide the most accurate accounting of crop production, preliminary food gap analysis usually begins long before the harvest is in. For this reason, the analyst must often rely, at least initially, upon crop forecasts. The numbers are likely to become more precise in the course of the growing cycle and the analysis can easily be altered to reflect the new circumstances. The most common methods by which to assess gross food crop production are discussed below and are summarized on Table 2-7.

The first option available to calculate gross domestic production is an official or direct estimate. This option, which is provided for nearly every variable in the food needs assessment, simply refers to a number that is calculated outside of the food needs assessment worksheets. In the case of production, it can be a number for total production provided by the government or another organization without disaggregate information on area and yields.

One of the most widely available means of estimating gross domestic food production is the area/yield method. In this method, the area harvested in a particular crop is simply multiplied by the anticipated yield per area unit (usually hectares) for that crop to get the expected production. It should be noted that this method uses the area harvested rather than the area planted. Some countries have not reached the level of precision in their production estimates to differentiate between area planted and area harvested, but in the cases where both sets of data exist, the harvested area data should be used. Estimates of area planted may be the only data available early in the growing season, although for updates and historic estimates, area harvested should be used whenever possible.

Area/yield estimates are often provided by ministries of agriculture or in-country agricultural production projects. The primary source of this data may be field surveys, remote sensing activities, satellite imagery or agrometeorological forecasting. Where these data are unavailable, restricted or simply unreliable, the analyst's task is much more formidable. In most cases, food needs analysts will not have the resources available to carry out this type of primary data collection and will have to rely on another option for estimating production. Only experienced agronomists or analysts with the time and resources to make regular and sustained visits to the field or to interpret remote sensing or satellite imagery should attempt yield and area calculations of their own.

A third method for assessing gross domestic production, post-harvest method, is most relevant in countries where marketing boards play an important role. This method attempts to quantify the different uses of production after harvest in order to estimate total production. Summing sales to government marketing boards, local transactions and rural utilization (gross on-farm consumption plus build-up or drawdown of stocks) can provide some estimate of total gross domestic production.

Although data on sales to government marketing boards are usually available and may provide some indication about trends in current year production, data for on-farm stocks, consumption and local sales are extremely difficult to find and often subject to dispute. If government marketing boards historically purchase a certain percentage of production, data on current year marketing board purchases could allow the analyst to extrapolate total current year production, but the accuracy of this type of extrapolation is questionable. In

years of poor harvests, the percentage sold to the marketing board is likely to decrease. Another disadvantage in this method is that it is difficult to complete until the harvest is in, which may be too late for many food needs assessments.

In the absence of reliable data on the current year's production, projections or estimates can be based on historical information, using the trend extrapolation method. The results of this method must be interpreted carefully and may not be as reliable as the area/yield analysis described above. The implicit assumption in the trend extrapolation method is that historic production trends will be useful in determining current year production levels. In some cases, this will be accurate. In many other circumstances, production levels will be a factor of agricultural inputs, pricing policies, weather and so forth, and will differ significantly from historic trends.

One of the easiest ways to make a preliminary determination of whether a trend extrapolation method might be useful is to graph the historic production levels for a specific commodity. The trend method of projection can be linear (if agricultural production appears to be changing each year by a relatively fixed amount), or non-linear (in all other cases). If production does not appear to change significantly from one year to the next, but instead fluctuates around a typical level, a five-year average may present the most accurate picture of gross production.

Finally, if official crop forecasts or estimates are not available and other information is not adequate to enable the analyst to estimate crop production based on any of the alternatives outlined above, production must be estimated on the basis of whatever information is available. It may be necessary for the analyst to form a simple judgement of the extent to which production is expected to fall short of or exceed some commonly-held opinion of the "normal" production level.

Such an estimation of the expected variation from norm may be best accomplished through interviews with farmers, extension officers, relief workers, or other individuals closely familiar with the agricultural setting over the historical period. Care must be taken to assure that the analyst and the respondents hold a similar view or definition of "norm." It is not always best to speak in terms of some technically derived, base period average familiar only to the experienced country analyst. Instead, and especially in the case of small farmers, it may be easier to evaluate current year production in terms of the previous year's harvest. A question such as "Will this year's harvest be better or worse than last year's harvest, and by how much?" is more likely to yield accurate results than that of "How does this year's harvest compare to normal?" In the latter case, there is no way to assure that the farmer and the analyst have the same conception of normal.

The value of such subjective analysis is only recently gaining recognition. Recent studies from the World Bank and other institutions suggest that farmer interviews, when properly conducted, more closely project actual production levels than other methods commonly employed. However, in the absence of the properly trained farmer interviewer, such analysis is often less accurate than the alternative methods outlined above and should be attempted only where no acceptable alternatives exist. Even then, care must be taken to collect and evaluate all available information, generated locally and abroad, before any conclusions are derived.

Many in-country groups and international organizations track historical rainfall levels and analyze remote sensing and agrometeorological data which could be helpful to the analyst attempting early estimates of agricultural production. Several early warning projects have been established over the past several years, including the USAID Famine Early Warning System (FEWS) project, the FAO Global Information and Early Warning System, as well as other in-country projects. While this type of information may not always provide hard numbers on production levels, it can give an indication of the direction and degree of magnitude of changes from past years. Such subjective estimates might be all the analyst has to work with when making early forecasts of production. Revisions can be made when more concrete information is available.

Table 2-7

GROSS DOMESTIC PRODUCTION	
YEAR OF ANALYSIS 19	COMMODITY
(1) Official or direct estimate -or- (2) Area/yield method Area harvested (hectares) ×Yield (metric ton/hectare) (0.000) =Gross domestic production -or- (3) Post-harvest method Sales to government marketing board +Local sales +On-farm stocks +On-farm consumption =Gross domestic production -or- (4) Trend extrapolation methods (1) Linear (2) Non-linear (3) Base period average Specify option (1,2, or 3) ____ Gross domestic production -or- (5) Variation from norm Expected percentage of norm (0.00) ×Norm value =Gross domestic production	
Specify option (1,2,3,4 or 5) ——→	
GROSS DOMESTIC FOOD PRODUCTION	

Non-Food Use. Some portion of gross domestic production is likely be used for seed, animal feed and industrial processes, while another volume will be lost after harvest due to waste, pests, spoilage, etc. Such non-food usage must be subtracted from gross production in order to arrive at the net domestic production available for human consumption. Table 2-8 shows the components of the non-food uses worksheet. The equation for determining total non-food use is:

Seed saved for subsequent year
\+ Feed use
\+ Post-harvest losses
\+ Industrial use/processing losses
= **Non-food use**

In some countries, data on the four categories of non-food use will be available or can be calculated. Alternative methods for these calculations are presented below. If disaggregated data on the four non-food use variables are not available, an aggregate percentage for all losses can be applied. Aggregate percentages, available from FAO and other sources, should be used with caution because they can overestimate actual losses in years when the food supply for human consumption is constrained and underestimate losses in years with bumper harvests.

Seed

The amount of the harvest reserved for seed use in the following year must be deducted from gross domestic production. Only seed that comes directly from the current year production should be deducted; seed grown on multiplication farms expressly for seed use should not be subtracted, nor should any grain imported for use as seed. The estimate of seed saved may need to be adjusted if farmers are forced to replant because of late or sporadic rains. In such cases, two or more seedings may take place and each should be reflected in the estimation of seed saved.

Three methods are available to calculate the amount of production saved for seed. The first is an official or direct estimate. As in the case of production, this option allows the analyst to input a number calculated outside of the methodology.

The second method is to calculate seed saved as a share of production. The FAO, some governments and local organizations maintain data on the average percentage of total production historically saved for seed. This method is easy to use, but is not always accurate. The amount of seed saved does not vary as a function of production. After a bumper crop, farmers normally will not reserve more production for seed use in the following year and likewise, after a drought year they will not necessarily save less. Instead, the amount of seed saved for the coming year depends more upon the area the farmer anticipates planting in the that year.

Table 2-8

NON-FOOD USE

YEAR OF ANALYSIS: 19__	COMMODITY
(1) AGGREGATE METHOD:	
(1) Official or direct estimate -or- (2) Share of production method Gross domestic production x Estimated % of production (.00) = Total non-food used (all sources)	
Specify option (1 or 2) → TOTAL NON-FOOD USE (AGGREGATE)	
(2) DISAGGREGATE METHOD:	
(A) SEED USE: (1) Official or direct estimate -or- (2) Share of production method Gross domestic production x % of production saved as seed (.00) = Total seed use -or- (3) Area norm method Seeding rate (metric ton/hectare) x Area to be cultivated in next year (ha) = Total seed use	
Specify option (1,2 or 3) → Total SEED Use	
(B) FEED USE: (1) Official or direct estimate -or- (2) Share of production method Gross domestic production x % of production used as feed (0.00) = Total feed use -or- (3) Feeding rate method Livestock numbers (head) x Feeding rate (metric ton/head) = Total feed use	
Specify option (1,2 or 3) → Total FEED Use	
(C) POST-HARVEST LOSSES (1) Official or direct estimate -or- (2) Share of production method Gross domestic production x % of production (.00) = Total Post-Harvest losses	
Specify option (1 or 2) → Total POST-HARVEST losses	
(D) INDUSTRIAL USES/PROCESSING LOSSES (1) Official or direct estimate -or- (2) Share of production method Gross domestic production x % of production (.00) = Total industrial/processing losses	
Specify option (1 or 2) → Total INDUSTRIAL/PROCESSING losses	
NON-FOOD USE (DISAGGREGATE) (A+B+C+D)	
Specify option (1=AGGREGATE or 2=DISAGGREGATE) →	
TOTAL NON-FOOD USE	

The third method for calculating seed rates, known as the area/norm method, is the most accurate. It requires an estimate of the area to be planted in the subsequent year and the normal quantity planted per hectare. Data on seeding densities are usually easy to find in-country; otherwise country-specific estimates from FAO can be used.

Feed

The amount of gross domestic production used for animal feed is also deducted when deriving a value for net food production. Only food which otherwise would have been available for human consumption is subtracted here. Forage, husks or wild grasses are not included in gross domestic production and, therefore, need not be subtracted. An official or direct estimate may be available from the government or another source. However, the most common method for estimating feed use is by using a share of production calculation. Governments often maintain a standard estimate of feed use as a percentage of total production. This value is simply applied against actual or expected production to get an estimate of the proportion of gross production used for animal feed. Some precision is lost here since the amount of total output used for feed probably does not vary as a function of production as much as a function of the number of animals.

A more accurate method of determining the portion of gross agricultural production consumed as animal feed would be to multiply the number of animals by some estimate of consumption, using the feeding rate per animal method. In countries with large livestock production or commercial livestock sectors, sufficient data might available to use this method.

Industrial Uses/Processing Losses

Any portion of gross agricultural production that enters the industrial process only to re-emerge in non-edible form (i.e. soap, fuel, etc.) should also be deducted from gross production when determining the domestic production available for human consumption. Agricultural commodities that are merely processed before being consumed are dealt with in a different fashion. These commodities are not excluded from the analysis, however any portion of them lost or rendered inedible through processing should be subtracted from gross domestic production when assessing the amount of production available for consumption.

An official or direct estimate of industrial uses/processing losses might be available from the government or directly from the factories. If not, it might be possible to obtain a fairly reasonable estimate of industrial uses based on some assessment of their historical share of production.

The analyst should be careful not to recount milling losses at this point. Milling losses are indeed processing losses and would appear in this category if not for the fact that they are dealt with independently elsewhere in the analysis.

Post-Harvest Losses

Losses occurring between the time the crop is harvested and the time the food reaches the consumer - not including the standard milling losses which were discussed previously - must also be deducted from gross domestic production. These include losses from insects, rodents, molding, spoilage and simple mishandling.

Data may exist for these losses on a category by category basis. If not, the analyst can rely instead on an aggregate approach based upon the country-specific share of production estimates provided by the FAO or the local government. Some care should be taken in the aggregate approach since losses tend to increase (as a percentage of gross production) in years of good harvests and decrease when harvests are bad. As always, an official or direct estimate can be used.

Net Change in Stocks

Stocks must be included in the estimate of domestically available food. With the exception of rice, grains are usually stored in the unmilled form, although occasionally wheat flour or another milled grain will be held. Table 2-9 shows the unmilled stock worksheet; an identical worksheet is included for milled stocks in Appendix A.

For each historical year, stocks left at the end of the year (closing stocks) less stocks at the start of the year (opening stocks) will give the **net change in stocks** during the year. A negative net change in stocks (i.e., closing stock balances less than opening stock balances) indicates that a stock drawdown has occurred; a positive net change (i.e., closing stock balances greater than opening stock balances) means that stocks have been built up. For the historical years, the closing stock balance in one year becomes the opening stock balance for the following year. The equation for determining stocks is:

Closing stocks
− Opening stocks
= **Net change in stocks**

If data on opening and closing stock levels are not available, the analyst can use an official or direct estimate of the net change in stocks. Whenever data are available, both opening and closing figures should be included.

In the current year, the analyst probably will have to predict what the closing stock balances will be at the end of the period of analysis. If significant opening stocks exist and domestic production levels are down, a stock drawdown might seem likely. In this case, the estimated closing stock level will be lower than the opening stock balance (a negative net change) indicating additional food was available for consumption.

Stocks which accumulate from the current year's production should not be included. Current year surplus production will appear on "the bottom line" as an overall commodity surplus. When the analysis is updated in the subsequent year, the current year becomes the first historical year and surpluses can be factored in as opening stocks.

Five types of stocks should be included in the analysis: public (government) working, public reserve, donor, commercial and on-farm. Stocks may not be stored by each of these five sources in every country, but as a potential holder of food, each should be considered. If disaggregate data on stocks are not available by source, total stocks can be included under the **aggregate method**. The analyst should attempt to find out who holds stocks included in the aggregate total in order to determine whether other important sources have been missed. Stock data that appears to be an aggregate total might refer only to official stocks.

	Net change: Public working stocks
+	Net change: Public reserve stocks
+	Net change: Private stocks
+	Net change: On-farm stocks
+	Net change: Donor
=	**Total net change in stocks**

In almost every country, it is very difficult to get reliable data on commercial (private trader) and on-farm stocks. Because of the paucity of data, some analyses leave out these two stock figures. While the hesitancy to hazard guesses is understandable, in many cases a rough estimate is better than no estimate at all.

For example, after two years of bumper harvests, a country in Sub-Saharan Africa experiences a drought. Farmers in this country, accustomed to erratic weather conditions, are likely to have significant stores of grain on their farms from the two good years. If no estimate of on-farms stocks is included, the food deficit will be significantly overstated.

Public Working Stocks. Information on government working stock levels is usually available. Some governments have marketing agencies which hold working stocks to maintain prices, export surpluses and meet seasonal food requirements. These agencies may distribute and purchase large volumes of food during the marketing year, but only the difference between closing stocks and opening stocks is important in the balance sheet. The working stock balance of marketing agencies should not be expected to drop to zero at the end of the marketing season.

Public Reserve Stocks. Some countries maintain food security stocks to provide a buffer for deficit years or to guard against irregular deliveries of food aid. Governments may establish a target level for the stocks, such as a two-month or three-month supply of a basic grain. Food security stock levels are often seen as an

Table 2-9

NET CHANGE IN STOCKS: UNMILLED STOCKS

YEAR OF ANALYSIS 19	COMMODITY
(1) AGGREGATE METHOD:	
(1) Official or direct estimate -or- (2) Closing UNMILLED stock level (all sources) - Opening UNMILLED stock level (all sources) = Net change in UNMILLED stocks (all sources)	
(2) DISAGGREGATE METHOD:	
(A) UNMILLED PUBLIC WORKING STOCKS (1) Official or direct estimate -or- (2) Closing working stock level - Opening working stock level = Net change in working stocks	
(B) UNMILLED PUBLIC RESERVE STOCKS (1) Official or direct estimate -or- (2) Closing reserve stock level - Opening reserve stock level = Net change in reserve stocks	
(C) UNMILLED COMMERCIAL STOCKS (1) Official or direct estimate -or- (2) Closing commercial stock level - Opening commercial stock level = Net change in commercial stocks	
(D) UNMILLED ON-FARM STOCKS (1) Official or direct estimate -or- (2) Closing on-farm stock level - Opening on-farm stock level = Net change in on-farm stocks	
(E) UNMILLED DONOR STOCKS (1) Official or direct estimate -or- (2) Closing donor stock level - Opening donor stock level = Net change in donor stocks	
NET CHANGE IN UNMILLED STOCKS (A + B + C + D + E)	
Specify option (1 = aggregate, 2 = disaggregate) →	
NET CHANGE IN UNMILLED STOCKS	

important government policy decision, so data on targets, drawdowns or replenishments are usually available.

Donor Stocks. Stocks of food aid may exist at the start of the year. These stocks may be held either by Private Voluntary Organizations (PVOs, also known as Non-Governmental Organizations) or by government relief agencies. In some cases, these stocks can result from food aid that is programmed in one year but is not distributed until the following marketing year. Frequently, this occurs when food aid is programmed according to the fiscal year of the donor, which may not coincide with the marketing year used in the analysis. Shipping schedules and other logistical considerations might also cause the temporary build-up of donor stocks.

Private Commercial Stocks. Commercial traders often hold large quantities of stocks, although data might not be as readily available as data on government or donor stocks. When many individual traders are involved, getting an aggregate total can be difficult. In many cases, private trader stocks do not vary widely from year to year; that is, they buy approximately as much as they sell so the net change in stocks is minimal. The government might have estimates of private commercial stocks, which can then be verified with individual trading companies.

On-Farm Stocks. As mentioned, on-farm stock figures are among the most difficult data to obtain. In rare instances, surveys have been conducted and estimates can be made. In the majority of cases, however, a subjective assessment is necessary. Studies of farmer behavior by research groups, field interviews or discussions with aid workers might give some indication about "normal" on-farm stock levels.

In countries with recurring food deficits, farmers are likely to keep relatively large stocks, perhaps enough to meet their own families' needs for a year or more. In these cases, on-farm stocks probably will not drop to zero unless deficits persist for several years. This generalization does not apply in all cases; prices, the availability of food substitutes, past experiences and expectations of the future can all cause differing farmer behavior.

Once again, an educated guess probably will be the only alternative available. When the analyst has reason to believe that farmers are holding significant stocks, a guess is likely to be more accurate than an assumption of no on-farm stocks. The analyst should carefully document assumptions made about on-farm stocks. Because it is an important and often very subjective variable, sensitivity analyses can be useful.

Exports

The final variable in the calculation of domestically available food is food exports. Any food that is exported will not be available for consumption by humans in-country, so it must be deducted from domestic production. Food can be exported through official channels, such as government trading companies and certified private traders, or unofficially, through unregistered traders or private citizens.

Exports, both registered and unregistered, can be traded in milled or unmilled forms. Table 2-10 shows current year unmilled and milled export calculations.

Registered Food Exports. Historical data on food exported by the government or private traders are usually available from Ministries of Finance, Commerce or Trade or from international organizations. For the current year, official export targets might be available from these same sources. If such a figure is available and considered reliable, no calculations will be necessary and an official or direct estimate (option 1) can be used.

Table 2-10

COMMERCIAL FOOD EXPORTS	
YEAR OF ANALYSIS: 19	COMMODITY
(A) REGISTERED commercial food exports	
(1) Official or direct estimate	
MILLED commercial food exports	
- Milling extraction rate (m.e.r.)	
= MILLED commercial food exports (UNMILLED terms)	
+ UNMILLED commercial food exports	
= Total REGISTERED commercial food exports	
-or-	
(2) Trend extrapolation	
(1) Linear	
(2) Non-linear	
(3) Base period average	
Specify option (1,2 or 3) ——→	
Total REGISTERED commercial food exports	
-or-	
(3) Variation from norm	
Expected percent of norm (.00)	
x Norm value	
= Total REGISTERED commercial food export	
Specify option (1,2 or 3) ——→	
Total REGISTERED commercial food exports	
(B) UNREGISTERED commercial food exports:	
MILLED commercial food exports	
- Milling extraction rate (m.e.r.)	
= MILLED commercial food exports (UNMILLED terms)	
+ UNMILLED commercial food exports	
= Total UNREGISTERED commercial food exports	
TOTAL COMMERCIAL FOOD EXPORTS (A+B)	

If official estimates are not yet available for the current year, a trend extrapolation or historical average could be used. Graphing exports over the historical period can be useful in determining which type of trend or average should be used. If the graph clearly indicates annual increases or decreases in export amounts, a linear extrapolation may be accurate. If annual changes appear to move in one general direction but not in a linear fashion, a non-linear extrapolation may be appropriate. Finally, if historical data show no clear directional change, but appear to move randomly over a range, a simple average might be the best estimate of current year export levels. Of course, a number of factors can influence current year export levels - changes in commodity pricing, production amounts, etc. might be more important determinants than historic export levels.

For countries which are basically self-sufficient in a particular commodity, production estimates might provide useful information on potential export levels. The prospect of a bumper harvest might indicate an exportable surplus, while below normal production levels might cause exports to be curtailed. Although production data can be useful, it is necessary to consider the relationship between production and exports for each commodity individually. There may be cases where a government would chose to export a high-valued commodity to earn foreign exchange, even when faced with potential shortfall in domestic production.

Finally, a variation for trend or average can be used if the analyst has reason to believe that the results returned in the extrapolation option above will be biased by a certain percentage. For example, if a graph of historic exports shows a clear linear increase but the analyst believes levels will be 20% lower than the level that would be expected under "normal" conditions due to drought, this method might be useful.

Unregistered Food Exports. In some countries, contraband exports are significant. Obviously, concrete data will be difficult to find, but in some cases it is necessary to make an estimate based on qualitative information. It is important to get a sense of the order of magnitude of the unofficial trade. Is the trade limited to people from neighboring villages carrying small quantities of food across the border? If so, unregistered trade probably can be ignored. On the other hand, if large volumes of food are transported out of the country by truck or by ship, some estimate of quantity will be necessary.

Price data from neighboring countries are sometimes available and can lead to some general conclusions. If the bordering country faces a crop failure or a chronic deficit and transportation between countries is not a major constraint, the analyst often can assume that some unregistered trade exists. Similarly, if exchange rate differentials mean that a commodity is more expensive in a neighboring country, the analyst should investigate possible illegal trade. As in the case of on-farm stocks, it may be impossible to get a definitive estimate of the volume, but an educated guess based on qualitative information is almost always better than assuming that no trade exists.

Some commodities will be exported and imported. In these cases, the net direction of the trade should be assessed. Again, the order of magnitude is important. If imports at one border and exports at another seem to be of roughly equal proportions, unregistered trade probably can be ignored.

2.5 The Import Requirement

The import requirement is defined as the amount of food, in addition to the domestically available supply, necessary to meet the current year consumption requirements. This additional food could come from registered or unregistered commercial imports or, ultimately, from food aid. The import requirement is an intermediate calculation; it is simply the difference between the total consumption requirement and the total domestic food supply. In essence, the import requirement provides the analyst with a measurement of the country's self-sufficiency on a commodity by commodity basis. The equation is as follows:

Total consumption requirement
− Domestic food supply
= **Import requirement**

2.6 The Food Deficit or Surplus

Countries are usually expected to purchase as much food as possible commercially, before food aid is considered. After the import requirement is determined, the amount of registered and unregistered commercial imports is deducted. The remaining amount is the food deficit. The methodology has been developed so that the "bottom line" is the food deficit, therefore, a negative food deficit represents a food surplus. The equation is as follows:

	Import requirement
−	Commercial food imports
=	**Food deficit**

The alternative methods to calculate registered and unregistered imported food are described below and included on Table 2-11.

Registered Commercial Imports

Historical information on food imports is usually available from the Ministry of Finance, Trade or Commerce. For the current year, commercial imports levels can be difficult to estimate, depending on a variety of factors. As seen on Table 2-11, the methodology suggests six alternative ways to estimate commercial imports.

In the event of a shortfall in domestic production, some countries simply increase commercial purchases of food. Other countries may not have adequate amounts of foreign exchange available to increase commercial food imports. In both cases, it may be necessary to estimate the quantity of food the country could afford to import commercially.

International commodity prices also can be an important variable determining commercial import levels. If a country has consistently imported 100,000 tons of rice during the base period and world rice prices suddenly double, it is possible that historic import levels will not be maintained.

In countries where commercial imports do not vary widely from year-to-year, the government might have data on anticipated levels for the current year. Occasionally, important private traders can provide estimates on their expected import volumes or multilateral organizations such as the World Bank may have projections. In these cases, commercial imports can be included using method 1, an official or direct estimate.

In most situations, however, the analyst will have to calculate current year imports. One option available is the trend extrapolation (linear, non-linear or five-year average) method. If the country's commercial imports have been relatively stable over the base period, or have changed by some fixed level in each year, this method might be useful. However, if commercial imports levels were erratic during the base period, extrapolations might not prove useful. If the country's imports have changed by a more or less fixed absolute amount each year, the linear extrapolation method might be used. A non-linear extrapolation is recommended if commercial imports have changed by some fixed percentage annually. A simple average might be used if import volumes appear to fluctuate around some "normal" level during the base period. Again, graphing historical import levels can be useful.

The Usual Marketing Requirement (UMR) is another option for calculating current year commercial imports. The UMR is basically an average of the past five years of imports. Officially, it is part of an international agreement for some 40 developing countries which defines the minimum amount of food each country should import commercially before receiving food aid, under normal conditions. This minimum level is based on the average amount of commercial imports recorded during the past five years. The UMR defines the concept of "additionality," that is, that food aid must augment and not displace "normal" commercial food imports. Some food aid donors, including USAID, take the UMR into account when programming aid.

In non-emergency situations, the UMR is often a good indicator of the minimum expected current year commercial imports. In the case of food emergencies, countries might exceed their UMR by diverting resources from other expenditures to food imports. Likewise, countries facing deteriorating economic situations or higher imported food prices might have

Table 2-11

COMMERCIAL FOOD IMPORTS

YEAR OF ANALYSIS: 19__	COMMODITY
(A) REGISTERED commercial food imports:	
(1) Official or direct estimate	
MILLED commercial food imports	
× Milling extraction rate (m.e.r.)	
= MILLED commercial food imports (UNMILLED terms)	
+ UNMILLED commercial food imports	
= Total REGISTERED commercial food imports	
or	
(2) Trend extrapolation	
(1) Linear	
(2) Non-linear	
(3) Base period average	
Specify option (1, 2 or 3) →	
Total REGISTERED commercial food imports	
or	
(3) Usual Marketing Requirement (UMR)	
or	
(4) Commercial Import Capacity (CIC)	
or	
(5) Maximum historical value (year = 19__)	
Specify option (1, 2 or 3) →	
Total REGISTERED commercial food imports	
(B) UNREGISTERED commercial food imports:	
MILLED commercial food imports	
× Milling extraction rate (m.e.r.)	
= MILLED commercial food imports (UNMILLED terms)	
+ UNMILLED commercial food imports	
= Total UNREGISTERED commercial food imports	
TOTAL COMMERCIAL FOOD IMPORTS (A+B)	

difficulty meeting their UMR.

