

STATISTICAL OFFICE OF THE EUROPEAN COMMUNITIES

HARAMBEE SIMULATION EXERCISE

PARTICIPANTS MANUAL

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Preface

The Harambee Simulation Exercise has been developed by the Munich Centre for Advanced Training in applied statistics for developing countries of Carl Duisberg Gesellschaft e.V. in Munich and the Food Studies Group at Queen Elizabeth House at the University of Oxford. It has been commissioned and financed by the Statistical Office of the European Communities (Eurostat) in Luxembourg. An earlier version of the exercise was prepared by the two organisations listed above together with INSEE in Paris.

The first version of the Exercise was designed for use in a series of seminars for the users and providers of statistics in the field of food and agricultural statistics which have been held in a number of sub-Saharan African countries. The second version has been prepared for continued use in these seminars, but also so that the Exercise can be made more widely available to training centres in Africa and elsewhere. Both English and French versions of the Exercise have been prepared and a Portuguese version is under development.

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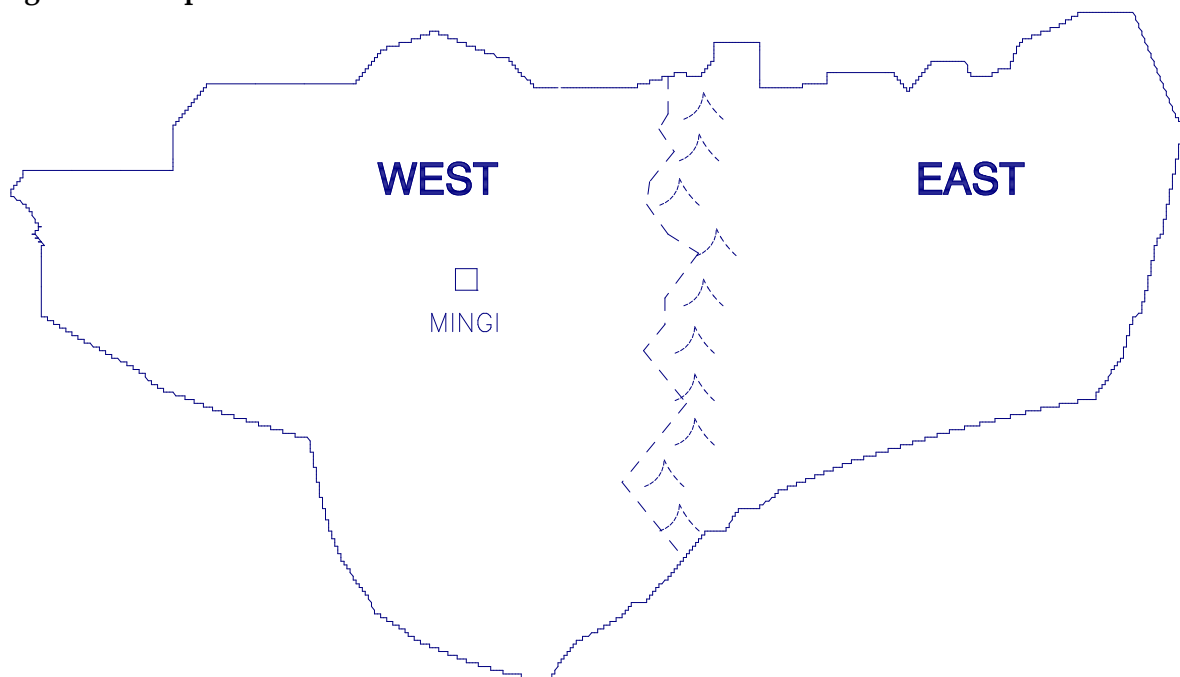
Section 1 Introduction to HARAMBEE

1 Introduction

Harambee is a country somewhere in sub-Saharan Africa. Like many other countries in the continent it is facing serious food problems. In this section of the manual you will find some basic information about Harambee, its food system and the recent history of food strategies in the country. You will be asked to make decisions about the management of the food system of Harambee for a number of years. All the decisions you will make will be based on the information provided in this manual, together with statistical data on different aspects of the food and agricultural sector of the country.

In addition to this manual you will be provided with a statistical summary of what has happened in Harambee in the past ten years. These data have been collected and processed by the Central Statistical Office (CSO) in Harambee. During the exercise you will have the opportunity to instruct the CSO to undertake new surveys and other types of data collection. You will be provided with a budget for statistics and you will need to decide how best to use it.

Figure 1.1: Map of HARAMBEE



HARAMBEE

3 Geography of Harambee

Harambee is a land-locked country and is divided into two regions which are known as the Western Region and the Eastern Region. There is one urban centre, the capital city called Mingi which is located in the Western Region. A map of Harambee is provided as Figure 1.1.

The two regions differ in a number of respects. The Western Region gets more rainfall on average than the Eastern Region and has more high quality arable land. As a consequence it is more densely populated and has closer links with the urban economy of Mingi. Recent surveys have found that the population of the Eastern Region is disadvantaged in a number of ways. In general incomes are lower than in the West and there is a higher incidence of malnutrition.

5 Climate in Harambee

Like much of the rest of sub-Saharan Africa, rainfall in Harambee varies considerably from year to year. Serious drought is an ever-present possibility. Because almost all agricultural production is rain-fed, drought can have a major impact on the level of crop production in any one year and on the population's access to food and other resources.

In general, rainfall levels are higher and more reliable in the Western Region, compared with the Eastern Region. Meteorological records suggest that the long-term annual average rainfall is 900 mm in the Western Region and is 525 mm in the Eastern Region. More information on the annual totals observed in the past ten years can be found in the Statistical Report. In the past ten years, annual rainfall in the Western Region varied from a minimum of 540 mm, to a maximum of 1,168 mm; in the Eastern Region, rainfall varied from 263 mm to 754 mm.

7 The People of Harambee

The latest available population census in Harambee estimated the total population at about 18 million people. The annual growth rate of the population is high and is estimated at about 3.3 per cent per year. The average household size was estimated at 5.0 people at the time of the census and is not thought to have changed very much since then.

The vast majority of the population live in the rural areas and derive their living either directly or indirectly from agriculture. At the time of the census, 82 per cent of the population lived in the rural areas. Of this number, 88 per cent were smallholders, that is were living in households who gained their livelihood cultivating small plots of land. There were also a small number of large-scale farmers with their households. The remainder of the rural population work as labourers on the large farms or derive a living through trade, services or rural industries. This group is classified as the non-agricultural population and comprised just under 12 per cent of the rural population when the census was taken.

The capital city (and only major urban area) of Harambee is called Mingi. At the time of the census, the population of Mingi was estimated at 3.4 million people. The urban population is growing rapidly because of both the natural growth rate and rural-urban migration. It is thought that Government policies have a direct effect on migration, for example, rural urban migration increases when urban incomes rise faster than rural incomes.

9 Agricultural Production in Harambee

Agriculture is the mainstay of the economy of Harambee. The sector alone employs about 85 per cent of the population, supplies most of the industrial inputs and accounts for a considerable proportion of the foreign exchange earnings. Agriculture is also responsible for providing most of the food supply in the country. All agricultural activity in Harambee is devoted to crop production, there are no significant numbers of livestock. Crops are produced in one season per year. Three crops are cultivated; two of these are food crops (maize and cassava) and one is a non-food crop that is exported (cotton). All three crops are grown in both regions, although the drier conditions of the Eastern Region mean that more cassava and relatively little cotton is grown there compared with the Western Region.

Agricultural surveys have been carried out in recent years at six yearly intervals and the main results from the last two surveys are given in the Statistical Report. In the first survey, it was estimated that 74 per cent of the total area under crops was planted to maize, 5 per cent was under cassava and 21 per cent was under cotton. Six years later, the corresponding percentages were: 83 per cent maize; 5 per cent cassava; and 12 per cent cotton.

Cassava is grown exclusively for domestic consumption within the country. Maize is produced both for consumption and for export when there is a sufficient surplus. In years when national production falls, Harambee can import maize, depending on the availability of foreign exchange reserves. Cotton is produced only for export.

.11 Farmers and Agricultural Production in Harambee

There are two types of farmers in Harambee: large commercial farms and smallholders. There are no producer cooperatives or state farms. Smallholders are found in both regions, but large farms only occur in the Western Region. This means that there are three categories of producer:

- western large farmers;
- western smallholders;
- eastern smallholders.

Smallholdings are defined as farms with a total area of less than 20 hectares. In practice, most smallholdings are much smaller than this and many have a crop area of less than one hectare. Large farms are defined as farms with a total area of 20 hectares or more. Some large farms are considerably larger than this and may plant up to 300 hectares to crops.

Smallholders grow all three crops and make decisions on what to plant each season depending on what they think prices will be and their expectations of the return from each crop. Large farms do not grow cassava, they only produce maize and cotton. They too make decisions on how much of each crop to produce depending on the return they expect to get.

Large farms produce almost exclusively for sale and retain only a very small proportion of their crop for their own consumption. Small farms, on the other hand, behave rather differently. They produce to meet the consumption needs of their households as well as selling surpluses in the market. They retain both maize and cassava for their own consumption, but sell all the cotton they produce.

The main purchased input to agricultural production is fertilizer and the importation and distribution of this is controlled by the Government. Each year Government decides on the quantity of fertilizer to be imported (there is no domestic production of fertilizer) and on the

quantities to be sold to each of the main types of farmer. Government also specifies the selling price, which is the same for all farmers. Farmers decide whether or not to purchase the fertilizer depending on their view of the likely return. They also decide how to allocate the fertilizer to the specific crops. Any fertilizer which is imported, but not sold in the same year is dumped by the Government who will bear the loss.

.13 The Food Marketing System in Harambee

There are domestic markets in Harambee for cotton, maize and cassava. Maize and cotton are also traded on world markets. Marketing functions are carried out both by Government agencies and private traders. The actions of the Government agencies can and do affect the operations of the markets; in particular they can affect prices. Private traders, on the other hand, are individually too small for their activities to have any influence on prices.

The Government does not trade in cassava and there is no official market for this crop. All cassava is traded privately in informal markets. This means that it is only private traders that buy cassava from farmers and sell it to consumers. Traders determine the price at which they will buy and sell and because there is a large number of traders, prices are determined by the interaction of supply and demand. Because of high transport costs, however, as well as government restrictions, traders do not move cassava between the Eastern and Western Regions.

By contrast with cassava, all cotton is marketed by a Government Agency, the Harambee Cotton Board. Private traders are prohibited from buying cotton from farmers. Anyone producing cotton is obliged by law to sell it to the Cotton Board at the announced price. All of the cotton purchased is then exported and the Government receives the world market price. The world price can vary and it is not possible to predict in advance exactly what level it will be at.

Both private traders and the Government are involved in the marketing of maize. This means that there are both formal and informal markets for maize. Maize producers can decide to sell either to the Government agency - The National Food Marketing Board (NFMB) - at a fixed price, or to private traders who will pay whatever price can be negotiated. Likewise, consumers are free to purchase maize from the NFMB at a fixed price or from private traders.

The Government fixes the prices that NFMB buy and sell maize. The producer price is announced in advance of the planting season, the consumer price is announced just before the marketing season. Private traders can buy and sell maize at any price they want. Prices are determined by the amount of maize available for sale and the amount consumers want to buy.

