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Food Security Research Project

**IMPROVING INFORMATION
AND PERFORMANCE IN
GRAIN MARKETING:**

**AN ASSESSMENT OF CURRENT MARKET
INFORMATION SYSTEMS, AND
RECOMMENDATIONS FOR DEVELOPING A
PUBLIC GRAIN MIS**

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WORKING PAPER 1
FOOD SECURITY RESEARCH PROJECT
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Food Security Research Project

Working Paper 1

IMPROVING INFORMATION AND PERFORMANCE IN GRAIN MARKETING: An Assessment of Current Market Information Systems, and Recommendations for Developing a Public Grain MIS

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Executive Summary

Ethiopia faces many challenges as it attempts to reestablish an efficient and equitable food production and marketing system after more than a decade of increasing state control. Chief among these is the need to rethink the role of the government in economic life. This paper focuses on one dimension which is at the core of all modern economies: how to provide private and public agents with timely and accurate information regarding current and expected future market conditions. Its objective is to show the need for a public market information system for agricultural markets in Ethiopia, and to present concrete proposals that can be reviewed, debated, and modified as necessary by the relevant Ethiopian authorities in collaboration with Food Security Research Project (FSRP) personnel.

The paper argues that at this point in Ethiopia's development, government must take a lead role in creating a public market information system (MIS) to facilitate private production and marketing activities. In the absence of such a role, information will remain unreliable and poorly distributed, market performance will be hampered, and both farmer and consumer incomes will be reduced.

After presenting the case for an activist role for the public sector in this area and reviewing the status of current MIS services, the paper discusses eleven key issues for the design of such a system and makes specific recommendations on each. These issues are 1) the appropriate objectives for a public MIS, 2) the institutional home for the MIS, 3) geographic coverage, 4) definition of transaction levels to be monitored, 5) definition of products (including varieties of individual grains), 6) controlling for sampling error, 7) dealing with non-standard units and qualities, 8) determining the frequency of data collection, 9) establishing a system for data transmission and processing, 10) developing a dissemination plan, and 11) building a program of market research to complement and orient the MIS.

Key recommendations regarding the development of an MIS include:

1. Institutional Home/s for the MIS. In the short run, EGTE's price collection and reporting system should be used as the foundation for implementing a pilot MIS, with MOPED taking responsibility for data analysis and dissemination. Training should also be provided through the FSRP to EGTE and MOPED personnel involved in collecting and analyzing data during the pilot MIS. In the long run, however, possibilities of alternative institutional homes for the MIS should be explored. In particular, market data collection activities by CSA and/or RRC may be able to either supplement or substitute for EGTE's data collection activities.

2. Training/Capacity Building. Training should be provided, in the pilot phase, to EGTE and MOPED personnel involved in collecting and analyzing data. Such training should be expanded to RRC and/or CSA should they become involved in the MIS subsequent to the pilot phase. Training should be given to EGTE market surveyors to improve the reliability of their data collection, including issues related to standardization of qualities and measures, sampling techniques, and non-sampling errors. Training on data

processing and analysis skills should also be provided to EGTE, MOPED, and other Ethiopian personnel. This should include training for Ethiopian personnel in SPSS/Windows, as well as a visit to a current MIS country (e.g., Mali).

3. Geographic Coverage for the MIS. The MIS should eventually expand to the majority of current EGTE markets, in addition to other markets in chronic deficit areas of southern and eastern Ethiopia. However, the pilot phase of the MIS should be more limited in scope, covering a limited number of markets. In choosing which markets to include for broadcasting information during the pilot phase, there is a trade-off between concentrating on markets in a small number of regions, or covering all regions where EGTE collects data, but with only one or two major markets per region. In either case, the pilot MIS should have a balance between surplus and chronic deficit areas. Three possible options for coverage by the pilot MIS would be:

Option 1: Mekele and its surrounding markets + Dese and its surrounding markets + Addis Ababa + Ambo and its surrounding markets + Nekemte and its surrounding markets + Bahir Dar. Crops to be covered under this option would be teff, maize and sorghum.

Option 2: Shashemane and surrounding markets + Assela and its surrounding markets + Nazreth and surrounding markets + Addis Ababa + Dire Dawa and its surrounding markets. Crops covered under this option would include teff, maize, wheat, barley and sorghum.

Option 3: All 16 EGTE branch office markets, with NO surrounding sub-branch markets. Crops covered would be the same as in Option 2.

One of these options, or perhaps an alternative option, should be decided upon after further discussion by the FSRP Technical Committee.

4. Media for Disseminating Market Information. For disseminating information to market participants, three possibilities are: (1) via radio; (2) via newspaper; and (3) via posted bulletins. Weekly radio broadcasts appear to be the best means for reaching farmers in a timely way. Newspaper reports would be a good complement to radio reports, and may be better for reaching urban traders and consumers. Where these options are not feasible, posted bulletins in villages may be the only available option. For reaching policy makers, regularly published bulletins (monthly or quarterly) may be a good means of dissemination, with more frequent bulletins in times of crisis. Ideally, such bulletins could be disseminated by fax, and where this is not possible, by hand delivery or by express mail.

5. Developing a Market Research Program. Development of the MIS should be closely integrated with the development of a market research program. The MIS may provide a foundation of information on which to better understand the organization and performance of grain markets. A successful market research program can also create insights which improve the design and implementation of the MIS.

IMPROVING INFORMATION AND PERFORMANCE IN GRAIN MARKETING: An Assessment of Current Market Information Systems, and Recommendations for Developing a Public Grain MIS

I. Introduction

Ethiopia faces many challenges as it attempts to reestablish an efficient and equitable food production and marketing system after more than a decade of increasing state control. Chief among these is the need to rethink the role of the government in economic life: what is government to do if it is to **facilitate** rather than **control** private production and marketing activities? What specific actions can government take to ensure that the essentially private food system which develops over the next years and decades is both efficient and equitable? Are there services which government **must** provide if this is to happen?

There are many dimensions to these questions. Among these are how to plan and finance the construction of roads and other hard marketing infrastructure needed to integrate isolated areas into the regional and national marketing system, and how to structure the legal and regulatory environment to promote competitive markets. This paper will focus on one dimension which is at the core of all modern economies: how to provide private and public agents with timely and accurate information regarding current and expected future market conditions. It will argue that at this point in Ethiopia's development, government must take a lead role in creating a public market information system (MIS) to facilitate private production and marketing activities; in the absence of such a role, information will remain unreliable and poorly distributed, market performance will be hampered, and both farmer and consumer incomes will be reduced. After presenting the case for an activist role for the public sector in this area and reviewing the status of current MIS services, the paper will discuss key issues and make specific recommendations for the design of such a system. The objective of this latter section is to outline a concrete plan of action that can be reviewed, debated, and modified as necessary by the relevant Ethiopian authorities in collaboration with Food Security Research Project (FSRP) personnel.

The paper is organized as follows: sections II, III, and IV discuss the justification for a public market information system in Ethiopia; section V looks at specific data needs for the MIS; section VI is a relatively detailed discussion of current sources of market information in Ethiopia; and section VII discusses key issues and makes specific recommendations for designing a MIS.

II. The Need for Broad Access to Timely and Accurate Market Information

Market economies run on information. Decisions on where to allocate resources depend on expected rates of return in alternative activities. These decisions determine the level, pattern, and distribution of economic growth, and they all depend on the level, distribution, accuracy, and timeliness of information. Better information leads to better

decisions, which leads to greater economic growth. Broader distribution of that information leads to more equitable participation in that growth.

The development of an efficient and equitable food marketing system is a critical component for improving food security in Ethiopia, improving both food availability and food access. Efficient and equitable performance of food markets, however, may be impeded by high uncertainty about prices facing participants in various markets. A lack of timely and accurate information for market participants contributes to poorly functioning food markets and leads many farm households to rely on relatively low-productivity subsistence production for most of their food needs. Access to timely and accurate market information is thus one important element for transforming Ethiopia from a subsistence-oriented, low-productivity, agriculturally-based economy into a modern, exchange-oriented, high-productivity economy.

Reducing uncertainty in grain marketing through the dissemination of timely and accurate information to market participants, may, by reducing marketing risks and margins, serve both to improve production incentives for grain producers, and to drive down prices for grain consumers (Staatz, et al, 1992; Staatz and Dembéle, 1992). Improving farmer and trader awareness of prices in various markets throughout the country promotes grain system efficiency by: (1) encouraging grain flows from relatively surplus to relatively deficit areas, thus helping stabilize prices over space; (2) improving farmers' decisions and confidence regarding what to plant, how much to invest, and where and when to market their produce; and (3) promoting a more competitive marketing system, which will benefit both producers and consumers.

Access to timely and accurate grain market information is also crucial for policy makers and food relief agencies, to allow them to understand and effectively address food insecurity problems in Ethiopia. For instance, price increases may signal food supply shortfalls in certain areas, and give an early warning of the possible need for food relief or other government interventions in these areas. Conversely, low grain prices may suggest the need to discontinue food relief interventions or to target them more carefully on vulnerable populations. Analysis of market information can also assist policy makers to understand the evolving structure and performance of the country's agricultural marketing system. This is especially important in a country such as Ethiopia, which is emerging from more than a decade of increasing state control over marketing activities and attempting to reestablish a viable private marketing system. Under such circumstances, the nature of the food marketing system can change rapidly. Food relief agencies must understand these changes if they are to channel their resources most effectively, and Government must understand them to determine where its actions in support of a competitive private production and marketing system are most needed.

III. The Inadequacy of Current Market Information

Currently, both private and public sector decision makers in Ethiopia face inadequate access to grain market information. Most private grain market participants receive information about grain prices in selected markets through telephone or personal reports by friends or employees, or by visiting the markets themselves. This system of obtaining information has at least three disadvantages: (1) the information is generally limited to a

very small number of markets; (2) telephoning or visiting far away markets involves significant costs, and these costs are repeated over all participants; and (3) poor and remote farmers, traders, and consumers may be unable to access information in these ways, contributing to unequal and inequitable distribution of information. These individuals could benefit greatly from broader and more timely dissemination of information, improving both their negotiating power and their ability to make good planting, investment, and marketing decisions.

In addition to data on current market prices, farmers and traders also need information on food stock levels, trade volumes, and the direction of trade flows, in order to develop informed expectations regarding future market demands (Kuma & Makonnen 1994). There is a need, therefore, for a system of generating and disseminating market information which can provide timely knowledge about a broader variety of markets, at less cost, and to a greater number of market participants.

Government and donor agency decision makers also face inadequate access to timely, accurate grain market information. Currently, the most extensive and systematic grain price monitoring in Ethiopia is being conducted by the Ethiopian Grain Trading Enterprise (EGTE). However, the use of this data is mostly limited to EGTE itself, with very little analysis and dissemination for government or donor agency purposes, and no dissemination at all to private market participants.