The most detailed and data-intensive method is to calculate the commercial import capacity. In this method, the analyst attempts to estimate the amount of food the country can afford to import given its financial and economic resources and its past performance. Several different organizations have developed methodologies to estimate commercial import capacity. A brief description of the methodology used in the FNA is included below. (See Appendix I for the equations used in the methodology for estimating commercial import capacity, as well as a description of the methodology used by USDA.) Because of the complicated nature of the calculations, the commercial import capacity is calculated on a separate worksheet (available upon request), the results of which can be transferred to the main commercial import worksheet.

The FNA methodology determines the amount of foreign exchange available for food imports through a four step process:

(1) Calculate total foreign exchange available in current year: Add projected current year merchandise export earnings, international reserves and commercial credits, and then subtract debt service payments due.

(2) Calculate necessary strategic reserves: Calculate the average of the reserve/commercial import ratios for the base period.

(3) Calculate foreign exchange available for food: Average the historical ratio of food imports to total imports and apply to current year.

(4) Convert foreign exchange available for food imports to metric tons: Divide the foreign exchange available for food imports by the CIF price of the commodity at the main import location.

Finally, the analyst might want to assign the maximum historical value to the current year imports of a specific commodity. For example, if the country imported a record amount of rice during a drought four years ago, in some situations, it would be reasonable to assume that the country could import the same amount during this drought year. Of course, the analyst would need to make a comparison of the overall economic situation in the year of the maximum imports and the current year before proceeding with such an assumption.

Unregistered food imports

Food imports arriving in the country illegally should be considered. Like unregistered food exports, no hard data are likely to exist, but the order of magnitude should be assessed. If inflows of food appear to be significant, they should be estimated. Again, although the number is unlikely to be precise, some qualitative estimate is usually better than ignoring potentially large amounts of additional food arriving in the country.

A Note on Food Aid

Food aid is included on the historical food balances only. Figure 2-12 shows the worksheet for food aid in the historical years. On the current year balance, the amount of food available domestically is added to the expected commercial food imports; this total is deducted from the consumption requirement to determine the deficit. For the current year, the food deficit could be seen as the food aid need, although there is no guarantee that donors will meet the entire deficit.

Figure 2-12

FOOD AID	
YEAR OF ANALYSIS 19	COMMODITY
MILLED food aid - Milling extraction rate (%) =MILLED food aid (UNMILLED terms) +UNMILLED food aid	
=TOTAL FOOD AID (UNMILLED TERMS)	

2.7 Summary

All of the equations presented in this chapter are summarized below:

The Key Equations:	
Population × Per Capita Requirement = **Total Consumption Requirement**	Net Domestic Production − Net Change in stocks − Total Food Exports = **Domestic Food Supply**
Total Consumption Requirement − Domestic Food Supply = **Import Requirement**	Import Requirement − Commercial Food Imports = **Food Deficit**

Other Equations:	
Gross Domestic Production − Non-Food Uses = **Net Domestic Production**	Closing Stock Balances − Opening Stock Balances = **Net Change in Stocks**
Seed Saved for Subsequent Year + Animal Feed + Post-Harvest Losses + Industrial Uses/Processing Losses = **Non-Food Use**	Net Change: Public Working Stocks + Net Change: Public Reserve Stocks + Net Change: Commercial Stocks + Net Change: On-Farm Stocks + Net Change: Donor Stocks = **Net Change in Total Stocks**

Chapter 3

The Software Documentation

3.1 Overview

The concepts behind the FVA Food Needs Assessment methodology have been described in Chapter 2. This chapter provides detailed information on the installation and use of the accompanying software, which is available as a Lotus 1-2-3 template. This template is a **MENU-DRIVEN** system, used in conjunction with Lotus 1-2-3, for entering, editing and calculating assessment data. The template allows the user to view the assessment analysis in tabular, report and graphical forms. Earlier versions of the template are still methodologically sound but the current version (2.0) is updated to reflect users' suggestions and to provide greater ease of use.

This discussion assumes that the user is familiar with the basic concepts and operation of DOS and Lotus 1-2-3. It also assumes that the Lotus 1-2-3 and PrintGraph programs have already been properly installed and configured for the user's computer equipment.

There are two disks in the FNA Template, FNA Disk 1 and FNA Disk 2. (See *Figure 3-1* for a list of all the files contained on disks 1 and 2.)

This chapter will detail how to install the FNA Template, general topics relating to the template, procedures for loading the template under Lotus 1-2-3 and a walking tour through each of the template's modules.

3.2 Installation

The following instructions will indicate how to properly install the Food Needs Assessment (FNA) Template for the computer. "Installing" software for the computer prepares the software to run with the particular equipment available. It is necessary to perform the installation only once for each computer system. Before beginning, it is necessary to verify that the computer equipment is capable of running the template.

Software Requirements:

- The FNA template disks 1 & 2
- Lotus 1-2-3 release 2.0 or later
- Lotus PrintGraph

Hardware Requirements:

- IBM PC or compatible with (2) 360K diskette drives
  - or -
  IBM PC, XT or compatible with hard disk
- Minimum 512K RAM
- Graphics card and screen
- Graphics printer

This installation section refers to using the template on an IBM or IBM compatible system, and references MS-DOS commands. The FNA Template is compatible with Lotus 1-2-3 running under a WANG system. WANG system users should make appropriate adjustments, where necessary, to perform similar DOS tasks on their machines. Prior to using the FNA template, Lotus 1-2-3 must be properly installed and configured for the computer system. Refer to the Lotus 1-2-3 guide for details.

STEP 1: Making a backup copy

After verifying the software and hardware requirements, make backup copies of the two distribution diskettes. The FNA Disk 1 and FNA Disk 2 are not copy protected.

Use the DOS DISKCOPY command to create a backup of each diskette. Start the computer in the normal manner. With the DOS disk in drive A, and at the A> prompt, type:

DISKCOPY A: B:

At the prompt, remove the DOS disk. Insert one of the two FNA distribution disks as a source disk in drive A and insert a blank disk in drive B. Repeat this procedure for the other distribution disk. Consult the DOS manual for more details.

Store the original diskettes in a safe place and use the duplicates from now on. DO NOT place a write protect tab on either of the FNA disks.

STEP 2: Installing the FNA Template.

It is necessary to follow a slightly different installation procedure for two disk drive systems and hard disk systems.

Figure 3-1

Contents of the FNA Template Disks.

File		Description	FNA DISK #
Name	Type		
AUTO123.WK1	System	Template main menu	1
FNAGEN.WK1	System	Parameters module	1
FNAHIST.WK1	System	Historical years module	1
FNASUMM.WK1	System	Summary reports & graphs module	2
FNACURR.WK1	System	Current year module	2
FNAGEN.DAT	Data	Parameters data	1
FNA0000.DAT	Data	New historical year data	1
FNA19??.DAT	Data	Existing historical year data	1
FNA19??.BAL	Data	Existing historical year balance	2
FNATREND.DAT	Data	Base period trend data	1
FNACURR.BAL	Data	Current year balance	2
FNAGDPC.PIC	Graph	Gross domestic production cereals	2
FNAGDPN.PIC	Graph	Gross domestic production non-cereals	2
FNAIMPC.PIC	Graph	Commercial cereal imports	2
FNAIMPN.PIC	Graph	Commercial non-cereal imports	2
FNAEXPC.PIC	Graph	Cereal exports	2
FNAEXPN.PIC	Graph	Non-cereal exports	2
FNAAIDC.PIC	Graph	Cereal food aid	2
FNAAIDN.PIC	Graph	Non-cereal food aid	2
FNAPCCC.PIC	Graph	Per capita consumption of cereals	2
FNAPCCN.PIC	Graph	Per capita consumption of non-cereals	2
FNACONVS.PIC	Graph	Per capita consumption vs production	2
FNAIMVSF.PIC	Graph	Commercial Imports vs Food Aid	2
FNAPDIET.PIC	Graph	Commodity shares in total diet	2
INSTALL.BAT	Install	Installation program	1 & 2
F.DAT or H.DAT	Flag	Two drive or hard disk flag	1
REP&GRA.DAT	Flag	Base period or assessment summary flag	1

Two Diskette Drive Installation

Place the Lotus 1-2-3 SYSTEM disk in drive A and the FNA Disk 1 in drive B. Transfer the DOS prompt to drive B by typing B: (Enter). From drive B issue the command:

B:> INSTALL F (Enter)

Two diskette system installation is now completed; FNA Disk 2 is not needed during installation.

Hard Disk Installation

During a hard disk installation, the files contained on both FNA disks will be copied to a directory on the hard disk. It is recommended that FNA files be placed in a separate directory of their own. If a suitable directory does not exist, create one using the DOS MD or MKDIR command. Make certain the DOS prompt is in the root directory of the hard disk (C:). Type:

C:> MD \ <directory name> (Enter)

Choose a directory name containing no more than 8 characters; we recommend FNA for the name of this directory on the installation command line.

After creating a suitable directory, place the FNA Disk 1 in drive A. Transfer the DOS prompt to drive A by typing A: (Enter), and proceed to install the FNA Disk 1 to the hard disk directory by typing the following:

A:> INSTALL H (drive\directory name) (Enter)

example A:> INSTALL H C:\FNA (Enter)

The message "Now copying FNA Disk 1 files" will be displayed. Following this will be a prompt telling the user to place the FNA Disk 2 in drive A and then to press (Enter) to copy the contents of the disk. After this is done and the FNA Disk 2 files are copied to the hard disk, installation is complete.

3.3 General Topics

Before instructions on loading the template can be given, several general topics must be covered.

Template Modules

Throughout this discussion, references will be made to tables within the several template modules. Replicas of these tables can be found in the Worksheets, Appendix A.

Each template module will be discussed briefly below. The Walking Tour, section 7, provides more detailed descriptions of them.

The FNA Template consists of several main worksheet files and supplementary data files. It is important that users not delete or rename any of the original files. Two-diskette system users must maintain files on the disk to which they were originally assigned.

At the beginning of an assessment, the AUTO123 file is loaded and the FNA logo and the template main menu appear on the screen. From this template main menu, the user can access a number of individual modules.

The first module users should examine is the parameters module. This file will be automatically retrieved when the user selects (Parameters). The parameters module contains basic country-specific information including commodity names and coefficients, specification of current and historical years, and population.

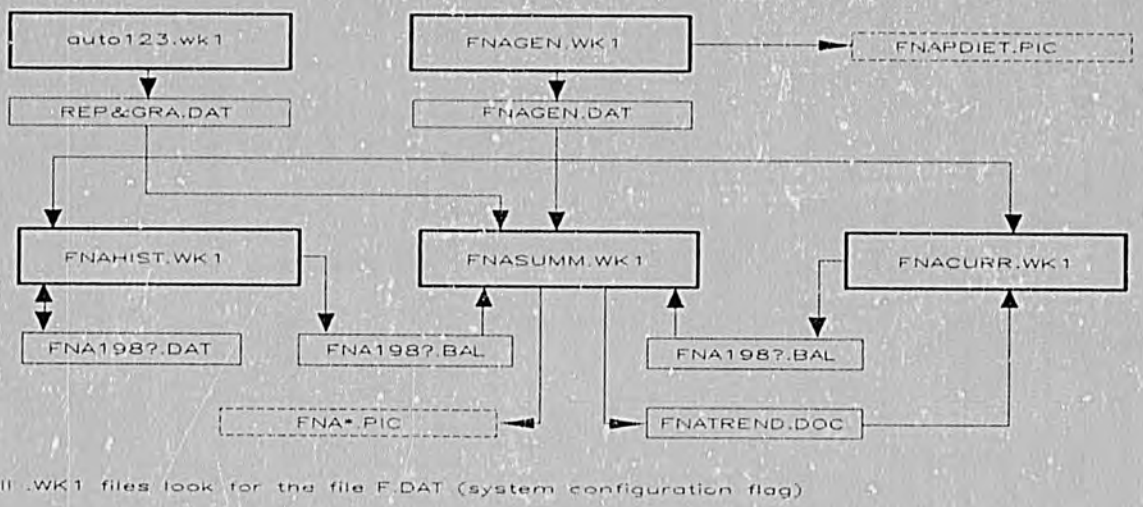
The second module is the historical years module. Historical information for each of the five historical years is entered through this module. This module is retrieved when the user selects (Historical) - (Base Year). This module will load an existing historical year's data or allow the user to enter information concerning a new historical year. *The FNA Template assumes that data for five historical years is present in the system prior to running either the base year summary or performing a current year analysis.*

After historical information for the five years is entered into the system, it can be viewed in summary form using the third module-the historical summary module. This module is retrieved when the user selects (Historical) - (Summary). It provides views of each of the five historical years' balance tables as well as up to 10 "by commodity" balances.

In addition, there are a twelve different summary graphs available that include data for all historical years plus a base period average. (This module optionally uses current year balance data to replace the base period average when accessed through Reports and Graphs in the template main menu. For examples of each of the summary graphs, see *pages 42-45.*)

Figure 3-2

The Overall Template Design



The next module in the template is the current year module. This module incorporates trend data from the base year summary and structures the current year analysis. The general design of the template is shown graphically in *Figure 3-2*.

The last module is the reports and graphs module. This module summarizes all historical and current data in tabular and graphical form. The user has the option of including base period averages or current year data in the sixth column.

Menus

The FNA Template is a completely menu-driven system. The menus have the same format as standard Lotus 1-2-3 menus. Selections are made either by moving the cursor to highlight the desired option and pressing Enter or by typing the unique first letter of the desired menu option. Similarly, pressing ESC allows the user to move backwards through the menu tree.

Throughout the template, there are menus that enable the user to move into the various modules, to view specific tables or graphs, or to perform printing or saving functions. A menu will be displayed at all times, except during table data entry. After selecting an Enter/Edit/View menu choice, the user is presented with a data entry table. At the bottom of each table is a reminder that Alt-M is used to post the menu. After data entry, the user should press Alt-M to repost the menu and continue the analysis.

An added enhancement to the FNA Template menus is that they remember the user's previous menu selection. When the user presses / in Lotus 1-2-3, it produces the standard first menu, regardless of which menu choice was most recently used. This feature is useful because each menu option is distinct and self-contained.

Within the FNA tables of the template, a user can press Alt-M and the menu from which the most recent selection was made is displayed. This feature greatly eases use of the template. For example, several levels down the menu tree may lie a menu for viewing STOCKS data. There are separate menu options for viewing the milled, unmilled and total tables and for accessing an explain screen. The user is likely to find it very convenient to access first the milled and then the unmilled tables without having to traverse the menu tree in between.

Entering Data

Template users enter assessment information into the various tables provided. Worksheet cells within a table are divided into three categories. The first category is labels, which includes row and column titles and lines. The second

category is formulas. Both label and formula cells are protected. Cell protection means that data cannot be entered in these cells. If the user attempts to enter data into a protected cell, Lotus 1-2-3 produces an error message and does not accept the input. Note that some unprotected data entry cells in the historical year module contain cell references, which appear like formulas. The user should ignore these formulas and overwrite them with the appropriate data.

Knowledgeable users can deactivate cell protection by using the */ worksheet global protection disable* command. Note that label cells are protected for the user's benefit and to prevent accidental changing of formulas.

The third category of cells in the table is data cells. These cells are unprotected and may appear highlighted on the monitor. Data can and should be freely entered in them.

Note that worksheet titles are activated when the user is presented with a data entry table. These titles allow the user to view the row and column titles as he or she enters data across commodities. If desired, titles can be removed using the */ worksheet titles clear* command.

Specify Options

As described in Chapter 2, the FVA methodology offers several alternative methods for calculating each variable in the historical and current year food balances. In many circumstances, the user is encouraged to collect the data necessary for several approaches, although for calculation on the spreadsheet only one alternative can be carried forward. For variables with multiple alternatives for calculation, the user is prompted with "*Specify option ----> (1,2,3, etc ...)*". The calculation contained in the option specified will be carried forward automatically to relevant tables. By simply changing the options specified, the user can perform sensitivity analyses with data supplied from different sources or generated through different methods of calculation.

Notes

There is a one character wide column between the table row titles column and the first commodity column. This column is designed to contain any notes the user may wish to include to explain the data for that row. Due to the single character display width of the column, the user should begin each note with an asterisk (*). For example, if the user types:

**Source: Ministry of Agriculture page 37*

the screen will display only the asterisk. To view an existing note simply move the cursor to the note's cell and the entire text of the note will be visible at the top of the screen in the Lotus cell contents line.

Hidden Columns

The user may also observe that certain columns within a given table may be hidden. Hidden columns are used to remove unneeded commodity columns when less than five cereals or less than five non cereals is contained in the assessment. While hidden columns are not displayed during most worksheet operations, they are displayed, with an accompanying asterisk (*), during certain Lotus 1-2-3 menu options, such as the COPY command, and can be referenced in formulas. Columns can be displayed by using the */ worksheet column display* command.

Help

The FNA Template provides the user with help in two different ways. The first source of help is this documentation; if the user requires more information about a particular element of the template, he or she is likely to find it elsewhere in this manual.

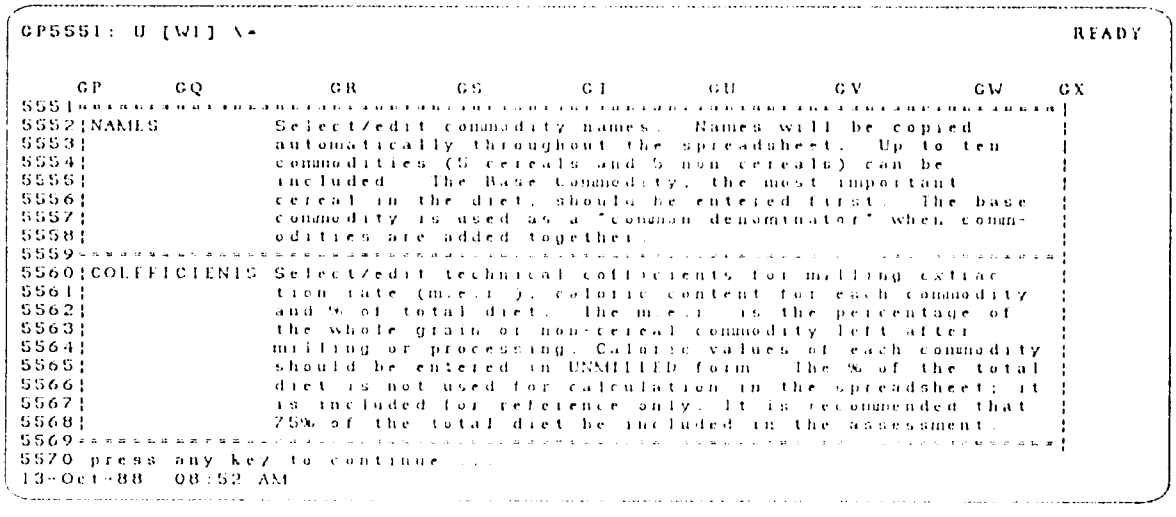
The second form of help is available throught the **EXPLAIN SCREENS**. At most of the menus from which the user will enter, edit or view data there is an option for (Explain). Selecting this option produces an explain screen with more information relating to the menu choices and related tables. The user can return from the explain screen by pressing any key. An example of an explain screen from the parameters module is found in *Figure 3-3*.

Printing

The main menu of most modules contains a print option. There will usually be a parallel set of printing menus to those for entering and viewing data tables. There may also be a **PRINT ALL** option.

Figure 3-3

Sample Explain Screen



Depending on the number of commodities in the assessment, it may be necessary to use compressed printing (or equivalent if supported by the printer) in order to produce a desired format. The template uses a predefined print range, but specifications of printer margins, setup strings and headers and footers can be altered at the discretion of the user through the standard Lotus 1-2-3 print commands.

Graphing

The summary module produces a dozen graphs for the user. After each graph is viewed, there is a prompt asking if this graph should be saved for later printing. Graphs are saved to predefined .PIC filenames. Saved graphs can be printed at any time using the Lotus 1-2-3 PrintGraph program. (See the Walking Tour step 7 or the Lotus manual for details on the use of PrintGraph.)

Macros

The FNA Template's functions are produced through the use of the Lotus 1-2-3 macro programming language. Each module contains a set of these macro commands, which control that sheet's operations. Users unfamiliar with macros should not modify these commands in any way. See Appendix K for more details on the macros used in the template.

Trouble Shooting

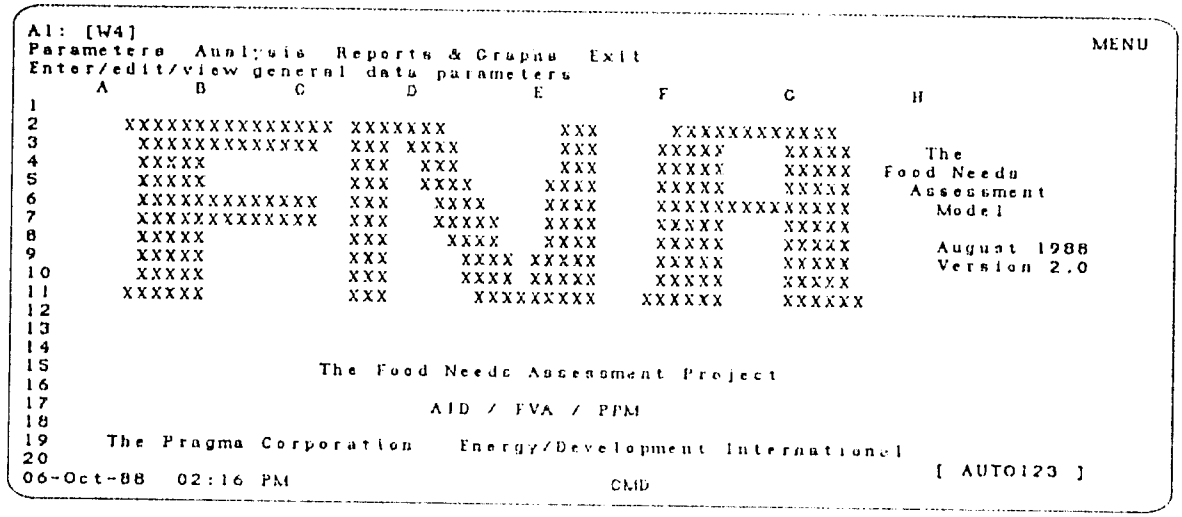
If "unexpected" events take place while using the template, refer to this documentation for assistance. If a particular worksheet file appears to be damaged or its macros inadvertently modified to produce a malfunction, make a new copy of the worksheet involved from the original distribution diskettes.

Making Changes

The FNA Template has been designed to be as flexible as possible and to support a variety of different forms of assessment. There are some elements of the template such as row or column titles that can be changed by the careful user. It is strongly recommended that no other types of changes be undertaken, including changes to formulas or table layout. Refer to Appendix K for a technical guide to the template structure before considering the implementation of any other changes.

Figure 3-4

The FNA Logo and Template Main Menu



3.4 Loading the FNA Template

To access the FNA Template, Lotus must be called up (loaded) first. With 640K RAM, Lotus can be loaded through the Lotus Access System. The Access System provides the user with direct access to Lotus 1-2-3, Print-Graph and other Lotus Utilities through a common menu. Enter (Lotus) at the DOS prompt. The Lotus Access System should appear on the screen. Select (123). A blank spreadsheet or the FNA logo should appear on the screen.

If the system does not have 640K RAM, the Lotus access system should not be used. To load the Lotus 1-2-3 spreadsheet program from a two disk system with 512K, insert the Lotus System disk in drive A and FNA Disk 1 in drive B and type (123) from the A:> prompt. From a hard disk system with 512K, type (123) from the Lotus program directory prompt. A blank spreadsheet or the FNA logo should appear on the screen.

After Lotus 1-2-3 is loaded, the FNA Template logo should be displayed as in *Figure 3-4*. If a blank spreadsheet has appeared instead of the FNA logo, the user must ensure that the default directory setting is appropriate for use with the FNA template. If the FNA template was installed on a hard disk, the appropriate default directory is that which contains the template files (FNA was suggested). If the FNA template was installed on a two-disk system, the appropriate default directory is B:.

To set the default directory in the current (blank) spreadsheet, type a forward slash (/) to post the master spreadsheet menu. From the master menu select (File) then (Directory) and type the appropriate default setting as discussed in the paragraph above. Press (Enter) to confirm the selection.

The user may now load the FNA template. From the blank spreadsheet post the Lotus master menu again by typing a forward slash (/). From the master menu select (File) then (Retrieve). The menu line should now contain a listing of FNA worksheet files. Select AUTO123 and press (Enter). The FNA logo will now appear.

After the FNA Template appears, two-diskette system users will be prompted to remove the Lotus 1-2-3 SYSTEM disk from drive A and insert the FNA Disk 2 into the drive. The Lotus 1-2-3 SYSTEM disk is not needed once Lotus 1-2-3 has been loaded into memory.

3.5 Walking Tour

The sections that follow will guide the user through an assessment. Explanations of menu options and sample output is contained throughout. Information presented in earlier stops on the tour may not be repeated at similar points later.

Overview of the Assessment

1. The first stop on the assessment is the template main menu. From this menu all of the template modules can be accessed. After the following brief overview of the template modules, each section will be discussed in detail.

2. Selecting [Parameters] will load the parameters module. This should be the second stop on any assessment. In the parameters module the user enters country-specific information that will apply to the entire assessment. For example, within the parameters module, the user will enter the names and conversion coefficients for all commodities, designate the five historical years of the assessment and specify populations for those years.

3. Selecting [Analysis] - [Historic] - [Base Year] loads the base period historical years module. This should be the third stop on the assessment. In the base period historical years module the user will create five data files, one for each of the five historical years. After a historical year's data file is created, the user enters data specific to that year in the various worksheet tables on Production, Imports, Exports, Stocks and Food Aid. A historical year balance is generated automatically from this data. Options exist for editing and printing any existing historical year's data.

4. Selecting [Analysis] - [Historic] - [Summary] loads the base period summary module. This should be the fourth stop on the assessment. In the base-period summary module, the five historical year balances are automatically imported. The user can view summary graphs and tables based on this base period information. Note that when the base period summary module is accessed in this way, simple averages based on the five historical years of data are placed in the last column of tables and graphs.

5. Selecting [Analysis] - [Current] loads the current year module file. This should be the fifth stop on the assessment. In the current year module the user enters data for the current year. Many data entry tables include an option to select trend values (linear, non-linear or simple historical average) calculated from the summary generated in the summary module.

6. Selecting [Reports & Graphs] loads the summary module file once again. This should be the sixth stop on the assessment. The summary module, when accessed in this way, allows the user to choose whether base period averages or current year data are displayed in the final column of reports and graphs.