As with cassava, transport costs and government restrictions mean that maize is not moved from one region to the other by private traders. Only NFMB is able to move maize from the Eastern to the Western Regions or vice versa.

.15 Consumption of Food

Maize and cassava are the two staple foods of Harambee. These two crops provide most of the calories and protein that people consume. People eat other foods as well, but particularly for those on low incomes, cassava and maize are by far the most important foods in the diet. The amount of the two foods that poor people eat, therefore, will determine how well nourished the population is.

Given the choice, and sufficient income, people prefer to eat maize rather than cassava. Maize is considered more tasty, easier to prepare and easier to store. If incomes rise, then people tend to consume more maize and less cassava.

There are different groups of consumers in Harambee just as there are different groups of producers and they tend to show rather different characteristics as concern food consumption. The CSO has divided the population into eight categories when it collects data on income and expenditure and nutritional status. The groups are as follows:

Urban consumers

High income
Middle income
Low income

Rural consumers

Western smallholders
Western non-agricultural households
Western large farm households
Eastern smallholders
Eastern non-agricultural households

Rural farmers consume food that they produce as well as purchase food in the market. Their income are derived mainly from agricultural activities. Non-agricultural households purchase all the food they consume, they derive most of their income from wage employment. Their income is influenced by the level of agricultural activity and hence the demand for labour, but also by the Government determined minimum wage rate.

In the urban area all consumers have to purchase the food they need. Urban incomes are affected by the Government wage and the richer people are the more varied is their diet. In general, only the urban poor eat significant quantities of cassava.

All of the maize that urban consumers eat is supplied either by private traders operating in the Western Region or by the NFMB. Maize grown in the Eastern Region can only reach Mingi through the NFMB.

.17 Money in Harambee

The unit of currency in Harambee is the Harambee Currency Unit (HCU). Over the past ten years the exchange rate between the HCU and the United States Dollar has declined from 1.6 HCU to the dollar to almost 2.0.

.19 International Trade and Finance

In the food sector of Harambee the main imports are fertilizer and maize. Export revenues are obtained from sales of maize and of cotton. Harambee can be in the position of importing maize in one year and exporting it in another, depending on the level of national production. Only the Government, through the various parastatals is allowed to import or export.

Each year the Government decides how much maize and fertilizer to import and how much cotton and maize to export. The prices that these commodities are traded at depends on conditions on

the world market which are outside the control of the Government. In effect world prices vary at random around a long-term trend.

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1.11 The Government of Harambee

There are three main ministries which are concerned with food policy, they are:

- Ministry of Agriculture
- Ministry of Finance and Planning
- Ministry of Health

Food policy is decided by the cabinet on the recommendations of a Food Strategy Committee which is comprised as follows:

- Minister of Health
- Minister of Agriculture
- Minister of Finance
- Chairman of the National Food Marketing Board
- Government Statistician

The roles and objectives of each member of the Committee are described in more detail in a later section of this manual.

Section 3

2 Statistical Information for Food Policy Analysis

.1 Central Statistical Office

The CSO collects and publishes data about the food and agricultural sector in Harambee. Statistical information is obtained from two main sources:

- specially designed surveys;
- administrative activities.

The special surveys collect and process a wide variety of information, but tend to be both expensive to carry out and time consuming. For example, it may take up to two years before data from a survey can be made available to decision makers. Administrative sources, on the other hand, are cheaper and quicker, but do not provide so wide a coverage.

.3 Resources for Statistical Activities

The CSO has an overall budget set by the Ministry of Finance and this figure cannot be altered. Within the budget a certain sum has been identified for the collection of food and agricultural statistics. A number of different surveys and other data collection activities can be undertaken and the costs of each of these is known. Within the constraints of the total budget the Food Strategy Committee can set the requirements for individual surveys or sets of administrative statistics.

The surveys and administrative statistics that can be undertaken are indicated in tables 1 and 2. Because of the complexity of some surveys, the data can only be made available after a delay to allow for data processing and report preparation. The delays associated with each survey are shown in table 1. Administrative statistics are all available in the year they are requested.

Table 1 Surveys Available

Survey	Cost (HCU)	Delay
Agricultural production survey	175,000	2 years
Household income and expenditure survey	150,000	2 years
Consumer price survey	25,000	None
Nutrition survey	40,000	1 year
Meteorological report	10,000	None
Crop rapid assessment	30,000	None
Population census	200,000	3 years

Table 2 Administrative Statistics Available

Administrative Statistics	Cost
Records of Government policy	
Government budget	15,000
Balance of payments	10,000
World prices and exchange rates	5,000
Cotton Board Records	10,000
NFMB Records	20,000

At the start of the exercise, a new budget for statistical operations has been made available. The amount allocated to food and agricultural statistics is 995,000 hcu. This budget is to last for a period of five years. After five years, a new budget will be made available.

Although the budget is sufficient to allow all of the enquiries to be completed in one year, it will not allow all of them to be carried out each year. The Food Strategy Committee is required to set out the requirements for statistics for each year from 1989 to 1993 before making policy recommendations for 1989. The budget can be amended each year, but amounts already allocated for activities in preceding years are no longer available for use in subsequent years.

Section 5 The Food System of Harambee

.1 Introduction

Section 1 introduced the basic characteristics of Harambee and the main components of the food system. The simulation exercise is based on this food system, that is, the processes by which food is produced, distributed and consumed. It is important to have a good understanding of how the system works if you are to achieve your objectives during the exercise.

We will divide the food system up into three main sections: production; marketing and distribution; and consumption. In each section, outcomes are produced through flows of food and income which have been generated by the use of resources. The relationship between the resources, flows and outcomes are determined by a set of mathematical equations. These equations together form a model which is an attempt to describe in the form of mathematical equations how the food system operates.

Some of the relationships in the food system can be quite complex and so the equations that describe them in turn are complicated. For example, the production of food in Harambee in a specific year will be determined by the area under a crop and the yield. The yield is affected by the level of rainfall, the quantity of fertilizer applied and the amount of labour available for weeding and other activities. The amount of fertilizer applied to a crop depends on the total quantity made available to farmers, the price of the fertilizer and the expected return from each crop. Each of these relationships is represented by an equation.

The basic model of the food system of Harambee is made up of about thirty main equations with a number of variations to allow for different crops, types of producer and so on. Within the model there are a number of different types of variable as follows:

- policy variables** - that is variables that are changed by the Food Strategy Committee, these variables represent the intervention by the Government in the food system;
- exogenous variables** - that is external variables which are outside the control of the Government, they include things such as rainfall and world prices. In many cases these variables are subject to some random variation which means that it is not possible to predict their exact values in advance;
- outcome or endogenous variables** - variables which measure the effect of changes in policy.

In order to participate in the Harambee exercise it is not necessary to know about the model in detail. You will, however, need to understand how the food system of Harambee works and be able to identify how changes in the policy variables may have an impact on various outcomes.

3 The Production Sub-system

The production sub-system determines the quantities of maize, cassava and cotton that are produced each year. Maize and cotton are produced by both smallholders and large farms, cassava is only produced by smallholders.

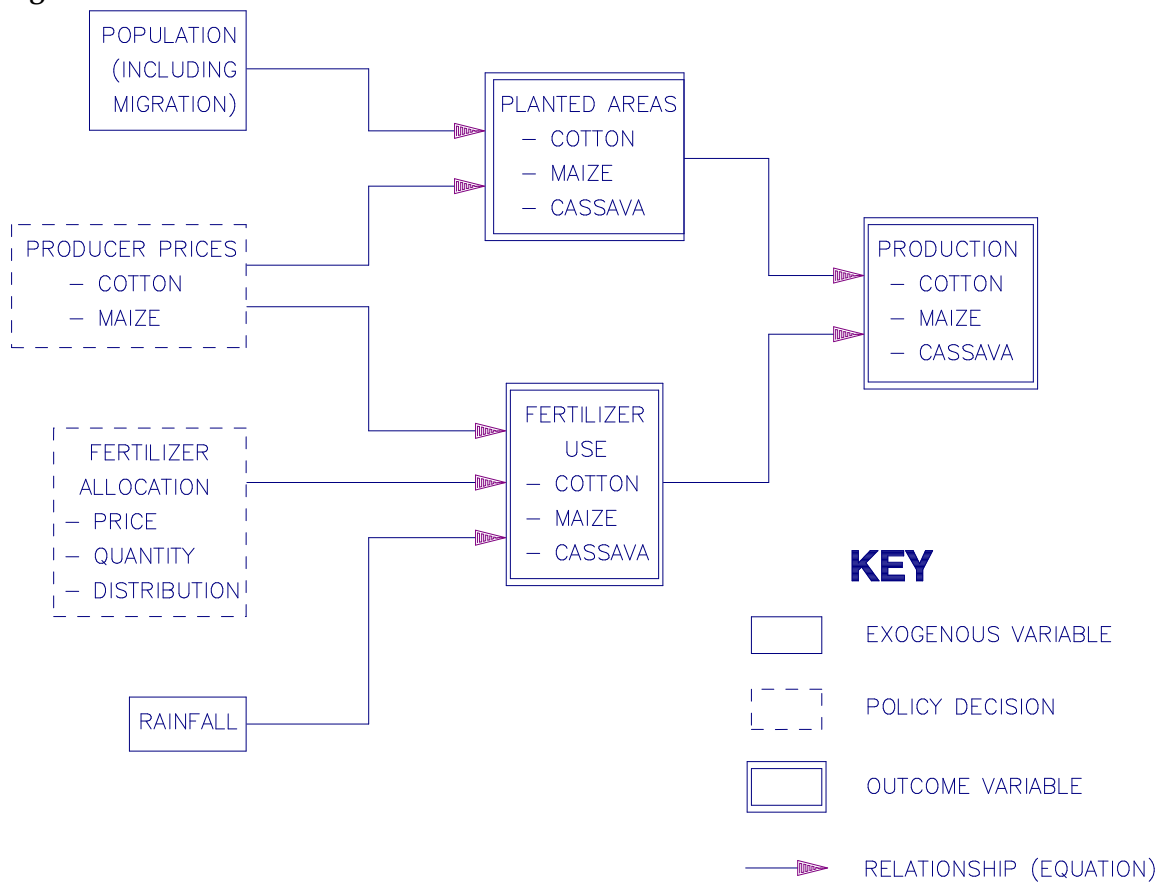
Production is calculated by multiplying the area planted by the yield. The planted area for any crop depends on the relative levels of expected producer prices and on the population in the smallholder sector. Population in turn is based on annual growth rates adjusted for any migration. The level of migration is affected by the relative levels of rural and urban incomes in previous years.

Crop yields are determined by the level of the rainfall, the quantity of fertilizer applied to the crop and labour inputs. These factors in turn are affected by the level of producer prices. The farmer, for example, decides how much fertilizer to apply to each crop depending on the fertilizer price and the return he expects to get.

The policy variables in the production sub-system are as follows:

- the total quantity of fertilizer imports (all fertilizer is imported in Harambee);
- the quantity of fertilizer to be allocated to each production sector (large farms, western smallholders and eastern smallholders);
- the price at which fertilizer is sold to farmers;
- official producer prices for maize and cotton;
- the quantity of maize that is to be imported in the coming year.