IV. The Need for *Public* Provision of Improved Market Information

Market information is clearly, what economists call, a public good. As such, it is a good which is likely to be under-produced if left to the private market. This underprovision derives from the fact that the social benefits of generating and disseminating accurate, timely market information exceed the returns that a private agent would likely receive from investing in such an activity. This dilemma is illustrated by three examples:

1. Traders who gather market information through telephone calls or personal market visits have strong incentives to keep that information to themselves, or within their small trading partnership, since sharing the information may allow others to take advantage of (and thereby reduce or eliminate) profit opportunities that the trader has identified. As a result, the costs of collecting market information are repeated over thousands of traders and millions of producers and consumers.
2. In theory, private entrepreneurs could specialize in providing market information if they could recover their own, private, costs of such provision. In practice, however, recovering even these private costs is very difficult, because once the information is sold to a few people, it is impossible to prevent it from spreading to others who do not pay the original provider. Economists refer to this as the problem of *high exclusion costs*.
3. Finally, even if private firms find it profitable to provide some information services, they will do so at socially sub-optimal levels. Private market analysis firms have often been profitable in high-income countries, but such firms provide only a narrow range of information to a relatively small, specialized, audience; they

do not provide the broad-based, fundamental market information being discussed here. Furthermore, Bonnen (1986) argues that private firms are able to provide such information and analyses only because public information services provide much of the needed basic data. In low-income countries, even this low level of private provisioning of information has been very slow to develop.

As a result of these factors, in the absence of a public system all market participants must either: (1) invest in gathering information themselves, thus duplicating costs many times over; or (2) accept the risks of uncertainty involved in going to market without a knowledge of prices. Both options are socially inefficient and inequitable.

In addition, as experience in other countries such as Mozambique and Mali has demonstrated, a public grain market information system, by disseminating timely market information and analyses, can improve the ability of governments and donor agencies to make appropriate policies and market interventions for promoting food security. Staatz, et al (1992) have summarized the benefits of Mali's experience with a public grain market information system. These benefits included: (1) reducing marketing margins resulting from risk premia and monopoly power in the system; (2) reducing the need for market participants to bargain over prices; (3) stabilizing food supplies over space and time by encouraging arbitrage; (4) encouraging long-distance trade by increasing information about far away markets; (5) improving farmers' planting and trading decisions; and (6) improving policy makers' understanding of food system performance for use in the design of appropriate policy interventions.

V. Beneficiaries of an MIS and their Specific Data Needs

Current and potential users of market information in Ethiopia include grain market participants (producers, traders, consumers), government policy makers, and donor agencies and NGOs concerned in the short-run with famine early warning and relief, and in the longer run with economic development. The particular needs of these MIS users are mixed. Some need information on smaller markets, while others are more concerned with what is happening in larger markets. Some will benefit from knowledge about farmgate prices, while others need to know only about wholesale prices. This section describes current and potential uses of market information in Ethiopia, as well as the data priorities and major institutions/user groups associated with each.

Two key characteristics of market information are its **timeliness** and its **analytical content**. There is typically an inverse relationship between the two: more timely information tends to be descriptive (price levels, price changes, supply conditions), while with a greater delay between collection and dissemination, the analytical content of the information can be increased. One type of information is not necessarily more helpful than another; each is helpful for specific agents and uses. A third important characteristic of information is its **time orientation**: is the information retrospective, reporting on past conditions (last week, last month, last year) or is it prospective, attempting to predict future conditions (e.g., outlook information on forthcoming domestic harvests and prices, or trends in international prices). As a general rule, all agents value timely information; they differ in the rate at which they will sacrifice timeliness to gain analytical content.

V.A. Data Needs for Farmers, Traders, and Consumers

Private economic agents include farmers, assemblers, wholesalers, retailers, and consumers. They primarily want timely retrospective information (e.g., market prices last week, or three days ago) that will help them make buy/sell decisions. Price information is essential, but information on stock levels, market flows, and food aid arrivals is an important complement. Larger traders and farmers can also benefit from certain types of market analyses, especially regarding seasonal price patterns and possible returns to storage. This includes outlook type information on future harvests and price movements over several months.

Emerging market economies are typically characterized by a low level of information and by unequal distribution of the information that exists. As a general rule, traders have much better information than farmers and are thereby in a stronger negotiating position. Farmers frequently arrive at market without a firm idea of the price that they will receive in that market, nor prices they might receive in other markets. **Providing farmers with this type of information in a timely manner can significantly increase their bargaining position, and ability to make good marketing decisions.**

Access to information also varies across traders. In Ethiopia, for example, brokers in Addis Ababa's Ehil Berenda terminal market are extremely well informed regarding prices and supply conditions throughout the country. These brokers perform an important role in bringing dispersed buyers and sellers together and thus integrating regional and zonal markets into the national food marketing system. This carries real benefits for farmers and consumers. Yet the very fact that these brokers are so well informed means that they have a competitive advantage over other traders, who seldom share the brokers' broad knowledge of market conditions. Providing timely information on all major and many lesser markets throughout the country to all traders will reduce this informational disparity and mediate against any possible use of market power by brokers.¹

In addition, rapid market appraisals have shown that certain assemblers involved in inter-regional grain trade obtain information on prices in Addis Ababa and other terminal markets three or more times per week². These traders are able to react more quickly to profit opportunities than other, less informed traders. Providing broad access to market information will "level the playing field" and allow more traders to compete on an equal basis. An anecdote from a recent appraisal along the Addis-Nekemte road is instructive in

¹ See KUAWAB (1994) for a discussion of the role of brokers in Ehil Berenda. This report also contains a wealth of other information on the structure of grain marketing in Ethiopia.

² These traders are often referred to as "wholesalers". We use the term "assembler" here because they are typically the first buyers from farmers who arrive in the market towns. They collect larger quantities of grain (25-50 quintals) in this way and sell to wholesalers, either by transporting themselves to a deficit market (often but not always Addis Ababa) or by selling within their own town to an arriving wholesaler. See Section ? for more detail on the structure of the grain trade in Ethiopia.

this regard. After speaking with a young, dynamic assembler in Bako about how he conducts his business and the problems he encounters, the appraisal team explained to him plans to create a public MIS. When the trader realized that the MIS would make information available to **anyone** interested in it, his response was "that will force me to compete much more with the other traders around here; I would rather the information not be made public". This response was very similar to those received in other areas of the country from some traders. An effective public MIS will force traders such as these to compete on a basis other than informational advantages (e.g., providing guaranteed forward contracts, or improved quality guarantees, or simply a lower price), thus benefitting farmers and consumers.

A key insight from market research is that improved market information can reduce the negative effects on farmers and consumers of localized market power. Many small markets in low-income countries are served by only one or two resident assemblers, who may be able to reduce prices to farmers (and increase them to consumers) to levels not justified by real marketing costs. If farmers have information about prices in larger markets, they are better able to bargain with local traders and force them to pay prices more in line with these costs. In addition, outside traders will be more likely to compete with these local traders if they have reliable price information. As a result, **local** market structure becomes less important in determining prices to farmers and consumers.

V.B. Data Needs for Famine Early Warning and Relief Programs

Government and Non-Governmental Organizations (NGOs) involved in food aid distribution and broader famine early warning and relief operations have a need for outlook information to help them plan their activities. Harvest forecasts are important, and price forecasts one or two months hence can be especially useful. By monitoring the prices of staple crops, particularly in vulnerable areas and during the pre-harvest, "hungry" season, decision makers and food aid donors and distributors can target and mobilize their relief efforts before an emergency situation develops. Timely retrospective information (e.g., prices and commodity flows last week, or over the past several weeks) can also be very useful in adjusting their on-going field activities, though these institutions often do not use such information in this way. An important role of a MIS can be to sensitize NGOs and government relief organizations to the usefulness of this type of information.

At present, there are two sets of early warning systems operating in Ethiopia. The public sector Relief and Rehabilitation Commission (RRC), obtains information from 158 Woredas located in the most vulnerable areas, i.e., small markets in food deficit areas. RRC has an impressive system mounted and functioning for the analysis of these data, but they are collected only monthly, and available for use only after a three-month delay - too late for early warning purposes. The USAID Famine Early Warning System (FEWS) uses market information from EGTE, but this is made available only once a month, and is most representative of the larger markets and of surplus areas rather than the more vulnerable small market and deficit areas. In addition, FEWS reports are currently aimed more at the larger international community (external to Ethiopia) than to a target audience within the country.

In addition to use by the RRC and USAID early warning systems, most of the NGOs

involved in food aid distribution also collect market and other information on their own to target vulnerable segments of the population. Examples of data used by NGOs include:

CARE. Among the major NGOs in Ethiopia, CARE appears to have developed one of the more complete and regular information systems. The system is called CEFIS (CARE Ethiopia Food Information System) and combines information of several types, including market prices, rainfall, crop condition, population movement, seasonal employment, water supply, nutritional status, and health conditions. The most important price information for CARE's purposes is farmgate prices in regional markets. Priority is placed on livestock, cereal, and cash crop prices.

Since CARE focuses their efforts on one area of the country (East and West Hararghe, Borena and East Shewa), their information base is useful primarily to other government institutions and NGOs working in this zone. CARE's price and other information are formally published and disseminated every three months in their "Quarterly Bulletin of Household Food Information Systems." This is an excellent service that CARE provides, yet RRC and other NGOs would benefit from a system that made such information available on a more timely basis.

Catholic Relief Services (CRS). Along with CARE, CRS places an emphasis on data collection and analysis for their own programming purposes. They have developed a "Vulnerability Early Warning System" (VEWS) in the Hararghe region, where their food aid and other relief efforts (tools, seeds, etc.) have been concentrated.

Market information used in the VEWS system includes monthly prices for staple crops and livestock. Data are collected through counterparts (Catholic dioceses) in five regional CRS distribution points. Marketing questions are becoming increasingly important to CRS as it moves from an emphasis on relief activities to development projects. CRS especially needs such information at the village level, where most small farmers sell their surplus production. Market prices are especially important for programming the appropriate balance between food-for-work (FFW) and cash-for-work (CFW) initiatives in a given region.

CRS has recognized a need for more standardized early warning concepts, methods and information among Ethiopian relief agencies. Toward this end they have developed a proposal for a workshop on the subject for NGOs and other institutions in Ethiopia as well as in neighboring countries.

Lutheran World Federation (LWF). Distributing over \$30 million in food aid per year, LWF's food aid program is one of the country's largest. As such, they have a strong and expressed need for accurate and current market information. Before 1991, LWF had great difficulty obtaining price information because of state control over markets and secrecy about prices. Since that time, market information has become easier to get, though LWF must collect it largely on its own.

Currently, they maintain an information system through their regional and local offices and through other staff who are not tied to a particular market or locality. Price information is gathered, mostly on an ad hoc basis, from farmers, traders, and consumers

in the western and southern areas of the country. These are areas where LWF has focused its food aid distribution efforts and where their church partners have been particularly strong.

Market information is important both for their own food aid distribution purposes and to convince their overseas (Canada and Europe) headquarters of the need for requested amounts of food aid. Other information used includes rainfall, pest infestation, and livestock sales. It is crucial in all cases that the data be made available quickly, preferably within a week of collection.

Other information that would be helpful to LWF programming is an empirical assessment of the impact of food aid distributions on local market prices. Having the ability to predict at what levels food aid will significantly distort market prices could influence how much, when, and how distributions are made (e.g., FFW vs. free distribution).

