



**MARKET FUNCTIONS AND LINKAGES
AS RELATED TO FOOD SECURITY
IN SOUTH WOLLO, ETHIOPIA:
PRELIMINARY OBSERVATIONS**

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INTRODUCTION

This report is part of a larger research project: "From Household to Region: Factor Market Constraints to Income and Food Security in a High Diverse Environment, South Wollo, Ethiopia." This larger project seeks to explore the integrated social and economic factors related to food security at a variety of spatial scales—from household to region. A central part of the study proposes to explore the role of lack of access to markets and market centers as significant factor market constraints.

During the summer of 1998, a field team conducted research in South Wollo in order to explore food linkages explicitly related to market centers in a highly diverse set of environments. This is part of an overall strategy to conduct comprehensive research at a wide variety of spatial scales. The field team surveyed most market centers in the study area. The remaining market centers will be surveyed during subsequent field efforts. The study area is defined as a sixty-kilometer radius around the regional center of Dessie. It also includes some market centers just past the perimeter defined by this radius. Environmental diversity in the study area is high. The study area includes five agro-ecological zones and ranges in altitude from 1000 meters to over 3000 meters.

Surveys reveal the complexity of the food delivery system across market centers and diverse environments. Three separate, but related, surveys connect these complex and diverse strands so we obtain a better picture of the food delivery system, at least at this point in time. An urban inventory provides full information on institutions, infrastructure, and the workings of the market in the specific market centers. A survey of traders and transporters establishes the intra-urban linkages within the study area and between market centers in the study area and market centers outside the study area. Finally, a survey of buyers and sellers in the periodic markets of these market centers establishes the details of the rural-urban linkages between farm households and the market centers. Thus, at the moment, we have the basis of following food from 'plant to palate' in the geographical food chain. Of importance, we have the elemental components to track prices through the study area that should provide the ability to identify specific *places* where prices are impacted. These spatial identifications should facilitate the identification of factor market constraints, especially those dealing with access or environmental diversity.

A Preliminary Report

Much of this report is based on data that still need to be verified, and on analyses using these data. Further, more data will be collected. As such, it should be considered very much a preliminary report that will be replicated with greater accuracy and validity.

CONCEPTUAL FRAMEWORK: MARKET FUNCTIONS AND LINKAGES

Integrated urban and rural development has been propounded recently on the account that separate and isolated rural and urban developments do not bring a lasting solution to the problems of rural development in many countries. Rural development cannot be realized only by efforts targeted at rural areas. Urban settlements play key roles in the overall rural development efforts. The Urban Functions in Rural Development (UFRD) approach realizes such key roles of urban settlements in rural development and attempts to strengthen the settlement system encompassing intermediate cities, market towns and small cities. These settlements are envisaged to provide services and non-agricultural employment to the rural people and stimulate the commercialization of agriculture, thus both directly and indirectly impacting food security.

These roles of settlements are performed by their functions and by the linkages they have with other settlements. The functions are services and activities existing in the settlement centers. The services and activities cater to the needs of the resident population and the surroundings. Central Place Theory envisages that settlements vary by size and the number of functions they support. Higher order centers possess higher forms of services and functions that cater to a wider population in addition to the lower order services found in smaller centers and settlements. The latter with their relatively lower functional complexities, cater to a lower size of population.

Settlements do not exist in isolation, but rather are linked with other settlements. These linkages could be between the center and the hinterland; the center and other centers within the region, and/or between the center and other centers outside the region. The linkages between the center and the hinterland are usually termed rural-urban linkages. Such linkages could be manifested in terms of production, consumption and financial linkages. These links are expected to benefit both the hinterland and the center. The center-center linkages could be manifested through flows of goods, people and capital. These linkages are facilitated through the activities of inter-center traders and transporters. Such linkages are instrumental in linking two or more hinterlands that may depict surplus and deficit situations in food production.

These roles of inter-center linkage have implications for food security. Market center linkages enhance and expand the availability for food security by linking areas of production so that deficiencies in an own area's production could be supplemented by another area's production. Centers that depict wider interactions with other centers ensure wider availability of produce and hence help strengthen food security situations by making products available in the market. In addition, centers with higher forms of interactions with other centers are likely to be trade centers and hence provide opportunities for employment that will raise the purchasing powers of the people.

Food security is not a function of production alone, but also of entitlement, and increased opportunities could lead to increased entitlement.