Figure 3.1: RELATIONSHIPS IN THE PRODUCTION SUB-SYSTEM



The relationships in the production sub-system are shown in Figure 3.1. It is important to note that although the Government decides on the overall level of fertilizer imports as well as on the quantities that are to be allocated to each type of producer, it is the individual decisions of farmers that will determine whether or not the fertilizer will actually be used. Farmers will continue to use fertilizer while it is profitable to do so. They will apply it to the crop which is expected to give the greatest returns. If the price of fertilizer is increased, relative to the selling price of a crop, then it is to be expected that farmers will use less. It is possible, therefore, that farmers will not use all the fertilizer allocated to them. In this case, it is assumed that the fertilizer is simply wasted and the Government will incur a loss.

Because of transportation delays incurred in the arrival of imports of maize, once the order has been placed, the Government has to place orders for maize imports at the beginning of the year. This is before the level of domestic production is known. The quantity of imports will depend, therefore, on the level of stocks held by the NFMB and carried forward from the previous year as well as the expected level of production this year. The ability of the Government to import may be constrained by the availability of foreign exchange and by the accumulated deficit on the balance of payments.

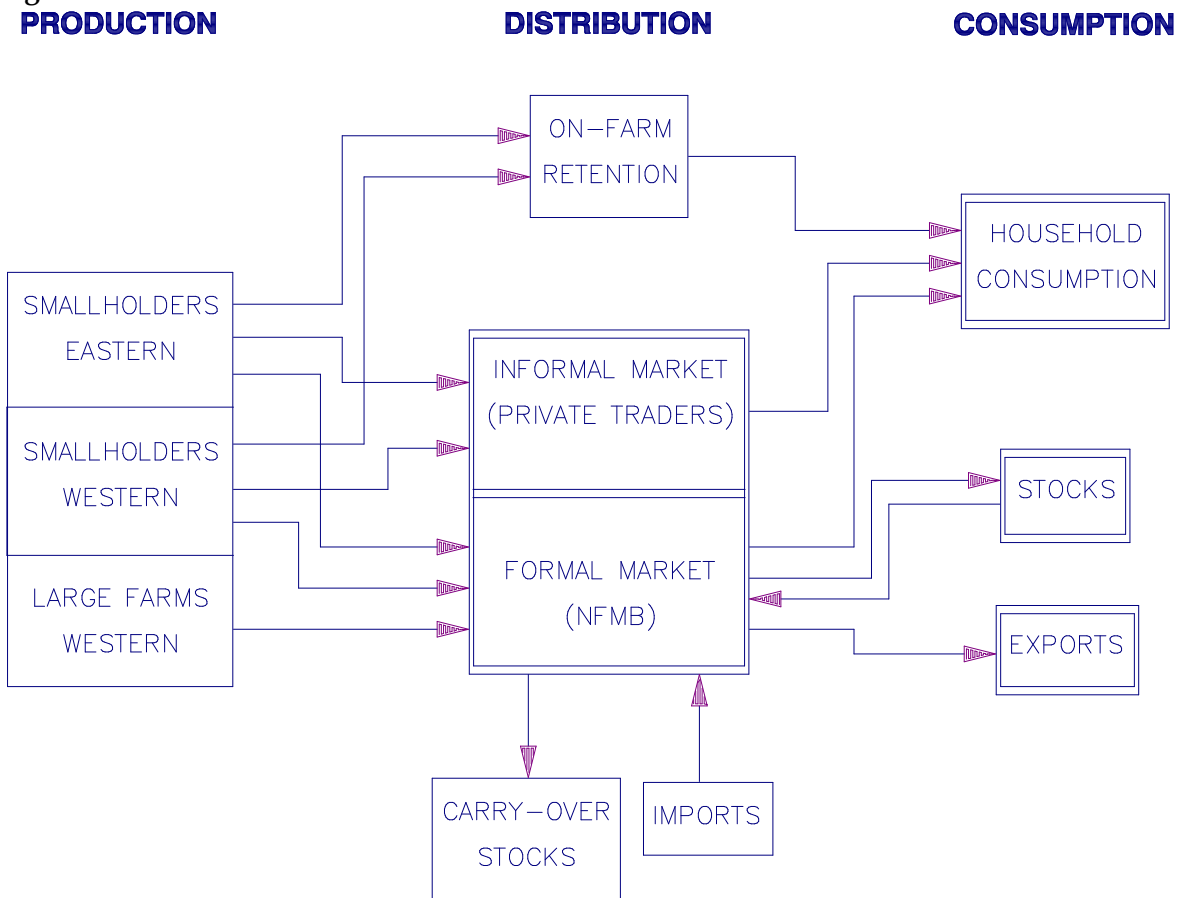
5 Distribution and Marketing Sub-system

Once the quantities of crops produced have been calculated in the production sub-system, then commodities are made available for distribution and marketing. This sub-system determines how much of each crop is sold and through which channel. Some commodities may be kept by farmers for on-farm storage and later consumption. Crops that have been sold may then be sold on to consumers, they may be exported, or they can be kept in store for food security purposes. Exports and imports are included as part of the distribution sub-system. NFMB food security stocks held over from the previous year are also included.

Cassava is retained on the farm and sold to private traders. There is no storage of cassava from one year to the next, so the total quantity sold to traders is then sold on to consumers in the same year. All the cotton that is produced, both by large farms and smallholders, is sold to the Cotton Board and then exported. There are no carry over stocks of cotton at the end of the year.

The maize distribution system is more complicated than that of either cassava or cotton. Smallholder farmers can decide to retain part of the production for their own consumption, they can sell maize to the NFMB or they can sell it to private traders. Large farms may retain a small part of their production, but they only sell maize to the NFMB. The distribution system for maize is shown in Figure 3.2.

Figure 3.2 THE DISTRIBUTION SYSTEM FOR MAIZE



The maize and cassava distribution sub-system takes place in two stages. First, farmers decide how much to sell and how much to retain for their own consumption. This decision depends on the levels of producer prices as well as the farmers' estimates of the consumption needs of their families. The quantities that are marketed are divided between the NFMB and private traders according to the prevailing producer prices.

The second stage of marketing involves the interaction between supply and demand to set a price at which consumers are prepared to purchase all the maize and cassava offered for sale by private traders. It is assumed that private traders do not hold stocks from one year to another. This means that the informal market must clear, that is the price will adjust until consumers are prepared to purchase all of the commodities that are offered for sale.

Consumer prices on the formal market are set by the Government and form part of the set of policy variables that affect the marketing and distribution sub-system. At the beginning of the marketing season, the Government also sets targets for the sale of maize in the Eastern and Western Regions and in the capital city. Because of transport costs and government restrictions, only the NFMB is able to move maize from one region to another. The Government may choose not to offer all the maize it has available for sale, but rather keep some as a food security stock, available for use in later seasons.

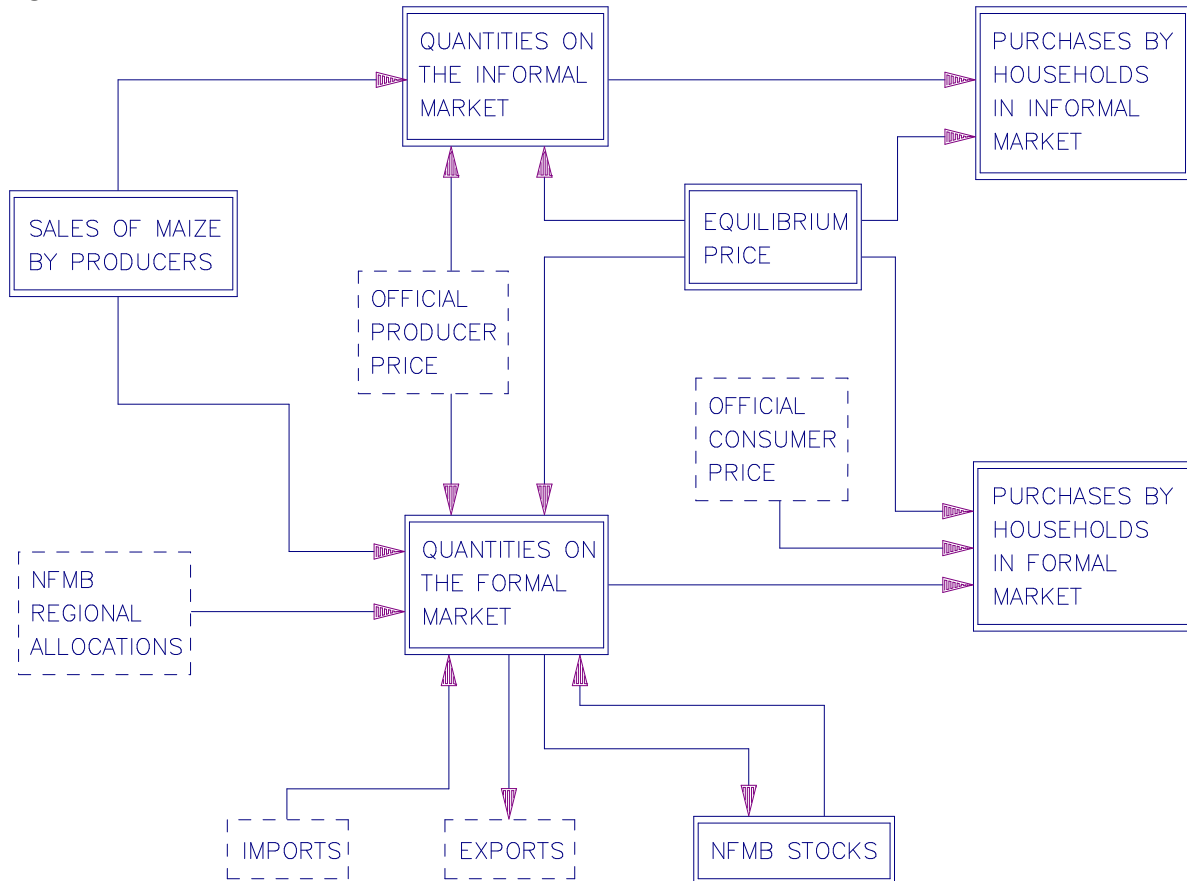
Because the NFMB sells at a fixed price, then it may well be left with excess stocks at the end of the season, over and above the targets already set for a strategic reserve. This depends on the relationship between the fixed NFMB price and the consumer price in the informal market. If the NFMB price is above the informal price, then it will not be able to sell all of the crop offered for sale and stocks will build up. If the NFMB consumer price is below the informal market price, then consumers will wish to purchase from the Board and there is a danger that stocks will run out. If the allocation of stocks between regions is not undertaken carefully, then it is quite possible for there to be excess stocks in one region while in another there is insufficient maize. If there are sufficient stocks, then NFMB may export maize in order to earn foreign exchange for the country.

The policy variables that have a direct impact on the distribution and marketing sub-system are:

- official producer prices for maize;
- official consumer prices for maize;
- the target quantity for official sales in each region;
- imports and exports of maize;

The ways that the policy variables interact with the sub-system for maize are shown in Figure 3.3.