7. As the seventh and final stop, the user can print any or all of the reports and graphs. There are up to 16 summary reports (5 historical balances, the current year balance, and up to 10 commodity balances). The twelve summary graphs with either historical averages or current year data can also be printed using PrintGraph.

1. Beginning the Assessment

The first stop on the tour is the template main menu. If the template main menu was not automatically retrieved when Lotus 1-2-3 was loaded, the user must use the */ file directory* command and indicate the FNA file directory and then retrieve the file AUTO123.WK1, which posts the template main menu. Whenever the template main menu module is retrieved, the FNA logo is displayed. The menu posted above the logo is used to move amoung the various modules. Selecting [Exit] from the template main menu returns the user to DOS. All other selections place the user within another module. Selecting [Quit] from within any other module returns the user to the template main menu.

The template main menu structure is shown in *Figure 3-5*.

2. Entering Assessment Parameters

Before data can be entered for either historical years or the current year of an assessment, the user must specify certain global characteristics. The parameters module menu tree is outlined in *Figure 3-6*. For details on each of the variables in the parameters module, refer to Chapter 2.2.

If data has been entered in the template previously, the user's current choices are summarized. A summary, shown in *Figure 3-7*, greets the user upon entry to the module.

Figure 3-5

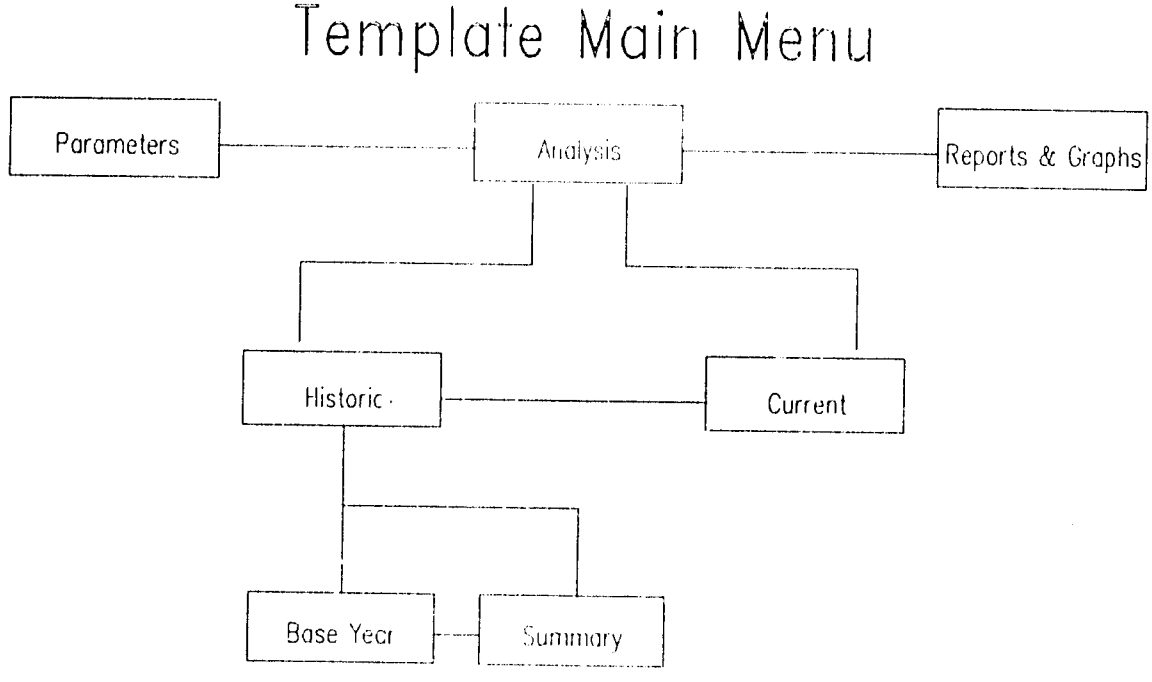


Figure 3-6

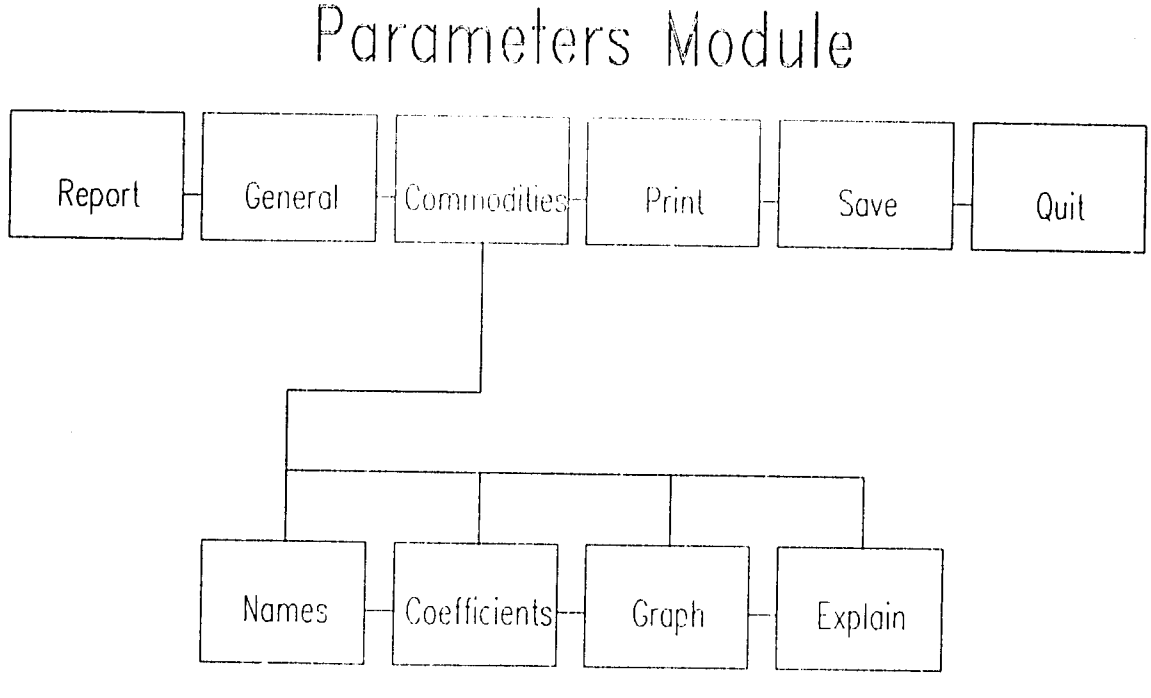


Figure 3-7

General Parameters Summary

```
A1: PR                                                                    MENU
Report  General  Commodities  Print  Save  Quit
View general data report (NO DATA ENTRY)
        A          B          C          D          E          F          G          H
1
2
3                                  Summary of General Information
4                                        Country:       Name
5              ------------------------------------------------------------
6
7              Consumption Year: Mar/Feb                 Base Commodity:
8              Current year:          1988               Rice
9              Population:              10,000
10
11                  Year Population                      Cereals:   Non-Cereals:
12
13             1987          9,892                       Rice       Milk
14             1986          9,617                       Wheat      Cassava
15             1985          9,349                       Maize
16             1984          9,089
17             1983          8,606
18
19
20
06-Oct-88  02:25 PM                              CMD
```

The user should first select (General). This will place the user within an input range. This means that the user will only be allowed to enter data within highlighted cells. There are data entry locations for country name, calendar and historical years and population (see *Figure 3-8*). It is important that all cells on this table be filled in.

The most recent historical year should be entered as "T-1", the second most recent year as "T-2", etc. Note that 1983 was not included in the sample data. As discussed in Chapter 2.2, the historical period does not have to be chronological if a strong case can be made for eliminating an unrepresentative year. Be aware that the trend formula coefficients in the current year module do not automatically compensate for non-consecutive years. Although the years do not have to be chronological, five historical years must be specified.

The user should next select (Commodities). From the displayed menu the user can enter commodity names (see *Figure 3-9*). Up to five cereals and five non-cereals can be included. The first commodity entered under the cereals should be the "Base Commodity" i.e., the most important commodity in the diet. The commodity selected as the base will be used as the "common denominator" when cereals and non-cereals are added together. (See pages 7-8 for a discussion of base commodity equivalents.) For each included commodity there must also be coefficients. To remove an undesired commodity name, move the cursor to the desired cell, press the space bar once and then press enter.

Once commodity names have been specified and data has been entered for the tables, do not reorder commodity names. Data on historical years and the current year is stored in column format and *is not* linked to a given commodity name. For example, if the first cereal is corn and the second cereal is rice, corn will become the first column in all assessment tables. If at a later time the order of these commodities in the parameters module is reversed, the commodity names atop the first and second columns of the tables would be reversed but the data contained within these columns would not be switched. Corn's data, remaining in column one, will now appear under rice's label. This data would have to be edited. As a result of this data storage system, it is imperative that commodity names not be reordered.

An explanation of the options within the (Parameters) - (Commodities) menu is available by selecting (Explain). Data for "percent of total diet" can be entered, if available. These data are not used in the remainder of the assessment, but are used to generate the pie chart shown in *Figure 3-10*, which demonstrates the commodity coverage of the food needs assessment. As discussed in the General Parameters section of Chapter 2, the target coverage is 75% of the total diet, although this will not always be feasible.

After all data have been entered, the general data report can be analyzed and printed. (See *Figure 3-11*.)

Figure 3-8

Data Entry for General Section of Parameters Module

```
U44: U [W10] 'Name                                                    READY

      R       S          T          U          V          W          X        Y   Z
41
42
43
44        Country:              Name
45
46        Consumption Year: Mar/Feb
47        (e.g. May/Apr)
48
49        Current Year:              1988          Population:        10,000
50        (e.g. 1988 or 1988.89)                   ( x 000 )
51
52        Historic Year  t-1:       1987 Population (000)  t-1:      9,892
53                       t-2:       1986                   t-2:      9,617
54                       t-3:       1985                   t-3:      9,349
55                       t-4:       1984                   t-4:      9,089
56                       t-5:       1982                   t-5:      8,606
57
58
59        press <<esc>> when data entry is completed
60
06-Oct-88  02:25 PM                          CMD
```

Figure 3-9

Data Entry for Commodities Section of Parameters Module

```
121: PR [W4]                                                          MENU
Names  Coefficients  Graph  Explain
Enter/Edit commodity names
     I     J     K          L          M          N          O          P
21
22
23                          Commodity Milling  Caloric  % of total
24                             Name     Rate  Equivalent   Diet
25        [cereals]          ------------------------------------
26              Base  1.  Rice          0.90       3,440      25%
27                    2.  Wheat         0.88       3,205      15%
28                    3.  Maize         0.88       3,028      10%
29                    4                 0.00           0       0%
30                    5.                0.00           0       0%
31
32        [non-cereals]
33                    1.  Milk          0.78       7,986      12%
34                    2.  Cassava       0.57       4,050      13%
35                    3.                0.00           0       0%
36                    4.                0.00           0       0%
37                    5.                0.00           0       0%
38                        other                                25%
39
40
06-Oct-88  02:25 PM                          CMD
```

Figure 3-10

Graph for General Parameters Section (FNAPDIET.PIC)

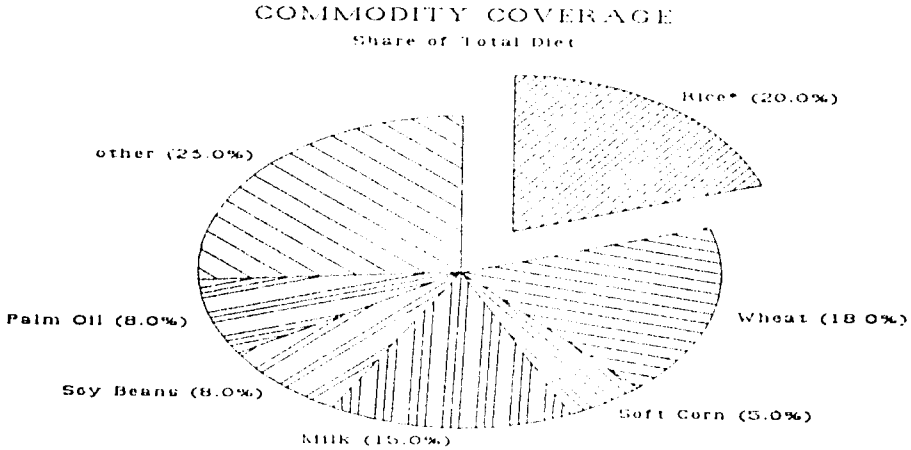


Figure 3-11

General Data Report

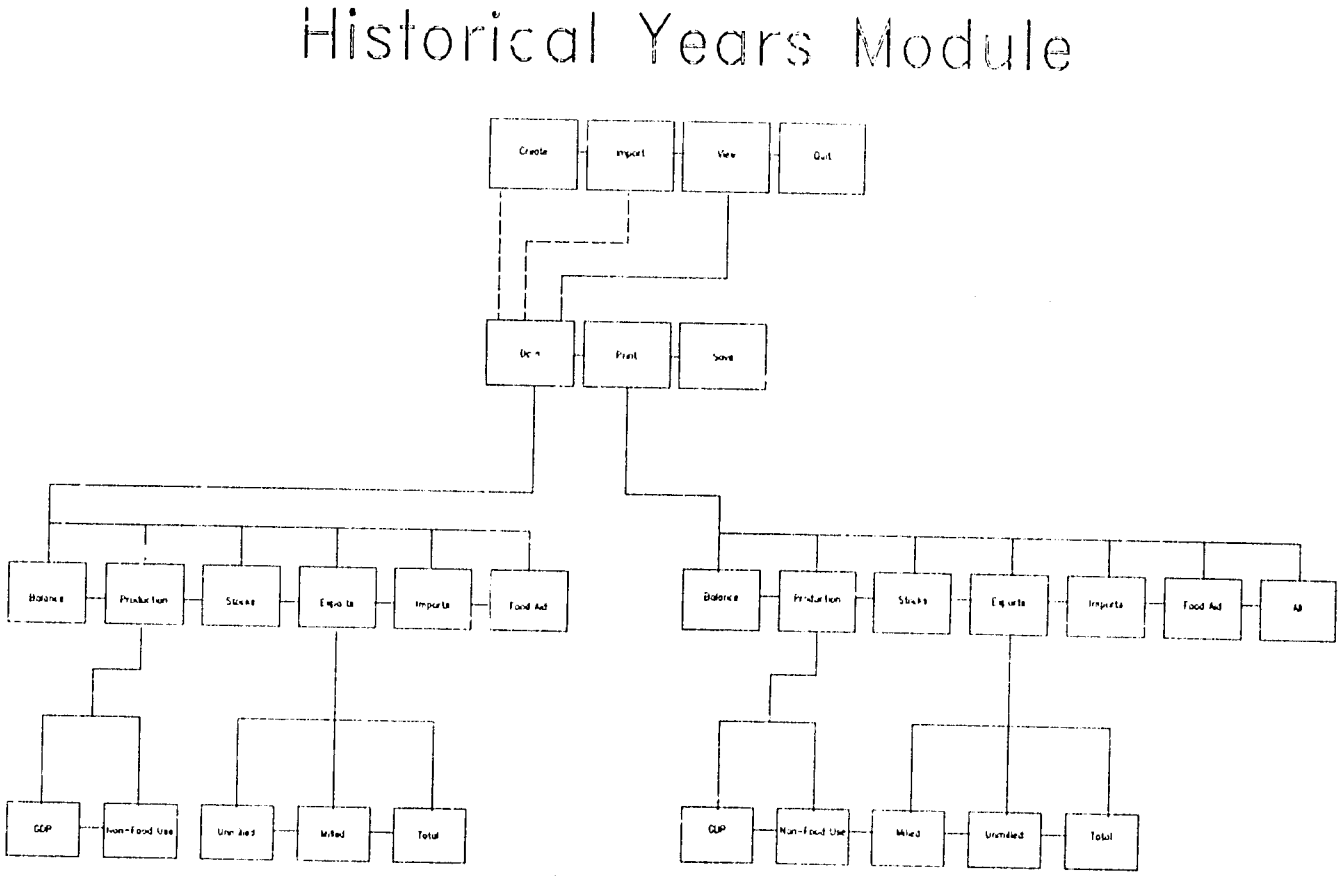
Food Needs Assessment: (Country Name)

Consumption Year: Jan/Dec

Current Year (year of analysis):	1988	Current Year Population:	10,204
Historical Years T-1:	1987	Historical Year T-1 Population (000)	9,892
T-2:	1986	T-2 Population (000)	9,617
T-3:	1985	T-3 Population (000)	9,349
T-4:	1984	T-4 Population (000)	9,089
T-5:	1982	T-5 Population (000)	8,606

Commodities Included in Assessment:	Base = = >	Rice	Wheat	Soft Corn	Milk	Soy Beans	Palm Oil
Caloric equivalent (calories/ UNMILLED kilogram)		3,440	3,205	3,028	640	4,050	4,050
/ Caloric equivalent of base commodity		3,440	3,440	3,440	3,440	3,440	3,440
= Base Commodity Equivalent Coefficient (.00)		1.00	0.93	0.88	0.19	1.18	1.18
Milling extraction rate (.00)		0.81	0.76	0.90	0.72	0.18	0.18

Figure 3-12



3. Preparing Historical Data

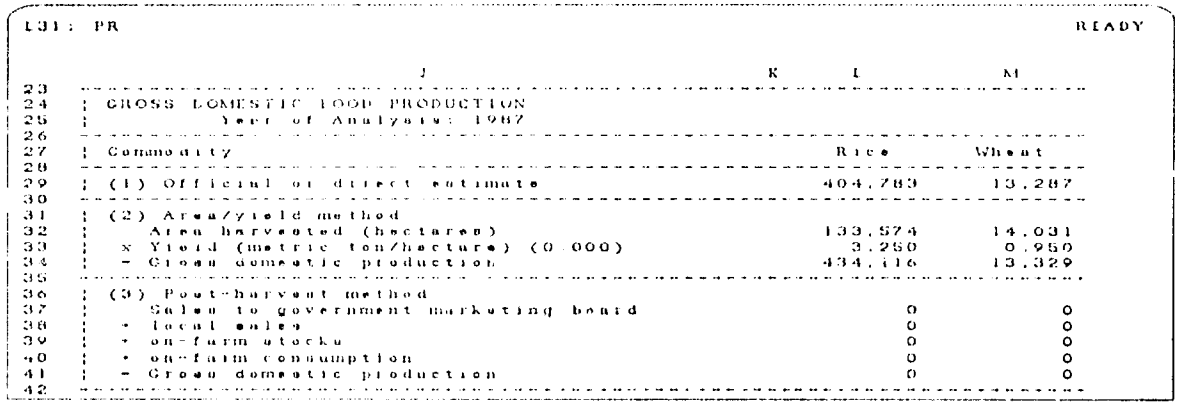
The five historical year data files form the backbone of an assessment. When the template diskettes are distributed, they do not contain any historical year data files. The first decision that the user must make upon entering the historical years module will be which historical year data files to create. Under the create menu, the five historical years specified in the parameters module will appear automatically. After a given historical year has been created and saved, its name will appear under [import] and will no longer appear under [create]. The historical module examines the diskette each time the create or import choices are selected. If a data file exists for any of the five years specified in the general parameters module, that year will appear only under import. Similarly, if a data file does not exist for one of the five historical years, that year will appear under [create]. It is essential that data for all five years be created and saved before accessing the summary module. An outline of these options is shown in *Figure 3-12*.

After a given historical year has been created or imported, there is a set of tables available for data entry, viewing and printing. Data can be entered in any table in any order.

In order to print a specific table, select print from the main menu and indicate the appropriate table. The print selection ALL will print all tables in the module.

Figure 3-13

Sample Data Entry Table for Historical Gross Domestic Production



L31: PR READY

	J	K	L	M
23				
24	GROSS DOMESTIC FOOD PRODUCTION			
25	Year of Analysis: 1987			
26				
27	Commodity		Rice	Wheat
28				
29	(1) Official or direct estimate		404,789	13,287
30				
31	(2) Area/yield method			
32	Area harvested (hectares)		133,574	14,031
33	x Yield (metric ton/hectare) (0.000)		3.250	0.950
34	= Gross domestic production		434,116	13,329
35				
36	(3) Post-harvest method			
37	Sales to government marketing board		0	0
38	+ local sales		0	0
39	+ on-farm stocks		0	0
40	+ on-farm consumption		0	0
41	= Gross domestic production		0	0
42				

After the user selects to view or to edit a specific table, the cursor will move to that table and to the first row of unprotected data cells*. As the user moves to the right or down within the table, the left column of row titles and the top line of commodity names will remain visible. If a cell entry appears as a row of stars (*****), the number may be larger than can be supported by the current column width. Use the */ worksheet column set-width* command to adjust the column widths as necessary.

The *Figure 3-13* is a sample of the table for Gross Domestic Food Production. More detailed information on these tables is found in Chapter 2 of this manual.

4. Summarizing Historical Data

It is essential that data for all five years be created and saved in the historical year module prior to accessing the summary module. When a given historical year is saved, its balance is automatically copied into a .BAL file. When the summary module is loaded, the five .BAL files corresponding to the five historical years of the assessment are combined in the module.

The purpose of a five-year base period of information is to permit the assessment to draw on trend information during the current year analysis. It is recommended that the analyst print all historical reports (balances from each historical year and commodity summaries) and all relevant graphs at this point. This will enable the analyst to have an easy reference to historical data while conducting the current year analysis.

The summary module imports the five balances from the five historical years. (See *Figure 3-19* on page 40 for a sample historical balance.) The balance can be viewed by selecting [Reports] followed by [View], [Balance] and the desired year. This module also provides for the reorganizing of historical information into trend tables for each of the assessment commodities. (See *Figure 3-20* on page 40 for a sample commodity table.)

Note that the final column of data is the base period average; after the current year analysis has been completed, this same table can be accessed with current year data in the final column. Specific commodity trend tables can be accessed by selecting [Reports] followed by [View], [Cereals] or [Non-Cereals] and finally the desired commodity name. Commodity reports and historical balances can be printed by choosing [Print] from the View / Print menu (see *Figure 3-14*).

*When the tables of a historical year are retrieved, the data cells will contain a cell reference. This occurs because of the storage system used in the template. These cells are unprotected and the user should overwrite these formulas with the appropriate data.

Figure 3-14

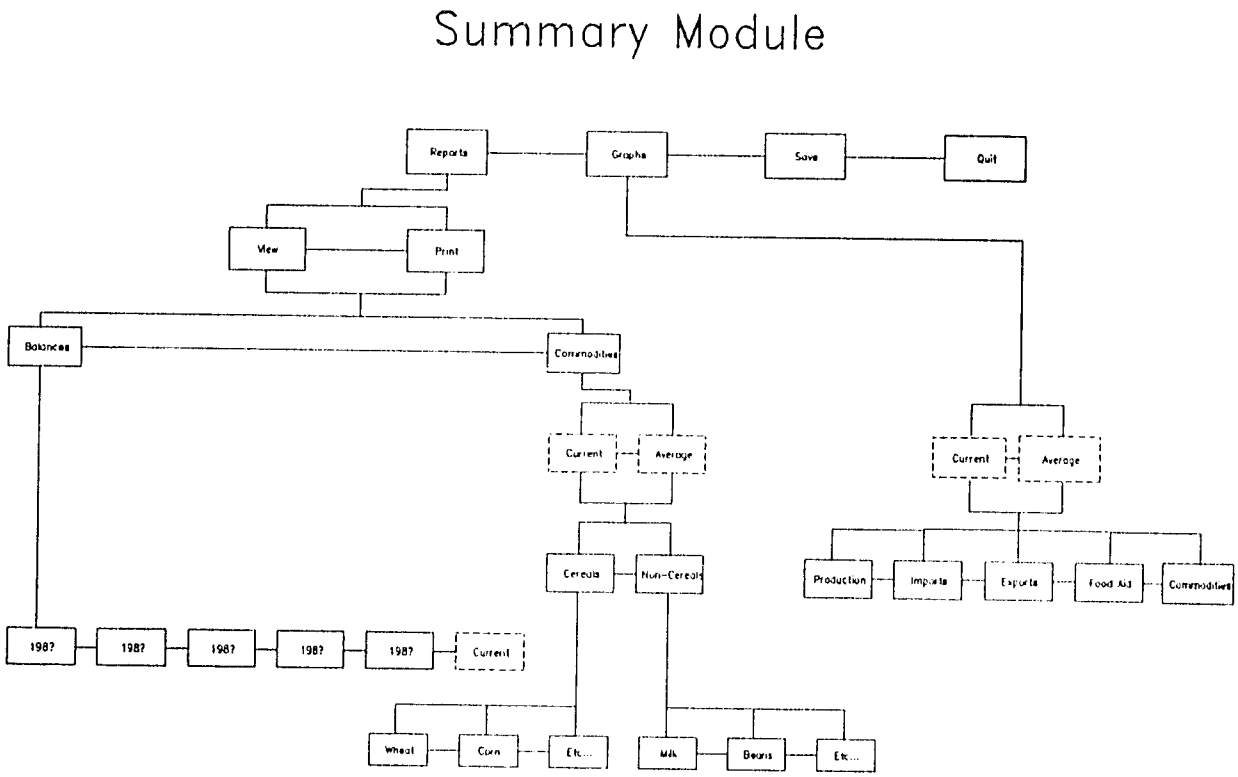


Figure 3-15

List of Pre-Designed Graphs.

Filename	Description
FNAGDPC.PIC	Gross domestic production cereals
FNAGDPN.PIC	Gross domestic production non-cereals
FNAIMPC.PIC	Commercial cereal imports
FNAIMPN.PIC	Commercial non-cereal imports
FNAEXPC.PIC	Cereal exports
FNAEXPN.PIC	Non-cereal exports
FNAAIDC.PIC	Cereal food aid
FNAAIDN.PIC	Non-cereal food aid
FNAPCCC.PIC	Per capita consumption of cereals
FNAPCCN.PIC	Per capita consumption of non-cereals
FNACONVS.PIC	Per capita consumption vs production
FNAIMVSF.PIC	Commercial Imports vs Food Aid
FNAPDIET.PIC	Commodity shares in total diet

In addition to summary tables, summary graphs are available. The FNA template includes a set of twelve summary graphs already designed, labeled and saved in Lotus .PIC files on template disk 2.

These graphs have been formatted to reflect the appropriate titles, data ranges, graph types, etc., and can be viewed as soon as data have been entered for the relevant variables. If data are adjusted, the graphs will change accordingly. The *Figure 3-15* provides a summary of the predesigned graphs.