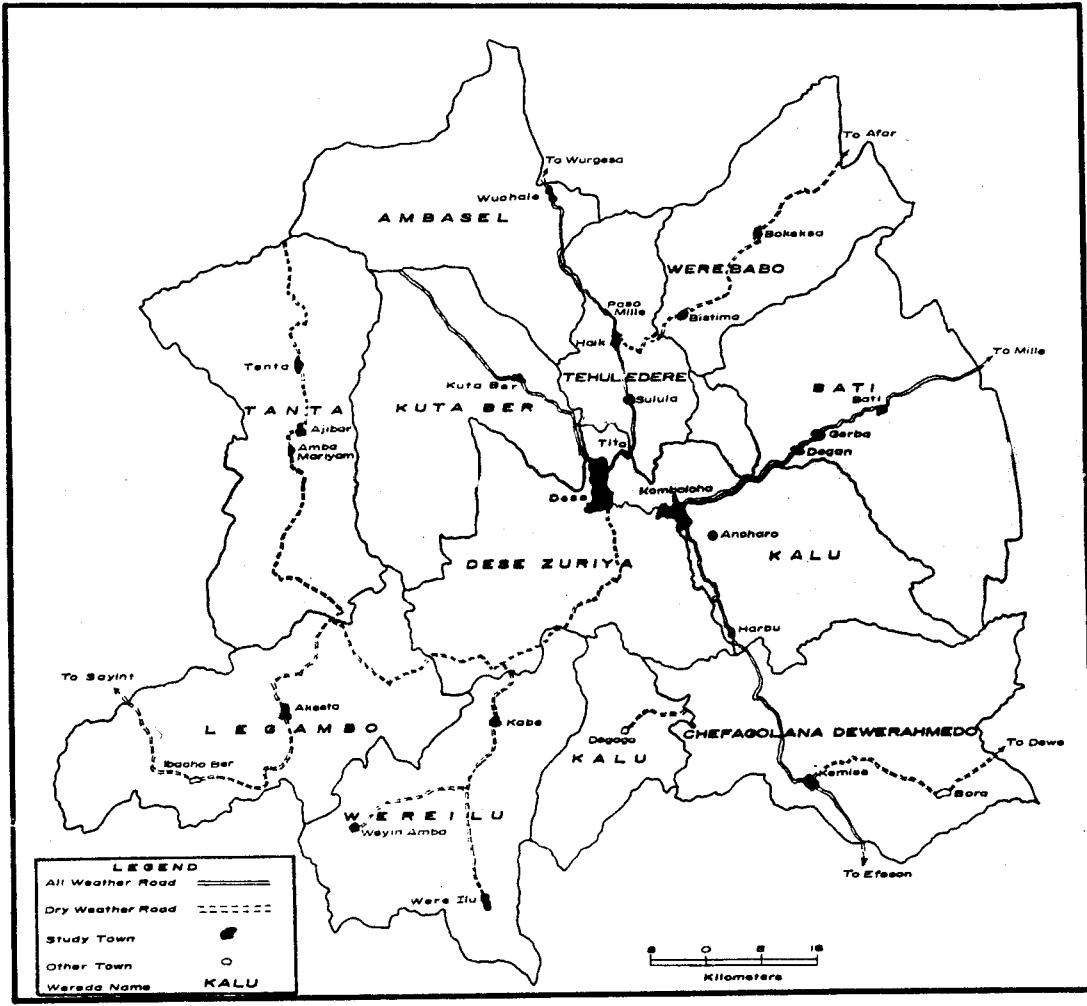
THE URBAN SYSTEM OF THE STUDY AREA

Topography and transport do much to define the location of the urban system in the study region. Rugged terrain both restricts locations of towns and provides unique locational opportunities for towns. We find towns in the hearts of valleys, on ridges between valleys, at the edge of a lake and on the edges of escarpments. Each location provides distinct access advantages to hinterlands or trading opportunities.

Two major national transport routes (Route #1 and Route #2) meet in the center of the study region. These routes provide important loci for the urban system. Goods flow from the north region (and, in former times of peace, from Eritrea and its ports) along Route #1. They also flow from the south and Addis Ababa up Route#1. And finally, goods flow from the east through Bati along Route #2 from the pastoral areas and from the port of Djibouti (especially in times of war). Flows from the west part of the region are more difficult since this is where the highlands occur.

The Study Area

The team of researchers defined the *study area* as the entire region within a sixty kilometer radius of South Wollo's capital of Dessie. Added to this study area are market centers past the perimeter of the study area which are somewhat over 60km away, but which actively interact with the market center at Dessie (e.g., Bati). The inclusion of these areas was determined after discussion with local officials. The total number of market centers included is twenty-nine. A map of the study area (Figure 1) indicates the market centers that were incorporated in the studies and their relationships to agro-ecological zones and major transport lines



URBAN INVENTORIES

Urban inventories provide a crucial link in the study of factor markets. By providing a literal census of the multitude of factors in a market center that either directly or indirectly may influence food security, these inventories provide both a critical part of the rural-urban and urban-urban food linkage information. They will also serve as a very useful baseline for future studies. These inventories provide a complete assessment of information on locational and environmental features, availability and quality of infrastructure, government related services, non-governmental organization activities, financial services, social services, commercial activity, items specifically related to food security, and periodic market information. The latter includes a census of non-food businesses and a detailed enumeration of crops and livestock for sale, prices of crops and livestock, number of sellers and dominant source of each crop or livestock product.