Figure 3.3: THE DISTRIBUTION AND MARKETING SUB-SYSTEM FOR MAIZE



It is clear that the NFMB has a crucial role to play in the marketing and distribution sub-system. Even though the NFMB does not handle all the maize that is marketed and does not deal in cassava at all, the actions of the Board have a direct impact on both the formal and informal markets. Decisions on imports and exports of maize affect the total quantity of maize available for consumption and hence the consumer price in the informal market. Decisions on producer and consumer prices determine how much maize the NFMB will buy from farmers and how much it will sell. The margin between the producer and consumer price meets the marketing costs of the Board. If the margin is too low, then the Board will operate at a loss and will require a subvention from the Government.

The Board can be required to hold security stocks of maize, but obviously there are costs associated with this. The higher the level of stocks, the higher the cost and hence the need for more government financial support. The operations of the NFMB are shown in Figure 3.4.

.7 The Consumption Sub-system

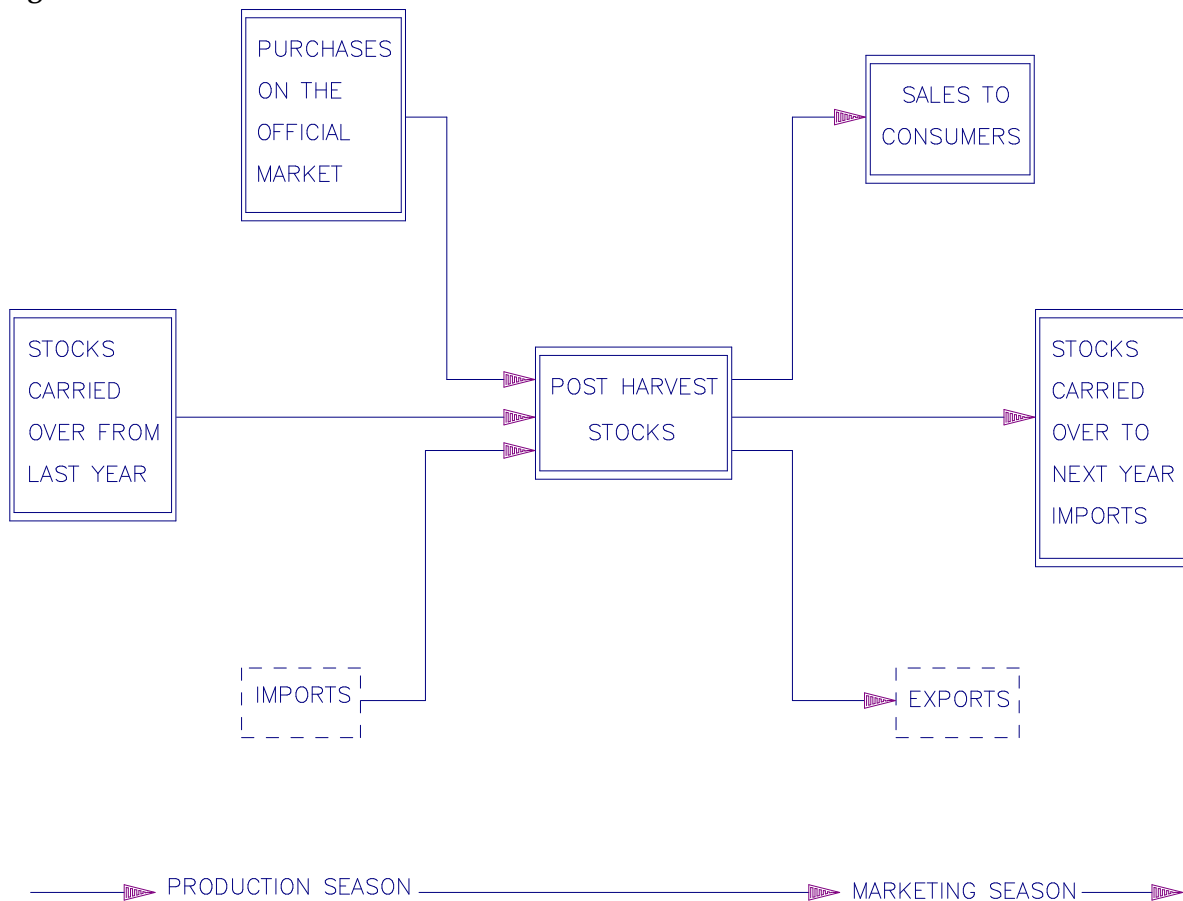
The quantities of maize and cassava that are consumed by each kind of consumer are determined by the consumption sub-system. The outcomes that are obtained from this sub-system are the quantities of maize and cassava that are obtained by each of the different consumer groups. The quantities consumed are determined by the incomes of each household, their tastes and preferences and by the consumer prices.

The income of smallholder households depends on the level of agricultural production in that year and prices for agricultural inputs and outputs. In addition, it is assumed that smallholders get a small amount of income from off-farm activities. This level of income is linked to the minimum wage level set by the Government. For rural non-agricultural and urban households, their income depends on the minimum wage level. The higher the wage level then the higher the demand for food commodities. At the same time, however, the level of the minimum wage affects the government budget.

The prices consumers face depend on the prices in both the formal and informal markets. In the informal market for maize and cassava, prices adjust until supply is equal to demand. In the formal market, prices are set by the Government. Thus the level of food demand is set by the following policy variables:

- the quantities of maize imported and/or exported;
- the allocations of NFMB post-harvest stocks to each region;
- the desired level of carry-over security stocks;
- official consumer prices for maize in each region;
- the minimum wage level.

Figure 3.4: OPERATIONS OF THE NATIONAL FOOD MARKETING BOARD



.9 Outcomes From the Food System

A number of outcomes are generated by the food system and data about these are provided in the various statistical tables. Important outcomes include: the impact on the Government budget; the effect on foreign exchange earnings and the balance of payments; and the nutritional status of pre-school children. The computer model calculates the effect of your policies on these outcomes and then reports the results in the appropriate statistical tables. Remember that in order to obtain these data you must select the appropriate statistical enquiry before the beginning of the year.

In the Government budget, trading balances are calculated for maize, cotton and fertilizer. These will depend on the price received and the price paid, taking into account trading and other costs. There is also a trading balance for other commodities, but this is not directly affected by the policies you select. Government income is derived from taxes on incomes and also by the level of wages paid, which is directly related to the government wage. The current surplus or deficit is then added to the position from previous years to obtain the cumulative balance. If this is negative (there is an overall Government debt) then interest charges will have to be paid. If it is positive, on the other hand, then the Government will earn interest on its reserves.

The balance of payments works in a similar way, but reports the effects of both exports and imports on the foreign exchange earnings of the country. Surpluses, or deficits in the current year are added to the previous totals to obtain a cumulative balance. Once again, the Government has to pay interest on any overseas debt.

Nutritional outcomes are provided in the form of estimates of the prevalence of malnutrition among pre-school children in Harambee. Two measures of malnutrition are included in the nutrition survey: stunting measured by height-for-age; and wasting measured by weight-for-height. Prevalences of malnutrition are estimated by determining the percentage of children falling below pre-determined cut-off points for these measures.

Section 7 Recent Food Strategy In Harambee

.1 Background

The recent history of food strategy in Harambee can be seen from the information given in the Statistical Report. The past ten years have been quite eventful.

A Food Strategy Paper prepared by the cabinet ten years ago, stated that the objectives of the Government's food strategy were as follows:

- to decrease levels of malnutrition;
- to ensure that adequate levels of food are always available in all parts of the country at all times;
- to increase levels of agricultural production to ensure that the country no longer depended on food imports.

In practice, the Government has found it very difficult to meet all of these objectives at the same time. Consequently the direction of the strategy has tended to vary depending on conditions at the time.

Initially, the Government pursued a policy of trying to keep food prices down so as to provide cheap food for the urban population. In real terms, the producer price of maize declined from 0.32 HCU per kg to 0.25 HCU per kg. As a result, the NFMB found it increasingly difficult to purchase sufficient maize to meet demand. As a result they were not able to hold any food security stocks from year to year. Cotton prices on the other hand were increased to encourage the production of an export crop to earn foreign exchange.

After three years, Harambee was taken by surprise when there was a severe drought in throughout the country. Production declined dramatically and there were sever food shortages. NFMB purchases declined to an all-time low of less than 200,000 tons. Without food imports, shortages occurred in many localities. Informal food prices shot up and famine threatened in parts of the Eastern Region. The Government found itself in a very difficult political situation in the face of many criticisms of the prevailing policy.

Following this food crisis, the Government decided to promote food production in Harambee. Producer prices were raised and food imports allowed to help build up security stocks. This was done by increasing the price of maize relative to cotton. It was hoped that the market share of NFMB would improve as a result of these decisions.

Although this did have an effect on levels of food availability in the country, the balance of payments soon began to deteriorate. While there did appear to be some reduction in the levels of malnutrition from the very high rates observed in 1983, the long-term trend did not seem to be in the right direction. A further drought occurred in the East two years later, causing many food problems again.

During the past three years there has been considerable uncertainty about food policy. The Government is concerned about malnutrition, but is worried about the balance of payments situation. Many of the parastatals have been building up worrying deficits and it may be that a programme of economic adjustment will soon have to be put into effect.

3 The Next Ten Years

At the start of the exercise, there has been a change of Government in Harambee and this has provided the impetus for a complete review of food policy. The new Food Strategy Committee takes over with a clean slate and will need to establish its long-term strategy very soon. At the same time, however, it must take into account some worrying trends. Malnutrition is still at unacceptably high levels. The foreign exchange situation is deteriorating and there are worrying Government budget deficits.

It is clear that a change of policy is required, but you will need to determine the direction this should take. You will need to continue to take into account the variation in domestic production of crops arising from the effect of changes in rainfall; this is something that is outside the control of the Government. The need to guard against the possibility of drought must be set against the cost of strategies such as holding strategic grain reserves. In the short to medium term it will also not be possible to do anything to reduce the time required to arrange maize imports.

Section 9 The Exercise

.1 Introduction

The exercise is undertaken in groups of four or five and each group will be responsible for forming a Food Strategy Committee and for setting the policy decisions for Harambee over a number of years. At the end of the exercise the results obtained by each group will be assessed and compared.

One round of the exercise covers one year and a complete agricultural season in Harambee. Each round requires two stages of policy decisions. You will complete the exercise for a number of rounds.

Within each group, each person will be take a specific role corresponding to one member of the Food Strategy Committee. Each member has a different set of objectives and a specified way of evaluating how well they have done. Within their individual roles, participants are responsible for developing their own recommendations about how food policy in Harambee should proceed. These individual recommendations are then discussed by the Food Strategy Committee as a whole and a set of agreed policy decisions for each year arrived at.

Each time the Committee meets, one person is appointed as the Chairman and he or she is then responsible for ensuring that the Committee reaches a decision about what to do at each stage of the exercise. If the members of the Committee are unable to reach a consensus, then the Chairman has a deciding vote.

At each stage, the Food Strategy Committee prepares a set of policy decisions relating to the management of food strategy in Harambee. These decisions are then entered into the computer and outcomes are monitored through the various statistical series that are available. Decisions for further years will be based on what happens in the current and future years.

The Committee has a budget which can be used to pay for statistical information about the food system in Harambee. This budget lasts for a period of five years and it is up to the Committee to decide on which kinds of surveys and other statistical enquiries it will be spent. Data from surveys and other enquiries which have not been paid for by the Committee will not be available. After each year, the budget for future surveys and enquiries can be altered, but once data collection has started, surveys cannot be cancelled. The budget is not sufficient to allow all available surveys and administrative statistics to be produced every year. The statistical data represent the only information available to the committee about what has happened in past years.