The standardized summary graphs are included in the template for convenience. The analyst will probably want to create additional graphs to reveal issues and situations specific to the country being studied. Two diskette system users will not have enough room to store any additional graphs (beyond the predefined graphs) on the FNA Disk 2 diskette. These users should, at the moment they wish to save a graph from Lotus 1-2-3's graph command line, replace FNA Disk 1 (in the default drive B) with a formatted disk. After the graph has been saved on this disk, the user should return the FNA Disk 1 to drive B.

5. Preparing Current Year Data

This module contains the current year data. Trend data, extracted from the base period summary during the viewing of summary historical data, is used to generate historical averages and linear and non-linear projections. These projections are included as options in most current year tables and can be carried forward automatically, if desired, using the "*Specify Option ---> "* selection. The structure of this module is displayed in *Figure 3-16.*

With the exception of the trend and variation from norm options and the inclusion of a table for consumption in place of food aid, the tables and options found in the current year module are the same as those found in the historical year module. Note that there are no creating or importing options within the current year module, as all data for the current year reside within the module.

In *Figure 3-17* the analyst decided that the automatically - generated linear trend best reflected current year rice production. To carry this option forward, the analyst specified option 1 under the trend extrapolation method **AND** selected option 4 under the final specify option prompt. For wheat production, the analyst decided that current year production would be 10% greater than "norm" (110% of norm, as entered in the spreadsheet). In this case, the analyst decided to define "norm" as the base period average. To carry the expected variation from norm selection for wheat production forward, the analyst specified option 5 on the final line under wheat.

More detailed information on each of the options available on these tables is found in Chapter 2 of this manual. Note that options four and five are not present in the historical module's tables.

> WARNING! To be certain that all data in a given table reflect changes in other tables, press the [F9] {calc} key.

6. Assessment Summary

The summary module performs two functions within the template. When accessed from the historical menu in the main module, tables and graphs capture five years of historical data and base period averages. When accessed using(Reports & Graphs) from the template main menu, additional menu choices are inserted. These additional menus allow the user to select whether to display current year data or base period averages in the last column of tables and graphs.

The graphs use the same .PIC filenames regardless of whether current year or average data was selected for the final column. Print all saved .PIC files containing base period averages before saving new .PIC files with the current year data.

7. Printing Reports and Graphs

After completing the current year analysis, the user can print the final reports and graphs. As mentioned above, the analyst is able to choose whether historical averages or current year data appear in the final column of reports or as the final data point on graphs.

Sample reports are included on the following pages. The top report (*Figure 3-18*) is the current year balance; the middle report (*Figure 3-19*) is one of the five historical year balances; and the bottom report (*Figure 3-20*) is one of the commodity summary tables.

Figure 3-16

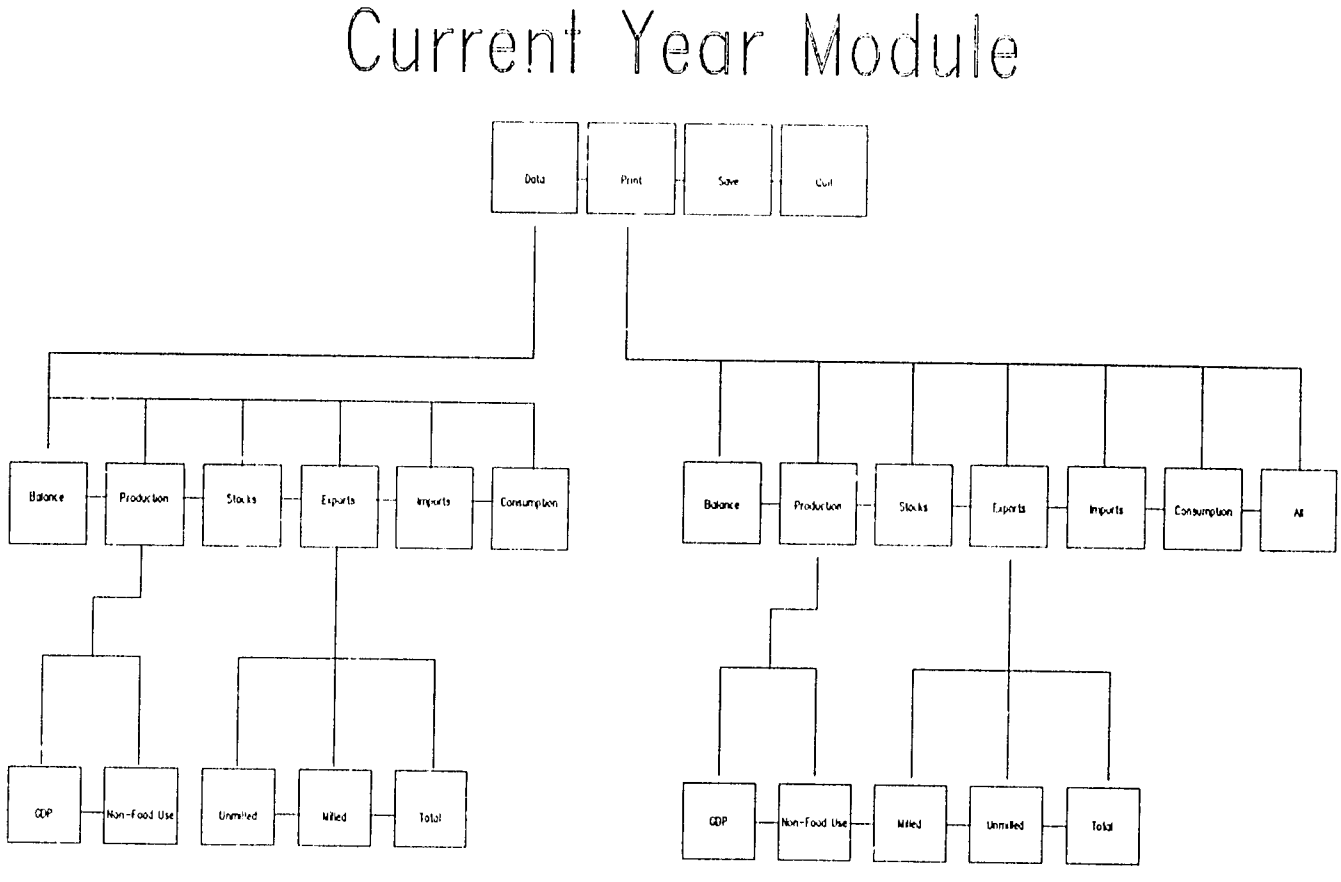


Figure 3-17

Sample Data Entry Table for Current Year Gross Domestic Production

```
J57: [W1]                                                          READY

                                                    J        K          L
24   | GROSS DOMESTIC FOOD PRODUCTION
25   |         Current Year: 1988
26   ---------------------------------------------------------------------
27   | Commodity                                                 Rice       Wheat
42   ---------------------------------------------------------------------
43   | (4) Trend extrapolation methods
44   |         (1) Linear trend                                  424.427    20.671
45   |         (2) Non-linear trend                              445.214     8.549
46   |         (3) Base period average                           421.968    22.943
47   ---------------------------------------------------------------------
48   |         Specify option (1,2 or 3) -->                            1          3
49   |       = Gross domestic production                         424.427    22.943
50   ---------------------------------------------------------------------
51   | (5) Expected variation from norm
52   |         Expected % of norm (0.00)                                0%       110%
53   |         x Norm value                                             0    22.943
54   |         = Gross domestic production                              0    25.237
55   ---------------------------------------------------------------------
56   |  Specify option (1,2,3,4 or 5) -->                               4          5
57   | GROSS DOMESTIC FOOD PRODUCTION                            424.427    25.237
06-Oct-88  02:31 PM                                  CALC
```

Figure 3-18

Sample Reports*

```
J600: [W11]                                                                 READY

                              I                          J           K          L
599 ----------------------------------------------------------------------------------
600 | CURRENT YEAR FOOD BALANCE
601 |          Current Year: 1988
602 ----------------------------------------------------------------------------------
603 | Commodity                                        Rice       Wheat   Soft Corn
604 ----------------------------------------------------------------------------------
605 |Per capita consumption (UNMILLED kg/yr)          9,687        4,383         331
606 |  x Population (thousands)                      10,204       10,204      10,204
607 |  = Total consumption requirement          97,826,748  44,722,861   3,379,230
608 ----------------------------------------------------------------------------------
609 |    Gross domestic food production            439,114       18,940     104,170
610 |  - Total non-food use                        439,114       52,977     104,170
611 |  = Net domestic food production                  (0)     (34,037)         (0)
612 ----------------------------------------------------------------------------------
613 |  - Net change in stocks                     (18,519)            0           0
614 ----------------------------------------------------------------------------------
615 |  - Total food exports                              0        8,684           0
616 ----------------------------------------------------------------------------------
617 |  = Domestic food supply                       18,518     (42,721)         (0)
618 ----------------------------------------------------------------------------------
13-Oct-88   10:10 AM                              CALC
```

Figure 3-19

```
J175:                                                                       READY

                    H                        I        J             K             L
174 ---------------------------------------------------------------------------------
175 | HISTORICAL YEAR FOOD BALANCE
176 |          Year of Analysis: 1987
177 ---------------------------------------------------------------------------------
178 | Commodity                                     Rice        Wheat     Soft Corn
179 ---------------------------------------------------------------------------------
180 |    Gross domestic food production          434,116       13,329       134,424
181 |  - Total non-food use                       50,143       30,714        13,805
182 |  = Net domestic food production            383,972     (17,385)      120,619
183 ---------------------------------------------------------------------------------
184 |  - Net change in stocks                    (35,200)            0             0
185 ---------------------------------------------------------------------------------
186 |  - Total food exports                       40,000  [illegible]           556
187 ---------------------------------------------------------------------------------
188 |  = Domestic food supply                    379,172     (23,964)      120,063
189 ---------------------------------------------------------------------------------
190 |  + Total commercial food imports             3,000      360,000             0
191 ---------------------------------------------------------------------------------
192 |  + Food aid                                   3,000       46,210             0
193 ---------------------------------------------------------------------------------
13-Oct-88   09:55 AM                              CALC
```

Figure 3-20

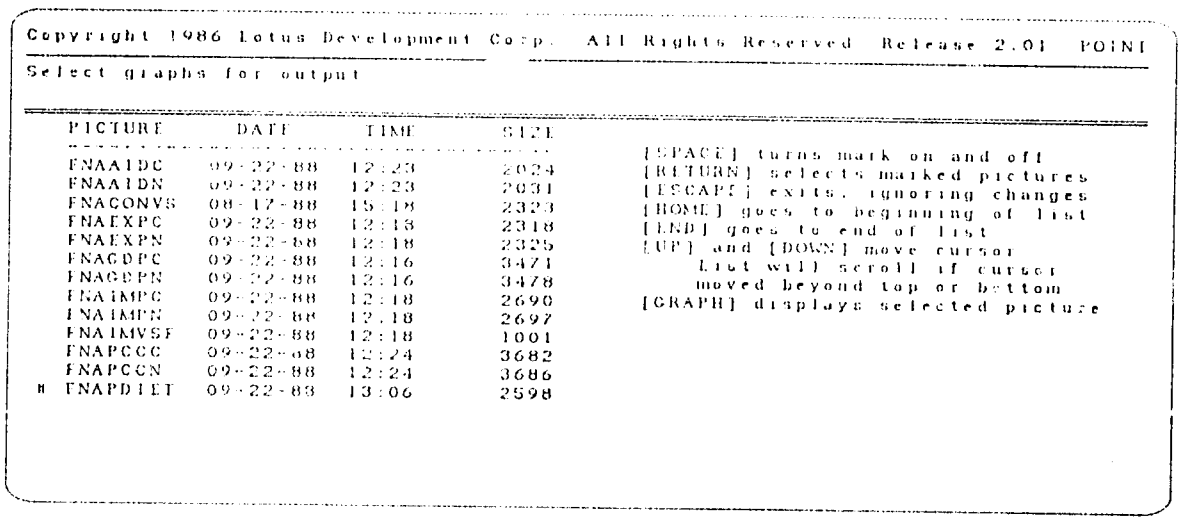
```
Z245: [W6]                                                                  READY

                     Y                           Z      AA      AB      AC      AD       AE
245 COMMODITY:       Rice (Base)                                                        Name
246 ---------------------------------------------------------------------------------------------
247 |                                          1982    1984    1985    1986    1987  Average
248 ---------------------------------------------------------------------------------------------
249 |      Gross domestic food production         0       0       0       0       0        0
250 |   - Total non-food uses                     0       0       0       0       0        0
251 |   = Net domestic food production            0       0       0       0       0        0
252 ---------------------------------------------------------------------------------------------
253 |   - Net change in stocks                    0       0       0       0       0        0
254 ---------------------------------------------------------------------------------------------
255 |   - Total food exports                      0       0       0       0       0        0
256 ---------------------------------------------------------------------------------------------
257 |   = Domestic food supply                    0       0       0       0       0        0
258 ---------------------------------------------------------------------------------------------
259 |   + Total commercial food imports           0       0       0       0       0        0
260 ---------------------------------------------------------------------------------------------
261 |   + Food Aid                                0       0       0       0       0        0
262 ---------------------------------------------------------------------------------------------
263 |   = Total food supply                       0       0       0       0       0        0
264 |   / Population (thousands)                  0       0       0       0       0        0
07-Oct-88   12:34 PM                              CALC
```

*The top report is the current year balance (*Figure 18*); the middle report is the historical year balance (*Figure 19*), and the bottom report is the commodity summary (*Figure 20*).

Figure 3-21

Lotus PrintGraph Image-Select Screen



Samples of the twelve graphs are reproduced on the following pages. Note that these graphs have the current year (1988 in this case) as the final data point. If the analyst chooses the historical averages menu option, the final data point will change to averages.

When graphs are accessed through either the template main menu or the historical summary module, the user is presented with the option of viewing one or more of the predesigned graphs. The graphs reflect the data entered to that point in the assessment. Upon leaving the graph to return to the spreadsheet (by striking any key), the user is prompted to SAVE the current graph for future printing or to QUIT without saving. The graph is saved under predefined file name. It is not necessary to save the graphs each time they are viewed. Instead, the user should experiment with different data options, view the related effects in graphical form, and save only the final graph for printing.

While it is possible to view a graph from within the template, it is not possible to print the graph without first leaving the Lotus 1-2-3 spreadsheet environment. Once the graph has been created and saved, it can be printed later using the PrintGraph program accompanying Lotus 1-2-3. It is first necessary to exit the spreadsheet and template. As always, before exiting ensure that the current worksheet has been saved.

If the user started from the Lotus Access System, he or she will be returned to the Access System menu upon exiting the template. If the user bypassed the Lotus Access System in order to save RAM, the screen will now show the DOS prompt. (If the message "insert Command.Com in Drive A:" appears, return the Lotus disk to drive A and press any key when ready.)

To load PrintGraph from the Access System, simply move the cursor to PrintGraph and press (Enter). To load PrintGraph from DOS, first remove the FNA disk 1 from drive B and the FNA disk 2 from drive A, then insert the Lotus PrintGraph disk in drive A and the FNA disk 2 in drive B. At the DOS A:> prompt, type PGRAPH(Enter). Upon exiting PrintGraph, reinsert FNA disk 2 in drive A and FNA disk 1 in drive B.

PrintGraph's current settings should be displayed on the screen. If the system has been used to print Lotus graphs before, PrintGraph should work without much additional configuration. If the system has never been configured for the hardware present, refer to the Lotus manual for detailed instructions on first-time setup.

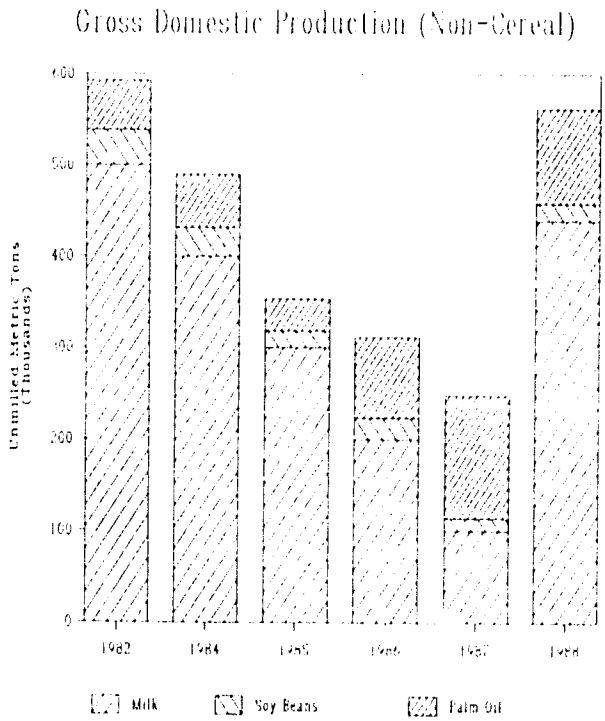
PrintGraph will look for files in the directory listed under "Graphs Directory." If the template graphs are not located in the drive listed under "Graphs Directory," the user will have to modify this before continuing.

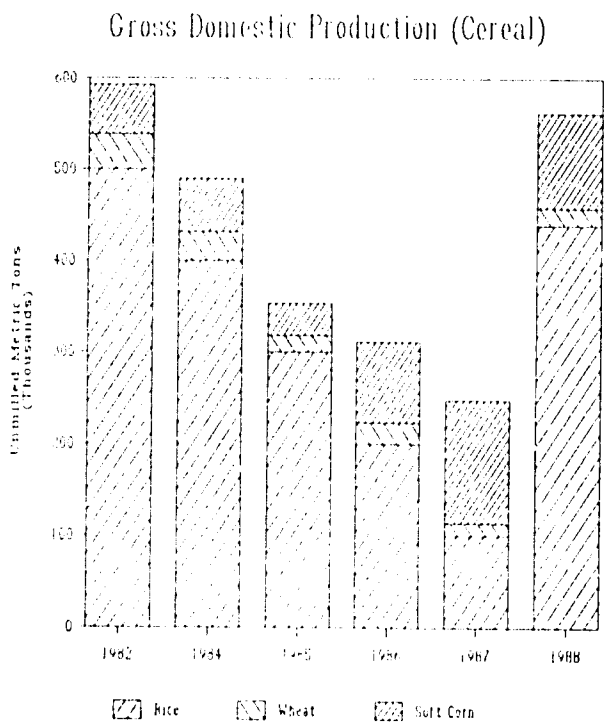
On a two-disk system, the template graphs will be found on FNA Disk 2 in drive B. On a hard disk system, the graphs will be found within the FNA directory created during installation.

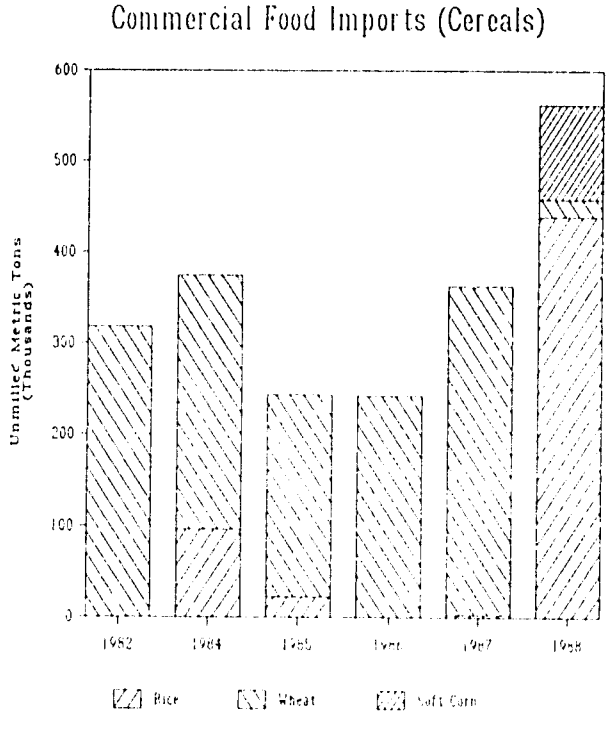
To change the Graphs Directory, select */ Settings Hardware Graphs Directory*.

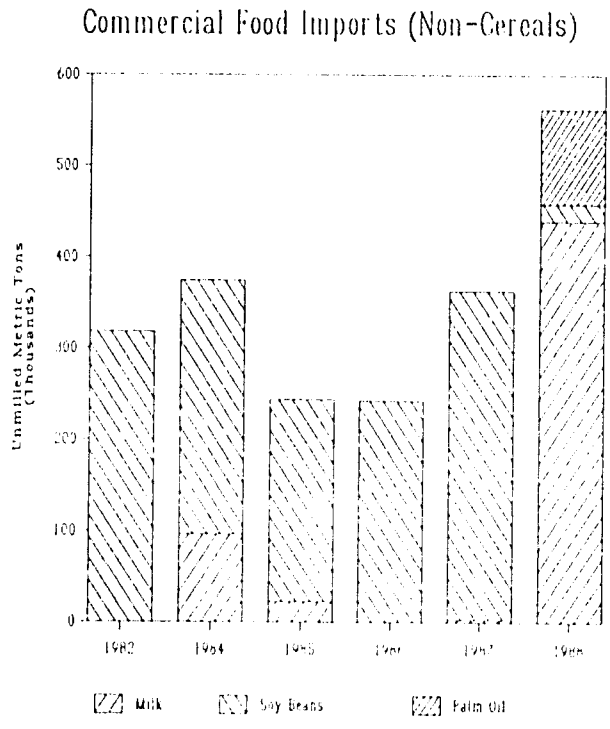
Next, type the directory on which the graph files can be found (B: or C:/FNA, for example) and press return to confirm the selection. Now select [Quit] twice to return to the main PrintGraph menu. Now the user specifies which graphs he or she wishes to print. From the PrintGraph main menu, select [Image-Select]. PrintGraph will list all .PIC files in the specified graphs directory, as well as directions for selecting and deselecting graphs. Following the directions on the image select screen to mark the desired graphs for printing (See *Figure 3-21*), the user may select more than one graph at a time.

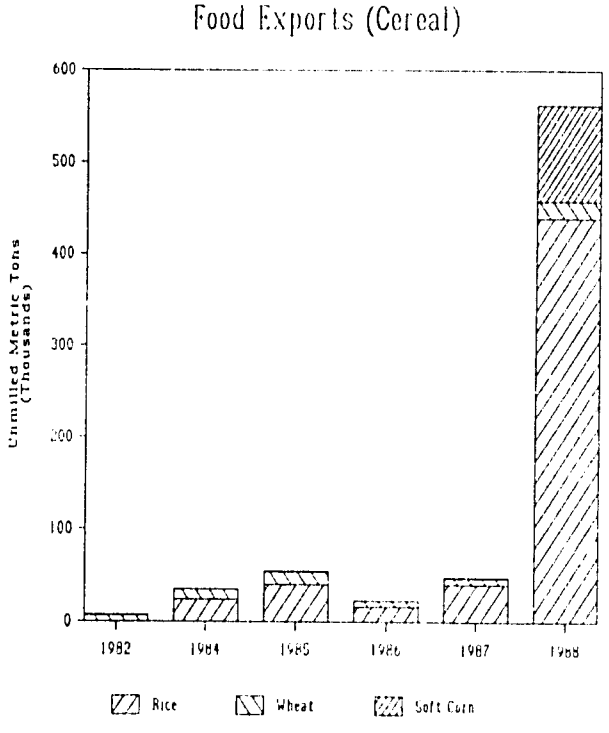
Once the graph has been selected for printing, the user selects [Go]. The graphs selected will print. For adjustments of paper or graph size, fonts, additional hardware, etc., the user should refer to the PrintGraph section of the Lotus manual.