In the first round of fieldwork, 19 urban inventories were completed (see the market centers in Table 1). Several smaller centers were not reached in the first round of surveys, largely due to inaccessibility and lack of time. The total number of market centers for the study area (including major centers on its fringe, e.g., Bati) is 24. Most of the unsurveyed market centers occur in the lowest level of the hierarchy.

It should be noted that the analytical value of the urban inventories will largely be realized after they are completed; after their locations have been formalized (see map in Figure 1); and in conjunction with other surveys of households, communities, and traders and transporters have been completed. Further, these analyses would be helped immeasurably by incorporating them into a geographical information system (GIS) which will allow both access and environmental variables to be easily incorporated into spatial statistical and conventional statistical procedures. Thus this report is very much preliminary and largely descriptive, since more sophisticated analyses would have to be repeated once the data are complete and the mapping, GIS and complementary surveys are available. Still, it is the intent here to provide some early clues as to the “state of the market centers” in the study area, and their role in food security.

Again, nineteen of twenty-four market centers were surveyed during the initial round of the urban inventory survey. It is important for this research to have a *population* and not a *sample* of market centers. A *population* includes *all* places that can be defined as market centers within the study area. By selecting all relevant centers we will be sure of the comprehensiveness of this report and insure full spatial coverage. Spatial coverage will be important if access questions are to be comprehensively addressed and all linkages well defined. In the proposed July/August, 1999 field research effort, the remaining market centers in the study area will be surveyed.

TABLE 1: MARKET CENTERS IN THE STUDY AREA BY URBAN INVENTORY STATUS

Inventory Status	Market Centers
Inventoried	Dessie, Kombolcha, Bati, Akesta, Ajibar, Amba Mariam, Kuta Ber, Wechale, Bokeksa, Bistima, Kemise, Harbu, Tita, Sulula, Fitto, Haik, Paso Mile, Tenta
Not Inventoried	Weyin Amba, Were Ilu, Kabe, Degan, Gerba, Ancharo

Urban inventories provided the function count to determine hierarchical level. Simply, we tallied a sum of whether a specific business or governmental function is operating in the market center (Is there a butcher, a baker, a candle-stick maker? —one point for each function present). A wealth of past urban research tells us that there is a direct correlation between the number of functions and the population served, and that further, the number of functions determines hierarchical level. Further, functions tend to be nested so that a market center higher in the hierarchy has almost all the functions of a lower order market center as well as additional functions which determine its higher order. An analysis of functions also allows us to determine functional specializations of specific market centers.

Table 2 shows the number of market centers surveyed in the urban inventory analysis in which specific functions were found. Every market center had teja bets (tej is a local wine), restaurant/snack bars, tailors, retail shops, telek and araki (local drinks) sellers and grain mills. It is reasonable to argue that these functions represent the bottom of the urban hierarchy (the fourth and lowest level shown in figure 2). From the standpoint of food security, it is important to note that grain mills exist in every market center.

Table 2 also shows that some other functions are found in most centers. The presence of these functions (e.g., carpenters, weavers, bakers, blacksmiths and grain traders) is indicative of the third level of the urban hierarchy. Again, from a food security standpoint, it is important to note that grain traders are represented at this level of the hierarchy, thereby facilitating the local import and export of basic foodstuffs.

Hotels and butgeries are indicative of the second tier of the hierarchy. Hotels are important to note, since they indicate that towns of this level are sufficiently dispersed that people using the functions in these places may require an overnight stay.

Only in the twin cities of Dessie and Kombolcha, at the top of the urban hierarchy, is one likely to find specialized services that require a large market area. Here one can find specialized traders of livestock, tobacco, butter, honey and incense. One can also find the region's concentration of large and smallscale industry. This is also where people would come if they are interested in pastry, sweaters, playing billiards, learning to drive or shop at a store run by an urban civic society (kebele).