Printouts of statistical tables will be provided at the end of each round with some information being available at the end of stage 1 and the remainder at the end of stage 2.

3 Roles and Responsibilities

The Food Strategy Committee is made up of five people as follows:

```
*****
**  Minister of Finance                **
**  Minister of Agriculture            **
**  Minister of Health                 **
**  Director of the NFMB                **
**  Director of the Statistical Office  **
*****
```

Within each group, one person will take on one of these roles. (In groups where there are only four participants, the role of the Director of the Statistical Office may be omitted). Each role has a specific set of objectives to fulfil. For example, the Minister of Health is concerned with levels of malnutrition and low food consumption, particularly among the poorer households. The Minister of Finance, on the other hand, is mostly concerned with the Government budget and the balance of payments.

Depending on what happens in the rest of the world and the level of annual rainfall, it may well be that the objectives of the different members of the Committee will be in conflict. It may well not be possible, for example, to achieve both improved nutrition and maximum foreign exchange earnings. More information about each of the roles is provided below.

Minister of Finance

Food strategy context: the food and agricultural sector in Harambee is an important component of the Government budget and the balance of payments. The cost of imports of maize and fertilizer can be offset by exports of cotton and maize when conditions permit. The impact on the Government budget is felt through any losses (or profits) made by the NFMB as well as possible subsidies on fertilizer and the minimum wage rate.

Responsibilities: to prevent the budget and the balance of payments from going into deficit. This means that the cost of imports must be met by exports and that subsidies to either producers or consumers should be kept to a minimum. You must advise the Food Strategy on the potential financial impact of different policy options. If deficits are incurred, then they will accumulate from year to year and interest will have to be paid on outstanding balances.

It is important to remember that there are several food strategies the Committee might want to follow. You could press for a strategy of export growth by promoting greater production of cotton. You could also attempt to reduce the need for imports, particularly of maize.

Objective: to maintain a positive balance of payments position and to minimise government budget deficits.

Performance measure: whether the balance of payments is in deficit each year and also the position of the Government budget.

Minister of Agriculture

Food strategy context: all agricultural production is carried out by smallholders or large farmers. Government policy can affect which crops farmers plant by changing the relative values of producer prices. You can also affect production by the policy you adopt on the distribution and

price of fertilizer. You should remember, however, that other factors outside the control of the Government can also affect production. Of particular importance is the level of rainfall.

Responsibilities: in the past, the Ministry of Agriculture has set production targets for the different crops and has attempted to set the policy variables to help achieve these targets. Your job is to decide on appropriate target levels for production in future years and to advise the Committee on the best set of policy measures to achieve them. In general you want to protect and help improve farmers' incomes, but you also want to ensure that agricultural production at least keeps pace with population growth.

Objectives: to ensure growth in agricultural production and to make sure that production meets national targets. You are also interested in making sure that farmers' incomes improve.

Performance measure: levels of production for maize, cotton and cassava, and levels of agricultural incomes.

Minister of Health

Food strategy context: levels of malnutrition in parts of Harambee are high, this is a particular problem in the Eastern Region. Although factors such as disease and infection are important, low levels of food consumption certainly contribute to the problem of malnutrition. In some years there is even danger of famine.

Responsibilities: you must advise the Committee on the effect that policy decisions are likely to have on food consumption and malnutrition. Many different policy decisions can affect the level of malnutrition, for example, reductions in food imports to save foreign exchange may mean that some people do not get enough to eat. Support for cotton rather than maize may also lead to food problems in some areas. You have to identify what factors are likely to affect malnutrition and then argue for policies that help to improve the situation.

Objectives: to improve average levels of food consumption and to reduce levels of malnutrition.

Performance measure: the average level of food consumption and the level of child malnutrition.

Director of the National Food Marketing Board

Food strategy context: the NFMB is the key Government agency for the implementation of food policy in Harambee. Your responsibility is to provide marketing services to farmers and to sell maize to consumers. You are required to buy all the crop that farmers offer for sale and to meet the demand from consumers. To do this you have to make recommendations on levels of producer and consumer prices, imports and exports of maize, and the movement of maize between the regions. Only NFMB can move maize between the Eastern and Western Regions so these decisions can be crucial in making sure that demand is satisfied.

Responsibilities: NFMB has direct control over the prices it buys and sells maize at, but it cannot control the quantities it handles. The amount of maize NFMB purchases in any year will depend on the level of production and the relationship between formal and informal market prices. You must advise the committee on the appropriate level for both producer and consumer prices. The margin between the buying and selling price should be sufficient to cover the NFMB's marketing costs, if it is not the Board will make a loss and will require a subvention from the Ministry of

Finance. You must also make recommendations about the levels of imports and exports needed. NFMB may be required to hold food security stocks, but the higher the level, then the greater the cost.

During the second stage of decision making each year, you must make recommendations about how much maize to move from one region to the other. To do this you will need to know something about the likely level of demand in each region.

Objectives: to ensure that the NFMB can meet demand and hold sufficient stocks to meet food security requirements. You are also required to make sure that NFMB does not operate at a loss.

Performance measure: the actual level of sales and stocks compared with targets set during stage 2 plus the operating loss or profit made by the Board as reported in the Government Finance statistics.

Director of the Central Statistical Office

Food strategy context: in the past many food policy decisions have been made without reference to the relevant statistical information. This has made it difficult for planners and policy makers to follow a definite strategy and to evaluate their progress. Now that the Government statistician has been included in the Food Strategy Committee you want to improve this situation.

Responsibilities: there is a fixed budget available for the collection and dissemination of statistics and you have to make recommendations as to how this budget should be used. There is not sufficient to carry out every survey and other enquiry each year, you have to recommend what should be done and when. You are also required to interpret the information provided in the various statistical tables and to analyse data where appropriate. You do not have any specific responsibility for any one aspect of food strategy and so you can concentrate on making sure that the statistical data are properly used.

Objectives: to ensure that statistics are used in the setting of food policy.

Performance measure: whether the statistics provided meet the need of the other members of the Committee.

.5 Making Policy Decisions

Decision making is the responsibility of the Food Strategy Committee who act on the recommendations of individual members. The Chairman of the Committee is responsible for ensuring that decisions are reached.

There are a total of 15 policy decisions that have to be made each year. For each of these decisions, a particular value has to be assigned. The values may be prices, the level of imports or other items such as the minimum wage rate.

The Committee makes policy decisions at two stages during the year. The first stage is at the beginning of the year and is mostly concerned with production. The second stage marks the end of the production season and the start of the marketing season. After each stage, the values are

entered into the computer and results obtained in the form of statistical data. The policy decisions are as follows:

Stage 1, Production Decisions - Committee President: Minister of Health

1. Fertilizer allocation for Eastern smallholders ('000 tons)
2. Fertilizer allocation for Western smallholders ('000 tons)
3. Fertilizer allocation for Western large farmers ('000 tons)
4. Producer price for maize (cents per kg)
5. Producer price for cotton (cents per kg)
6. Fertilizer price (cents per kg)
7. Maize imports ('000 tons)

Note that the computer will automatically calculate the total level of fertilizer imports by accumulating the figures entered for items 1, 2 and 3.

Stage 2, Consumption Decisions - Committee President: Minister of Agriculture

1. The Government minimum wage (HCU per year)
2. Official maize sales in Eastern Region ('000 tons)
3. Official maize sales in Western Region ('000 tons)
4. Official maize sales in Mingi ('000 tons)
5. NFMB consumer price of maize in Eastern Region (cents per kg)
6. NFMB consumer price of maize in Western Region (cents per kg)
7. NFMB consumer price of maize in Mingi (cents per kg)
8. Exports of maize ('000 tons)

Note that the total of official sales of maize in the three areas plus exports of maize cannot exceed the total stocks held by NFMB at the end of the production stage. This quantity is provided by the computer and is called security stocks. Any quantity not allocated to items 2, 3, 4 or 8 is assumed to be retained as security stocks.

.7 Using Statistics

At the start of the exercise and after every five years, the Food Strategy Committee has a budget for statistical surveys which must be allocated. Data can only be obtained from a particular source if that particular survey or set of administrative statistics has been included in the budget. The sources available are indicated below.

Surveys Available

Survey	Cost (HCU)	Delay
Agricultural production survey	175,000	2 years
Household income and expenditure survey	150,000	2 years
Consumer price survey	25,000	None
Nutrition survey	40,000	1 year
Meteorological report	10,000	None

Crop rapid assessment	30,000	None
Population census	200,000	3 years

Administrative Statistics Available

Administrative Statistics	Cost
Records of Government policy	-
Government budget	15,000
Balance of payments	10,000
World prices and exchange rates	5,000
Cotton Board Records	10,000
NFMB Records	20,000

The initial budget for statistics is set at 995,00 HCU and lasts for five years from the start of the exercise. For those surveys where there is a delay, the results are only available to the Committee after the period indicated. Thus data from a 1990 agricultural production survey can not be obtained until 1992.

The statistics are an essential part of the exercise. You will not be able to know what is happening in the food and agricultural sector of Harambee without looking at the statistical tables.

.9 Using the Budget for Statistical Data

At the start of the exercise, the first thing you will need to do as a Food Strategy Committee is to decide on which statistical surveys and administrative enquiries you will want to use. These choices will then be entered into the computer. You can make choices for the whole five year period or you can make selections year by year. If you choose the latter course, you must make a new selection of statistics at the beginning of each year. Remember if you do not select a survey at the beginning of the year, you will not have any data. If you use up all your budget in the first two or three years, then you will not have any funds left for the data you will need for the later years.

You can alter selections at the beginning of each year provided that you still have funds left in your budget. Remember, however, that you cannot cancel a survey once data collection has started.

Section 11 How to Use the Computer

.1 Getting Started

If the program is not installed on the computer you are using, then follow the instructions in Appendix A.