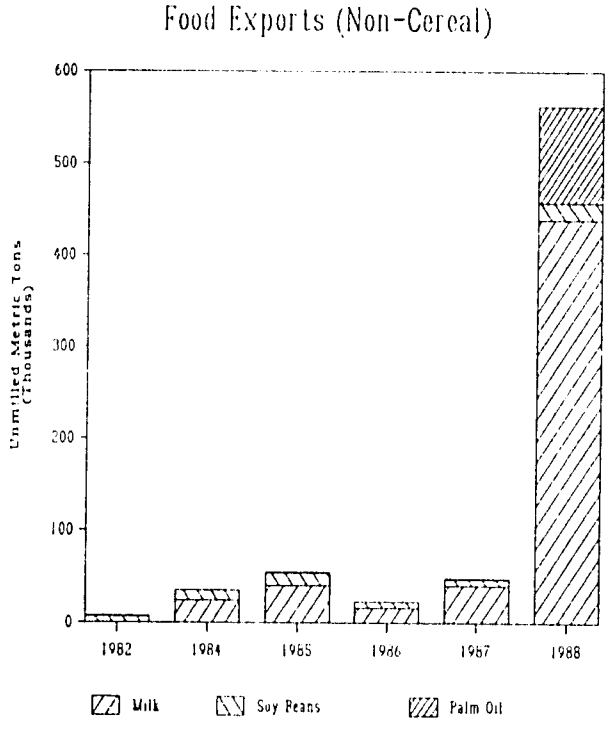




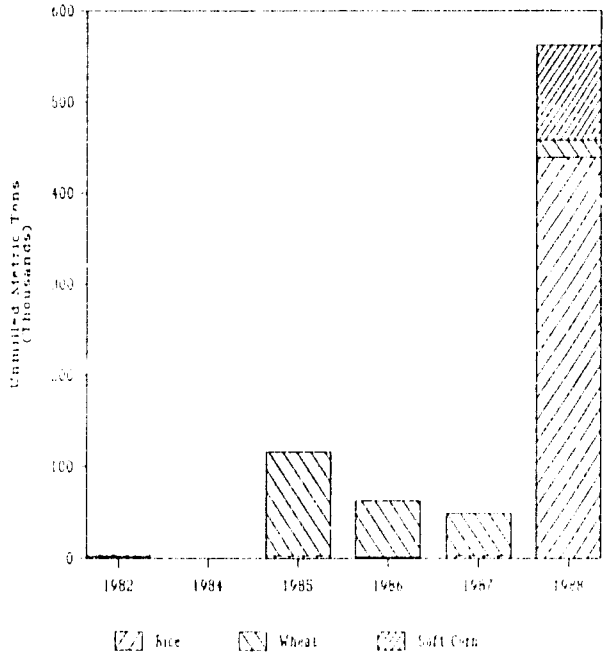

Commercial Food Imports (Cereals)
Unmilled Metric Tons (Thousands)
600
500
400
300
200
100
0
1982
1984
1985
1986
1987
1988
Rice
Wheat
Soft Corn


Commercial Food Imports (Non-Cereals)
Unmilled Metric Tons (Thousands)
600
500
400
300
200
100
0
1982
1984
1985
1986
1987
1988
Milk
Soy Beans
Palm Oil

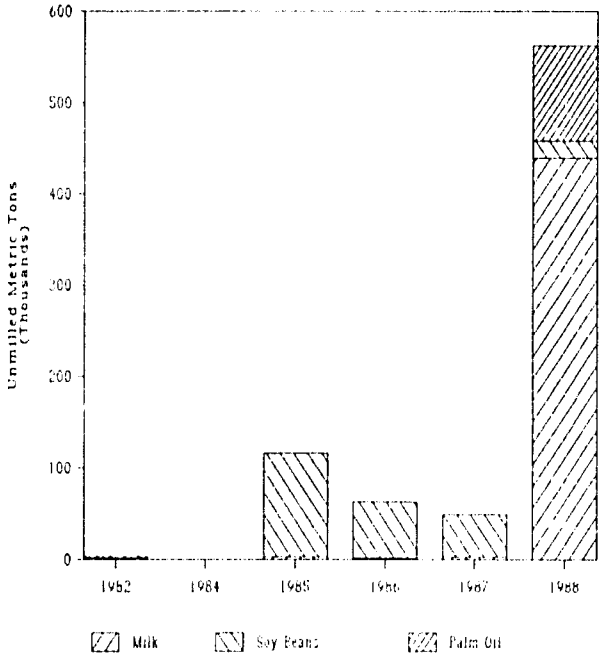

Food Exports (Cereal)
Unmilled Metric Tons (Thousands)
600
500
400
300
200
100
0
1982
1984
1985
1986
1987
1988
Rice
Wheat
Soft Corn


Food Exports (Non-Cereal)
Unmilled Metric Tons (Thousands)
600
500
400
300
200
100
0
1982
1984
1985
1986
1987
1988
Milk
Soy Beans
Palm Oil

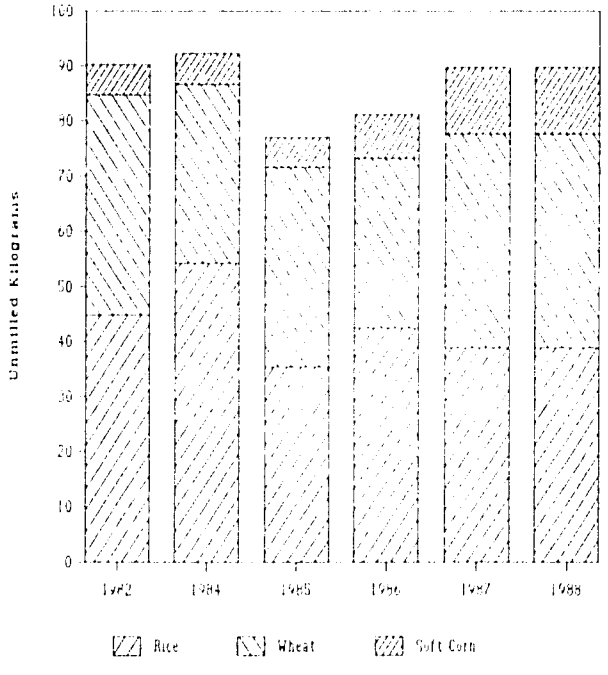
Food Aid (Cereal)



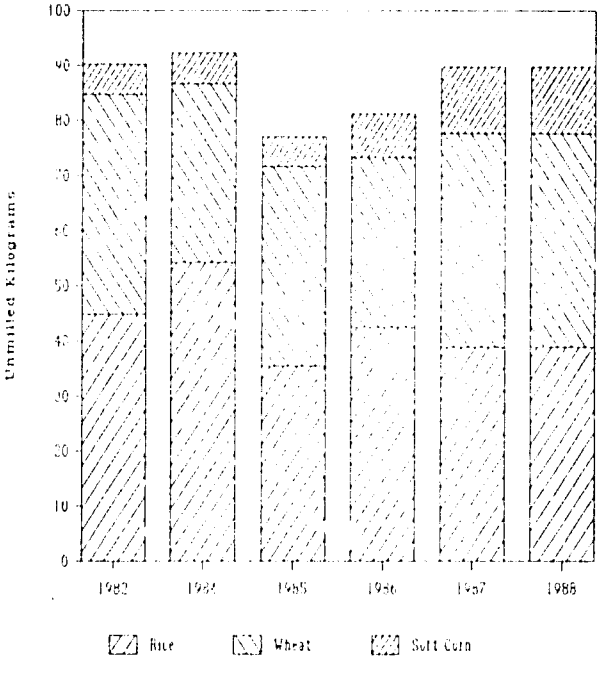
Food Aid (Non-Cereal)

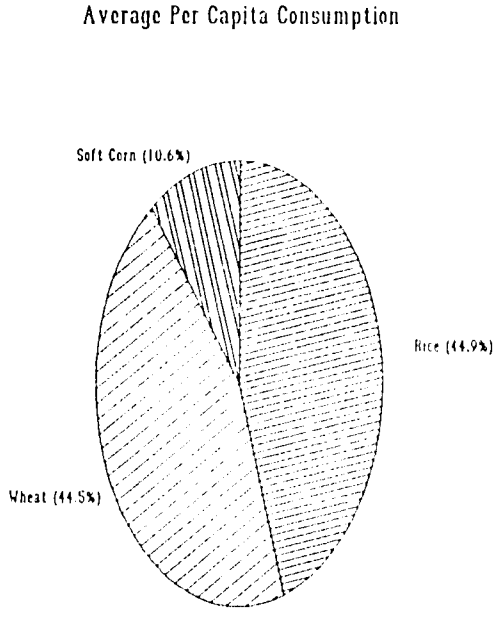


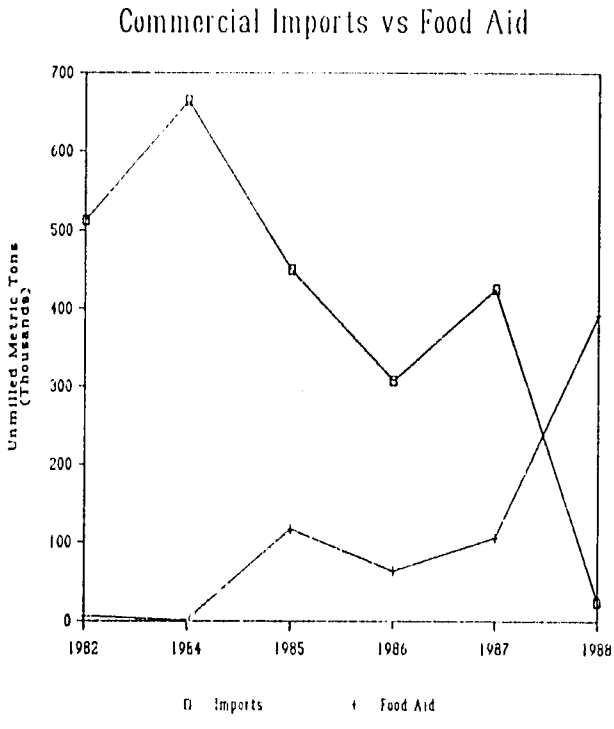
Per Capita Consumption (Cereal)



Per Capita Consumption (Non-Cereal)







Refining the Assessment

After the user has completed the steps of an assessment, he or she may have occasion to revise historical data or select different current year options. Changes to the modules' data can be made at will, but it is essential that the user be mindful of the order in which changes to data trickle through to other modules. After any changes to a module's data, the user must select SAVE from that module's main menu. If the user alters data in any of the historical years, the historical summary should be rerun. This is important because the historical summary generates a trend information file that is, in turn, used by the current year module to calculate average, linear and non-linear trends.

The template is designed to support five historical years of data. After an assessment has been performed and a new year becomes the current year, the previous year's data should be entered as an historical year and the oldest historical year should be moved to a separate data disk for storage. Use the parameters module .o change the five years of the assessment to reflect the progress of years. On a two drive system, space for storing old historical year data files may be limited. If necessary, copy the oldest historical year's files (FNA19??.DAT and FNA19??.BAL) to a new diskette, then delete those files from the program disks before creating a new histori al year.

Data contained in the parameters module controls the historical years for the assessment and the commodities for the economy. Feel free to change the historical years. Each new historical year will have to be created in the historical years module. Remember that the historical years module examines the disk to determine which years exist and which years are not present and therefore must be created. Note that if commodity names are changed, or the existing set of commodities are reordered, the historical and current year data files will have to be revised. Data are stored in the modules and data files by columns from left to right and are not linked to a given commodity name.

LIST OF APPENDICES

A number of appendices have been compiled to assist the user in carrying out food needs assessments. The information is drawn from various sources and the reader should realize that most of the material is general in nature. Each appendix is preceded by notes describing how to use the information and its source.

APPENDIX A

WORKSHEETS

The worksheets in this appendix provide a concise, step-by- step outline of the calculations involved in the FVA approach to food needs assessment. They are intended to provide the analyst with a quick-reference to the concepts and formulas involved in each step of a food needs assessment.The worksheets follow very closely the layout of the electronic assessment spreadsheet provided in the FNA Template, Version 2.0 (October 1988).

Analysts using a microcomputer to conduct the assessment will find the worksheets helpful in that they provide a complete outline of all calculations in the assessment, including those calculations which have been pre-programmed into the spreadsheet and are not immediately apparent to the user. The analyst without access to a microcomputer will find this appendix especially helpful since the worksheets outline the complete formulas for an assessment and arrange the calculations in such a way as to permit a step-by-step completion of a pencil and paper food needs assessment. In so doing, the analyst is assured that his/her assessment will be methodologically consistent with assessments conducted with the FVA Lotus template.

USING THE WORKSHEETS TO PERFORM AN ASSESSMENT

To begin a pencil and paper food needs assessment using these worksheets the analyst should first make a photocopy of all the worksheets in this appendix and set aside the blank originals as master copies. Depending upon the number of commodities to be covered it may be necessary to make more than one photocopy of each page. Typically the analyst will chose to group cereal and non-cereal commodities on separate pages.

If a historical data base does not already exist it will be necessary for the analyst to collect and analyze information for at least five historical years. A complete set of worksheet copies will be necessary for each year of this historical period. Also, the analyst will need one photocopy of the Base Period Consumption Summary (Worksheet 5) for each commodity (cereal and non-cereal) under analysis.

Once the necessary copies have been made, the analyst may proceed with the assessment beginning with the most-distant year of the base period. All options and formulas for data estimation are included on the worksheets. The bottom line from each table or set of tables is transferred to a summary table, where additional calculations are then indicated. Although the summary format differs slightly between the current year (Worksheet 2) and the historical year (Worksheet 6), all other worksheet formats are identical and are used regardless of the year under analysis.

SUMMARY WORKSHEETS:		ELEMENT WORKSHEETS	
1:	General Parameters	7:	Gross Domestic Production
2:	Current Year Food Balance	8:	Non-Food Use
3:	Food Deficit (B.C.E. terms)	9 a:	Net Change in Unmilled Stocks
4:	Per Capita Food Consumption	9 b:	Net Change in Milled Stocks
5:	Base Period Consumption Summary	9 c:	Total Net Change in Stocks
6:	Historical Year Summary	10:	Food Exports
		11:	Commercial Food Imports
		12:	Food Aid Summary

WORKSHEET 1.
General Parameters

The General Parameters contains information common to all years of the assessment process. The period of analysis (mo/mo), base period, population, commodity names, coefficients and milling extraction rates are determined and/or registered here before the assessment is begun. These values should not change over the course of the assessment.

GENERAL PARAMETERS						
GENERAL	PERIOD OF ANALYSIS	POPULATION				
Country:_____ Analyst:_____ Date:_____	Consumption Year (mo/mo):___/_____ Current Year: 19___ or 19___/___ Base Period: 19___ or 19___/___ 19___ or 19___/___ 19___ or 19___/___ 19___ or 19___/___	Current Year: Base Year 1 (t-1): _____ Base Year 2 (t-2): _____ Base Year 3 (t-3): _____ Base Year 4 (t-4): _____ Base Year 5 (t-5): _____				
TECHNICAL COEFFICIENTS						
Base Commodity Equivalent (B.C.E.) Caloric equivalent (calories/unmilled kilogram) / Caloric equivalent of the base commodity = Base commodity equivalent (B.C.E.) coefficient (0.00)						
Milling extraction rate (m.e.r.) (.00)						

WORKSHEET2
Current Year Food Balance

The Current Year Food Balance is the summary table of the food assessment for the current year. It is the depository for the "bottom line" information calculated in the General Data Summary and the component worksheets (i.e. per capita consumption, gross domestic production, total non-food uses, imports, exports, net change in stocks, etc.). With the exception of per capita consumption (status quo method), all information in the Current Year Food Balance is derived from the component worksheets for the current year.

CURRENT YEAR FOOD BALANCE						
YEAR OF ANALYSIS:	COMMODITY:					
Per capita consumption (UNMILLED kg/year) x Population (thousands) = Total consumption requirement						
Gross domestic food production - Total non-food use = Net domestic food production						
- Net change in stocks - Total food exports = Domestic food supply						
Total consumption requirement (from above) - Domestic food supply (from above) = Import requirement						
- Total commercial food imports						
= FOOD DEFICIT (UNMILLED) x Milling extraction rate (m.e.r.) **= FOOD DEFICIT (MILLED)**						

WORKSHEET 3
Current Year Food Deficit (B.C.E. terms)

The current year food deficit for a particular commodity can be found on the bottom line of the Current Year Food Balance (Worksheet 2). If an aggregate (all commodities) food deficit value is desired, individual commodity deficits must first be converted to common terms using the base commodity equivalent coefficient calculated in General Parameters (Worksheet 1) and then aggregated. This worksheet provides the format for such analysis.

FOOD DEFICIT (BASE EQUIVALENT TERMS)						
YEAR OF ANALYSIS:	COMMODITY:					TOTAL
Food deficit (UNMILLED) x Base commodity equivalent (B.C.E.) coefficient						
= FOOD DEFICIT (UNMILLED) (B.C.E. TERMS)						

WORKSHEET 4
Per Capita Food Consumption

This worksheet addresses various alternative for determining the expected per capita food consumption in the current year. The historical (base-period) average per capita food consumption by commodity (option 1) is calculated in the Base Period Consumption Summary (Worksheet 5). The analyst should compare the values of the alternatives investigated and carry the appropriate per capita consumption figures forward to the Current Year Food Balance (Worksheet 2).

PER CAPITA FOOD CONSUMPTION					
YEAR OF ANALYSIS: 19___ COMMODITY:					
(1) Historical (base-period) average					
or					
(2) Trend extrapolation (1) Linear projection (2) Log-linear projection					
Specify option (1 or 2) →					
Per capita consumption					
or					
(3) Nutritional norm					
or					
(4) Other					
Specify option (1,2,3 or 4) →					
PER CAPITA CONSUMPTION (UNMILLED KG/YEAR)					

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WORKSHEET5
Base Period Consumption Summary

In the Base Period Summary, data from each Historical Year Food Balance are compiled to enable the analyst to view and/or analyze averages or trends, by commodity, over the base period. Most importantly, the Base Period Summary provides for the calculation of the status quo per capita consumption, a simple average of per capita consumption across all years in the base period.

BASE PERIOD CONSUMPTION SUMMARY

COMMODITY: _____ year:	19____	19____	19____	19____	19____	AVG.
Gross domestic food production - Total non-food use = Net domestic food production						
- Net change in stocks - Total food exports = Domestic food supply						
+ Total commercial food imports + Food aid = Total food supply						
/ Population (thousands)						
= PER CAPITA CONSUMPTION (UNMILLED KG/YEAR) x Milling extraction rate (m.e.r.) **= PER CAPITA CONSUMPTION (MILLED KG/YEAR)**						

WORKSHEET 6
Historical Year Food Balance

The Historical Year Food Balance compiles "bottom line" data from the component worksheets for all commodities in a given historical year. The format of the Historical Year Food Balance differs slightly from that of the Current Year Food Balance since consumption in historical years must reflect the contribution of food aid. Data from the Historical Year Food Balance worksheets are re-compiled, by commodity, in Table 5 (Base Period Summary).

HISTORICAL YEAR FOOD BALANCE						
YEAR OF ANALYSIS:	COMMODITY:					
Gross domestic food production - Total non-food use = Net domestic food production						
- Net change in stocks - Total food exports = Domestic food supply						
+ Total commercial food imports + Food aid = Total food supply						
/ Population (thousands)						
= PER CAPITA CONSUMPTION (UNMILLED KG/YEAR) X Milling extraction rate (m.e.r.) **= PER CAPITA CONSUMPTION (MILLED KG/YEAR)**						

WORKSHEET7
Gross Domestic Food Production

In this worksheet, five possible methods for determining or projecting gross domestic food production are outlined. The bottom line, Total Gross Domestic Food Production, should be carried forward to the appropriate (current or historical) Food Balance worksheet.

GROSS DOMESTIC FOOD PRODUCTION						
YEAR OF ANALYSIS: 19___	COMMODITY:					
(1) Official or direct estimate:						
— or —						
(2) Area/yield method: Area harvested (hectares) x Yield (metric ton/hectare) (0.000) = Gross domestic production						
— or —						
(3) Post-Harvest method: Sales to government marketing board + local sales + on-farm stocks + on-farm consumption = Gross domestic production						
— or —						
(continued)						

GROSS DOMESTIC FOOD PRODUCTION

Worksheet 7 (continued)

YEAR OF ANALYSIS: 19___	COMMODITY:				
(4) Trend extrapolation methods: (1) Linear (2) Non-linear (3) Base period average Specify option (1,2 or 3) Gross domestic production					
or					
(5) Variation from norm: Expected percentage of norm (0.00) x Norm value = Gross domestic production Specify option (1,2,3,4,5)					
TOTAL GROSS DOMESTIC FOOD PRODUCTION					

WORKSHEET 8
Non-Food Use

Gross domestic food production must be adjusted for non-food uses when assessing the amount of domestic food production that is actually available for human consumption. Non-food uses include seed, feed, post-harvest losses and industrial/processing usage. This worksheet allows for the estimation or calculation of non-food uses in an aggregate or disaggregate manner. The total non-food use (aggregate or disaggregate method) is applied against gross domestic food production in the appropriate (Current or Historical) Food Balance worksheet.

NON FOOD USE						
YEAR OF ANALYSIS:	COMMODITY:					
(1) AGGREGATE method:						
(1) Official or direct estimate: ——— or ———						
(2) Share of production method: Gross domestic production x Estimated % of production (.00) = Total non-food use (all sources)						
Specify option (1 or 2) →						
TOTAL NON-FOOD USE (all sources)						
(2) DISAGGREGATE method:						
(A) SEED USE: (1) Official or direct estimate: ——— or ———						
(2) Share of production method: Gross domestic production x % of production saved as seed (.00) = Total seed use ——— or ———						
(continued)						

NON FOOD USE

Worksheet 8 (continued)

YEAR OF ANALYSIS:	COMMODITY:					
(3) Area norm method: Seeding rate (metric ton/hectare) x Area cultivated in subsequent year (ha) = Total seed use						
Specify option (1,2 or 3) →						
Total SEED Use						
(B) FEED USE: (1) Official or direct estimate:						
or						
(2) Share of production method: Gross domestic production x % of production used as feed (.00) = Total feed use						
or						
(3) Feeding rate method: Livestock numbers (head) x Feeding rate (metric ton/head) = Total feed use						
Specify option (1,2 or 3) →						
Total FEED Use						
(C) POST-HARVEST LOSSES: (1) Official or direct estimate:						
or						
(2) Share of production method: Gross domestic production x % of production (.00) = Total post-harvest losses						
Specify option (1 or 2) →						
Total POST-HARVEST losses						

NON-FOOD USE

Worksheet 8 (continued)

YEAR OF ANALYSIS:	COMMODITY:				
(D) INDUSTRIAL USES/PROCESSING LOSSES:					
(1) Official or direct estimate:					
——— or ———					
(2) Share of production method:					
Gross domestic production					
x % of production (.00)					
= Total industrial/processing losses					
Specify option (1 or 2) →					
Total INDUSTRIAL/PROCESSING losses					
NON-FOOD USE (DISAGGREGATE)(A+B+C+D)					
Specify option (1=AGGREGATE or 2=DISAGGREGATE) →					
TOTAL NON-FOOD USE					

WORKSHEET 9a.- 9c.
Net Change in Stocks

These worksheets outline the steps necessary to calculate stock changes from an aggregate or disaggregate orientation. Worksheet 9a compiles information on commodities stored in an UNMILLED state; Worksheet 9b in a milled state. Worksheet 8c draws the two together in 100% UNMILLED terms. The total net change in stocks (from Worksheet 9c) should be carried forward to the appropriate (Current or Historic) Food Balance.

NET CHANGE IN UNMILLED STOCKS
Worksheet 9a

YEAR OF ANALYSIS: COMMODITY:					
AGGREGATE method:					
(1) Official or direct estimate: or					
(2) Closing UNMILLED stock level (all sources) - Opening UNMILLED stock level (all sources) = Net change in UNMILLED stocks (all sources)					
DISAGGREGATE method					
(A) PUBLIC WORKING STOCKS (UNMILLED) (1) Official or direct estimate or					
(2) Closing unmilled working stock level - Opening unmilled working stock level = Net change in unmilled working stocks					

(continued)

NET CHANGE IN UNMILLED STOCKS

Worksheet 9a (continued)

YEAR OF ANALYSIS: COMMODITY:					
(B) PUBLIC RESERVE STOCKS (UNMILLED) (1) Official or direct estimate					
or					
(2) Closing unmilled reserve stock level - Opening unmilled reserve stock level = Net change in unmilled reserve stocks					
(C) COMMERCIAL STOCKS (UNMILLED) (1) Official or direct estimate					
or					
(2) Closing unmilled commercial stock level - Opening unmilled commercial stock level = Net change in unmilled commercial stocks					
(D) ON-FARM STOCKS (UNMILLED) (1) Official or direct estimate:					
or					
(2) Closing unmilled on-farm stock level - Opening unmilled on-farm stock level = Net change in unmilled on-farm stocks					
(E) DONOR STOCKS (UNMILLED) (1) Official or direct estimate:					
or					
(2) Closing unmilled donor stock level - Opening unmilled donor stock level = Net change in unmilled donor stocks					
NET CHANGE IN STOCKS (UNMILLED) (A+B+C+D+E)					
Specify option selected (1=aggregate; 2=disaggregate)					
NET CHANGE IN UNMILLED STOCKS					

NET CHANGE IN MILLED STOCKS

Worksheet 9b

YEAR OF ANALYSIS:	COMMODITY:					
AGGREGATE method:						
(1) Official or direct estimate: or						
(2) Closing MILLED stock level (all sources) - Opening MILLED stock level (all sources) = Net change in MILLED stocks (all sources)						
DISAGGREGATE method:						
(A) PUBLIC WORKING STOCKS (MILLED) (1) Official or direct estimate or						
(2) Closing milled working stock level - Opening milled working stock level = Net change in milled working stocks						

(continued)

NET CHANGE IN MILLED STOCKS

Worksheet 9b (continued)

YEAR OF ANALYSIS: COMMODITY:					
(B) PUBLIC RESERVE STOCKS (MILLED) (1) Official or direct estimate					
or					
(2) Closing milled reserve stock level - Opening milled reserve stock level = Net change in milled reserve stocks					
(C) COMMERCIAL STOCKS (MILLED) (1) Official or direct estimate					
or					
(2) Closing milled commercial stock level - Opening milled commercial stock level = Net change in milled commercial stocks					
(D) ON-FARM STOCKS (MILLED) (1) Official or direct estimate:					
or					
(2) Closing milled on-farm stock level - Opening milled on-farm stock level = Net change in milled on-farm stocks					
(E) DONOR STOCKS (MILLED) (1) Official or direct estimate:					
or					
(2) Closing milled donor stock level - Opening milled donor stock level = Net change in milled donor stocks					
NET CHANGE IN MILLED STOCKS (A+B+C+D+E)					
Specify option selected (1=aggregate; 2=disaggregate)					
NET CHANGE IN MILLED STOCKS					

TOTAL (MILLED AND UNMILLED) NET CHANGE IN STOCKS

Worksheet 9c

YEAR OF ANALYSIS:	COMMODITY:				
Net change in MILLED stocks / Milling extraction rate (m.e.r.) = Net change in MILLED stocks (UNMILLED terms)					
+ Net change in UNMILLED stocks					
= Total net change in stocks (UNMILLED terms)					

WORKSHEET 10
Food Exports

Worksheet 10 outlines several methods for determining the level of commercial food exports in a given year. The worksheet looks at both registered and unregistered food exports; milled commodities are converted to unmilled equivalents before adding to the unmilled balance. The bottom line, total commercial exports, should be carried forward to the appropriate (Current or Historic) Food Balance.

FOOD EXPORTS						
YEAR OF ANALYSIS:	COMMODITY:					
(A) REGISTERED Commercial food exports:						
(1) Official or direct estimate: MILLED commercial food exports / Milling extraction rate (m.e.r.) = MILLED commercial food exports (UNMILLED terms) + UNMILLED commercial food exports = Total REGISTERED commercial food exports						
or						
(2) Trend extrapolation: (1) Linear (2) Non-linear (3) Base period average Specify option (1,2 or 3) →						
Total REGISTERED commercial food exports						
or						
(continued)						

FOOD EXPORTS

Worksheet 10 (continued)

YEAR OF ANALYSIS: COMMODITY:					
(3) Variation from norm: Expected percent of norm (.00) x Norm value = Total REGISTERED commercial food exports					
Specify option (1,2 or 3)					
Total REGISTERED commercial food exports					
(B) UNPEGISTERED Commercial food exports:					
MILLED unregistered commercial exports / Milling extraction rate (m.e.r.) = MILLED unregistered exports (UNMILLED terms) + UNMILLED unregistered commercial exports = Total UNREGISTERED commercial food exports					
TOTAL COMMERCIAL FOOD EXPORTS (A+B)					

WORKSHEET 11
Commercial Food Imports

Commercial food import levels can be determined in a number of ways. The following worksheets outline several of the most common methods in use. The worksheet looks at both registered and unregistered food imports; milled commodities are converted to unmilled equivalents before adding to the unmilled balance. The bottom line value for total commercial imports should be carried forward to the appropriate (Current or Historic) Food Balance.

COMMERCIAL FOOD IMPORTS

YEAR OF ANALYSIS:	COMMODITY:					
(A) REGISTERED Commercial food imports:						
(1) Official or direct estimate: MILLED commercial food imports / Milling extraction rate (m.e.r.) = MILLED commercial food imports (UNMILLED terms) + UNMILLED commercial food imports = Total REGISTERED commercial food imports						
or						
(2) Trend extrapolation: (1) Linear (2) Non-linear (3) Base period average Specify option (1,2 or 3) →						
Total REGISTERED commercial food imports						
or						
(3) Usual Marketing Requirement (UMR):						
or						

(continued)

COMMERCIAL FOOD IMPORTS

Worksheet 11 (continued)

YEAR OF ANALYSIS:	COMMODITY:				
(4) Commercial Import Capacity (CIC):					
——— or ———					
(5) Maximum historical value: (year = 19__)					
Specify option (1,2,3,4 or 5) ——→					
Total REGISTERED commercial food imports					
(B) UNREGISTERED Commercial food imports:					
MILLED unregistered commercial imports					
/ Milling extraction rate (m.e.r.)					
= MILLED unregistered imports (UNMILLED terms)					
+ UNMILLED unregistered imports					
= Total UNREGISTERED commercial food imports					
TOTAL COMMERCIAL FOOD IMPORTS (A+B)					

WORKSHEET 12.
Food Aid Summary

Food provided in the form of bilateral or multilateral assistance is factored into the calculation of per capita consumption in historical years. In this worksheet, the Food Aid Summary, data on milled and unmilled food aid can be recorded and converted to 100% unmilled equivalent.