Many of these data collection and analysis systems are impressive and serve real needs in Ethiopia. Several could be very usefully continued even in the presence of an effective public MIS in the country. Yet taken as a whole, they highlight many of the informational problems in the Ethiopian food system today: duplication of effort, lack of data collection standards and therefore of comparability across systems, limited sharing (at least in a timely fashion) of information, and, in some cases, long delays between collection and the availability of useful output. All three early warning and emergency relief groups have expressed a need for improved market information should it become available. In the absence of a more complete system, both RRC and the NGOs have plans to upgrade their own data collection efforts to meet this need.

V.C. Data Needs for Policy Analysis and Planning

Public sector officials and policy analysts (including academics) may have the greatest demand for analytical content from a MIS. A key insight from other countries with such systems is that an MIS can provide an organizational, administrative, and informational foundation upon which to build a broader system of market research. A MIS is in fact several systems working together:

- An organizational system of market reporters, data entry personnel, data processors, and market researchers
- An administrative system of procedures for data collection, transmission, processing, and reporting

For these systems to function properly (to generate useful information), the system needs analysts to understand the evolving organization, behavior, and performance of the marketing system being monitored. As this latter process proceeds, one is led into innumerable researchable, policy relevant questions. For example: what are the effects of emergency and commercial food aid on agricultural markets?; how might food aid distribution be redesigned to minimize any negative effects?; where are marketing margins in line with marketing costs and where are they not?; which markets are well linked with others by trade and which are not?; are there specific barriers to trade that can explain

these patterns?; how quickly, and where, is the marketing system extending into previously isolated areas (this is especially important in countries where markets have only recently been liberalized)?

In attempting to research these questions, one is greatly aided by the personnel, procedures, and data already developed in the MIS; one comes back to the data base that is being assembled, makes use of existing personnel to conduct complementary research, and uses both to generate useful results. Through this iterative process, one can enter into a "virtuous cycle" where doing an effective job of data collection and information dissemination requires market research, which brings to light important policy questions, which leads you back to the data being generated.

In Ethiopia, where government is involved in famine early warning and relief, it also has need for the kind of timely retrospective information and harvest and price forecasts discussed in the previous section. In addition, because of its market stabilization activities through EGTE, government in Ethiopia needs information very similar to that demanded by private market participants.

VI. Description of Current Sources of Market Information

There are currently three principal sources of market information in Ethiopia: the Ethiopian Grain Trading Enterprise (EGTE), the Relief and Rehabilitation Commission (RRC), and the Central Statistics Authority (CSA). A description of the data collection and dissemination of each institution is presented in the following sections.

VIA. EGTE Data Collection and Reporting

Collection: The greatest strength of the EGTE data collection system is that the market surveyors are quite knowledgeable about local markets, and they know that their superiors in branch offices and Addis Ababa place great value on the information. As a result, these surveyors face strong incentives to provide timely, accurate price information. The value of this incentive structure, of the resulting attitude on the part of market reporters toward their work, and of their accumulated knowledge regarding their markets, cannot be overestimated.

At the same time, the data collection system could be improved. Key areas for improvement include procedures for sampling traders, definition of transaction levels, and methods for converting prices observed in non-standard units (NSUs) to prices in kilograms. If EGTE is to form the basis for a national, public MIS, its geographical coverage may also need to be reviewed. The rest of this section describes in detail the EGTE data collection system.

EGTE collects price data from nearly 100 market centers. Data on trade volumes are not collected, except in Addis Ababa. Stock levels are also not systematically monitored, and generally not well known. Most, but not all, market centers are located in towns where EGTE has a branch or sub-branch office. The markets are spread widely around the country, though nearly all are located on or near main roads. The data are only collected in those markets in which EGTE engages in buying and selling. This generally excludes

small remote markets, as well as many markets in chronic deficit areas.

EGTE market surveyors collect weekly data in each market throughout the year on "market day". Market day differs across markets, though the majority are on Saturdays. Almost all grain wholesaling occurs on these regularly scheduled market days. Prices for up to eleven types of grains may be recorded, depending on which types are present in the markets. These include ten varieties of teff (white, mixed and red in each of three locations, plus "magna" from Ada), three types of wheat (white, mixed, and red), two types of barley (white and mixed), three types of sorghum (white, mixed and red), and one variety of maize. Also, prices for eight varieties of legumes and oilseeds are collected: white and mixed field peas, horsebean, chickpeas, lentils, nigger seed, linseed, and rape seed.

Data are collected by observing actual transactions and talking with market participants on market days. Procedures vary as to the timing of collection on market day, the number of traders surveyed, and the manner in which these traders are selected. In some markets, surveyors record prices three times during the day and use the average of the three observations for that day's price. In others, prices seem to be collected only once during the day (for example, in markets where trading stops around mid-day). A typical number of traders interviewed appears to be five, but surveyors have no explicit guidance on how to select these traders. Thus, it is not known how random the sampling is and therefore how representative it is of the market being surveyed. In all cases, surveyors average over all traders of a given commodity and report this average to the branch office.

EGTE headquarters primarily uses wholesale price data, but monitors three types of transactions. Rapid appraisal findings suggest that these types are not always defined as carefully as they need to be, resulting in the mixing of prices from different types of transactions into a single price:

- The "farmgate" price is actually the price paid by the "first buyer" in the market being monitored. EGTE refers to these traders either as "wholesalers" or "assemblers". We will use the term "assemblers". In smaller markets, this price is most often paid to farmers who arrive with their product from surrounding areas,³ but smaller assemblers from more rural markets may also be included. Some traders indicated that they pay a higher price to these assemblers than they do to farmers. In larger markets (Nekemte, for example), this price appears to be paid more often to rural assemblers than to farmers, yet is still reported as a "farmgate" price.
- The "wholesale" price is the price received by assemblers in towns when they sell in relatively large quantities, typically 50 quintals or more. This is a well defined price, with one exception: if all assemblers in a town are behaving as inter-regional wholesalers and transporting their grain out of the town for sale in a larger area, EGTE surveyors apparently still report a "wholesale" price for that town, by taking

³ A typical distance travelled may be 15-20 kilometers, but we interviewed farmers arriving from as far away as 65 km.

the price in the market of sale and subtracting costs of getting the product there. This practice will require modification in the public MIS (see below).

- The operational definition of "retail" price varies across locations. In most EGTE locations, there are in fact two types of retail transaction. In one, first-buyers (assemblers) sell in relatively small quantities (between one-half and two quintals) to whoever wishes to buy in this quantity. These buyers may often be consumers, but also include small scale retailers. The second type of retail transaction is sales by these retailers in small, non-standard units, typically less than a kilogram, to consumers in open air market places.

In some locations, surveyors report only the "retail" sales by first-buyers; in others, they include sales to consumers by the small scale retailers. In the latter case, it is not clear whether they mix the two prices or not.

Non-standard units are dealt with in an ad-hoc manner, introducing significant error into any retail prices collected in open air markets (the only markets where NSUs are used). Table 1 shows the result of an experiment in the Ginchi market. Appraisal team members worked with the EGTE surveyor to identify three types of NSUs used by retailers (small, medium, and large *karepes*). They then asked the surveyor if he knew how many of each type of unit it took to make a quintal of grain. The surveyor confidently indicated that he did. Once these estimates were recorded, the team worked with the surveyor to weigh wheat and teff from different traders in each of these units and then calculate how many were needed to make one quintal. As the results show, actual values were quite different from expected, and varied across traders.

Table II. Number of Non-Standard Units to Make one Quintal of Grain, Comparing EGTE Surveyor Estimate with Actual, Ginchi Market, June 1995

Grain	Non-standard Unit					
	Small		Medium		Large	
	Surveyor's estimate	Actual	Surveyor's estimate	Actual	Surveyor's estimate	Actual
		-----	no. of units to make one quintal	-----		
Teff	80	NA	75	71, 65*	70	60, 62*
Wheat	85	99	80	NA	75	56

The retail market in Ginchi showed greater variation across NSUs than was observed in other markets. Yet the fundamental point remains, to wit, that NSUs are the norm in such markets and that they vary in volume across traders. Thus, a systematic procedure for calculating accurate prices in kilograms is needed if prices are to be collected and disseminated in these markets. The importance of doing so is suggested by the fact that surveyors in all four markets visited along the Addis-Nekemte road indicated that open air

markets were the most important supply source for consumers in those towns.⁴

Transmission: Data transmission appears to be efficient and timely. Average prices for each commodity are transmitted quickly from the 100 or so market centers to the 16 EGTE branch offices. For example, prices collected on Saturday usually arrive at the branch office by Monday. Prices collected during the week typically arrive the same day or the following morning. Radio or telephones are most often used, though where each is absent in a reporting town, the actual questionnaire will be sent for delivery to the branch office. Personnel in the branch office review data from each sub-branch and contact the sub-branches if they have any questions about data reliability. The branch offices then report the prices from its market centers once a week to the headquarters in Addis Ababa. Telephones are used where possible, and radios elsewhere. As the prices are read from a standardized form over the phone or radio, personnel from the EGTE Price Monitoring Service transcribe them to an empty copy of the same standardized form. The data are then ready for keying.

Processing: Under the current procedure, data are keyed into a Lotus 1-2-3 spreadsheet which calculates monthly averages. These data (weekly and monthly averages) are then printed directly from Lotus into table form. No additional aggregation of the data is performed. Cleaning is done on an ad hoc basis; personnel in Addis Ababa may communicate with the branch office for clarification if they have questions about a specific price.

This system may be sufficient for EGTE's needs in making short-run buy/sell decisions. Its key limitation is that Lotus 1-2-3 does not allow the maintenance of a unified historical data base. Thus, for analytical purposes, the system is of very limited use. More powerful data management/statistical packages, such as SPSS/PC+ or SPSS/Windows, would make it possible to produce basic market reports very quickly, to maintain a unified historical data base, and to use that data base for extensive analysis. This issue will be discussed in more detail in a later section.

Dissemination: EGTE's data is primarily intended internal decisions regarding when and where to buy and sell grain. Thus, EGTE does no public dissemination of the price information. Data are shared on a monthly basis with the Prime Minister's office, as well as USAID/FEWS.

VI.B. RRC Data Collection and Reporting

The Early Warning and Planning Service of RRC is responsible for collecting information from a variety of sources for the purposes of alerting government and donor agencies of the location and need for famine relief. Price information on major food crops is among the more important data gathered by RRC. Data on rainfall, crop condition, greenness, and nutrition are also incorporated into the early warning system.

⁴ KUAWAB also reports that the open air suburban markets in Addis, where NSUs are used, are most important for Addis consumers.

Since 1978, RRC has collected monthly price data on major food crops and livestock in the more vulnerable areas of Ethiopia. The focus of attention is on retail prices in smaller as well as larger markets. Through an agreement with the Ministry of Agriculture, price data are collected by extension agents in the selected regions. Currently prices are collected from 158 woredas. Prices are sent to the RRC central office where they are edited and keyed into the data base. At present, long delays in the system compromise the usefulness of the data either for early warning purposes or for use by private market participants.