.1 Running the Program

Once the HARAMBEE program has been installed, it is very simple to run it:

a.If you have a hard disk, type:

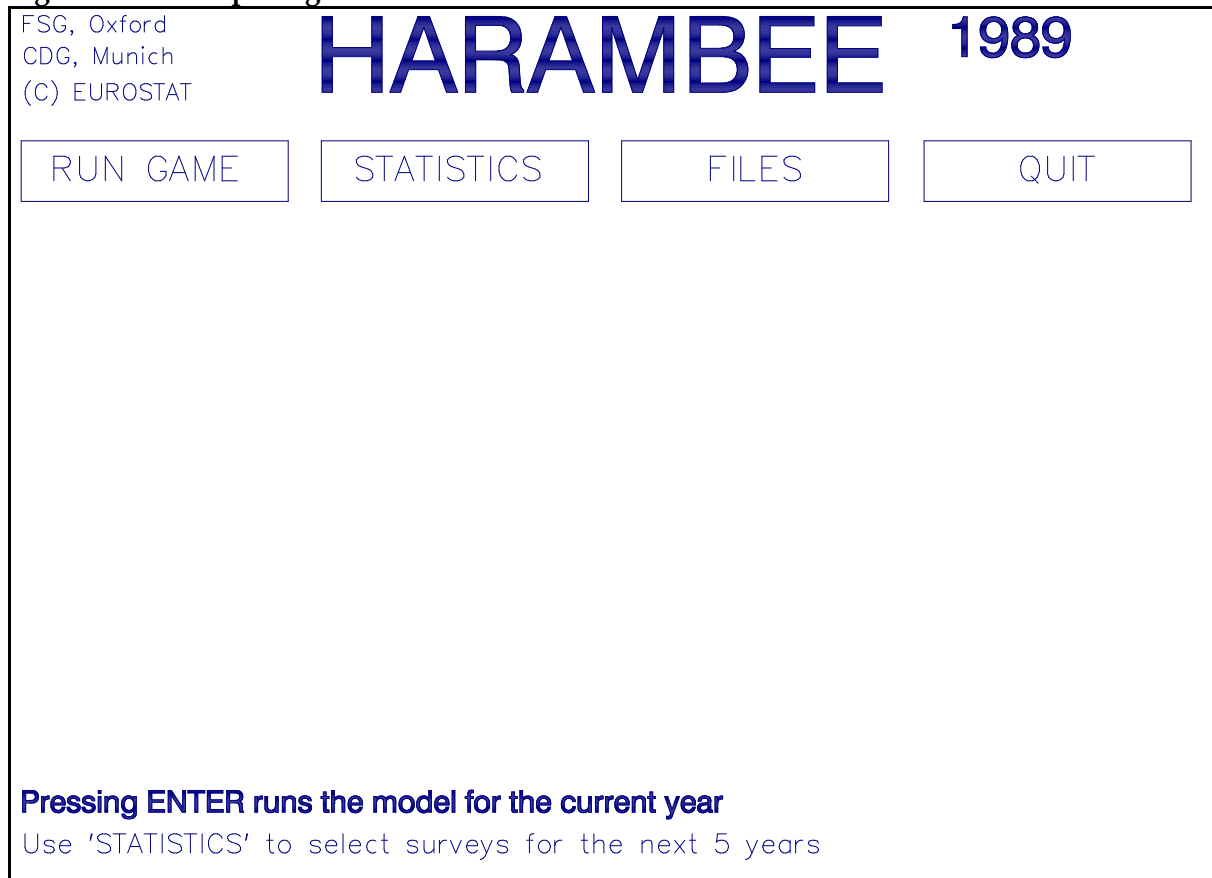
```
CD \HARAMBEE<Enter>
HARAMBEE<Enter>
```

b.If you are running the program from the floppy disk drive, type:

```
A:<Enter>
HARAMBEE<Enter>
```

You will see a message as the program is loaded. After a little while, the program will display the opening screen, also called the main menu. Figure 6.1 shows what this looks like.

Figure 6.1: The Opening Screen



.3 The Main Menu

.1 The Help and Information on the Screen

The screen is divided into three main sections, from top to bottom. At the top is the permanently displayed masthead information, consisting mainly of the word "HARAMBEE". Next to this is the current year, which will be taken from the system clock in your computer.

Below this masthead, there are four rectangular boxes representing the four main choices which can be made from the main menu. These choices are described in detail below.

At the bottom of the screen, there are two lines of information. The first line describes what will happen if you press the <Enter> key at any time (this is how you make a choice from the menu). The bottom line of the screen is a suggestion about what you should do next. When you start, it will say:

Use "STATISTICS" to select surveys for the next 5 years

It is useful to read these two lines if at any time you do not know what to do.

.2 Selecting a Choice from the Main Menu

The main menu consists of four possible choices, represented by the four rectangular boxes near the top of the screen, i.e.: RUN GAME, STATISTICS, FILE, and QUIT. When you start, the RUN GAME box will be brighter than the others. If you have a colour screen, then it will be a different colour from the others. This means that RUN GAME is the current choice.

You can change this by pressing the arrowed keys on the side of the computer keyboard. (--> or <--). This will change the currently selected choice from the main menu. The first help line at the bottom of the screen will describe what will happen if you make that choice.

In order to activate the current choice, simply press the <Enter> key. If you think you have selected the wrong choice, then you can always cancel what you have done by pressing the <Esc> or ESCAPE key on your keyboard.

Note that when you start, the advice on the bottom of the screen indicates that you should begin by choosing STATISTICS.

.3 The Meaning of Each Choice

The meaning of each of the main choices in the menu are briefly described below. The detailed description of the operation of the HARAMBEE exercise is in the next section.

RUN GAME

You select RUN GAME from the menu in order to specify policies and run the simulation model for HARAMBEE, for either the production stage, or the consumption stage.

STATISTICS

You select STATISTICS from the menu in order to specify which statistical surveys you want to be carried out in HARAMBEE, or to look at the results of the statistical surveys which have already been carried out.

FILE

You select FILE from the menu in order to save a copy of your exercise onto the disk (whichever disk you indicated when the program was installed), so that you can resume later. In order to resume, you can use the FILE choice in order to load your previous copy.

QUIT

You select QUIT from the menu in order to finish your exercise, and return to the MS/DOS operating system.

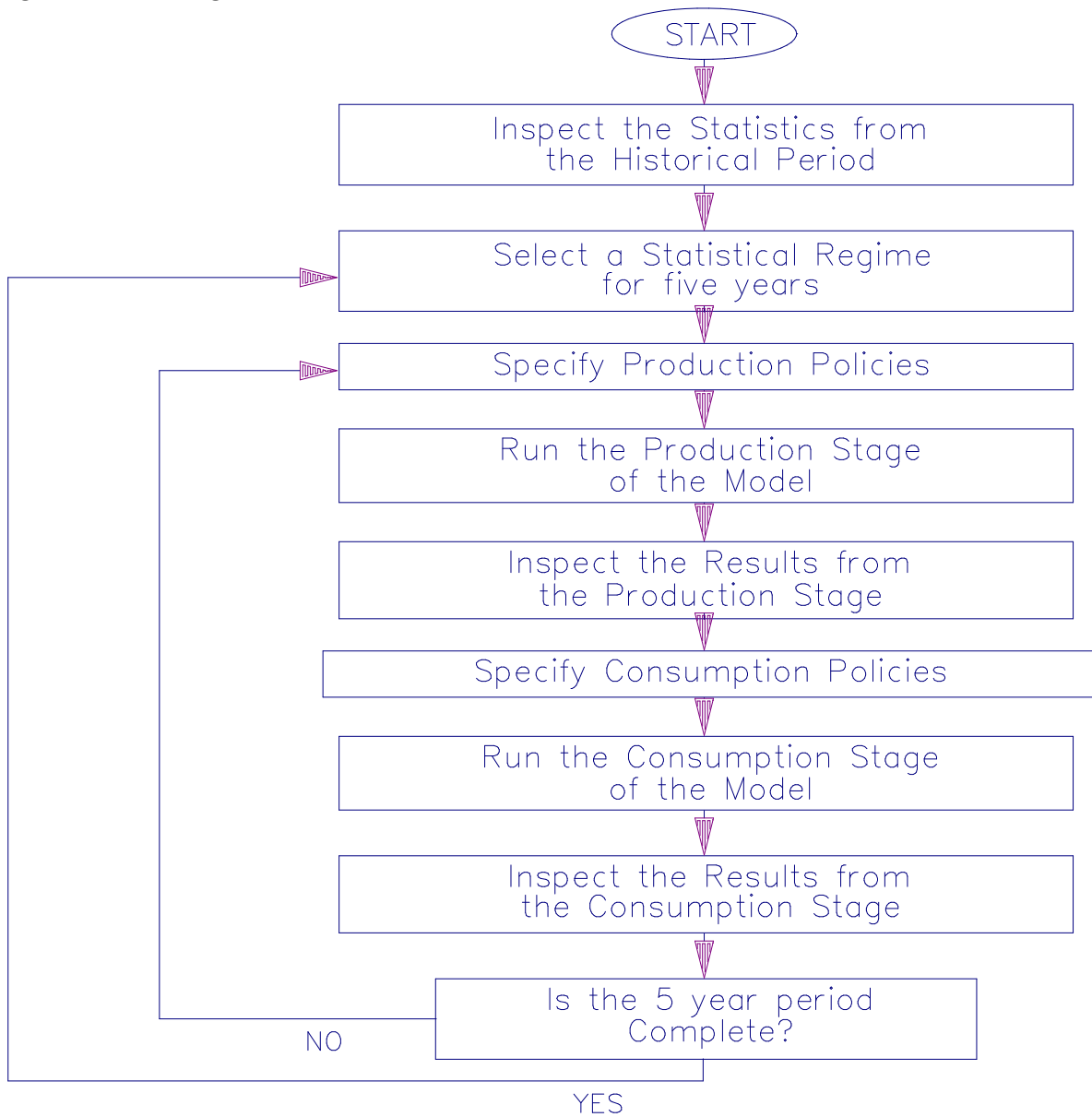
.4 The Logical Order of Activities

The HARAMBEE exercise is intended to simulate the decisions and actions which would be necessary in a real country for the management and planning of food policy. For this reason, there is a logical order for your actions when you are running the exercise. For example, you will not be able to specify policies for the consumption stage if you have not first run the model for the production stage.

At any time, the help line at the bottom of the screen will indicate the next logical action for you to take. This should of course only be regarded as a suggestion, and is not usually the only thing which you are able to do. For example, you can save your exercise and quit at any time, or discard your exercise and load one which you have previously saved. In addition, you can look at your statistical tables whenever you want to.

Figure 6.2 illustrates the logical order of activities in the HARAMBEE exercise. In the following section there is a more detailed description of how to carry out each of the activities using the HARAMBEE program.

Figure 6.2: The Logical Order of Activities



5 Running the HARAMBEE Exercise

.1 Inspect the Statistics from the Historical Period

a) The STATISTICS Menu

Before any decisions can be made about the new policies, it is clearly necessary to study what has happened in the past. The Statistical Handbook contains all of the results of the surveys which were carried out by the previous government during the preceding 10 years.

It is also possible to look at these tables on the screen, or even to print them all out again. This can be done in two ways. Either you can look at all of the tables which contain any new data (when you start, this will be all of the tables), or you can look at the tables (and accompanying graphs and charts) one at a time.

In order to look at statistics (at any time during the exercise), simply move the cursor with the arrow keys until the STATISTICS box is selected. Then press the ENTER key. The STATISTICS menu will now look like this:

Figure 6.3: The STATISTICS Menu



There are three possible selections on the STATISTICS menu. The SELECT option is used for setting up a statistical regime, and is covered later. The two options which can be used for looking at data are INSPECT and VIEW NEW. INSPECT is used for looking at the tables one at a time, while VIEW NEW is used for looking at all of the tables with new data in them. These are described in more detail below.

b) View New Tables

This selection is useful at the beginning at the exercise because it saves you the trouble of saying which tables you want to look at. If you select this option, the screen will look like this:

Figure 6.4The NEW TABLES Menu



You have the option of either VIEW, which will allow you to look at the tables on the screen, or PRINT, which will print the tables out on your printer, if you have one attached to the computer.

When you select VIEW, the tables will be displayed one at a time on the screen. In order to move onto the next table, you need to press the ENTER key. If you press the Esc key, the display of tables will be abandoned and you will be returned to the menu. Each table will look something like figure 6.5.

If you want to print the tables out on your printer, you should first check that the printer is switched on, and that the paper is positioned at the top of a page. Then select the PRINT option.

c) Inspect Tables

The INSPECT option will allow you to select a particular table or graph to look at on the screen, or to print out. When you select the INSPECT option, you will see a list of the available statistics, as shown in figure 6.6.