FOOD AID						
YEAR OF ANALYSIS:	COMMODITY:					
MILLED food aid / Milling extraction rate (m.e.r.) = MILLED food aid (UNMILLED terms) + UNMILLED food aid						
= TOTAL FOOD AID (UNMILLED TERMS)						

APPENDIX B

DATA CHECKLIST FOR FOOD NEEDS ASSESSMENTS

NOTES:

- Appendix B includes a list of the essential data required for a food needs assessment . Supplemental information useful for an assessment is also included. For each variable, alternative methods of calculation and data requirements are listed.

DATA CHECKLIST FOR FOOD NEEDS ASSESSMENT

VARIABLE	ALTERNATIVE METHODS OF CALCULATION	ESSENTIAL DATA	SUPPLEMENTARY INFORMATION
GENERAL PARAMETERS	-NA-	- period of analysis (i.e. consumption year, mo/mo) - historical base period - commodity coverage (cereals and non-cereals) - technical coefficients: milling extraction rates by commodity; caloric values by commodity - population series for base period and current year or base population and annual grwoth ratess	- percent of total diet contributed by each commodity covered - crop calendars, by commodity
CONSUMPTION REQUIREMENT	1. Historical average per capita consumption 2. Trend extrapolation (linear or non-linear)	- food balance sheets for base period including data on: domestic production non-food uses opening/closing stocks food exports/imports food aid deliveries population - current population	- household consumption surveys - graph plotting historical per capita consumption by commodity
	3. Nutritional norm	- nutritionally recommended per capita consumption levels by commodity - current population	- nutritionally recommended caloric intake disaggregated by age and sex structure - household consumption surveys
	4. Other	- per capita consumption stardard - current population	- price and income elasticities - commodity price series - household consumption surveys - consumer consumption in previous shortfalls/surpluses

DATA CHECKLIST FOR FOOD NEEDS ASSESSMENT (CONTINUED)

VARIABLE	ALTERNATIVE METHODS OF CALCULATION	ESSENTIAL DATA	SUPPLEMENTARY INFORMATION
GROSS DOMESTIC PRODUCTION (CONTINUED)	4. Variation from norm	- historical data series on gross domestic production by commodity - expected variation from norm (percent variation of current year production over trend, average or other normal production)	- farmer survey data - historical data series on: agricultural prices rainfall (monthly, by region) - availability, price and use of agricultural inputs - NASA or NOAA assessements
NON-FOOD USES AGGREGATE:	1. Official or direct estimate	- aggregate estimate of losses for all non-food uses, by commodity	
	2. Share of production method	- aggregated estimate of % of production lost to non-food uses by commodity - gross domestic production	
DISAGGREGATE: (BY SOURCE)	A. Seed Use 1. Official or direct estimate	- estimates of seed saved for subsequent year, by commodity - allocations for reseeding, if necessary	- amount of seed imported - amount of seed grown on multiplication farms
	2. Share of production	- gross domestic production by commodity - estimated share of production saved as seed - allocations for reseeding, if necessary	

DATA CHECKLIST FOR FOOD NEEDS ASSESSMENT (CONTINUED)

VARIABLE	ALTERNATIVE METHODS OF CALCULATION	ESSENTIAL DATA	SUPPLEMENTARY INFORMATION
NON-FOOD USE (CONTINUED) DISAGGREGATE: (BY SOURCE)	A. Seed Use (continued) 3. Area/norm method	- seeding rate by crop per hectare - expected area to be cultivated in subsequent year, by crop - allocations for reseeding	
	B. Feed Use 1. Official or direct estimate	- feed used by commodity	
	2. Share of production method	- gross domestic production, by commodity - estimate of % share of production used for feed	
	3. Feeding rate method	- number of head of livestock - feeding rate per animal, by commodity	
	C. Post-Harvest losses 1. Official or direct estimate	- estimated post-harvest losses, by commodity	- historical data series for post-harvest losses - survey data on variations in post-harvest loss rates between years of shortfall and years of surplus - survey data on grain storage practices and losses
	2. Share of production method	- gross domestic food production by commodity - aggregate estimate of % of production lost after harvest to insects, rodents, spoilage, mismanagement, etc., by commodity.	
	D. Industrial/processing losses 1. Official or direct estimate	- estimate of total industrial losses, by commodity	- historical data series for sales of food commodities to processing plants - production of processed food processed food exports - production of non-food items manufactured from food commodities
	2. Share of production method	- gross domestic food production - % of production used for processing/industrial purposes	

DATA CHECKLIST FOR FOOD NEEDS ASSESSMENT (CONTINUED)

VARIABLE	ALTERNATIVE METHODS OF CALCULATION	ESSENTIAL DATA	SUPPLEMENTARY INFORMATION
NET CHANGE IN STOCKS			
AGGREGATE METHOD	1. Official or direct estimate	- estimate of aggregate net change in stocks from all sources	- aggregate stock behavior in previous shortfall or surplus situations
	2. Closing - opening stock balances	- aggregate closing stock level - aggregate opening stock level	
2. DISAGGREGATE METHOD (BY SOURCE)	a. public working stocks		- gov't storage facility capacity - historical data series for public working stock target levels; actual public working stock balances; gov't sales/ purchases of food commodities - current public working stock policies and target levels - current gov't sales/purchases of food commodities
	1. Official or direct estimate	-net change in public working stocks	
	2. Closing - opening stock balances	- closing stock levels: public working - opening stock levels: public working	
	b. public reserve stocks		- historical data series for : public reserve (food security) stock target levels; actual public reserve stock balances; gov't sales/purchases of commodities - current food security stock policies and target levels - bi-lateral and/or multi-lateral contributions to reserve or security stocks - reserve stock storage capacity - reserve stock practices during previous shortfall or surplus situations
	1. Official or direct estimate	-net change in public reserve stocks	
	2. Closing - opening stock balances	- closing stock levels: public reserve - opening stock levels: public reserve	

DATA CHECKLIST FOR FOOD NEEDS ASSESSMENT (CONTINUED)

VARIABLE	ALTERNATIVE METHODS OF CALCULATION	ESSENTIAL DATA	SUPPLEMENTARY INFORMATION
NET CHANGE IN STOCKS (CONTINUED)	c. commercial stocks		- historical data series for private-trader purchases and sales of food commodities (by month) price and production policies gross domestic production - current production forecasts - current commodity price and production policies - commodity prices (by month)
	1. Official or direct estimate	-net change in private commercial stocks	
	2. Closing - opening stock balances	- closing stock levels: private commercial - opening stock levels: private commercial	
	d. on-farm stocks		- historical data series for on-farm stock retention; small-holder sales/barter of food commodities; price/production policies - current price/production polices - studies of farmer stock-holding during past shortfalls/surpluses
	1. Official or direct estimate	-net change in on-farm stocks	
	2. Closing - opening stock balances	- closing stock levels: on-farm - opening stock levels: on-farm	
	e. donor stocks		- commodity distribution (by month) - current rate of food distribution (by month) - current status of pledges, call-forward and arrivals - donor behavior in previous shortfall or surplus situations
	1. Official or direct estimate	-net change in donor stocks	
	2. Closing - opening stock balances	- closing stock levels: donor - opening stock levels: donor	

DATA CHECKLIST FOR FOOD NEEDS ASSESSMENT (CONTINUED)

VARIABLE	ALTERNATIVE METHODS OF CALCULATION	ESSENTIAL DATA	SUPPLEMENTARY INFORMATION
COMMERCIAL FOOD EXPORTS	1. Official or direct estimate	- milled export levels, by commodity - milling extraction rate, by commodty - unmilled export levels, by commodity	- regression analysis measuring the relationship between registered commercial food exports and indep. variables, such as gross domestic production, stocks, food imports, debt payments, etc. - world commodity prices - commercial export policies/ practices - historical data series for: commercial food exports world commodity prices - export activity during previous shortfall or surplus situations
	2. Trend extrapolation method	- historical data series of registered commercial exports over the selected base period, by commodity	
	3. Variation from norm	'norm' or expected value of commercial exports based on trend or average or other calculation - expected variation (%) from norm	
UNREGISTERED FOOD EXPORTS	Official or direct estimate	- estimate of milled unregistered exports, by commodity - milling extraction rates - estimate of unmilled unregistered exports, by commodity	- current export policies/ practices - pricing data from neighboring cos. - historical data series on contraband trade
REGISTERED COMMERICAL FOOD IMPORTS	1. official or direct estimate	- milled export levels, by commodity - milling extraction rate, by commodty - unmilled export levels, by commodity	- regression analysis measuring the relationship between registered commerical food imports and independent variables such as gross domestic food production, currency reserves, export earnings, etc. - world commodity prices - commercial import policies/ practices
	2. trend extrapolation method	- historical data series of registered commercial imports over the selected base period, by commodity	

DATA CHECKLIST FOR FOOD NEEDS ASSESSMENT (CONTINUED)

VARIABLE	ALTERNATIVE METHODS OF CALCULATION	ESSENTIAL DATA	SUPPLEMENTARY INFORMATION
REGISTERED COMMERICAL FOOD IMPORTS (CONTINUED)	3. Usual Marketing Requirement (UMR)	- determination of official UMR based on official historical data series	- food import strategy - available international credit for import finance - illegal smuggling (import/ export) - import behavior in past economic or food crises
	4. commercial import capacity	- historical data from each year in base period on: international reserves (US$) total commercial imports (US$) total food imports (US$) - current year data on: international reserves (US$) projected export earnings (US$) avail. commercial credit (US$) debt service payments (US$) CIF price of each commodity at major point of entry	
UNREGISTERED FOOD IMPORTS	Official or direct estimate	- estimate of milled unregistered imports, by commodity - milling extraction rates - estimate of unmilled unregistered imports, by commodity	- pricing data in neighboring countries - data on production surpluses in neighboring cos.

APPENDIX C

EQUATIONS USED IN ESTIMATING FOOD NEEDS

- Summary equations used in the FVA Food Needs Assessment methodology are included on the following page. Chapter 2 develops the concepts behind each of these equations.

The Key Equations:

Population × Par Capita Requirement = **Total Consumption Requirement**	Net Domestic Production – Net Change in stocks – Total Food Exports = **Domestic Food Supply**
Total Consumption Requirement – Domestic Food Supply = **Import Requirement**	Import Requirement – Commercial Food Imports = **Food Deficit**

Other Equations:

Gross Domestic Production – Non-Food Uses = **Net Domestic Production**	Closing Stock Balance – Opening Stock Balances = **Net Change in Stocks**
Seed Saved for Subsequent Year + Animal Feed + Post-Harvest Losses + Industrial Uses/Processing Losses = **Non-Food Use**	Net Change: Public Working Stocks + Net Change: Public Reserve Stocks + Net Change: Commercial Stocks + Net Change: On-Farm Stocks + Net Change: Donor Stocks = **Net Change in Total Stocks**

APPENDIX D

TECHNICAL CONVERSION FACTORS

from
"Agricultural Commodities Projections for 1975 and 1985"
Vol. 1. Methodological Notes. Statistical Appendix
Food and Agricultural Organization, Rome , 1967.

NOTES:

- These Technical Conversion Factors were used in the preparation of the food balance sheets in use by FAO.
- The conversion factors are useful as a rough guide for the losses incurred during milling, husking, extraction, etc that result during processing.
- The factors should only be used in the event that the analyst is unable to find local factors.
- FAO publishes these conversion factors for each country and these should be consulted for the analysis.
- Often a range is provided (e.g. with paddy rice the range is 60-70 percent remaining after adding the total production), the range is the result of variation across countries.

Table I.27 Technical Conversion Factors Used in the Preparation of Standardized Food Balance Sheets[1]

Basic commodity	Derived commodity	Conversion factor (percent)
Wheat	wheat flour	72-80
Rice, Paddy	rice, milled	60-70
Rice,	rice, milled	80
Barley	flour	60-80
Oats	flour	50-80
Maise	flour	80-95
Millet and sorghum	flour	80-95
Rye	flour	70-80
Cassava, fresh	cassava flour	25-33
Cassava, fresh	tapioca	15-30
Sugar cane	raw centrifugal sugar	10-12
Sugar beet	raw centrifugal sugar	14-17
Non-centrifugal sugar	raw centrifugal sugar	60
Raw centrifugal sugar	refined sugar	92
Groundnuts, in shell	groundnuts, shelled	70
Coconuts, in husk	copra	15-24
Fruit, Fresh	Fruit, dried	
Apples	dried apples	10-20
Pears	dried pears	17
Figs	dried figs	33
Peaches	dried peaches	18
Plums	dried plums	23
Citrus Fruit, Fresh	citrus juice, natural	30-40
Citrus Fruit, Fresh	citrus juice, concentrated	8
Meat, carcass weight	canned mean	60-80
Meat, carcass weight	smoked meat	75
Meat, carcass weight	salted meat	89
Eggs, in shell	liquid or frozen eggs	18
Eggs, in shell	dried eggs	24
Fish, round weight	fish, landed weight	67
Fish, Round weight	fish, fillet weight	50
Milk, whole	powered whole milk	12
Milk, whole	condensed or evaporated milk	38
Milk, whole	cheese	11
Milk, whole	butter	5
Milk, whole	cream	16
Milk, skimmed	powdered skim milk	9
Cotton seed	cottonseed oil	16
Sesame seed	sesame seed oil	47
Rapeseed	rapeseed oil	35
Linseed	linseed oil	34
Sunflower seed	sunflowerseed oil	30
Castor seed	castor seed oil	45
Groundnuts, shelled	groundnut oil	43
Soybeans	soybean oil	16
Melon seed	melonseed oil	30
Hempseed	hempseed oil	30
Palm Kernels	palm oil	46
Copra	coconut oil	64
Tungnuts	tung oil	17
Sheanuts	shea nut oil	46
Safflower seeds	safflower oil	30
Other seeds N.E.S.	oil	30

[1] Where conversion factor is applicable to many countries, it is shown as a dingle figure, while for those products for which conversion rates vary substantially from country to country the conversion factors are shown as a range. For further references regarding the specific factors applicable to particular countries see the FAO publication: Technical Conversion Factors for Agricultural Commodities", Rome 1960.

APPENDIX E

ENERGY AND PROTEIN CONTENTS OF COMMON COMMODITIES

NOTES:

- The information presented in Appendix E, drawn from published sources, lists average calories per kilogram of different forms of common commodities.
- The user is encouraged to compile local figures that represent the energy contents of commodities in the specific country. Local figures often will be more reliable because they reflect variations in variety of crops, growing conditions, method of storage and reporting of caloric contents. Exercise care when dealing with processed and unprocessed states of a commodity. As the tables show, caloric differences between various processed forms of a commodity can be significant.
- Energy is expressed as kilocalories per kilogram of commodity. Energy is often referred to as simply "calories" and not the equilavent and technically correct "kilocalories." Energy can also be expressed in the metric system as kilojoules: 1 kilocalorie (kcal) equals 4.25 kilojoules (kJ). As a useful approximation, the gross energy or calories available from burning pure fat is 9 kcals per g, carbohydrate: 4 kcal per g, and protein: 4 kcal per g. These approximations are useful as a guide, but do not represent the total energy available to the consumer due to metabolic losses and absorptive differences.
- Commodity groups include: Cereals, Roots and Tubers, Grain Legumes, Sugar and Syrups, Meats, Eggs, Fish, Milk, and Oils and Fats.
- Code is an FAO code number.

APPENDIX E

Energy content of common commodities

Code	Name	Kcal/Kg	Protein	Source	Comments
	1. Cereals:				
005	BARLEY (Whole grain)	3,370	100	1	(Hordeum vulgare)
042	CORN				see Maize (Zea mays)
042	MAIZE (Whole kernel dried)	3,570	94	1	Unmilled white/yellow Moisture 11.6%
049	MAIZE (Flour or meal)	3,530	94	1	Ground & Unsifted
052	MAIZE (Flour)	3,680	94	1	Ground & sifted
078	MILLET (Whole grain dried)	3,410	104	1	Bulrush Pennisetum typhoides. Same as ground millet.
087	MILLET (Whole grain dried Finger)	3,300	75	1	Known as Ragimillet African millet etc. (Eleusine coracana)
105	OATS (Whole grain)	3,780	171	1	Avena sativa
106	OATS (oatmeal or rolled)	3,940	126	1	Milled
122	RYE (Whole grain)	3,360	105	1	Secale cereale
123	RYE (Flour)	3,650	82	1	
108	RICE (Whole grain)	3,530	63	1	Paddy or rough
109	RICE (Whole grain)	3,570	65	1	Brown or hulled
111	RICE (Whole grain)	3,630	70	1	Milled and polished
126	SORGHUM (Whole grain dried)	3,450	107	1	Average of brown, red white, yellow & other varieties.

Code	Name	Kcal/Kg	Protein	Source	Comments
	1. Cereals (con't):				
160	TEFF (Whole grain)	3,400	95	1	Mixed red and white varieties.
166	WHEAT (Whole grain)	3,320	140	1	Mixed hard and soft varieties
171	WHEAT (Whole flour or meal)	3,320	124	1	Unsifted from unspecified wheat
172	WHEAT (Flour sifted)	3,510	105	1	Milled -- 85-90% extraction
173	WHEAT (Flour sifted)	3,640	110	1	Milled -- 75-80% extraction
174	WHEAT (Flour sifted)	3,640	103	1	Milled -- 72% extraction
	2. Roots and Tubers				
186	ABYSSINIAN BANANA - Ensete	1,710	12	1	Stem Pith (Kocho) Ensete edule
187	ABY. BANANA GREY	2,250	2	1	Stem Pith (Bolla)
188	ABY. BANANA (Flour)	1,950	18	1	(Karta)
206	BANANA (Ripe Common)	1,110	15	1	Sweet common banana (Musa cavendishii)
	BANANA (Cooking)				see Plantain
213	CASSAVA (Raw -- Root)	1,490	12	1	Common bitter or sweet, also called Manioc
214	CASSAVA (Dried)	3,550	21	1	Also known as konkonte
217	CASSAVA (Meal)	3,440	16	1	
	COCOYAM				see Taro
	ELEPHANTSEAR				see Taro
	ENSETE				see Abyssinian banana

Code	Name	Kcal/Kg	Protein	Source	Comments
	2. Roots and Tubers (con't)				
	FALSE BANANA				see Abyssinian banana
227	FALSEYAM (Flour)	3,350	105	1	Icacina senegalensis
229	HAUSA POTATO (Raw tuber)	940	13	1	Also known as the Sudan potato and tumulka
230	KAFFIR POTATO (Raw tuber)	840	19	1	Plectranthus esculentus and coleus
234	MALANGA (Raw tuber)	1,370	22	1	Also known as Yautia Xanthosoma spp.
236	PLANTAIN (Ripe)	1,350	12	1	Cooking banana Musa paradisiaca
240	POTATOES (Raw tubers)	820	17	1	Solanum tuberosum also known as English potatoes
	POTATO - SUDAN				see Hausa Potato
245	SWEET POTATO (Raw root)	1,210	16	1	Same for different colors Ipomoea batatas
254	TARO	1,020	18	1	Colocasia esculenta also known as cocoyam, dasheen
259	YAM, AFRICAN (Raw tuber)	1,120	15	1	Diosorea spp. Values applicable to other varieties of yams
262	YAM, ATTOTE (Raw tuber)	710	15	1	Also known as yellow guinea
	3. Grain Legumes				
293	COWPEA (Whole dried)	3,420	231	1	Also known as catjang, hindu cowpea, kaffir bean and similiar to common cowpea (Vigna spp.)
311	KIDNEY BEAN (Whole dried)	3,360	217	1	Phaseolus vulgaris also known as haricot, navy, pinto, and french bean
317	LIMA BEAN (Whole dried)	3,350	214	1	Phaseolus lunatus also known as butter, curry, rangoon, sieva, burma, or Madagascar bean

Code	Name	Kcal/Kg	Protein	Source	Comments
	3. Grain Legumes				
326	PEANUT (Shelled whole dried)	5,490	232	1	Arachis hypogaea, also known as groundnut
336	PHASEOLUS (Whole dried)	3,350	234	1	Also known as Adenguarre
346	SOYBEAN (Whole dried)	4,050	337	1	Glycine spp.
	4. Sugars and Syrups				
	SUGAR (White)	4,000	0	2	Refined highly
	SUGAR (Brown)	3,444	0	1	Partly refined
	SUGAR CANE (Stem)	600	10	2	Actual stem sugar cane
	5. Meats				
1080	BEEF	2,370	182	1	Medium fat content
1082	BEEF FAT	4,100	137	1	
1102	CHICKEN				Mature Bird
1165	SHEEP	2,650	169	1	Unspecified fat level
	5. Eggs				
1208	EGGS (Whole raw)	1,400	118	1	
	6. Fish				
1252	CARP (Raw)	860	188	1	Labeo spp. African, Rhino fish, mudsucker

Code	Name	Kcal/Kg	Protein	Source	Comments
	6. Fish (con't)				
1299	FISH (Raw)	1,030	188	1	Average of all kinds
1300	FISH (Dried, salted, whole)	2,690	473	1	Average of all kinds
1368	NILE PERCH (Raw)	1,070	219	1	Lates spp. Mbuta
	7. Milk				
	MILK (Whole)	640	330	2	Cow's milk with 3.6% fat
	MILK (Skim)	390	350	1	Cow's with 0.8% fat
	MILK (Skim and dried)	3,530	289	1	Cow's with 0.4% fat and 4.7% moisture
	8. Oils and Fats				
	BUTTER (Cow)	6,850	0	1	With 21% moisture
	GHEE	8,620	0	1	With 1.4% moisture

SOURCES

1. FAO. Food composition table for use in Africa. USDA and FAO Research Project. Compiled by Woot-Tsuen Wu Leung. Food and Agricultural Organization. Washington, DC: FAO, 1968.

2 Platt BS. Tables of representative values of food commonly used in tropical countries. Special report series i 302. Medical Research Council (revised edition of SRS No. 253). London UK: Her Majesty's Stationery Office, 1962.

APPENDIX F

CROP CALENDARS

NOTES:

- Appendix includes information on crop calendars by country and by commodity.
- Information should be checked against locally available crop calendars.

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APPENDIX F
CROP CALENDARS

Region/Country	Crop	Planting	Harvest	Marketing year
AFRICA				
North Africa				
Algeria	Winter grains	Nov-Dec	Jun-Aug	
Egypt	Wheat Maize Rice	November Apr-Jun May-Jun	Apr-Jun Jul-Sept Sept-Nov	July/June
Morocco	Winter grains Maize	Nov-Dec February	May-Jun Jun-Jul	July/June
Tunisia	Wheat Barley	Oct-Dec Oct-Dec	June May-Jun	
Western Africa				
Benin	Maize	Mar-Apr	Aug-Oct	Jan/Dec
Burkina Faso	Coarse grains	May-July	Aug-Oct	Nov/Oct
Cape Verde	Maize	July-Aug	Oct-Dec	Jan/Dec
Chad	Coarse grains	May-July	Oct-Dec	Nov/Oct
Cote d'Ivoire	Cereals	Mar-June	Oct-Dec	July/June
Gambia	Coarse grains Rice	May-June Jun-July	Sept-Oct December	Oct/Sept
Ghana	Coarse grains Rice	Apr-June Apr-July	Jul-Aug Oct-Jan	Oct/Sept
Guinea	Cereals	May-June	Sept-Dec	Jan/Dec
Guinea Bissau	Cereals	May-June	Sept-Dec	Jan/Dec
Liberia	Rice	Apr-July	Oct-Jan	Jan/Dec
Mali	Cereals	May-July	Sept-Nov	Nov/Oct
Mauritania	Millet/Sorghum	May-July	Oct-Nov	Nov/Oct
Niger	Coarse grains	Jun-July	Sept-Nov	Oct/Sept
Nigeria	Cereals	Mar-June	Oct-Dec	Jan/Dec
Senegal	Cereals	May-July	Oct-Nov	Nov/Oct
Sierra Leone	Rice	Apr-June	Oct-Dec	Jan/Dec
Togo	Coarse grains	Mar-Apr	Aug-Oct	Jan/Dec

Region/Country	Crop	Planting	Harvest	Marketing year
Central Africa				
Cameroon	Maize Rice	Mar-Apr Sept-Oct	Jul-Sept Dec-Jan	July/June
Central Africa Republic	Maize Rice/Millet/ Sorghum	Apr-May May-June	Aug-Sept Nov-Dec	Sept/Aug
Congo	Maize	Feb-June	June-Dec	July/June
Gabon	Maize	February	June	Jan/Dec
Sao Tome & Pr.	Maize	Sept-Oct	Dec-Jan	July/June
Zaire	Maize - first - second	 June January	 November June	Jan/Dec
Eastern Africa				
Burundi	Coarse grains - first - second	 Sept-Oct Jan-Feb	 Jan-Feb May-June	July/June
Comoros	Rice/Maize	Dec-Jan	Apr-May	Jan/Dec
Djibouti				Jan/Dec
Ethiopia	Maize/Sorghum Barley/Wheat	May-June Feb-Mar	Oct-Dec June-July	Jan/Dec
Kenya	Coarse grain/ Wheat Coarse grain/ Beans	Mar-May Oct-Nov	Aug-Nov Feb-Mar	July/June
Rwanda	Coarse grains - first - second	 Oct-Nov Jan-Feb	 February May-June	July/June
Somalia	Coarse grains - main - secondary	 Mar-Apr December	 Aug-Oct March	Jan/Dec
Sudan	Coarse grains Wheat	June-July November	Nov-Dec March	Nov/Oct
Tanzania	Coarse grains - main - secondary	 Dec-Jan Oct-Nov	 May-Aug Jan-Feb	June/May
Uganda	Coarse grains - main - secondary	 Feb-Mar July-Aug	 Jun-July Nov-Jan	Jan/Dec