Only retail prices are collected by RRC. Interviewers obtain prices from at least 5 retailers. Though data collection guidelines indicate that prices should be obtained at different times of the day (morning, mid-day, and afternoon), this does not always occur; interviewers often do not live near the sampled markets or, because they are extension agents, they have other obligations which may interfere with the price collection. Under these conditions it is hard to motivate field agents to spend the time required (nearly a full day) to get the three different prices.

VI.C. CSA Data Collection and Reporting

The Central Statistics Authority collects data on grain prices at both producer and retail levels. Other grain market-relevant information collected by CSA includes annual estimates of crop areas planted, yields, and total annual production.

Average monthly producer prices are collected through surveys of farm households or cooperatives in selected areas who have sold output during the reported month. Cereal prices collected include; teff (white, red, and mixed), wheat (white and mixed), barley (white and mixed), maize, durrah, and sorghum (red and mixed). Also, producer prices on several varieties each of pulses, oilseeds, vegetables, fruits, spices, livestock, and dairy products are collected.

The CSA lacks a system for rapid dissemination of price information, and there is generally a long lag in the publication of data. Price data for September 1991 to July 1992, for example, were published in December, 1993.

VII. Issues and Recommendations for Designing a Public Grain MIS

Designers of a public MIS must make decisions on a multitude of issues, from broad conceptual questions such as the system's objectives and geographical scope, to technical details such as how operationally to deal with NSUs, or how specifically to define transaction levels. This chapter will focus on eleven issues: objectives, institutional home, geographic coverage, definition of transaction levels, product definition, controlling for sampling error, dealing with non-standard units and qualities, determining the frequency of data collection, establishing a system for data transmission and processing, developing a dissemination plan, and building a program of market research. In each case, we will present a general discussion of the issue, make a proposal for Ethiopia's public MIS (distinguishing where appropriate between an initial pilot phase and the full operational phase), and briefly discuss outstanding issues. The objective of this section is to outline a

concrete plan of action that can be reviewed, debated, and modified as necessary by the relevant Ethiopian authorities in collaboration with Food Security Research Project (FSRP) personnel.

VII.A. Defining Objectives

Objectives of Current Systems: Current systems are designed around the objectives of their home institution. For EGTE, the objective is to provide information for quick buy/sell decisions; for most NGOs, price information is one important component in an information system to give early warning of consumption shortfalls and help program food aid distribution; for CSA, price information is only one of many types of information they develop through their statistical surveys. EGTE puts the greatest premium of all these users on timeliness, CSA the least.

A key characteristic of individual NGO information systems is that they tend to be very focused on the geographical area where the NGO has emergency relief or development projects. Coverage in these areas can be fairly dense. Thus, it is an empirical question to what extent a national MIS can cover all the specific price information needs of these NGOs. A public MIS is perhaps best viewed as an important complement to the price component of NGO systems, and possibly a partial substitute for that component. For example, CARE collects price information Gelemso, Chiro, and Meiso of West Harerge. An MIS based on current EGTE sites would include the town of Asbe Teferi, relatively close to each of these CARE locations. It is an empirical question whether weekly prices from Asbe Teferi would be sufficiently correlated with prices in the three CARE towns to eliminate the need for CARE to do its own price monitoring in these areas. Quite aside from this question, however, a national MIS can prove very valuable to CARE, other NGOs, and RRC in improving their understanding of the national food system, and how prices and supplies in their local areas may be affected by this broader system.

In addition to the formal systems just discussed, it is important to note that traders, especially assemblers and wholesalers involved in inter-regional trade, have their own informal information systems. Traders outside Addis typically inquire about prices in the capital two or three times per week, by telephone or through personal contacts. As in the case of NGOs, a national MIS should be viewed as an important complement and only a partial substitute for these activities. It is likely that many traders will continue to do at least some of their own price collection for the routes they most use, yet having access to a broader base of information will help all of them identify previously unknown opportunities.

Proposed Objectives for a Public MIS: A public MIS in Ethiopia should be viewed primarily as a complement to current data collection activities in the country. By broadening private agents' and NGOs' understanding of the national food system and its effects on their more narrow geographical areas of action, an MIS can change and improve the way that these actors do their jobs. By increasing competition among traders, an MIS can benefit many farmers and consumers who may not directly use the MIS. Yet in the short-run, many of the collection activities of RRC, NGOs and private agents will likely to continue.

Over time, the MIS can become a partial substitute for current price collection efforts. As the system expands, and as private market participants and NGOs gain more confidence in its accuracy and timeliness, the need for some of the current price collection may diminish.

We thus propose the following objectives for the Ethiopian MIS:

- a. To improve the way that private agents, NGOs, and RRC perform their jobs by broadening their understanding of the national marketing system and its effects on their local areas of operation.
- b. To improve food policy in Ethiopia by increasing policy makers' understanding of the evolving structure, conduct, and performance of rural and urban grain markets. We expect that this will increase policy makers ability to identify specific problems and identify opportunities for government to address.
- c. To reduce costs and increase competition in Ethiopia's private grain marketing system by providing timely and accurate market information on prices and direction of trade flows to private marketing agents, beyond what they currently collect through their informal systems. We expect that realizing this objective will increase prices to farmers and reduce them to consumers.
- d. To improve early warning and emergency response capabilities by providing timely information to RRC, FEWS/USAID, and NGOs regarding price increases in deficit areas.

Proposed Objectives for the Pilot MIS: The pilot MIS will operate in a reduced geographical area (see below) for a period of between six months and one year, with the following objectives:

- a. To test and improve operational procedures for data collection, transmission, processing, analysis, and dissemination prior to expansion of the MIS to a national level.
- b. To provide formal and in-service training to EGTE and MOPED personnel to better enable them to operate and modify the system, and use MIS data to conduct policy relevant market analyses.
- c. To evaluate the ability of an MIS to meet the four objectives proposed in the previous section and adjust objectives as necessary.

VII.B. Choosing an Institutional Home

Conceptual Issues: A key question in developing a MIS is to decide in which institution/s it should be located, or whether a new institution should be created for the purpose. In making this decision, MIS designers must keep firmly in mind need to integrate or strongly coordinate the data collection and data analysis functions of the MIS,

especially in its early stages.⁵ The reason is that data analysis needs to inform data collection regarding issues such as data quality (short-run), about the evolving structure of the food marketing system (medium and long-run), and about what each implies about the organization of data collection. Analysis will be more fruitful, and data collection more useful, if the two activities are strongly coordinated.

Proposed Home for a Public MIS: EGTE's price monitoring, described in detail earlier in this document, appears to be an ideal foundation for developing a market information system, at least on a pilot basis. This is particularly true given its social mandate to support the development of efficient and stable markets.

However, currently, EGTE is not involved in disseminating its data to market participants, and only provides analyses to other government decision makers on a very limited basis. Also, the policy questions which could potentially be addressed by the MIS may go beyond the types and levels of data analysis currently being done by EGTE. EGTE's breadth and depth of analysis may be constrained both by the limits of its current mandate, and by limited analytical capacity.

Therefore, EGTE should work jointly with Ministry of Planning and Economic Development (MOPED) personnel currently involved in the FSRP project, to carry out the additional data analysis and dissemination responsibilities involved in implementing a pilot public MIS. Also the FSRP should provide additional support and training on data management and analysis skills for EGTE and MOPED personnel. MOPED's involvement in data analysis and dissemination would be advantageous, both because it can provide additional analytical capacity, and because of the relevance of such data analysis for informing their own policy planning activities.

One important disadvantage to using EGTE for the MIS is that the markets from where it collects its data tend to be located along main roads, and do not cover many very small markets where many small farmers in Ethiopia sell their grain, and where many net buyers may buy their grain. This bias towards markets that are relatively larger and better connected to infrastructure limits the usefulness of EGTE market information for smallholders who, with small margins and in the most vulnerable position, have a great need for such information. The same goes for smaller traders and farmer cooperatives who tend to operate in the smaller and more remote markets not covered by the EGTE system. This disadvantage suggests, at least in the longer run, the possible participation of alternative data collecting agencies (e.g, CSA, RRC) either to supplement EGTE, or to substitute for it.

Another possible disadvantage of using EGTE as the foundation for an MIS is its dual roles as a social institution and commercial enterprise. Participating in implementing an MIS may conflict with EGTE's commercial role in buying and selling grain. While EGTE management has expressed its willingness to participate in a pilot MIS, the possible conflict with its commercial activities, may make it an unsuitable home in the long run.

⁵ See Aldridge and Staatz (1993), for a good discussion of the institutional design and evolution of market information systems.

Our specific recommendations are:

1. **In the short run**, use EGTE's price collection and reporting system as the foundation for implementing a pilot MIS, with MOPED taking responsibility for data analysis and dissemination. Training should also be provided through the FSRP to EGTE and MOPED personnel involved in collecting and analyzing data during the pilot MIS.
2. **In the long run**, explore possibilities of appropriate alternative institutional homes for the MIS. In particular, possible suitable institutions to either supplement or substitute for EGTE's data collection activities would include CSA, RRC, Ministry of Trade and/or Ministry of Agriculture. An estimate of the costs and benefits that would be associated with implementing an MIS through each of these institutions should be conducted as part of the evaluation of the pilot MIS.

Outstanding Issues: The key outstanding issue is how to ensure continuous, substantive interaction between MOPED and EGTE regarding data collection and analysis. FSRP personnel may be able to play a key role in this regard.

VII.C. Deciding Geographic Coverage

Current Coverage of Existing Systems: Because their strategic objectives differ, EGTE, RRC, CSA and the NGO community have focused their market data collection activities in different regions, and within regions at different market levels.

Since EGTE's primary function is to buy and sell grains in ways that stabilize the country's grain markets, they have focused their market information in areas that best enable them to do their job. Thus, this system provides very good coverage of surplus areas, and of deficit areas with some level of effective demand. Deficit areas with little effective demand, such as the pastoral areas of eastern Harerge, are not covered by the EGTE system at all. Thus, this system would not provide sufficient coverage for food aid and relief activities, but would offer excellent coverage for the country's commercial food system.

The main use of market information by RRC is for early warning and food aid programming purposes. It is their job to signal a potential emergency situation, and to provide information necessary to mobilize relief to the affected areas. Since emergency assistance is most commonly needed in the deficit production areas, such as Harerge and Welo regions, RRC's geographical coverage is heaviest in these areas.

CSA's mandate for geographical coverage is wider than for EGTE and RRC, and their data is intended to be nationally representative. In many months, however, the number of markets covered has been quite limited, "due to several reasons" (CSA, 1993).

The NGOs also tend to use market information for early warning and food aid programming, and thus, as a group, tend to focus on the deficit production zones. CARE and CRS have especially strong data collection efforts in Harerge. Lutheran World Federation works in the west and south of the country, and also Welo region of the north; they collect information, though not systematically, in each of these areas. Individual

NGOs seem to concentrate their efforts in a small number of deficit areas, but through the various NGO coordinating bodies such as CRDA and the Joint Relief Partnership (JRP), ensure that all of the major deficit areas are covered.

The problem is that needs are diverse and that each system is geared to meet only the needs of its home institution. Thus the EGTE data are only moderately useful for early warning purposes since deficit areas and smaller markets are largely excluded. Conversely, the data collected in the deficit areas and smaller markets by RRC and many NGOs cannot inform EGTE about where and when to purchase grains.