Figure 6.5 Example of a Statistical Table

HARAMBEE CONSUMER PRICE SURVEY

INFORMAL MARKET CONSUMER PRICES (HCU/KG)

YEAR	INFORMAL MARKET PRICES					
	MAIZE			CASSAVA		
	EAST	WEST	URBAN	EAST	WEST	URBAN
1985	0.76	0.63	0.64	0.13	0.12	0.12
1986	0.64	0.60	0.60	0.09	0.09	0.09
1987	0.60	0.61	0.62	0.07	0.07	0.07
1988	0.63	0.62	0.62	0.09	0.10	0.10
1989	0.42	0.43	0.41	0.06	0.06	0.06
1990	0.60	0.57	0.57	0.10	0.09	0.09

Figure 6.6: Selection of Statistics to INSPECT

STATISTICS		
	AVAILABLE STATISTICS	
NE	AGRICULTURAL SURVEY	NEW
	HOUSEHOLD INCOME SURVEY	NEW
	CONSUMER PRICE SURVEY	NEW
	NUTRITION SURVEY	NEW
	METEOROLOGICAL REPORT	NEW
	RAPID ASSESSMENT	NEW
	POPULATION CENSUS	NEW
	RECORD OF POLICIES	NEW
	GOVERNMENT BUDGET	NEW
	BALANCE OF PAYMENT	NEW
	WORLD PRICES & EXCHANGE	NEW
	COTTON BOARD RECORDS	NEW
	NFMB RECORDS	NEW

For each of the available statistics, the second column will contain the word "NEW" or "OLD". This indicates whether or not there is any new data in the tables associated with this survey. At the beginning of the exercise, all of these will say "NEW". In later stages however, only the surveys you have carried out will have new data in them.

You can now select one of these types of statistics by moving the cursor with the arrow keys (up arrow and down arrow) to your desired selection, and then pressing the ENTER key. Suppose you selected the POPULATION CENSUS. A further menu would appear, as shown in figure 6.7.

In this example, there are two tables from the population census - one an overall summary, and one a summary of the urban population. For each of these, you can decide whether you want to see it on the screen (VIEW TABLE), whether you want to print it out on a printer (PRINT TABLE), or whether you want to look at a graph or chart. Simply select the option you want by using the arrow keys, and press the ENTER key.

Not all of the tables have a corresponding graph or chart. If there is no graph or chart, nothing will happen when you select VIEW GRAPH.

Figure 6.7: Selecting Tables from a Particular Survey

STATISTICS			
AVAILABLE STATISTICS			
	AGRICULTURAL SURVEY	NEW	
	HOUSEHOLD INCOME SURVEY	NEW	
NE	CONSUMER PRICE SURVEY	NEW	
POPULATION CENSUS			
POPULATION SUMMARY	VIEW TABLE	PRINT TABLE	VIEW GRAPH
URBAN SUMMARY	VIEW TABLE	PRINT TABLE	VIEW GRAPH
	RECORD OF POLICIES	NEW	
	GOVERNMENT BUDGET	NEW	
	BALANCE OF PAYMENT	NEW	
	WORLD PRICES & EXCHANGE	NEW	
	COTTON BOARD RECORDS	NEW	
	NFMB RECORDS	NEW	

.2 Select a Statistical Regime for the next Five Years

The next logical step in the HARAMBEE exercise (after you have inspected all of the statistics from the historical period) is to set up a statistical regime for the next five year period. You have a budget of 995,000 HCU to spend on statistics for the five year period. The available statistics are divided into two categories: Surveys, and Administrative Statistics. In general, the administrative statistics are cheaper to collect than the survey statistics, and are available without delay. The budget, however, must cover all of the statistics for all five years, not just one of the categories or one of the years.

The first step is to select the SELECT option from the STATISTICS menu (see figure 6.3). When you do this, the screen will appear as in figure 6.8.

Figure 6.8: The SELECT Option on the STATISTICS Menu



a) Survey Statistics

Now select the SURVEYS option, to set up your programme of surveys. The screen will now appear as in figure 6.9:

Figure 6.9: Specifying the Surveys to be Carried Out

SURVEYS	PRICE	1989	1990	1991	1992	1993
AGRICULTURAL SURVEY	175,000					
HOUSEHOLD INCOME SURVEY	150,000					
CONSUMER PRICE SURVEY	25,000					
NUTRITION SURVEY	40,000					
CLIMATOLOGICAL REPORT	10,000					
URBAN ASSESSMENT	30,000					
POPULATION CENSUS	200,000					
BUDGET	995,000					

There are seven possible surveys which you can carry out in HARAMBEE. If you want to do a survey in a particular year, simply use the arrow keys to move the cursor to the column corresponding to the year you want, and the row corresponding to the survey you want, and press the <Enter> key.

When you do this, the word "YES" will appear in the box where the cursor is. The word "RES" will also appear, but usually in a later year. This tells you when the results of that survey are going to be available. Some surveys have a considerable delay - for example the population census results are not available for three years after the census has been carried out.

The number in the second column next to the word "BUDGET" will be reduced by the cost of the survey which you have selected. This tells you how much you have left to spend on other surveys and statistics. There will also be a total at the bottom for each year, telling you how much you have spent in that year.

If you change your mind and decide that you no longer want to carry out a survey, you can cancel it by positioning the cursor in the box where the word "YES" appears, and then pressing the (DELETE) key. The amount you save will be returned to your budget.

It is possible to return to this table whenever you want to during the exercise, in order to make changes in the surveys which you want carried out. You can make changes to any surveys, provided of course they have not been carried out yet! When you have finished selecting surveys, press the Esc key, and you will be returned to the menu (of figure 6.8).

Figure 6.10: Selecting Administrative Statistics

ADMINISTRATIVE	PRICE	1989	1990	1991	1992	1993
RECORD OF POLICIES	0					
GOVERNMENT BUDGET	15,000					
BALANCE OF PAYMENT	10,000					
WORLD PRICES & EXCHANGE	5,000					
COTTON BOARD RECORDS	10,000					
NFMB RECORDS	20,000					
BUDGET	995,000					

b) Administrative Statistics

When you select the ADMINISTRATIVE option, you will get a list of the available administrative statistics, as in figure 6.10.

The administrative statistics are selected in exactly the same way as the surveys, by pressing the <Enter> key. Note that these statistics are considerably cheaper to collect than the survey statistics. When you have finished, press the <Esc> key twice to return to the STATISTICS menu.

You are now ready to start specifying your policies.

.3 Specify the Production Policies

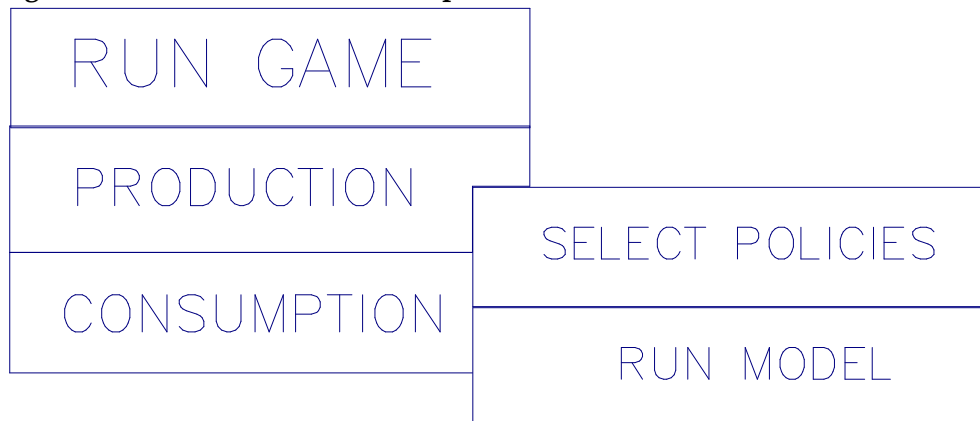
When you have decided upon a set of policies for the production stage of the exercise, you can return to the computer and enter them. You do this by selecting the RUN GAME option from the main menu. When you do this, the screen will look like figure 6.11.

Figure 6.11: The RUN GAME Menu



To run the production stage, simply select the PRODUCTION option from this menu. You will get two further options, as in figure 6.12.

Figure 6.12: The PRODUCTION Option on the RUN GAME Menu



The first thing you need to do is to select policies for your production stage. Selecting the SELECT POLICIES option will give you the following screen:

Figure 6.13: The Production Stage Policies

PRODUCTION POLICIES	1985	1986	1987	1988	19
FERTILIZERS EAST: SMALL FARMERS	31	34	38	42	
FERTILIZERS WEST: LARGE FARMERS	112	123	135	148	
FERTILIZERS WEST: SMALL FARMERS	317	349	384	422	
OFFICIAL PRODUCER PRICE: MAIZE	0.45	0.45	0.44	0.43	
OFFICIAL PRODUCER PRICE: COTTON	0.45	0.46	0.44	0.46	
OFFICIAL SALES PRICE: FERTILIZER	0.32	0.32	0.33	0.33	
TOTAL IMPORTS: MAIZE	640	450	350	300	
TOTAL IMPORTS: FERTILIZER	0	0	0	0	

You now need to enter numbers into the empty column on the right, which corresponds to the current year. The previous four columns contain the values of these policies for the preceding four years. This is intended to provide you with a guideline, but there is no need for you to continue the policies of the past!

In order to put a number into one of the boxes in the empty column, simply position the cursor in the box, type the number and press either the ENTER key, or one of the vertical arrow keys. If you have made a mistake entering a policy value or if you want to change your mind, then move the cursor to the appropriate box, delete the numbers by using the <Backspace> key and then type in the correct numbers. When you have finished entering all of your policy values, press the <Esc> key to return to the previous menu.

Note that when you type in values for the prices, you cannot begin with a decimal point. For example, if you want a price of 0.36, then you cannot simply type .36, you must start with the zero. You are also not allowed to enter the value zero for anything except the maize imports.

When you have finished entering your policy values, and pressed the Esc key, you are ready to run the production stage of the model.

4 Run the Production Stage of the Model

After entering your policies, you will be returned to the menu of figure 6.12. In order to run the model, simply select the RUN MODEL option and press the ENTER key. There will be a brief message saying "RUNNING". When it has finished (usually about one second), you are ready to look at the statistics from the production stage.

.5 Inspect the Statistics from the Production Stage

After the production stage of the model has been run, you can look at the results by returning to the STATISTICS menu (see figure 6.3.1). Note however that not all of the tables will now have any new data in them. In fact, the only new data will be from surveys or statistics which you have requested, and whose results are now ready (remember that some of the surveys have a delay of one to three years before the results are available).

Most of the statistics are never available after the end of the production stage. The only ones which are relevant are the Meteorological Report, the Rapid Assessment, the Record of Policies (production stage only), the Cotton Board Records, and the NFMB Records (Mid-Year records only).

If you use the NEW TABLES option, you will be able to see only those tables with some new data in them. When you have studied these tables and graphs, you will be ready to specify policies for the consumption stage of the exercise.

.6 Specify the Consumption Policies

The Consumption policies are specified in very much the same way as the production policies. Return to the RUN GAME menu (figure 6.3.9), select the CONSUMPTION option (you will get a screen just like figure 6.12 again), and then select the SELECT POLICIES option. You will now get a screen showing the consumption policies, as in figure 6.14.