Region/Country	Crop	Planting	Harvest	Marketing year
Southern Africa				
Angola	Coarse grains	Oct-Nov	Apr-May	Apr/March
Botswana	Coarse grains	Nov-Jan	Apr-Mar	
Lesotho	Coarse grains	Oct-Dec	Apr-May	July/June
Madagascar	Rice/Maize	Nov-Dec	Apr-May	Jan/Dec
Malawi	Coarse grains	Nov-Dec	Apr-Jun	Apr/March
Mauritius	Maize			
	- first	February	August	July/June
	- second	July	December	
Mozambique	Coarse grains	Oct-Dec	Apr-May	May/April
South Africa	Coarse grains	Oct-Jan	Apr-June	
	Wheat	May-June	Nov-Dec	
Swaziland	Coarse grains	Oct-Nov	Apr-May	May/April
Zambia	Coarse grains	Nov-Dec	Apr-May	May/April
Zimbabwe	Coarse grains	Nov-Dec	Apr-May	Apr/March
	Wheat	May-June	Oct-Nov	
ASIA				
Afghanistan	Winter grains	Oct-Nov	May-June	July/June
Bangladesh	Wheat	November	Mar-May	July/June
	Rice			
	- boro	December	Apr-Jun	
	- aus	Mar-Apr	July-Aug	
	- aman	May-July	Oct-Dec	
Burma	Rice	June	November	
Cambodia	Rice			
	- main	June-July	December	Jan/Dec
	- second	November	March	
China	Wheat			
	- winter	Sept-Oct	May-June	July/June
	- spring	Apr-May	Aug-Sept	
	Rice			
	- early	February	May-June	
	- int.	May-June	Aug-Sept	
	- late	June-July	Nov-Dec	
	Coarse grains	Mar-May	Aug-Sept	

Region/Country	Crop	Planting	Harvest	Marketing year
Cyprus	Wheat	Nov-Dec	June-Aug	
	Barley	Oct-Nov	May-July	
India	Wheat	Oct-Nov	Apr-May	July/June
	Rice			
	- Rabi	Oct-Nov	Apr-May	
	- Kharif	May-July	Sept-Nov	
India	Coarse grains	May-July	Sept-Nov	
Indonesia	Rice			
	- main	Oct-Nov	Mar-Apr	Apr/Mar
	- second	Feb-June	Jul-Oct	
	Maize	Sept-Nov	Dec-Feb	
Iran, Islamic Republic of	Wheat	Oct-Nov	June-Aug	
	Barley	Sept-Oct	April	
	Rice	Apr-June	Aug-Nov	
Iraq	Wheat	Nov-Dec	May-June	
Israel	Wheat	Oct-Dec	Apr-May	
Japan	Rice	May	October	
Jordan	Wheat	Nov-Jan	May-June	
	Barley	Nov-Jan	Apr-June	
Kampuchea (see Cambodia)				
Korea, Rep. of	Rice	June-July	Oct-Nov	
Laos	Rice	June-July	Oct-Nov	Jan/Dec
Lebanon	Wheat	Oct-Jan	June-July	
Malaysia	Rice			
	- main	June-Oct	Oct-Mar	
	- second	Apr-May	July-Oct	
Nepal	Wheat	Nov-Dec	April	July/June
	Maize	Apr-May	July-Sept	
	Rice	June-Aug	Nov-Dec	
Pakistan	Wheat	Oct-Nov	April-May	
	Rice	May-July	Oct-Nov	
	Coarse grains	June-July	Oct-Nov	
Philippines	Rice			
	- main	July	Nov-Dec	July/June
	- second	Dec-Jan	Apr-May	

Region/Country	Crop	Planting	Harvest	Marketing year
Philippines (con't)	Maize			
	- main	July	December	
	- second	January	June	
Saudi Arabia	Wheat	Nov-Dec	Apr-May	
Sri Lanka	Rice			
	- Maha	Oct-Nov	Feb-Mar	Jan/Dec
	- Yala	Apr-May	Aug-Sept	
Syria	Winter grains	Oct-Jan	May-July	
Thailand	Rice			
	- main	May-Sept	Nov-Feb	
	- second	Feb-Mar	June-July	
	Maize	May-June	Aug-Sept	
Turkey	Wheat	Sept-Nov	July-Aug	
	Barley	Sept-Nov	May-July	
Viet Nam	Rice			July/June
	-10th month	July-Aug	Oct-Nov	
	-winter/spring	Dec-Feb	Mar-June	
	-summer/autumn	Apr-May	Aug-Sept	
Yemen, A.R.	Sorghum	Mar-June	Sept-Dec	Jan/Dec
Yemen, P.D.R.	Wheat	November	Feb-Mar	Jan/Dec
	Coarse grains	Mar-July	July-Nov	
CENTRAL AMERICA (Incl. Caribbean)				
Costa Rica	Cereals			
	- first	Apr-May	Aug-Sept	
	- second	Aug-Sept	Nov-Jan	
Cuba	Cereals			
	- first	June-Sept	Sept-Nov	
	- second	Nov-Dec	Mar-Apr	
Dominican Rep.	Rice			
	- first	Feb-Apr	July-Aug	Jan/Dec
	- second	Sept-Oct	February	
	Maize			
	- first	April	July-Aug	
	- second	Sept-Oct	February	
	Sorghum			
	- first	Apr-May	Aug-Sept	
	- second	Aug-Sept	Dec-Jan	
El Salvador	Maize			
	- first	Apr-May	Aug-Nov	Aug/July
	- second	Aug-Sept	Nov-Feb	

Region/Country	Crop	Planting	Harvest	Marketing year
El Salvador (con't)	Maize - third	Jan-Feb	Mar-Apr	
	Rice - first	Apr-May	Aug-Nov	
	- second	June-July	Aug-Feb	
	Sorghum	May-Sept	Aug-Feb	
Guatemala	Cereals			
	- first	Apr-May	Aug-Nov	
	- second	Aug-Sept	Nov-Feb	
Haiti	Maize			
	- first	Feb-July	June-Oct	July/June
	- second	Sept-Nov	Dec-Jan	
	Sorghum	June-Aug	July-Oct	
Honduras	Maize			
	- main	Feb-July	June-Oct	July/June
	- second	Aug-Nov	Dec-Feb	
Honduras	Rice	Mar-June	Sept-Oct	
Jamaica	Foodcrops			
Mexico	Maize	Mar-Sept	July-Feb	
	Sorghum	July-Sept	Oct-Nov	
	Wheat	Oct-Dec	Apr-May	
Nicaragua	Maize			
	- main	May-Aug	Aug-Nov	July/June
	- second	Aug-Dec	Dec-Feb	
SOUTH AMERICA				
Argentina	Winter grains	June-Sept	Nov-Jan	
	Maize	Oct-Dec	Mar-July	
	Sorghum	Sept-Dec	Mar-June	
Bolivia	Maize			
	- first	June	Oct-Nov	Jan/Dec
	- second	Oct-Nov	Jan-April	
	Rice	Oct-Nov	Jan-June	
	Wheat	Jan-Mar	Apr-Jun	
Brazil	Wheat	Mar-July	Aug-Dec	
	Maize	Aug-Dec	Feb-May	
	Rice	Oct-Dec	Feb-April	
Chile	Maize	Oct-Nov	Mar-May	
	Wheat	July-Oct	Dec-Feb	
Colombia	Cereals			
	- first	April-June	July-Sept	
	- second	Sept-Dec	Jan-Mar	
Ecuador	Wheat			
	- first	Feb-Mar	June-Aug	

Region/Country	Crop	Planting	Harvest	Marketing year
Ecuador (con't)	Wheat			
	- second	September	February	
	Maize	Dec-Apr	Apr-Aug	
Peru	Maize/Sorghum	Aug-Nov	Dec-Mar	
	Wheat			
	- main	Mar-Apr	July-Aug	
	- second	Nov-Dec	Mar-Apr	
	Rice			
	- main	Sept-Nov	May-June	
	- second	June-July	Jan-Feb	
Uruguay	Wheat	June-Sept	Nov-Jan	
	Maize	Oct-Dec	Feb-Apr	
	Rice	July-Sept	Jan-Apr	
EUROPE				
Western Europe	Wheat			
	- winter	Aug-Dec	June-Sept	
	- spring	Apr-May	July-Oct	
	Coarse grains	Mar-May	July-Oct	
Eastern Europe	Wheat			
	- winter	Aug-Oct	June-Aug	
	Coarse grains	Mar-May	July-Oct	
U.S.S.R.	Wheat			
	- winter	Aug-Oct	JuneAug	
	- spring	Apr-June	July-Sept	
	Coarse grains			
	- winter	Aug-Sept	June-July	
	- spring	Apr-June	Aug-Oct	
NORTH AMERICA				
Canada	Wheat			
	- winter	Aug-Sept	July-Aug	
	- spring	May-June	Aug-Oct	
	Coarse grains	May-June	Aug-Oct	
United States	Wheat			
	- winter	Aug-Nov	May-Sept	Oct/Sept
	- spring	Apr-May	Aug-Sept	
	Oats/Barley	Mar-May	May-Sept	
	Maize	May-June	Sept-Nov	
	Sorghum	Apr-June	July-Nov	
OCEANIA				
Australia	Wheat	Apr-June	Nov-Jan	July/June
	Coarse grains			
	- summer	Sept-Dec	Mar-June	

Region/Country	Crop	Planting	Harvest	Marketing year
Australia (con't)	Course grains - winter	May-July	Nov-Jan	
	Rice	October	April-May	
New Caledonia	Coarse grains	Apr-June	Aug-Sept	
New Zealand	Wheat	Apr-June	Jan-Feb	
	Coarse grains	Aug-Dec	Feb-June	
Vanuatu	Coarse grains	Apr-June	Aug-Sept	Jan/Dec

APPENDIX G

FAO FOOD BALANCE SHEETS -- Sample

from
"Food Balance Sheets -- 1979-81 Average"
U.N. Food and Agriculture Organization
Rome, 1984.

NOTES:

- The FAO Food Balance Sheets have been produced for over 145 countries for a number of years. It is a representation of the country's food supply during a specified reference period.
- The primary commodities and some processed items are included.
- The production estimates are adjusted for imports, stock changes, exports and non-food use (seed, feed , manufacturing use and waste). Per capita supply is derived by dividing the actual supply by the population estimates. Per capita supply is expressed in terms of quantity (grams) and converted to caloric value, protein and fat content.
- The caloric content of the food items are an average of the caloric contents of all forms of the commodity. For example, the consumption of wheat may be expressed as 200 grams per day yielding 600 calories. The 600 calories are derived from all forms of wheat including wheat grains, flour, breads, pasta, cakes, etc. The general caloric density for wheat from the balance sheet would be only 3,000 kcals/kilogram of wheat which is incorrect. The actual value for wheat flour is closer to 3,500 kcals/kg. Do not use the balance sheets, therefore, for deriving the energy content of food commodities.
- Users of FAO Balance Sheets are advised caution on any statistic. Check the values against locally available statistics and your knowledge of the data. Do not accept any of the values as correct without checking.

STANDARDIZED FOOD BALANCE SHEET

POPULATION 162000 — BELIZE AVERAGE 1979-81 — UNITS= 1 METRIC TON — INFORMATION AVAILABLE AS OF 19 MARCH 1990

	PRODUCTION	IMPORTS	STOCK CHANGES	EXPORTS	PROCESSED TRADE (E-I)	DOMESTIC SUPPLY	DOMESTIC UTILIZATION: FEED	SEED	MANUFACTURE: FOOD USE	MANUFACTURE: NON FOOD USE	WASTE	FOOD	PER CAPUT SUPPLY PER DAY: KILOGRAMS/YEAR	GRAMS	CALORIES	PROTEIN GRAMS	FAT GRAMS
GRAND TOTAL															2714	67.7	63.4
VEGETABLE PRODUCTS															2009	37.3	11.5
ANIMAL PRODUCTS															705	30.4	51.9
GRAND TOTAL EXC ALCOHOL															2634	67.5	63.4
CEREALS													128.3	351.4	959	24.1	2.9
WHEAT		6674	-1042		-2519	10235					245	9941	61.5	168.6	473	13.6	1.7
PADDY RICE	8709	91	82		563	8155		282			698	7174	44.2	121.1	296	5.7	.5
BARLEY			-78		-730	808			719			89	.6	1.5	3	.1	
MAIZE	18406	1669				20075	15367	330			1405	2974	18.3	50.2	160	3.6	.5
OATS		1				1						1					
CEREALS NES					-191	191						191	1.2	3.2	10	.3	
PREPARED CEREALS NES		403				403						403	2.5	6.8	26	.9	.1
ROOTS AND TUBERS													82.8	226.9	192	2.9	.5
POTATOES		1598				1598											
ROOTS AND TUBERS NES	16933					16933	1693				16	1582	9.8	26.7	20	.5	.1
SUGARS AND HONEY											3387	11853	73.0	200.1	172	2.4	.4
SUGAR CANE	1006696					1006696			1006696				47.1	129.0	458		
RAW SUGAR	101860		-2364	96589	-159	7434						7835	45.8	125.5	445		
SUGAR CONFECTIONERY		131		20		111						111	.7	1.9	6		
SUGAR AND SYRUPS NES		16				16						16	.1	.3	1		
HONEY	222		-73	216		79						80	.5	1.3	4		
PULSES													10.3	28.3	95	6.2	.5
DRY BEANS	1377	612	133			1856		115			60	1680	10.3	28.3	95	6.2	.5
NUTS AND OILSEEDS													13.0	35.6	98	.6	8.4
NUTS NES		1				1						1					
COCONUTS	2633					2633				527		2107	13.0	35.5	98	.6	8.4
VEGETABLES													24.6	67.5	19	1.0	.1
TOMATOES		121				121						121	.8	2.1			
DRY ONIONS		808				808						808	5.0	13.6	6	.2	
FRESH VEGETABLES NES	2500	539		54		2985					304	2681	16.5	45.3	10	.6	.1
PREPARED VEGETABLES NES		376		2		374						375	2.3	6.4	2	.1	
FRUIT													107.2	293.8	138	2.0	.6
BANANAS	20133			13620		6513					4027	2287	14.1	38.6	29	.3	
ORANGES	30333	428		343	12900	21518				12200		9319	57.3	157.0	70	1.2	.3
GRAPEFRUIT AND POMELO	14367				3847	10520			9695			824	5.1	13.9	3		
APPLES		143		8		135						135	.8	2.3	1		
PEARS		31		4		27						28	.2	.5			
GRAPES		49		8		41						41	.2	.7			
FRESH FRUIT NES	2600	29				2629			328		131	2169	13.4	36.6	16	.2	.2
DRIED FRUIT NES	131	58		26		163						163	1.0	2.7	7	.1	
PREPARED FRUIT NES	4843	131	1333	1156		2455						2455	15.1	41.4	15	.2	.1
MEAT AND OFFALS													35.7	97.9	197	13.8	15.2
BEEF AND VEAL	1062	1		133	-29	959						959	5.9	16.2	31	2.5	2.3
BEEF PREPARATIONS		665		90		575						575	3.6	9.7	23	2.4	1.8
EDIBLE OFFALS OF CATTLE	147	67				214						214	1.3	3.6	8	.7	.1
MUTTON AND LAMB	17	9				26						27	.2	.4	1	.1	.1
PIGMEAT	840	28	-37		-1005	1910						1911	11.8	32.2	82	4.0	7.1
EDIDLE OFFALS OF PIGS	48					48						48	.3	.8	1	.1	
CHICKEN MEAT	1906	129		3		2026						2026	12.5	34.1	58	4.0	4.1
DUCK MEAT	11					11						11	.1	.2	1		.1
TURKEY MEAT	25					25						25	.2	.4	1	.1	
EGGS													3.9	10.6	14	1.0	.9
HEN EGGS	647	91				738		75			37	625	3.9	10.6	14	1.0	.9
FISH AND SEAFOOD													4.7	13.0	10	1.3	.4
PELAGIC FISH					-421	421						421	2.6	7.1	7	.7	.4
MARINE FISH NES	353			250	-13	116						115	.7	1.9	1	.2	.1
CRUSTACEANS	643	2		500	-1	146						146	.9	2.5	1	.2	
MILK													124.0	339.8	249	14.2	9.2
WHOLE COW MILK	3900	42	-371	1	-6130	10442					197	10245	63.2	173.1	152	6.0	5.9
SKIN COW MILK			1000		-10223	9223						9223	57.0	156.3	57	5.6	.1
WHOLE COW MILK CHEESE		2186	100	1468		618						618	3.8	10.4	40	2.6	3.2
OILS AND FATS													11.1	30.4	251	.1	28.3
VEGETABLE OILS AND FATS													.8	2.1	19		2.1
VEGETABLE OILS NES		433		84		349				223		126	.8	2.1	19		2.1

STANDARDIZED F O O D B A L A N C E S H E E T

POPULATION 8036000

IVORY COAST
AVERAGE 1979-81
UNITS=1000 METRIC TONS

INFORMATION AVAILABLE AS OF 17 JUNE 1983

	PRODUCTION	IMPORTS	STOCK CHANGES	EXPORTS	PROCESSED TRADE (E-I)	DOMESTIC SUPPLY	DOMESTIC UTILIZATION					PER CAPOT SUPPLY			
							FEED	SEED	MANUFACTURE FOOD USE	MANUFACTURE NON FOOD USE	WASTE	FOOD	KILOGRAMS /YEAR	PER DAY GRAMS	CALORIES NOS	PROTEIN GRAMS	FAT GRAMS
GRAND TOTAL															2613	70.0	50.0
VEGETABLE PRODUCTS															2425	61.2	39.7
ANIMAL PRODUCTS															187	8.8	10.2
GRAND TOTAL EXC ALCOHOL															2567	66.7	50.0
CEREALS												143.0	391.7	987	23.3	4.7
WHEAT		181	-6		-2	189				10	4	176	21.9	59.9	168	5.1	.7
PADDY RICE	507				-435	942		51	4	56	79	753	93.5	256.2	571	11.7	1.4
BARLEY					-32	32			10			2	.2	.5	1		
MAIZE	280	19				299	53	28			48	170	21.1	57.9	194	5.1	2.1
MILLET	47	2				49	3	1	12		5	27	3.3	9.2	30	.7	.3
SORGHUM	34					34	13	2			4	16	2.0	5.5	18	.4	.1
FONIO	2					2						2	.2	.6	1		
CEREALS NES					-3	3						3	.4	1.1	4	.1	
PREPARED CEREALS NES		2				2						2	.3	.7	3	.1	
ROOTS AND TUBERS												257.4	705.2	715	9.7	1.1	
CASSAVA	753					753	38			1	75	639	79.5	217.8	240	2.0	.2
POTATOES	15	10				25		1			1	23	2.8	7.7	5	.1	
SWEET POTATOES	29					29					4	25	3.1	8.5	8	.1	
TARO (COCO YAM)	295					295		59			29	206	25.7	70.3	60	1.1	.1
YAMS	2099					2099	84	420			420	1175	146.3	400.8	401	6.4	.8
SUGARS AND HONEY												13.5	37.0	100			
SUGAR CANE	1840					1840		83	1310		59	28	3.5	9.5	3		
RAW SUGAR	101		5	26	-8	78			2			75	9.4	25.7	91		
SUGAR CONFECTIONERY	4	1		2		3						3	.3	.9	3		
SUGAR AND SYRUPS NES		3				3						3	.3	.9	3		
PULSES													.9	2.4	8	.5	
PULSES NES	8					8		1				7	.9	2.4	8	.5	
NUTS AND OILSEEDS													8.5	23.2	70	2.9	5.7
BRAZIL NUTS	3					3						3	.3	.9	3	.1	.3
CASHEW NUTS	1					1						1	.1	.2	1		
SOYBEANS	6					6		2				4	.5	1.3	4	.5	.2
GROUNDNUTS IN SHELL	54					54		5	2		5	42	5.2	14.3	51	2.2	4.2
COCONUTS	155			16	5	134			109	9		16	2.0	5.6	5	.1	.5
PALM KERNELS	36			11		25			25								
KARITE NUTS SHEANUTS	6			4		2			2								
SESAME SEED	3					3						3	.3	.9	5	.2	.5
COTTONSEED	73			2		71		6	65								
VEGETABLES												37.4	102.3	39	1.6	.5	
TOMATOES	21				-30	51					3	48	5.9	16.2	4	.2	
EGGPLANTS	18					18					4	14	1.8	4.9	1		
GREEN CHILLIES PEPPERS	19					19					2	17	2.1	5.8	2	.1	
GREEN ONIONS, SHALLOTS	7	13				20					2	18	2.2	6.1	1	.1	
FRESH VEGETABLES NES	83	2				85					8	75	9.4	25.7	6	.4	.1
GREEN CORN MAIZE	140					140					14	126	15.7	43.1	24	.8	.3
FRUIT													90.6	248.2	207	1.9	.6
BANANAS	168			117		51			3		23	25	3.1	8.5	5	.1	
PLANTAINS	780					780					156	624	77.7	212.9	189	1.7	.4
ORANGES	21					21			4		2	16	1.9	5.3	2		
CITRUS FRUIT NES	36					36			30		5						
APPLES		2				2						2	.3	.8			
MANGOES	10					10					1	9	1.1	2.9	1		
AVOCADOS	6					6					1	5	.7	1.8	1		.1
PINEAPPLES	332			99	144	89					54	35	4.4	11.9	5		
FRESH TROPICAL FRUIT NES	4					4						3	.4	1.1			
FRUIT TROPICAL DRIED NES	1					1						1	.1	.3	1		
FRESH FRUIT NES	6					6					1	5	.6	1.6	1		
MEAT AND OFFALS												18.3	50.3	83	7.5	5.6	
BEEF AND VEAL	45	11				56						56	6.9	19.0	38	2.8	2.7
BEEF PREPARATIONS		1				1						1	.1	.3	1	.1	
EDIBLE OFFALS OF CATTLE	10					10						11	1.3	3.6	4	.7	.1
MUTTON AND LAMB	6	1				7						7	.9	2.3	4	.3	.2
EDIBLE OFFALS OF SHEEP	2					2						2	.2	.5	1	.1	
GOAT MEAT	7					7						7	.9	2.3	3	.3	.2
EDIBLE OFFALS OF GOATS	2					2						2	.2	.6	1	.1	
PIGMEAT	13					13						13	1.6	4.5	14	.5	1.3
CHICKEN MEAT	21					21						22	2.7	7.4	9	.9	.6
GAME MEAT	13					13						13	1.6	4.4	5	.8	.1
MEAT NES	15					15						15	1.8	5.0	6	.9	.3
EGGS													.7	1.9	2	.2	.2
HEN EGGS	7					7		1				6	.7	1.9	2	.2	.2
FISH AND SEAFOOD													20.2	55.1	38	6.1	1.2
FRESHWATER DIADROM	13					13						13	1.6	4.3	3	.5	.1
DEMERSAL FISH	12					12						12	1.5	4.2	3	.5	
PELAGIC FISH	47	83		9	27	94						55	6.8	18.6	18	2.1	.5
MARINE FISH NES	5	73				78						78	9.7	26.7	17	2.9	.5
CROSTACEANS	4					4						4	.5	1.4	1	.1	

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STANDARDIZED F O O D B A L A N C E S H E E T

POPULATION 8982000

SYRIA
AVERAGE 1979-81
UNITS=1000 METRIC TONS

INFORMATION AVAILABLE AS OF 16 JUNE 1983

	PRO-DUC-TION	IM-PORTS	STOCK CHAN-GES	EX-PORTS	PROC-ESS-ED TRADE (E-I)	DOMES-TIC SUPPLY	DOMESTIC UTILIZATION					PER CAPUT SUPPLY				
							FEED	SEED	MANUFACTURE FOOD USE	MANUFACTURE NON FOOD USE	WASTE	FOOD	KILO-GRAMS /YEAR	PER DAY GRAMS	CALO-RIES NOS	PRO-TEIN GRAMS	FAT GRAMS
GRAND TOTAL															3005	84.5	80.7
VEGETABLE PRODUCTS															2600	63.0	49.6
ANIMAL PRODUCTS															405	21.6	31.1
GRAND TOTAL EXC ALCOHOL															2996	84.5	80.7
CEREALS													191.9	525.7	1514	43.1	6.9
WHEAT	1882	28	466		-361	1805	90	138			76	1499	166.8	456.9	1305	38.3	5.4
PADDY RICE			2		-118	112			7			105	11.7	32.1	82	1.4	.2
BARLEY	1130	84	197	43	-2	976	767	131	2		61	15	1.7	4.6	12	.3	
MAIZE	43	157	20			180	78	1			6	95	10.6	28.9	103	2.7	1.2
OATS	2					2	1										
MILLET	16					16	10					5	.5	1.4	5	.1	
SORGHUM	2					2	2										
PREPARED CEREALS NES	5	1				6						6	.6	1.7	7	.1	
ROOTS AND TUBERS													24.9	68.3	48	1.2	.1
POTATOES	279	10		4	-1	286	9	23		1	29	224	24.9	68.3	48	1.2	.1
SUGARS AND HONEY													31.1	85.3	302		
SUGAR CANE																	
SUGAR BEETS	433					433	84		315		33						
RAW SUGAR	34	70	-26		-142	272			3			268	29.8	81.7	291		
SUGAR CONFECTIONERY	3			2		1						1	.1	.2	1		
SUGAR AND SYRUPS NES		10				10						10	1.2	3.2	10		
PULSES													10.4	28.4	99	5.8	.9
DRY BEANS	10					10		1				9	1.0	2.8	9	.6	
DRY BROAD BEANS	14			1		13		1				11	1.2	3.3	11	.8	
DRY PEAS	1					1						1	.1	.2	1		
CHICK-PEAS	49		-3	1		51		4			3	47	5.1	14.1	51	2.7	.8
LENTILS	62		-33	65		30		5			2	24	2.7	7.4	25	1.5	
VETCHES	43					43	36	7			1						
LUPINS	1					1						1	.1	.2	1	.1	
PULSES NES	1					1						1	.1	.4	1	.1	
NUTS AND OILSEEDS													11.7	32.1	93	3.1	8.2
CHESTNUTS		1				1						1	.2	.4	1		
ALMONDS	10	1			-1	12						11	1.3	3.5	12	.4	1.1
WALNUTS		3			-1	4						3	.4	1.0	3	.1	.3
PISTACHIOS	7	1				8						9	1.0	2.7	8	.3	.7
HAZELNUTS FILBERTS					-1	1						1	.1	.3	1		.1
NUTS NES	10					10						11	1.2	3.3	9	.2	.8
GROUNDNUTS IN SHELL	18			1		17		1				16	1.8	5.0	19	.8	1.6
COCONUTS					-7	7						7	.7	2.1	3		.3
OLIVES	265					265			221		27	18	2.0	5.5	6	.1	.6
CASTOR BEANS																	
SUNFLOWER SEED	11		1			10			7			3	.3	1.0	3	.1	.2
SESAME SEED	19	5	5			19			9			9	1.0	2.8	16	.5	1.5
MELONSEED		6				6						6	.6	1.7	7	.3	.6
COTTONSEED	215		15			200		11	189								
OILSEEDS NES	11					11					1	10	1.1	3.0	6	.3	.5
VEGETABLES													205.5	563.0	128	7.1	1.4
CABBAGES	80	2				82					8	73	8.1	22.3	4	.3	
LETTUCE	50					50					5	45	5.0	13.7	2	.1	
TOMATOES	608	59		1		666					67	600	66.5	182.1	33	1.9	.5
CAULIFLOWER	79					79					8	71	7.9	21.6	4	.3	
PUMPKINS, SQUASH, GOURDS	165					165					17	149	16.6	45.4	14	.5	.1
CUCUMBERS AND GHERKINS	240	10				250			25			225	25.0	68.4	7	.3	.1
EGGPLANTS	175	16				191			4			187	20.8	57.0	14	.8	.2
GREEN CHILLIES PEPPERS	47					47					5	42	4.7	12.9	3	.1	
GREEN ONIONS, SHALLOTS	49					49					5	44	4.9	13.4	3	.2	.1
DRY ONIONS	163	2		4		161			25			136	15.1	41.5	16	.6	.1
GARLIC	17			1		16					2	14	1.6	4.4	5	.1	
GREEN BEANS	46	1				47					5	42	4.7	12.8	4	.3	
GREEN PEAS	7					7					1	7	.8	2.1	1	.1	
GREEN BROAD BEANS	73	3				76					8	68	7.6	20.9	7	.6	
FRESH VEGETABLES NES	123	4		2		125			10		13	102	11.4	31.1	7	.4	.1
DEHYDRATED VEGETABLES	2			2								1	.1	.2	1		
VEGETABLES IN VINEGAR	33					33						33	3.6	9.9	3	.1	.1
VEGETABLES TEMP PRESERVE	4					4						4	.4	1.2	1		
FRUIT													173.2	474.6	127	2.0	.7
BANANAS		41				41					4	37	4.2	11.6	7	.1	
ORANGES	35	88				123					12	111	12.3	33.8	8	.2	
TANGERINES MANDARINES		11				11					1	10	1.1	3.1	1		
LEMONS AND LIMES	10	18				28					3	26	2.9	7.8	1		
CITRUS FRUIT NES	19	9				28					1	27	3.0	8.3	2		
APPLES	90	24				114					11	103	11.4	31.2	13	.1	.1
PEARS	10	1				11					1	10	1.1	3.0	1		
QUINCES	1	1				2						2	.2	.5			
APRICOTS	48					48			9		2	37	4.1	11.3	4	.1	
CHERRIES	11	1				12					1	10	1.2	3.2	1		
PEACHES AND NECTARINES	21	2				23					2	21	2.3	6.3	2		
PLUMS	24					24					2	22	2.4	6.6	3		
STONE FRUIT NES	16					16						16	1.8	5.0	3		
GRAPES	351					351			96		18	237	26.3	72.1	31	.3	.1
WATERMELONS	770			8		762	38				154	569	62.9	172.3	22	.7	.2
MELONS CANTALOUPES	261			1		260					26	234	25.9	71.0	12	.1	.1
FIGS	47				10	37					7	30	3.3	9.2	5	.1	
DATES		6				6						6	.7	1.9	4		

APPENDIX H

COMMERCIAL IMPORT CAPACITY METHODOLOGIES

- This appendix includes methodological notes on USDA's commercial import capacity calculations, from World Food Needs and Availabilities, 1988/89, August 1988.
- Also included are the equations used in the FVA commercial import capacity method.