Proposed Coverage for a Public MIS: Consistent with the proposed objective for the MIS of serving private marketing agents first (farmers, traders, and consumers), government policy makers second, and famine early warning and relief agencies (public sector and NGOs) third, we propose that the Ethiopian MIS eventually expand to the majority of current EGTE markets, and that it add markets in chronic deficit areas of southern and eastern Ethiopia after consultation with RRC and NGOs.

Proposed Coverage for the Pilot MIS: It is recommended, however, that the pilot phase of the MIS be more limited in scope, covering a limited number of markets. Based on the lessons learned and the capacity developed during the pilot phase, the MIS could then be broadened both geographically and substantively, involving both additional markets and additional types of information and analyses.

In choosing which markets to include in broadcasting price information during the pilot phase, there is a difficult trade-off between concentrating on markets in a small number of regions, or covering all regions where EGTE collects data, but with only one or two major markets per region. An advantage of a regional focus is that a greater density of markets can be covered, with a greater variety in size. Covering small as well as large markets, can help promote grain flows between these types of markets, as well as increase competitiveness and integration in smaller markets, both by encouraging farmers in small markets, to market their commodities in larger markets, as well as encouraging traders in larger markets to travel to smaller markets. However, a disadvantage of a regional focus, of course, is that certain regions of people will be left out.

In either case, to evaluate effectively the usefulness of an MIS to each of its potential users, the pilot MIS should have a balance between surplus and chronic deficit areas. Among areas currently covered by EGTE, the strongest surplus production zone are to the north along the Addis-Gonder road, to the west along the Addis-Nekemte road, and to the south in areas around Nazareth, Shashemane and the Arsi region. Key deficit areas covered by EGTE are northern Welo and Tigray, and western Harerge. Based on this coverage of surplus and deficit markets, as well as the trade-off between national coverage and regional concentration, we suggest three possible options for coverage by the pilot MIS. One of these options, or an alternative suggestion, should be decided upon after further discussion:

Option 1: Mekele and its surrounding markets + Dese and its surrounding markets + Addis Ababa + Ambo and its surrounding markets + Nekemte and its surrounding markets + Bahir Dar. Crops to be covered under this option would be teff, maize and sorghum.

Option 2: Shashemane and its surrounding markets + Assela and its surrounding markets + Nazreth and (some of) its surrounding markets + Addis Ababa + Dire Dawa and its surrounding markets. Crops covered under this option would include teff, maize, wheat, barley and sorghum.

Option 3: All 16 EGTE branch office markets, with NO surrounding sub-branch markets. Crops covered would be the same as in Option 2.

VII.D. Defining Transaction Levels

The Structure of Ethiopian Grain Markets: Defining transaction levels to be monitored in a MIS first requires that one understand the structure of grain markets, in order to define the types of transactions that exist, where they exist, and which are most common. Figures 1 through 3 show market channels identified during rapid market appraisals over the past two months.

Key conclusions from these figures regarding producer prices are:

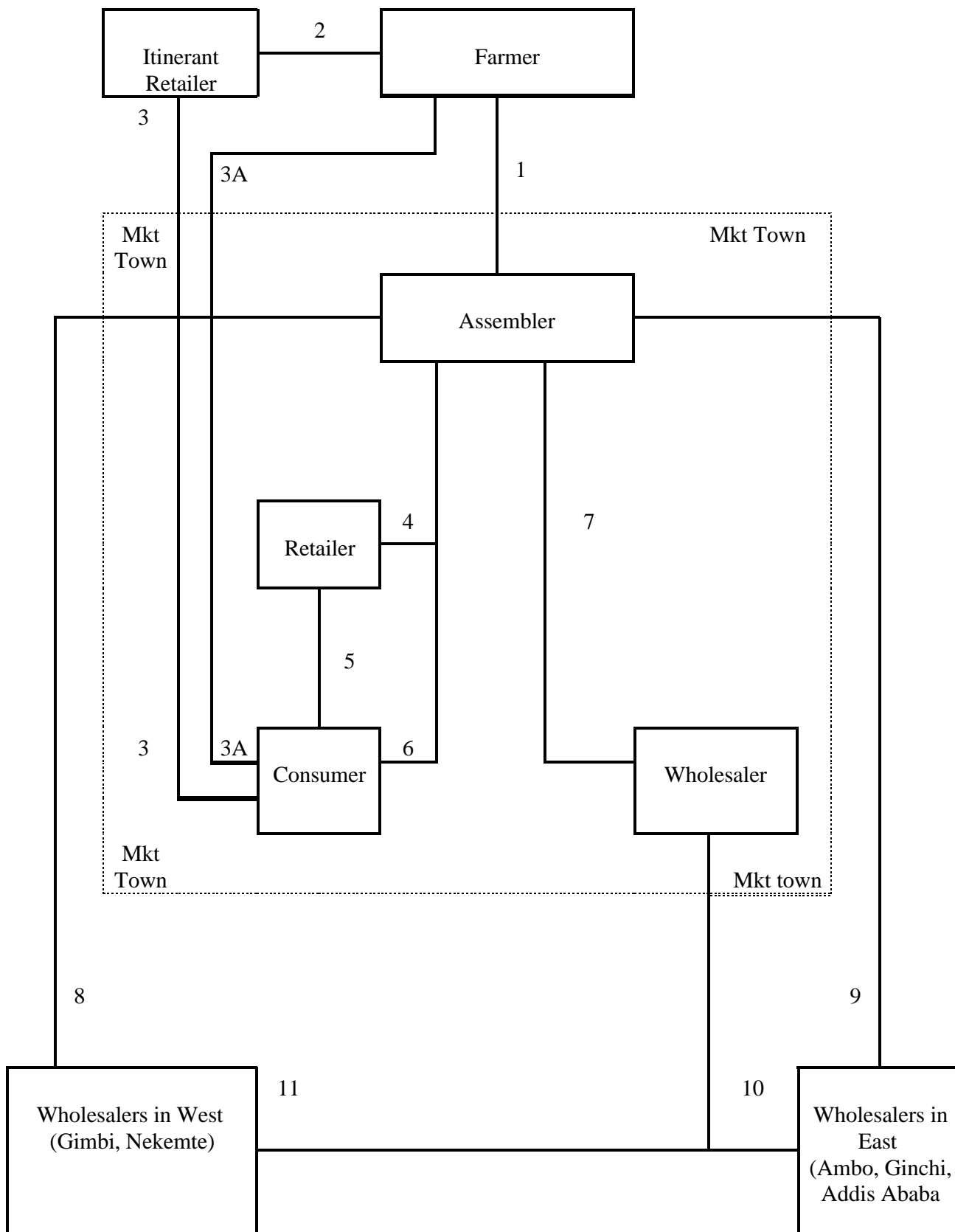
1. Farmers frequently go to market towns in surplus areas and sell to assemblers located in those towns (Figure 1). These assemblers then often operate as inter-regional wholesalers, transporting grain in larger quantities to other markets.
2. In larger towns of surplus areas (Figure 2), assemblers located in these towns do not typically purchase from farmers. Instead, they most often buy from a set of smaller assemblers who go to rural villages, purchase grain, and bring it to the larger town.
3. Thus, neither of these prices is a true "farmgate" price (EGTE's current terminology), since neither takes place on the farm.
4. The transaction described in number (1) above is a legitimate "producer" price, as long as surveyors are careful to monitor only **farmer** (not rural assembler) sales at this level.
5. The transaction described in number (2) above cannot be considered even a producer price.

Conclusions regarding wholesale prices are:

1. Assemblers in both smaller and larger markets of surplus areas sell in two ways at the wholesale level. In one case, the assembler sells in relatively large quantities (usually 50 quintals or more) to wholesalers from other areas who arrive in the assemblers' market town. This sale is represented by transaction 7 in Figure 1, or transaction 8 in Figure 2. The price at which this sale takes place can be appropriately recorded as a wholesale price for that market.

In a second case, the rural assembler behaves as an inter-regional wholesaler, renting a truck and transporting 50 quintals or more of grain to another town for

Figure 1. Observed market channels in small assembly markets of surplus regions, Addis Ababa - Nekemte highway, June, 1995



sale there. **In this case, no wholesale transaction has taken place in the assembler's town, so the price of this transaction, even corrected for transport and other costs, should not be registered as the wholesale price for that town.** If all assemblers in a town are behaving as inter-regional wholesalers and transporting their grain out of the town to be sold, then there will be no wholesale price for that town.

Often, the same assembler will behave as an inter-regional wholesaler on some occasions and on others will sell within his own town instead of transporting.

2. In Ehil Beranda, inter-regional wholesalers from surplus regions may sell to the large wholesaler-retailers located in Ehil Beranda, or to inter-regional wholesalers from deficit regions. However, each of these transactions typically takes place at the same price, and each is generally mediated by a broker. **Thus, for price collection purposes, one can assume that there is only one wholesale price in Ehil Beranda for a given product.**

Conclusions regarding consumer prices are:

1. Two types of retail transactions exist within both small and large market towns of surplus areas. The first is a sale by assemblers to consumers of between one-half and two quintals (transaction 6 in Figure 1; transaction 7 in Figure 2). The second is typically a much smaller sale to consumers, by retailers in open air markets. These latter transactions nearly always use NSUs. Rapid appraisal results show that prices for these two types of transactions differ, sometimes substantially. EGTE supervisors also indicate that most consumers obtain their grain through the second type of transaction, in open air markets.
2. At least two types of retail transactions exist in Addis Abeba, though only one within Ehil Beranda market. In Ehil Beranda, consumers purchase quantities of 50 kg or more from the wholesaler-retailers located in the market. Outside of Ehil Beranda, many suburban markets serve local consumers. Retailers in these markets obtain their grain either in Ehil Beranda or directly from farmers (farmers sometimes sell in the markets of the periphery, but retailers often go to rural areas to purchase and then resell in these suburban markets). Retail prices in these markets are typically higher than in Ehil Beranda.

Proposed Definition of Transaction Levels: Based on this information, we have identified the following types of transactions: "producer", "wholesale", "retail 1", and "retail 2". Operational definitions are:

Producer prices are prices paid by assemblers *in market towns to farmers* who have travelled to those market towns to make their sale. These may be in surplus or deficit areas, since some farmers are likely to be selling even in deficit areas. Prices paid to small traders by these same assemblers should not be included in the calculation of producer prices. Note that we are suggesting a change in terminology from "farmgate" to "producer" price.