Just as in the case of the production policies, you now need to enter numbers into the empty column on the right, which corresponds to the current year. The numbers are entered in exactly the same way. When you have finished entering all of your policy values, press the <Esc> key to return to the previous menu.

Remember that the values for the prices must not begin with a decimal point. You are also not allowed to enter the value zero for anything except the maize exports.

When you have finished entering your policy values, and pressed the Esc key, you are ready to run the consumption stage of the model.

Figure 6.14: The Consumption Stage Policies

CONSUMPTION POLICIES	1985	1986	1987	1988	1989
GOVERNMENT MINIMUM WAGE	1098	1164	1236	1308	
GOVERNMENT MAIZE SALES, EAST	310	321	317	266	
GOVERNMENT MAIZE SALES, WEST	560	501	589	571	
GOVERNMENT MAIZE SALES, URBAN	266	272	372	366	
GOVERNMENT MAIZE PRICE, EAST	0.57	0.58	0.57	0.57	
GOVERNMENT MAIZE PRICE, WEST	0.57	0.58	0.57	0.57	
GOVERNMENT MAIZE PRICE, URBAN	0.57	0.58	0.57	0.57	
MAIZE EXPORTS	0	0	0	0	
SECURITY STOCKS	0	0	0	0	

.7 Run the Consumption Stage of the Model

This is the same as the production stage. After entering your policies, you will be returned to the menu of figure 6.10. In order to run the model, simply select the RUN MODEL option and press the ENTER key. There will be a brief message saying "RUNNING". When it has finished (usually about three to five seconds), you are ready to look at the statistics from the consumption stage.

.8 Inspect the Statistics from the Consumption Stage

After the consumption stage of the model has been run, you can look at the results by returning to the STATISTICS menu (see figure 6.3). As in the production stage, not all of the tables will now have any new data in them. The only new data will be from surveys or statistics which you have requested, and whose results are now available.

Most of the statistics are potentially available after the end of the consumption stage (provided you have carried out the surveys). They include the Agricultural Survey, the Household Income Survey, the Consumer Price Survey, the Nutrition Survey, the Population Census, the Record of Policies (consumption stage only), the Government Budget, the Balance of Payment Records, the World Prices & Exchange Records, and the NFMB Records (End-Year records only).

It may be convenient to use the NEW TABLES option to look at only those tables with some new data in them.

When you have studied these tables and graphs, you will be ready to go on to the next year, and specify policies for the production stage. Note that the current year, displayed at the top of the screen, will now have advanced by one. You can if you wish first make changes to the remaining four years of the statistical regime.

You can continue in this way for as many years as you wish. Remember however, that at the end of every fifth year you must specify a new statistical regime. You will receive a new budget of 995,000 HCU to spend on surveys and statistics.

.7 Saving and Loading Copies of Exercises using the FILE Menu Choice

.1 Save Game

It is often convenient to be able to stop using the computer during the HARAMBEE exercise. For example, you may wish to take your tables away and think about the policies for the next stage. In the meantime, the computer could be used for something else.

You can stop at any time you like, and resume at a later stage, by using the SAVE GAME and LOAD GAME options on the FILE menu. Before you stop, use SAVE GAME to make a copy of your exercise on the disk. You can then QUIT from HARAMBEE. When you start again, all you need to do is to use LOAD GAME to get back the exercise which you were doing before. This will remember which year you were on and what stage you were carrying out. You can simply proceed as if you had never left.

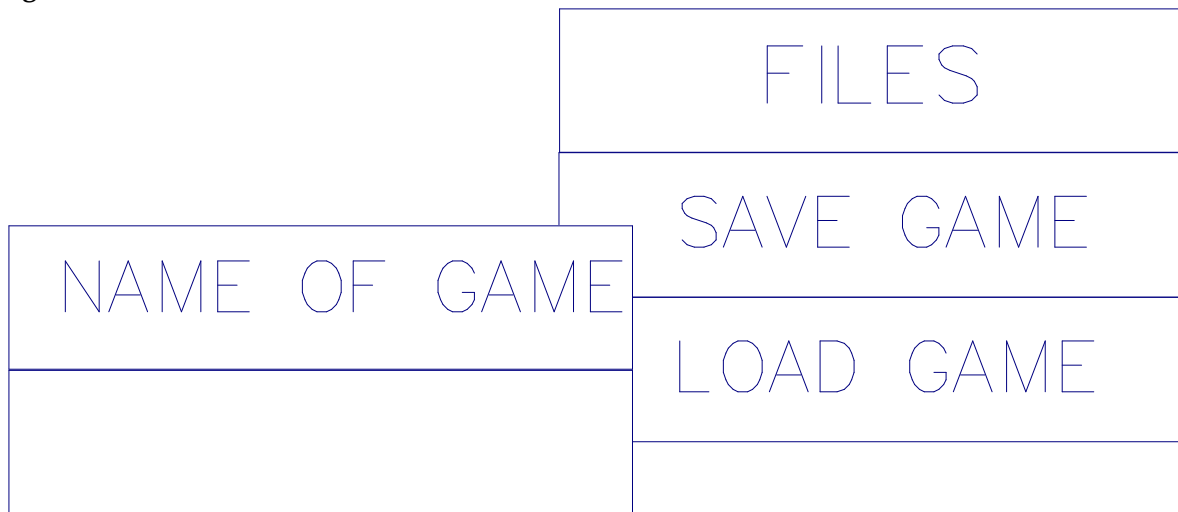
To make a copy of your exercise on the disk, go to the FILE option on the main menu. The menu will look like figure 6.15:

Figure 6.15: The FILE Menu



Now select the SAVE GAME option from this menu. You will now be asked to type in a name, which will be used to identify your exercise on the disk. The screen will look like figure 6.16:

Figure 6.16: The SAVE GAME Menu



You can type in any name you like, up to a total length of 8 characters, provided that you only use letters of the alphabet, or numbers and do not use punctuation marks. For example:

GROUP3 is a valid name

GROUP.3 is not a valid name, because it has a "." in it

When you have typed in a name, press the ENTER key, and the file will be saved onto the disk. This will take ten seconds or so on a hard disk, but a bit longer on a floppy disk. You will be returned to the FILE menu when this has finished.

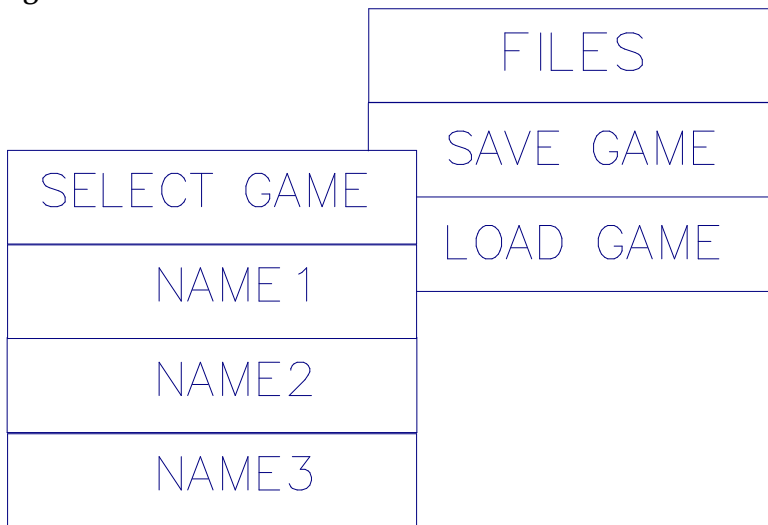
You can now QUIT from HARAMBEE if you want to, by selecting the QUIT option on the main menu.

Note that if you do not save your exercise in this way before you QUIT, then you will not be able to recover your exercise ever again!

.2 Load Game

At any time during the HARAMBEE exercise, you can use the LOAD GAME option to bring back a previously saved exercise. To do this, select the FILE option on the main menu, and then select LOAD GAME. You will now see a screen like figure 6.17.

Figure 6.17: The LOAD GAME Menu



You are asked to choose one of the names on the list, by moving the cursor to it, and pressing the ENTER key. The names on the list will be the names of exercises which you have saved in the past. If there are no previously saved exercises on the disk, then there will be a message saying "No old games were found".

When you select one of the names, the exercise will be loaded from the disk, with a small delay. When this has finished, you will find yourself in the same year and at the same stage as when the exercise was saved. You can continue with the next stage.

APPENDIX A GETTING STARTED

1. What you Need

In order to run the HARAMBEE simulation Exercise, you will need an IBM compatible microcomputer attached to a printer. The computer program which is used for the Exercise has been designed to operate on almost any computer which is IBM compatible and which runs the MS/DOS operating system.

The program does however require either a hard disk, or a computer with two floppy disk drives. In addition, it requires your computer to have at least 384K of RAM memory.

In summary, the requirements are:

- IBM compatible computer running MS/DOS
- A floppy disk drive (either 5.25" or 3.5") - called the A: drive
- Either a second floppy disk drive - called the B: drive
- Or a hard disk - normally called the C: drive
- At least 384K of RAM memory

In order to start the Exercise, you will also require:

- the HARAMBEE system disk in drive A:
- an empty formatted diskette in drive B: if you do not have a hard disk drive.

2. Installing the Program

Before you install the HARAMBEE program to run on your computer, you will need to make two decisions:

a) Where to install the program:

This decision depends on whether or not you have a hard disk. If you do, then the program runs much faster if it is first installed on the hard disk. If you do this, the program will create a directory called \HARAMBEE on your hard disk, and copy the files into it.

If you do not have a hard disk, then you can run the program from your copy of the HARAMBEE system disk in the A: floppy disk drive, or install it onto a floppy diskette in the B: disk drive.

b) Where to keep the copies of your exercises:

The HARAMBEE program will need some extra disk space in case you want to keep copies of your exercises. It is not possible to keep these copies on the HARAMBEE system disk, since this disk is almost full already.

Therefore, you need to decide whether you want to keep your copies on the hard disk (if you have one) or on a second floppy disk drive (usually called the B: drive).

If you decide to use your hard disk, the program will create a new directory called \HARAMBEE\GAMES (which is a subdirectory of the \HARAMBEE directory). This subdirectory will be used for the copies.

If you decide to use your B: drive, the program will use the root directory on it (called \).

Once you have decided where to put the program, and where to keep the copies of your exercises, you can start the installation by following these steps:

- a. Put the HARAMBEE system disk into the floppy disk drive A:
- b. If you are using a second floppy disk drive B:, make sure that there is an empty formatted disk in the drive
- c. If you want to install on a hard disk, type the following two commands:

```
A:                                     <Enter>  
INSTALL C: C: <Enter>
```

Alternatively, to install on a floppy disk, type:

```
A:<Enter>  
INSTALL B: B:<Enter>
```

- d. In either case, the installation program will do the rest. The program will be installed in a directory called \HARAMBEE on whichever disk drive you specified. Note that if you have installed the program onto a floppy diskette in the B: drive, then you should use that diskette in the A: drive, with a second empty disk in the B: drive.

- e. When the installation has finished, you will see the following message:

```
The HARAMBEE program has now been installed
```

- f. In order to run Harambee, now type the word "HARAMBEE" and press the ENTER key

You are now ready to run the program.