APPENDIX H

Calculating Commercial Import Capacity [1]

A country's capacity to pay for imports of food staples is calculated in two steps. The first formula measures the country's available foreign exchange and is as follows: (all values are in million U.S. $)

(1) $FEA = MEE - [(IR_B/MI_B * MI) - IR] - DS;$

where:

FEA	=	estimated foreign exchange availability;
MEE	=	projected merchandise export earnings (sources: World Bank and ERS);
IR_B	=	international reserves during the base period (sources: IMF and World Bank);
MI_B	=	merchandise imports during the base period (sources: IMF and World Bank);
MI	=	projected merchandise imports (sources: World Bank and ERS);
IR	=	projected international reserves (sources: World Bank and ERS);
DS	=	projected debt service (sources: World Bank and ERS); and
B	=	the base period over which IR and MI are averaged, (in this report, 1984-87)

Simply put, this formula states that the foreign exchange available for commercial food imports depends on export earnings, less any allowance for the accumulation or draw-down of reserves and debt service payments. The allowance for reserves is based on the notion that during the projection period a country be permitted to maintain a ratio of reserves to imports equal to the ratio in the base period. The term within the brackets determines the allowance for the accretion of reserves.

To illustrate, take the case of Sri Lanka, where for 1988:

MEE	=	1925
IR_B	=	399
MI_B	=	2279
MI	=	2645
IR	=	250
DS	=	550

[1] *From* World Food Needs and Availabilities, 1988/89, *USDA/ERS, August 1988.*

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(2) FEA = 1925 - [(399/2279 * 2645) - 250] - 550

(3) FEA = 1925 - [(.1751 * 2645) - 250] - 550

(4) FEA = 1925 - [462 - 250] - 550

(5) FEA = 1925 [212] - 550

(6) FEA = 1163

Equation (3) indicates that, from 1984 to 1987, Sri Lanka held reserves equal to about 18 percent of imports. After multiplication of this figure by the 1988 import projection, equation (4) shows that $463 million of reserves are needed to maintain the same reserves/imports ratio. Equation (5) shows the amount of reserves that Sri Lanka will accumulate -- the difference between reserves needed to maintain the base-period ratio and projected reserves. Equation (6) indicates the availability foreign exchange for Sri Lanka in 1988.

The next step in the formula determines the amount of available foreign exchange to be applied toward commercial imports of foods in a particular group of substitutable foods (cereals, roots and tubers, pulses, vegetable oils, etc.) designated by the subscript j. This step is specified as follows:

(7) $CICV_j = FEA * (CFI_j/MEE)_B$

where:

$CICV_j$ = estimated commercial import capacity for food commodities in group j;

FEA = estimated foreign exchange available as derived from part 1 of the formula;

CFI_{jB} = commercial food imports of commodities in group j during the base period (sources: FAO and ERS);

MEE_b = merchandise export earnings during the base period (sources: IMF and World Bank); and

B = the base period over which CFI and MEE are averaged (in this report, 1984-87)

THE FVA COMMERCIAL IMPORT CAPACITY METHODOLOGY[2]

Using the data listed below, the FVA methodology determines a country's ability to commercially import food through the following calculations:

(1) Calculate total foreign exchange available in current year: Add projected current year merchandise export earnings, international reserves and commercial credits, and then subtract debt service payments due.

(2) Calculate necessary strategic reserves for the current year: Average reserve/import ratios for the past five years. Apply this ratio to the current year.

(3) Calculate foreign exchange available for food imports in the current year by averaging the historical ratio of food imports to total imports and apply to current year.

(4) Convert foreign exchange available for food imports to metric tons: Divide the foreign exchange available for food imports by the CIF price of the commodity at the main import location.

Data required for historical years: (all figures in million US dollars)						
	Year T-1	Year T-2	Year T-3	Year T-4	Year T-5	AVERAGE
International reserves						
Total commercial imports						
Total food imports						

Data required for current year:	
International reserves	
Projected export earnings	
Available commercial credits	
Debt service payments due	
C.I.F. price of commodity	

[2] *The AID methodology for calculating commercial import capacity is currently under review. Revisions, including a Lotus-based worksheet for the calculations, will be issued at a later date.*

APPENDIX I

SOME NOTES ON THE LOGISTICS OF HANDLING FOOD AID

from
Laura Tuck, "A Manual for Food Needs Assessment"
AID/FVA, Washington, D.C.
June 1985

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APPENDIX I

Some Notes on the Logistics of Handling Food Aid

Logistical capacity is obviously a critical factor in determining the volume of food aid a country should receive. Food aid programs are very logistics-intensive; that is, the food must pass physically through hundreds of steps en route from the country of origin to the populations in need. Logistical capacity in most countries that need food aid is frequently limited, and the necessary supporting inputs that do exist are often subject to unexpected problems and may suddenly become unavailable. Thus, it is absolutely crucial that a logistics analysis be performed before food aid is requested.

First, the path that the food will follow to each of the recipient regions should be traced out. For example, food aid may pass on a container ship into a coastal port. From there it must be offloaded into bulk receiving stations, and then transferred into storage facilities at the port. Next, it will be cleared from the port, loaded onto trucks or railroad cars and transited across roads, rails, bridges, ferries. On the way, it may cross international boundaries or insecure regions.

Second, the logistics support available for each stage of the food's passage should be assessed. This support should be estimated, in capacity per unit of time (e.g., tons per month). For example, it is important to know the following:

At the port:

- What is the tonnage capacity of vessels that can be handled (draft/length limitations)?
- What is the number of vessels of this size that can be offloaded in a month?
- What is the capacity of bulk grain receiving stations?
- What is the capacity of food grain storage facilities in the port?
- What is the capacity for port clearance each month?

For transport:

- How many trucks of what capacity are available each month, taking into account the number that will be out of service for repairs and routine maintenance?
- What is the availability of mechanics and spare parts?
- What is the availability of diesel fuel?

Other constraints:

- Are there bridges or ferries with limited daily or monthly capacity that must be crossed?
- Is there a limit to the number of trucks that can cross the international border in a day/week/month?
- Are there seasonal roads or waterways that will limit access during certain periods?

Any other potential constraints should be identified. Realistic assessments should be given to the frequency of necessary repairs for the truck and rail fleet, and the speed at which these repairs can be accomplished.

The stage of the distribution chain that can handle the least amount of food during each month will determine the total quantity that can be handled that month. It must also be remembered that food aid is not the only commodity that will be making demands on logistical support services. Other commodities will be imported commercially, and many goods produced in major cities will require transiting to rural areas. Moreover, many different donors will be shipping food aid at the same time.

APPENDIX J

SPECIAL FOOD AID NEEDS FOR EMERGENCY SITUATIONS

APPENDIX J

Special Food Aid Needs for Emergency Situations

The food needs for groups of people in emergency situations has been established by various United Nations agencies, among others. The UNHCR offers practical guidance on needs assessments in refugee situations in such publications as: "Handbook for Emergencies" Chapter 3, UNHCR, Geneva, December, 1982. The material presented here is derived from FAO publications and is meant as a guide to determining food needs. It is not meant to replace the information published by UNHCR or other experts in programming assistance for refugees and other displaced people.

Various ration levels have been set and these are largely based on the types of supplies available. The actual level of food aid should be determined by considering the age and gender distribution of the population, the level of weight loss and accompanying catch-up growth necessary, the level of infection, level of activity of the population, other food sources, and consideration must be given to the logistics of moving, handling, and distribution of food aid.

The following is taken from FAO's Global Information and Early Warning System (GIEWS) on Food and Agriculture March 1987 publication of "Methodology for the assessment of the food supply situation and requirements for exceptional assistance arising from crop failures or unusual crop surplus", FAO, Rome.

(in grams/person/day)	Survival[1] ration	Simple but not optimal ration	Target ration	WFP[2] standard emergency ration
Cereals[3]	300	500	500	400
Protein food	60	50	50 - 70	-
Fat	30	10 - 20	20	-
Milk powder	-	40	20	-
Sugar	-	10	20	-
Salt	-	-	10	-
Tea or coffee	-	-	2 - 5	-
Calories	1,500	2,000	2,000	1,360

[1] The "survival" ration is considered minimal and of short duration for extremely adverse situations of food shortage. It is barely sufficient food for minimal activity and inadequate for catch-up growth or during periods of illness both of which commonly occur in refugee situations.

[2] The World Food Program (WFP) ration is under review but is commonly used to program food aid in emergency situations. The ration is equivalent to 146 kilograms of milled cereal per person per year. It is not considered adequate for long-term feeding programs (see note on Survival Ration).

[3] Cereals refers to the available milled form. The energy density of commonly found milled cereals are very similar and tend to be approximately 3,400 kilocalories per kilogram (see Appendix E).

APPENDIX K

SOFTWARE TECHNICAL REFERENCE

NOTES:

- Appendix K includes a detailed description of the structure of the FNA Template software. Supplemental information on worksheet macros is also included. For each file, modification issues are listed.

Appendix K

FNA Template Technical Reference

1.1 Introduction

This document outlines details and issues relating to how the FNA template was developed and procedures for implementing modifications to the template. This information is intended for users/programmers extremely familiar with the Lotus 1-2-3 macro programming language. There is no guarantee that alterations undertaken by the programmer will result in a perfectly functioning template. Be certain to make any changes to the template using backup copies of any files you intend to modify.

It is important to understand the set of constraints under which the worksheets were developed. This will aid the programmer in discovering why a particular approach was used to implement a template element or function.

The FNA template was developed under the assumption that the target machines would be, at best, IBM-XT compatibles with no more than 512 K of ram. Moreover, there was a desire to develop a system that would occupy only two 360K diskettes, and would not employ any file compression, such as SQUEEZE.

As a result of these extremely severe restrictions on development, many programming options were unacceptable. For example, because there was a 512K restriction, no large files could be developed. This required the use of many intermediate files for transferring information that would have been unnecessary on an expanded memory system. Almost all of the macro statements, exclusive of menus, are devoted to orchestrating this data transfer. The programmer will immediately notice the use of many round about formulas and data passing that could have been implemented in a vastly simpler mode.

A final note, this template was developed for Lotus 1-2-3 release 2.0, not 2.01 for the sake of compatibility with systems in the field. This restriction results in significantly less exciting frames for displaying data and passing messages.

1.2 General Comments on Macros

The following discussion applies to all .WK1 files in the template. Worksheet specific details are handled in later sections.

Detecting Two Disks Vs Hard Disk

Each of the worksheets uses an initialization macro (the {open} command) to determine whether F.DAT is in the default directory. If so, the drive "A:\" is patched onto the filenames of FNA DISK 2 files. This allows a two disk system to be easily implemented. This also assumes that, on a two disk system, files are assigned to specific disks rather than to either disk. The contents of the disks are as follows:

Note that the distribution disks do not contain the files FNA19??.DAT or FNA19??.BAL. These files contain historical year data and will be created by the user as part of an assessment. The FNA UTILITY disk contains program files and a window library for "Flash-Up Windows" run-time module.

FNA DISK 1 (Drive B)		FNA DISK 2 (drive A)			
INSTALL	BAT	FNASUMM	WK1	FNAEXPC	PIC
F	DAT	FNACURR	WK1	FNAEXPN	PIC
AUTO123	WK1	FNA19??	BAL	FNAAIDC	PIC
FNAGEN	WK1	FNACURR	BAL	FNAAIDN	PIC
FNAHIST	WK1	FNAPDIET	PIC	FNAPCCC	PIC
REP&GRA	DAT	FNAGDPC	PIC	FNAPCCN	PIC
FNA0000	DAT	FNAGDPN	PIC	FNACONVS	PIC
FNA19??	DAT	FNAIMPC	PIC	FNAIMVSF	PIC
FNATREND	DAT	FNAIMPN	PIC	INSTALL	BAT
FNAGEN	DAT				

Utility Macros

\0 - the auto execution macro will always determine whether a two disk drive system is being used. In the modules FNAHIST, FNASUMM and FNACURR, the global variables stored in FNAGEN.DAT are imported. Unused commodity columns are hidden, and menu choices are created based on these global variables.

\M - the menu calling macro will check for an empty or corrupted ALTMENU1 cell. If ALTMENU1 is a valid label then the \M macro branches to ALTMENU1, otherwise the MENU0 is posted.

FNAGEN.DAT

In order to have a flexible template, one that can support variable commodity names and historical years, global variables have to be passed between modules. The file FNAGEN.WK1 is used to query the user for country and assessment specific data. This data is stored in FNAGEN.WK1 as two columns (range names and data) at the location BASEDATA and extracted as FNAGEN.DAT. Each of the modules FNAHIST, FNASUMM and FNACURR start by importing this data and generating range names.

Sticky Menus and {Esc}

In order to provide a macro menu system similar to Lotus 1-2-3's standard menu interface, the ability to {Esc} back up through the menu tree was implemented. The macro language in structured so that if a user presses {Esc}, the current macro label is aborted and macro execution continues with the label beneath. As one moves down a given branch of a template menu tree, all the {menabranch} calls needed to step backward up the tree are written into successive cells beneath the forward {menubranch} call.

During the viewing of tables, it was assumed that users would want to post the menu from which they left. This would save the user from traversing the menu tree from the topmost branch, when viewing tables from a common sub-menu. At the macro where the user leaves the menu tree, the call to the most recently posted menu *as well as the complete {Esc} path* is written into a range called ALTMENUS.

Titles

The macro which presents a user with a data table, moves to the first unprotected cell and sets up both horizontal and vertical titles.

Formulas

Formulas in the template fall into three groups. The first group are simple addition and subtraction style formulas used for subtotal table lines. Also in this group are formulas to choose which line in a table to carry forward. The second group of formulas depends on global variables. Examples include the posting of commodity names, formulas to generate a sum or average across active commodities and macro lines. The third group of formulas are "synthesized" during a copy operation. These formulas are only present in FNAHIST and will be discussed in more detail later.

Tables

Physically disconnected tables will be assigned their own range names. The same range name is used for the menus' {Goto} commands when viewing a table and for the print macro subroutine.

Menus

There are two standard menus, MENU0 and MENU1. All other menu names include an abbreviation of the subject. MENU0 is the top menu in the tree and will usually contain the main SAVE PRINT and QUIT options. MENU1 is the top data table selection menu.

Printing

Printing of tables is performed through a call to a print subroutine. Header, Footer, Setup strings etc... are not reset by any macros and can be freely changed.

Graphing

The graphs contained in the FNASUMM.WK1 worksheet are all "synthesized". This means that there are no named graphs used. Creating each graph allows for a changing number of commodities and their legends.

Explain Screens

Associated with most of the menus from which a user selects a data table to edit or view, is an option for Explain. The explain option calls a subroutine called EXPLAIN. The subroutine issues a {Goto} and range name (passed) beginning with the word EXPLAIN followed by a number. After the {Goto} is completed, the user presses any key to continue. The user cannot move the cursor.

1.3 Description of Files

The following discussion of each file is designed to provide a brief description of its purpose and to highlight elements not discussed above.

AUTO123.WK1

This worksheet file is used to display the welcoming logo and to branch to the appropriate files. Note that there is an @function on the welcoming screen that picks up whether or not a two disk system is in place. If a two disk system is present, the formula returns a message prompting the user to swap Lotus 1-2-3 SYSTEM and FNA DISK 2 disks. The menu tree is designed to prevent using {Esc} to leave the tree. If the user selects the Reports and Graphs option then a

1 is written into REP&GRA.DAT. If the user selects Base Year Summary then a 0 is written into REP&GRA.DAT. The content of REP&GRA.DAT is detected during the startup macro in FNASUMM.WK1 and sets a flag. This flag indicates whether or not to include a menu for selecting historical averages or current year data at various points in the menu tree.

F.BAT or H.BAT

This file is renamed during installation to indicate whether a system has a hard disk (H.DAT) or two floppy diskettes (F.DAT). An attempt is made to {open} F.BAT as each worksheet file runs its initializing macro. If F.BAT exists, drive A:\ is patched onto the filenames FNASUMM.WK1, FNACURR.WK1, *.BAL and *.PIC.

FNAGEN.WK1

This worksheet is used to generate the set of global variables that will be passed to other modules. (FNAGEN.DAT). Careful attention should be paid to the way in which data is adjusted from its original form to the form appropriate for export or display. This usually involves converting between strings and numbers. The data set is reorganized into a report, at the range REPORT. The named pie chart graph of commodity shares is drawn from heavily "conditioned" data that controls for missing cases and string / number conversions. Note that commodity names and coefficients, as well as general data, are entered while within *range-input*.

FNAGEN.DAT

This data file is extracted from FNAGEN.WK1 and combined into FNAHIST, FNASUMM and FNACURR. This file contains global variables and their range names. The range names are reconstructed upon combining with *range - labels - right*.

FNAHIST.WK1

This worksheet file is used to create and edit historical year data sets. The worksheet's structure was developed to save disk space. Rather than using a complete set of tables for any year, a single skeleton of table labels and formulas exists and a .DAT file contains the year specific data.

There are three worksheet pieces working together to accomplish this structure. The first is a data area called DATA_IN. This is the area into which the data file FNA19??.DAT containing the year's data is combined. For the second piece, on the right side of each set of tables is a "seed" formula column. Each cell and formula in this column is carefully constructed so that it can be copied out to fill the ten commodity columns. These columns are copied over after a call to CREATE or IMPORT. These formulas, of course, reference the data combined into DATA_IN. These formulas must be regenerated after each load of a file because users will overwrite the cell formulas contained in these data entry cells. The third piece of the system is DATA_OUT, a range that reorders the tables' data back into a tight package for extraction to and FNA19??.DAT.

During a SAVE the DATA_OUT range is extracted as well as the historical balance table. The historical balance tables are combined into FNASUMM.WK1 from their data files FNA19??.BAL.

The Total BCE column in the balance uses cells filling ten columns to its right. These formulas control for less than ten commodities.

FNA19??.DAT, FNA0000.DAT and FNA19??.BAL

The .DAT files contain that year's historical data and are extracted from and combined with FNAHIST.WK1. FNA0000.DAT contains a "New" historical year's data consisting of zeros for data and ones for carry forward options. The .BAL files contain that year's historical balance table, extracted from FNAHIST.WK1 and combined into FNASUMM.WK1.

FNASUMM.WK1

This worksheet file integrates the balances from the five historical years, as specified in FNAGEN.DAT. This data can be view directly or reorganized into a given commodity's trend. While all of the historic year balances are combined into the file to save space and memory, they remain intact. The commodity trend tables are really a single table with a complex set of @CHOOSE formulas referencing the balances. During a view or print the trend table's data is chosen and presented.

The summary worksheet provides two types of summaries. The first type of summary consists of historical year data and a simple historical year average. Optionally, the current year balance, FNACURR.BAL, combined into the file, can be used to replace the AVERAGE column in the tables. A flag is set during the loading of FNASUMM that indicates whether or not to post menus allowing this option.

A set of summary graphs, including either an average or current year column is available. In order to handle changing numbers and names of commodities, the graphs are generated rather than named. The gengraph macro subroutine handles all of the cereal / non-cereal stacked-bar graphs by using a set of passed parameters. The two special non-stacked bar graphs are generated separately and branch to a later point in gengraph. This later point is where the user is prompted whether or not to save the graph to a pre-defined .PIC filename.

FNASUMM.WK1 contains a set of data lines above the trend table for use during the generation of graphs. There is also a set of data that is extracted into FNATREND.DAT for later combining into FNACURR.WK1.

REP&GRA.DAT

This file will contain a 1 if the user selected Reports & Graphs from the menu in AUTO123 and a 0 if the user selected Base Year Summary. FNASUMM.WK1 reads the contents of this file and, if 1 is present, inserts an additional menu for selecting historical average or current year data into the tree.

*.PIC

FNASUMM.WK1 and FNAGEN.WK1 generate graphs that can be saved to pre-defined .PIC files. The filenames are:

FNAGDPC	Gross Domestic Production - cereals
FNAGDPN	Gross Domestic Production - non-cereals
FNAIMPC	Commercial Imports - cereals
FNAIMPN	Commercial Imports - non-cereals
FNAEXPC	Exports - cereals
FNAEXPN	Exports - non-cereals
FNAAIDC	Food Aid - cereals
FNAAIDN	Food Aid - non-cereals
FNAPCCC	Per Capita Consumption - cereals
FNAPCCN	Per Capita Consumption - non-cereals
FNACONVS	*Per Capita Consumption vs Production
FNAIMVSF	*Imports vs Food Aid

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* indicates special graphs not using the complete gengraph macro.

FNAPDIET Commodity Diet Shares (FNAGEN.WK1)

FNATREND.DAT

This data file contains information extracted from FNASUMM.WK1 and combined into FNACURR.WK1. Several assessment data values in the current year worksheet, namely averages and linear or non-linear trends, are based on the historical data contained in FNATREND.DAT.

FNACURR.WK1

This worksheet file contains the structure and data for the current year assessment. This file differs from the historical year's data structure by the inclusion of trends (generated based on the combined FNATREND.DAT) and the replacement of the Food Aid table with a Consumption table.

Unlike FNAHIST.WK1, all data, with the exception of trend information, resides in the file. Similarly, "seed" formulas are not copied but are simply always in place.

The weights for the linear projections are stored beginning in cell LINEAR1. Non-linear weights are stored directly in the formulas. Non-linear formulas are tested for ERR in hidden cells at the trend extrapolation line.

During a save operation the current year balance is extracted into FNACURR.BAL for combination into FNASUMM.WK1.

The Total BCE column in the balance uses cells filling ten columns to its right. These formulas control for less than ten commodities.

FNACURR.BAL

This data file contains the current year balance table and is combined into FNASUMM.WK1 during startup. Values from the balance can replace simple historical averages in tables and graphs when the user makes certain menu selections.

1.4 Annotation of Macros

This discussion will consist primarily of macros listing annotations. Refer to previous sections for more information on these macros. Note that the listings themselves do not appear here due to printing limitations. Use the macros themselves to trace through changes.

There is a lot of identical macro code in the several worksheets, especially in the init and save macros. To understand an action begin the trace with the menu selection.

AUTO123.WK1

The menu {esc} path terminates in a branch \m. This, rather than the standard erase of the ALTMENUS range, prevents the user from escaping out of the menu tree.

Note the call to {write} as the user selects Reports & Graphs or Base Year Summary.

The range CSMENU lies directly beneath the menu for Current and is recalculated to include the drive.

Both tree paths that call FNASUMM branch to REMENU which recalculates the drive.

FNAGEN.WK1

The commodity share graph is generated with macros under the menu choice. The ranges starting with GSAVE patch the .PIC filenames.

The cerealcheck macro erases any commodities that were "blanked out" by pressing space during the *range - input*.

The area above basedata is used to order existing commodities and their coefficients consecutively for use by the graph.

FNAHIST.WK1

The loops for numcereals and numncereals control the hiding of table columns for absent commodities.

The LOAD and NEW macros detect the presence or absence of .DAT files for the five historical years and fill the create and import menus accordingly.

The range LOADYEAR contains the global label for the active data year.

The UPDATE macro copies the right of table column of seed formulas into the tables.

FNASUMM.WK1

The for loops for numcereals and numncereals control the hiding of table columns for absent commodities.

The menus MENUBAL and MENUBALP are generated during init to include the active historical years. They are also updated after a menu selection for current or historical average.

The menus MENUCEREAL etc. are generated during init only.

The range CURRLOADFLAG contains the global variable for the state of current vs historical average to be displayed in tables and graphs.

The GENGRAPH macro is used for all of the stacked bar graphs.

The Total BCE column in the balance uses cells filling ten columns to its right.

FNACURR.WK1

The loops for numcereals and numncereals control the hiding of table columns for absent commodities.