Figure 2. Observed market channels in Nekemte and Debre Zeyit markets, June, 1995 (large towns located in surplus regions)

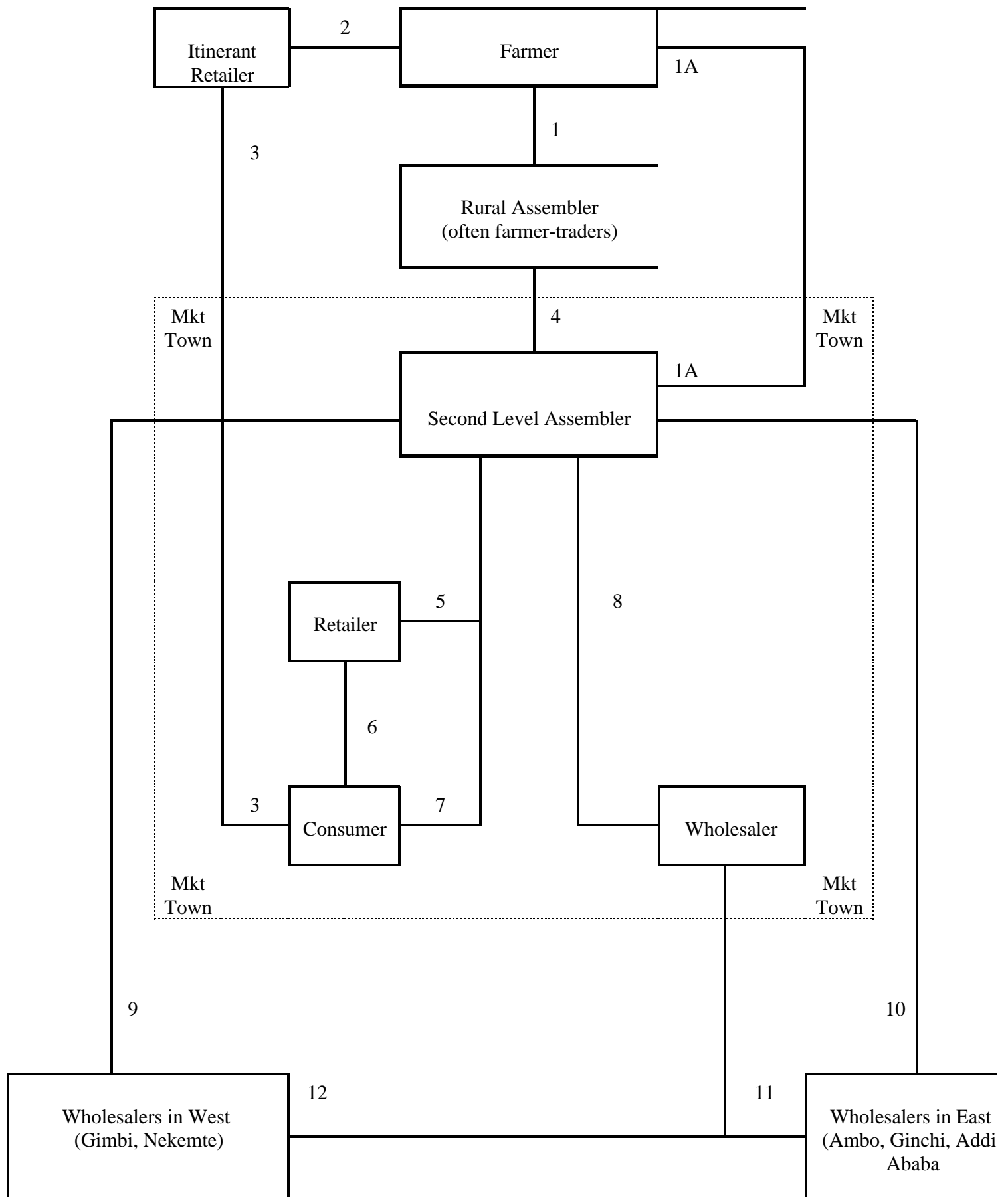
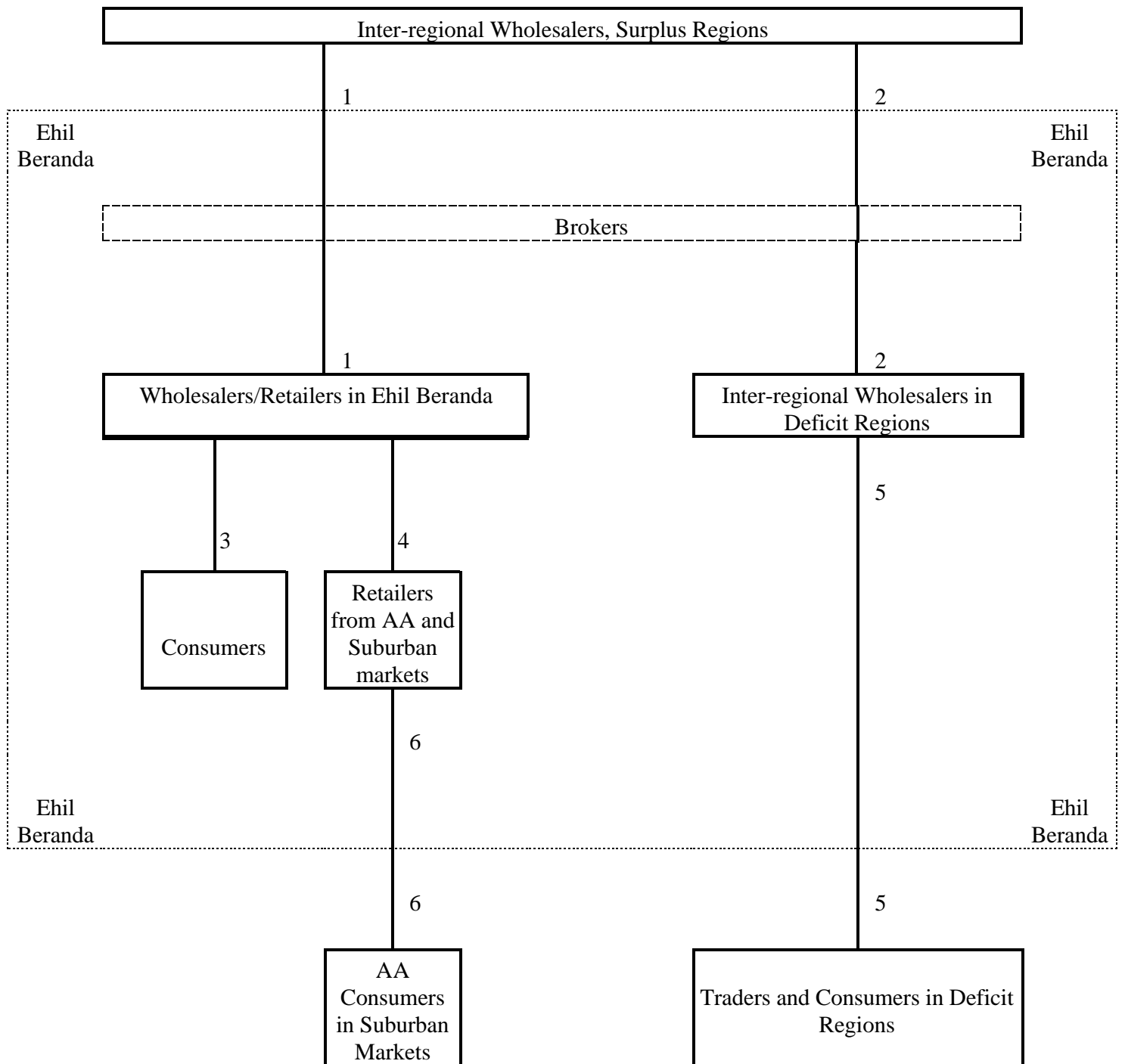


Figure 3. Observed market channels Addis Abeba Ehil Beranda market, June, 1995



Wholesale prices are prices paid to traders selling quantities of approximately 50 quintals and more. In market towns outside of Addis Ababa, these are prices paid *in those towns* to assemblers (transaction 7 in Figure 1, or 8 in Figure 2). In Ehil Beranda, these are sales by inter-regional wholesalers from surplus areas to wholesaler-retailers of Ehil Beranda when those are buying in large quantities (transaction 1 in Figure 3), or to inter-regional wholesalers in deficit areas who have come to Addis (transaction 2 in Figure 3).

Retail 1 prices are prices paid by consumers when they buy in quantities ranging from 25 kg to two quintals. In market towns outside of Addis, these quantities are purchased from assemblers (see Figures 1 and 2). Within Addis, these quantities are purchased from the wholesaler-retailers in Ehil Beranda or other large retailers in suburban markets such as Shola.

Retail 2 prices are prices paid by consumers when they buy from smaller retailers in open air markets. These purchases are generally smaller than Retail 1 purchases, and are nearly always made in non-standard units.

See Annex 1 for a proposed market coding scheme based on these transaction levels.

Outstanding Issues: One key issue is whether it is necessary for the MIS to collect both retail prices, or whether one would suffice. If only one, which? The answer to this question depends on the objectives of the MIS, and on consumer buying habits. If a large proportion of consumers depends on Retail 2 purchases in open markets, or if the poorest consumers do so, and if policy makers or NGOs wish to use the MIS for food security analyses, then it would be important to include that price in the system. Note that relatively straightforward techniques are available for converting NSU prices into kilogram prices, so the use of NSUs is not an obstacle to including this price in the system. If, on the other hand, very small numbers of consumers engage in such transactions, or if the MIS is not perceived as the correct data source for food security analyses, then one might include only Retail 1 transactions.

A second key issue is whether the operational definition of markets given above is appropriate for chronic deficit areas such as Harerge or Mekele area. In other words, is the structure of trade in these deficit areas, and thus the types of transactions taking place there, such that our operational definitions apply equally well in these areas as in others?

VII.E. Defining Products

Current EGTE Product Definition and Product Differentiation at Ehil Beranda:

Table 2 shows the current EGTE list of products. This list works well for EGTE purposes, and may be sufficient for the MIS, yet findings from rapid appraisals in Ehil Beranda indicate that there may be more economically relevant product differentiation in

Table III. EGTE Product Definition as of June 1995

Product		
Ad'a Teff	Welnkomi Teff	Gojam Teff
Magna	White	White
White	Mixed	Mixed
Mixed	Red	Red
Red		
Barley		
White		
Mixed		
Wheat		
White		
Mixed		
Red		
Sorghum		
White		
Mixed		
Red		
Maize		
Field Peas		
White		
Mixed		
Horsebeans		
Chickpea		
Lentils		
Nigger seed		
Lin seed		
Rape seed		

the market than is reflected in the EGTE list.⁶ Table 3 shows additional product differentiation noted during two visits to Ehil Beranda in June 1995. Among the three additional white wheats, price differences were on the order of 5-10 birr/quintal, out of a total price of around 160 birr/quintal. The different barley varieties showed similar or slightly larger price differences. White and yellow maize showed a price difference of 5

⁶ By "economically relevant differentiation", we mean differences between products that the market recognizes (usually by giving different names to the products) and which carry "significant" price differences. For example, EGTE differentiates Ad'a white teff from Gojam white teff because the market has done so by recognizing the zone of origin of the white teffs and pricing them quite differently.

birr/quintal out of a total price of approximately 130 birr/quintal. This information is based on only two visits during a period of 10 days, and thus may not be representative of actual price relationships. Are there persistent price differences between these products? Are these differences typically smaller or larger than those indicated here?

Table IV. Product Differentiation Beyond that Reflected in EGTE Product List, Ehil Beranda, June 1995

White Wheat	Barley	Maize	Chickpea	Horsebean
Dashen	Sanaf	Yellow	Gonder (large)	Large
Israel	White	White	Gojam (small)	Medium
Abesha	Black		Debre Zeyit (highest quality)	Small

Outstanding Issues and Product Definition Options: There are three outstanding issues that require debate. First, is the product differentiation just discussed sufficiently relevant in an economic sense that the list of products for the MIS should be expanded? If price differences are typically very small, it may be acceptable to continue using the EGTE product list. Alternatively, if price differences between, for example, Dashen and Israel wheat are sometimes large, then quoting a price for "white wheat" may not be useful for traders carrying a specific variety and attempting to decide where to sell it. In this case, it would be necessary to distinguish the types and quote separate prices for each.

Second, should the MIS include data on cash crops and/or livestock? The system could be much more useful for food security analyses and food aid programming if it did include such information, since it would allow calculation of terms of trade for farmers in vulnerable areas. Plummeting livestock prices may also be a sign of serious food shortages, as households dispose of their livestock to purchase grain. Should crops such as chat and coffee, and livestock such as goats and sheep be included in the MIS?

Finally, should the pilot phase of the MIS use an expanded or reduced list of products? One advantage of using an expanded list is that it will allow empirical evaluation of the price differences between different varieties (e.g., between Israel and Dashen white wheat, or between white and yellow maize), and thus of the need for an expanded list. **If data collection is not based on a more differentiated list of products, one can never evaluate systematically the need for such differentiation.** A further advantage of beginning with an expanded list is that it allows a fuller evaluation of the usefulness of the MIS to potential users. The principal disadvantage is that an expanded list will require more time for collection, transmission, processing, and reporting of information. Note, however, that statistical software packages such as SPSS/PC+ or SPSS/Windows, in

combination with powerful micro-computers, allow very rapid data processing.

At least two options may be debated:

1. Design the pilot phase of the MIS using the current EGTE product list and evaluate the need and feasibility of a) introducing greater differentiation of grains and b) adding key cash crops &/or livestock. If changes were deemed necessary and feasible, they could be made as the MIS is expanded into its operational phase.

To evaluate this need, MIS personnel during the pilot phase should conduct a market appraisal of wheat, barley, sorghum, maize, fieldpeas, horsebeans, chickpeas, lentils, key cash crops and key livestock. The objectives of the appraisal should be to 1) identify the range of varieties being produced, 2) estimate approximate volumes of production and marketing of each, 3) determine areas of production, 4) characterize the nature of the market for each, and 5) specify the nature (level, stability) of price differentiation between the varieties.

2. Design the MIS with an expanded list (on grains and cash crops) and evaluate the desirability of maintaining all or some of these products into the operational phase.

See Annex 2 for an illustrative product coding scheme for the MIS. See also Annex 3 for draft questionnaires.

VII.F. Controlling Sampling Error

EGTE personnel say that they interview as many farmers and traders as possible, and generally witness at least three to five transactions for each type of grain traded in that market, at each time of day. There is no systematic sampling method, however, and the number of observations for each price is not recorded. Because probability sampling techniques are not used by EGTE, sampling errors and confidence intervals cannot be meaningfully estimated. Thus, the significance of price changes from one time period to the next (week, month), or of price differences from one region to the next, cannot be scientifically determined. The risk of making a false claim about market changes or differences is unknown.

Our initial observation of market price variation in Ethiopian grain markets is that prices are relatively stable within markets, and much less so between them. Thus, the current EGTE and RRC practice of taking a small and purposive sample of prices within a given market may not be a significant risk (e.g., greater than 10% risk of being more than 5 birr from the true price). To confirm this impression, and to enable ourselves to attach approximate confidence intervals to future price estimates using the current procedures, it is recommended that an analysis of intra-market price variation be conducted using: 1) existing price data from EGTE, RRC and CSA, and 2) a complete enumeration of prices from one or two local markets.

The same type of analysis can be followed for estimating price variability in livestock markets. We suspect that because livestock tend to be less uniform than quintals of grain in terms of size and quality, the problem of sampling error under current procedures will

be much greater for livestock than for grains.

In addition to not being able to estimate sampling errors, there are potential problems of sampling bias due to the procedures used to select the producers, traders and retailers. Though the selection process is supposed to be random, and to cover different times of the day (early, mid, late), there may be a tendency to select larger market participants or those in just one area of the larger market or to make all of the observations at the same time of day. MIS designers will have to develop specific recommendations for these issues and train enumerators effectively.

VII.G. Dealing with Non-standard Units and Qualities

Current Practice: Grain prices recorded and reported by EGTE market surveyors do not adequately account for the differing qualities of grains found within and among various markets. This failure to relate prices to qualities does not affect EGTE's purchases, as EGTE sets single standards for moisture and impurity content for different grain varieties which sellers must meet in order for EGTE to buy. But it does create a problem for the reliability of a public MIS. EGTE does measure and records moisture and impurity levels from samples of grain being sold in the markets, but such quality information is not recorded with price data at EGTE headquarters, nor is it currently disseminated to outside users of the price information (e.g. USAID/FEWS).

A result of this lack of quality information is that interpretation of price data may be difficult. In Alaba, for instance, surprisingly low maize prices reported by EGTE in September, 1994 turned out to be the result of the maize being sold prematurely with excessively high moisture content. Such problems of interpretation need to be resolved to develop an effective MIS.

Regarding non-standard units, it appears that EGTE does not record prices in these units; all retail prices in the system are what we have classified as Retail 1 prices.

Proposed Method for Controlling for Moisture and Impurities: Measuring moisture and impurity content for all observed prices is obviously not possible in a public MIS. We propose that this issue be dealt with by incorporating into the price questionnaire used by enumerators a question classifying each grain as "acceptable" or "high" regarding each of the two quality dimensions. For example, depending on the condition of the grain, an enumerator could classify it as "acceptable" in both moisture and impurity, or "high" in one, or "high" in both. These classifications could be based on current EGTE standards. Data processing procedures would then be developed to either eliminate those prices from calculations or, more likely, to note the low quality of the grain in any reports.

A potential disadvantage of this procedure is that it would require some subjective judgement on the part of the surveyor; since they cannot test product for each observation, they must subjectively judge whether or not the product surpasses EGTE quality limits. It is an empirical question to what extent EGTE surveyors are able to make these judgements accurately. Rapid appraisal experience suggests, however, that these surveyors tend to be quite knowledgeable about the markets in which they work and about the products traded in those markets. With increased training prior to launching the pilot

MIS, we believe that this approach could result in acceptably accurate product classifications. If this is the case then this approach would be a significant improvement over not asking surveyors for any information on the issue.

Options for Dealing with Non-standard Units: If designers choose to include Retail 2 prices in the MIS, they must develop a procedure for accurately converting prices in NSUs to prices in kilograms (or quintals). The two basic approaches to this problem are: (1) to provide enumerators with scales to weigh the units; or (2) to develop a volumetric approach that uses product densities to convert to kilograms. In the market information systems developed in both Mali and Mozambique, the volumetric approach is used. This takes an up-front investment in training, but advantages are that the technology is simple (nothing more than a graduated plastic bucket) the field technique is simple (simply fill the graduated bucket with one NSU of the product, level, and read the volume), less subject to breaking than scales, cheap, and flexible (one can have a small bucket for retail transactions and a larger bucket, if necessary, for wholesale or farmer transactions that may use large NSUs).

VII.H. Frequency and Timing of Data Collection

Most market towns in Ethiopia have one or two market days per week, with one of those days being the most important. Trade can be very slow on non-market days. Thus, EGTE's practice outside of Addis of collecting prices one day per week, on the strongest market day, appears to be satisfactory.

Within Addis, EGTE collects three days per week at Ehil Beranda (Monday, Wednesday, Saturday). This reflects two facts: first, Ehil Beranda has a relatively large amount of trade during every day of the week, except Sunday; and second, while most market days outside Addis are on Saturday, a significant minority occur on other days of the week, and inter-regional wholesalers thus need to know Addis prices on more than one day a week.

Thus, we recommend that the MIS continue EGTE's practice of collecting prices in Ehil Beranda during three days per week.

VII.I. Establishing a System for Data Transmission and Processing

EGTE data transmission from sub-branch to branch offices, and from there to the central office in Addis, appears to work well, with some exceptions (e.g., the Dejen branch). We recommend that, in the pilot phase, the MIS rely on this system for data transmission and that it evaluate the scope for improvements prior to expansion into the operational phase.

To be useful, a public MIS must 1) produce weekly and possibly monthly reports in a timely fashion and 2) be capable of using the growing historical data base for a range of policy analyses. For this to happen, the MIS must be based on a statistical software package capable of handling very large data bases, manipulating multi-level data files, and producing statistical output with minimal difficulty. SPSS/PC+ for DOS has proven quite capable in this regard in several countries, and SPSS/Windows has introduced significant improvements over the DOS version. MSU has great expertise with SPSS and ability to train people to use it.

For initial reports to be timely, data cleaning, storage, and processing must be based on standard statistical routines developed for the MIS and modified by MIS personnel as appropriate. The Mali and Mozambique systems are good examples of this.⁷ This implies the need for 1) training of Ethiopian personnel and 2) on-going technical assistance to ensure that personnel understand and can work with the system, including modifying it as needed.

We recommend that 1) the data processing system for the Ethiopian MIS be based on SPSS/Windows, 2) the FSRP facilitate training for Ethiopian personnel in SPSS/Windows, and more broadly in the design and planned evolution of market information systems, and 3) visit to a current MIS country (e.g., Mali) by Ethiopian MIS personnel be included as part of this training.

VII.J. Developing a Dissemination Plan

Creating a system to collect and rapidly process market information requires a great deal of knowledge, skill, and creativity. Maintaining that system requires continuous attention to detail and constant monitoring of the evolving structure and performance of markets. It may not always be appreciated that creating and maintaining a good system for **disseminating** that work requires equal creativity and attention to detail. Unless great attention is paid to the details of dissemination, much of the work prior to that point may go unrewarded.

A key insight from experience in other countries is that all communications media are **complements** in dissemination, not substitutes. It follows that any MIS must have several means of disseminating its information. Typically, the form and content of the information will depend on the medium being used.

An important issue which should be debated for several of the media is the frequency of dissemination for Ehil Beranda market. We recommended above that the MIS continue EGTE's practice of collecting prices in Ehil Beranda three times per week. This was based on the conviction that this information should be made public that many times per week, due to Addis' importance in the national food marketing network. Many inter-regional wholesalers indicated that broadcasts of Addis prices two or three times per week would be far more helpful than simple weekly broadcasts.

A second key issue is what transaction level should be reported in each medium. For example, is it necessary and feasible to include producer prices in the radio broadcast, or would it be sufficient to limit it to wholesale prices? While including producer prices would be useful to farmers, even broadcasting wholesale prices alone will benefit them. It will do so in two ways. First, farmers will have additional information on which to decide which market to sell in. Second, wider availability of this information can increase competition among traders, to the benefit of farmers.

⁷ See SIMA/Mozambique (1993) and SIM/Mali (1994) for documentation of the systems in those two countries.

Among the dissemination possibilities that should be discussed are:

Radio: This medium will typically be the most timely and give the widest coverage, especially for farmers. Many traders may also find radio programming useful. The content of radio programs can range from simple market news (prices and supplies in key markets) to brief discussions of key marketing issues or policies. In Ethiopia, MIS designers need to learn more about the organization of the radio system, paying special attention to geographical coverage and language.

Newspaper: Newspapers can be effective in reaching many urban consumers and traders. It is generally a poor medium for farmers. The content of newspaper reports is typically limited to simple price tables.

FAX: Judicious use of FAX technology can be very helpful in getting basic price information out quickly to traders and policy makers. This approach has been used extensively in Mozambique.

Monthly Bulletins: Monthly bulletins allow somewhat more data analysis and interpretation than do weekly reports, yet much of the analysis will still be routine, and so can be programmed ahead of time. As a result, production of a good monthly bulletin can be relatively straightforward and pay high dividends.

Quarterly or Semester Reports: Tefft (1994) suggests that such reports were not helpful in Mali, and that personnel time could be better spent conducting special, focused analyses of marketing issues.

Special Reports: Using SPSS to automate much of the production of weekly radio/newspaper/fax bulletins and monthly reports frees time for MIS analysts. This opens the possibility of closely monitoring markets, identifying important emerging issues, and then using the MIS data base, in conjunction with special data collection activities (often but not limited to rapid appraisals) to produce very useful and timely special reports for policy makers, NGOs, and private agents. **Such reports can do a great deal to convince MIS clients of the usefulness of the system,** thereby increasing the chances that the system will compete effectively for the public resources it needs to continue operating.

VII.K. Building a Program of Market Research

In closing, we return to and restate a theme that we introduced in section V.C: a public MIS as a foundation for a program of market research. The complementary nature of MISs and programs of market research is perhaps best illustrated by the issue of product definition, raised in section VII.E. Ehil Beranda market appears to show more product differentiation among grains than is reflected in the EGTE product list. This suggests the possible need to incorporate this more detailed list of products into the MIS in order to report meaningful prices (for example, to avoid mixing into one price and supply report two types of wheat that may have different markets and different prices). Yet the fact is that there is not yet sufficient information on which to base a decision. MIS personnel need to develop a program of research to generate the knowledge needed to make an informed decision. Here, designing an MIS has brought to light important issues that can

be addressed with market research. Once an MIS is operating, more questions will come to light. Quantitative market integration analysis, using MIS data, may show that prices in certain markets do not move together as expected among markets linked by trade. This finding will raise more questions than it answers, and these will require field work to develop satisfactory answers. This field work may bring to light changes in the structure of markets that require modification in the definition of transaction levels so that the MIS continues to reflect actual marketing practice. Markets, market reporting, and market research must evolve together.

Annex 1

Illustrative Market Coding Scheme for Ethiopian MIS

MARKET CODES

This proposed coding scheme for markets is incomplete but illustrates the principles to be applied. It follows similar design principles as the product scheme. We suggest that the scheme be based on regions rather than EGTE branch offices, since markets beyond those covered by EGTE may be added in the future. Transaction level can be deduced from the thousands digit (0=producer, 1=wholesale, 2=retail 1, 3=retail 2), region from the hundreds value (100-149=Shewa, 150-199=Gojam, etc.). If designers choose to base the scheme on Ethiopia's new regional classifications, these same design principles should be followed.

Region/Market Town	Transaction Levels			
	Producer	Wholesale	Retail 1	Retail 2
Shewa	100	1,100	2,100	3,100
Efeson	101	1,101	2,101	3,101
Senbete	102	1,102	2,102	3,102
Robit	103	1,103	2,103	3,103
Debre Birhan	104	1,104	2,104	3,104
Gebre Guracha	105	1,105	2,105	3,105
	106	1,106	2,106	3,106
	107	1,107	2,107	3,107
Gojam	150	1,150	2,150	3,150
	151	1,151	2,151	3,151
	152	1,152	2,152	3,152
Wollo	200	1,200	2,200	3,200
	201	1,201	2,201	3,201
	202	1,202	2,202	3,202
Gonder	250	1,250	2,250	3,250
	251	1,251	2,251	3,251
	252	1,252	2,252	3,252
Arsi	300	1,300	2,300	3,300
	301	1,301	2,301	3,301
	302	1,302	2,302	3,302
Wollega	350	1,350	2,350	3,350
	351	1,351	2,351	3,351
	352	1,352	2,352	3,352
Harerge	400	1,400	2,400	3,400
	401	1,401	2,401	3,401
	402	1,402	2,402	3,402
Kefa	450	1,450	2,450	3,450
	451	1,451	2,451	3,451
	452	1,452	2,452	3,452

Region/Market Town	Transaction Levels			
	Producer	Wholesale	Retail 1	Retail 2
Tigrie	500	1,500	2,500	3,500
	501	1,501	2,501	3,501
	502	1,502	2,502	3,502
Sidamo	550	1,550	2,550	3,550
	551	1,551	2,551	3,551
	552	1,552	2,552	3,552
Bale	600	1,600	2,600	3,600
	601	1,601	2,601	3,601
	602	1,602	2,602	3,602
Gamu Gofa	650	1,650	2,650	3,650
	651	1,651	2,651	3,651
	652	1,652	2,652	3,652
Ilubador	700	1,700	2,700	3,700
	701	1,701	2,701	3,701
	702	1,702	2,702	3,702

Annex 2

Illustrative Product Coding Scheme for Ethiopian MIS

PRODUCT CODES

This is a proposed coding scheme for products covered under the Ethiopian MIS. The product list is the current EGTE list of products. The coding scheme assigns codes divisible by 10 to general product classes (e.g., "wheat", or "sorghum"), while varieties within that general class take on integer values within that product's decile. The system is designed to allow expansion or contraction of product types with minimal disruption to the basic scheme. For example, if MIS designers decide that wheat should be differentiated into Dashen, Israel, Abesha, mixed, and red, the general product class "wheat" will maintain its code of 60, all other general classes and varieties within classes will maintain their codes, and only the codes for the wheat varieties will need to change. Division of maize into white and yellow would leave "maize" with a code of 80, with codes of 81 and 82 for "white maize" and "yellow maize".

Product	
Teff	0
Magna Teff	10
White Teff	20
Ada	21
Welnkomi	22
Gojam	23
Mixed Teff	30
Ada	31
Welnkomi	32
Gojam	33
Red Teff	40
Ada	41
Welnkomi	42
Gojam	43
Barley	50
White	51
Mixed	52
Wheat	60
White	61
Mixed	62
Red	63
From food aid	64
Sorghum	70
White	71
Mixed	72
Red	73
Maize	80
Field Peas	90
White	91
Mixed	92
Horsebeans	100
Chickpea	110

Product	
Lentils	120
Nigger seed	130
Lin seed	140
Rape seed	150

Annex 3

Draft/Illustrative Questionnaires for Ethiopian MIS

Note that the questionnaires that follow are draft versions meant to illustrate an approach which might be used in Ethiopia, based on experience in Mozambique and Mali. These questionnaires are based on the assumption that MIS surveyors will continue to calculate in the field means over all observations, and transmit only these means to Addis.

Table 1 is a questionnaire that the enumerator would fill-out after collecting all information in the markets; it asks for the enumerator's assessment (synthesis) of certain market conditions. Table 2 is for data **collection** at the producer level. Table 2A is for **transmission** of this data to the branch office and on to Addis. Data collection and transmission questionnaires for the wholesale and retail levels would be identical, so tables 2 and 2A can be repeated (but renumbered) for these levels.

Product	Considering the entire market at the wholesale level , where is the flow of this product this week? 1 into this mkt (-> E2) 2 out of this mkt (-> E4) 3 prod. not traded in this mkt	If flow is INTO the market, name the two primary areas that are supplying this market			If flow is OUT OF this market, name the two primary destinations for this product		Considering the entire market at the wholesale level , would you say that supply of this product is: 1 high 2 medium 3 low 4 no supply	Again considering the entire market at the wholesale level , has supply of this product increased, decreased, or remained the same compared to last week? 1 increased 2 decreased 3 unchanged	Special comments
PROD	E1	E2	E3	E4	E5	E6	E7	E8	
80 Maize									
91 White Fieldp.									
92 Mixed Fieldp.									
100 Horsebeans									
110 Chickpeas									
120 Lentils									

TABLE 2. DATA COLLECTION SHEET FOR **PRODUCER** LEVEL PRICE AND QUALITY INFORMATION BY PRODUCT AND TRADER

Month _____
 Day _____
 Market _____

Product	Unit 1 NSU 2 kg (-> T4) 3 quintal (-> T4) 4 other (specify)	No. of NSUs in our measure	No. of ml in our measure	Unit price (unit must correspond to that indicated in T1)	Moisture content is: 1 high 2 acceptable	Impurity content is: 1 high 2 acceptable	Special Comments
PROD	T1	T2	T3	T4	T5	T6	T7
0 Teff							
10 Magna							
20 White							
30 Mixed							
40 Red							
50 Barley							
51 White							
52 Mixed							
60 Wheat							
61 White							
62 Mixed							
63 Red							

Product	Unit 1 NSU 2 kg (-> T4) 3 quintal (-> T4) 4 other (specify)	No. of NSUs in our measure	No. of ml in our measure	Unit price (unit must correspond to that indicated in T1)	Moisture content is: 1 high 2 acceptable	Impurity content is: 1 high 2 acceptable	Special Comments
PROD	T1	T2	T3	T4	T5	T6	T7
64 From food aid							
70 Sorghum							
71 White							
72 Mixed							
73 Red							
80 Maize							
90 Fieldpeas							
91 White							
92 Mixed							
100 Horsebeans							
110 Chickpea							
120 Lentil							

Product	Unit 1 NSU 2 kg (-> T4) 3 quintal (-> T4) 4 other (specify)	No. of NSUs in our measure	No. of ml in our measure	Unit price (unit must correspond to that indicated in T1)	Moisture content is: 1 high 2 acceptable	Impurity content is: 1 high 2 acceptable	Special Comments
PROD	T1	T2	T3	T4	T5	T6	T7

TABLE 2A. DATA TRANSMISSION SHEET FOR TABLE 2 (PRODUCER LEVEL)

Month _____
 Day _____
 Market _____

Product	Unit 1 NSU 2 kg (-> T4) 3 quintal (-> T4) 4 other (specify)	Mean No. of NSUs in our measure	Mean No. of ml in our measure	Mean price	No. of observations with HIGH moisture content (0-3)	No. of observations with HIGH impurity content (0-3)	Special Comments
PROD	T1	T2	T3	T4	T5	T6	T7
0 Teff							
10 Magna							
20 White							
30 Mixed							
40 Red							
50 Barley							
51 White							
52 Mixed							
60 Wheat							
61 White							
62 Mixed							
63 Red							
64 From food aid							
70 Sorghum							
71 White							
72 Mixed							
73 Red							
80 Maize							
90 Fieldpeas							
91 White							
92 Mixed							
100 Horsebeans							
110 Chickpea							
120 Lentil							

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(Note that the FSRP has on file copies of each of these references, with the exception of Bonnen. The project is more than happy to allow copying of these documents for those interested)

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