TABLE 2: THE PREVALENCE OF URBAN FUNCTIONS IN SURVEYED MARKET CENTERS

Number of Towns	Urban Functions	Teja Bets	Tailors	Retail Shops	Grain Mills	Telek & Araki
19	Restaurant/ Snack Bars					
18						
17	Tea Rooms					
16	Hides & Skins					
15	Buna Bet	Carpenter				
14	Weaver	Grain Trade				
13	Radio/Wat ch Repair					
12	Bakery	Blacksmith				
11	Pharmacy					
10						
9	Hotels	Butcher	Barber	Photography		
8						
7						
6	Shoeshine	Textile	Gasoline	Salt trade	Pepper & Spice Trade	Petrol Station
5	Yarn	Garage	Tire Repair			Oil Mills
4	Music Shop					
3	Cotton Trade	Potters	Grocery	Coffee Trade	Building Materials	Goldsmiths
2	Billard House	Store	Pension	Butter & Honey Trade	Livestock Trade	Woodwork
1	Tobacco Trade	Incense Trade	Wood Selling	Kitchenware	Sweater Shop	Stationary
1	Kebele shop	Horse Pulled Cart	Pastry	Fruit Shop	Small Scale Industry	Driving School
					Car - Spare Parts	Typing School
						Laundry
						Shoe Repair
						Souvenir
						Beauty Salon
						Iron Work
						Welding
						Bed & Mattress
						Printing

Table 3 shows the hierarchical ratings based on function counts for the market centers in South Wollo based on the finding of the urban inventory survey. These ranking were used to generate the urban hierarchy displayed in Figure 2 in a following section.

TABLE 3: FUNCTION COUNTS DETERMINING URBAN HIERARCHICAL RANK

Market Center	Business Functions	Govt. Infrastructure & Services	Total Function Count Rating
Dessie	45	26	71
Kombolcha	45	22	67
Bati	34	22	56
Harbu	28	18	56
Kemise	30	26	56
Were ilu	23	22	45
Haik	22	22	44
Ajibar	26	17	43
Kutaber	20	16	36
Akesta	15	17	32
Bistima	16	16	32
Tenta	19	12	31
Wechale	17	13	30
Tita	12	12	24
Sulula	11	9	20
Pasomile	13	6	19
Bokeksa	14	5	19
Amba Mariam	13	5	18
Fitto	13	2	15

Locational Features

One of the several features that led to the selection of South Wollo as a study area was its locational features and its diversity of environments. Dessie and Kombolcha, the twin centers of the region, sit at the crossroads (literally where national Route 1 crosses Route 2) of much of the country's economic interaction. The study region spans five agro-ecological zones in the space of a sixty kilometer radius around Dessie, thus providing a unique opportunity for market differentiation based on agro-ecology. Special attention will be paid to the extremes of these agro-ecological zones in order to assess their interaction with the study area.

There is also a considerable array of altitudes among the market centers from over 3000 meters to less than 1000 meters, although the data are not complete for this variable. These data can be attained either from the GIS or from topographic maps that we have acquired. All market centers have hinterlands that are able to plant during both the mahar and belge seasons.

Access to nearby centers and to larger towns in the urban hierarchy varies considerably. The average distance to the “nearest larger town” is 42.4 km (16.3 to the nearest small town), although three of the market centers in the west (Akesta, Ajibar and Tenta) are from 100 to 140 kilometers away by road. These towns are clearly relatively isolated from the urban hierarchy, although a new road project may alter this significantly in the future. At the moment, however, this isolation and distance are exacerbated by very difficult road linkage. In terms of food security, normal food distribution networks should barely exist between these relatively isolated towns and the rest of the region, except in extreme circumstances, since transport costs should make market prices prohibitive.

Overall and directional road access was surveyed, but these results will be able to be analytically incorporated much more accurately after the GIS is in place. The results currently are as expected, with access to the west (generally the uphill direction) being the most difficult. Road access is the key to the explanation of much of trade in this region. Market centers on an all-weather road face a very different access situation year-round than do other markets centers. Table 4 gives a simple road quality dichotomy of the market centers in the study area.

TABLE 4: MARKET CENTER ROAD ACCESS

All-Weather Road Access	Limited Road Access
Dessie	Ajibar
Kombolcha	Tenta
Bati	Ambo Mariam
Kemise	Akesta
Harbu	Were Ilu
Haik	Weyin Ambo
Kuta Ber	Kabe
Wechale	Ibacho Ber
Paso Mile	Ancharo
Sulula	Fitto
Tita	Bistema
Degan	Boeksa
Gerba	

In terms of unique locational factors, three market centers (Boeksa, Were Ilu and Ajibar) are distinctive because they are located at the top of plateaus or ridges; Sulula is unique since it is located on a pass between valleys; and Haik is unique because of its access to Lake Haik and its fresh water fishery.

Infrastructure

Table 5 lists the availability of infrastructure in the market centers surveyed thus far. In addition to these data shown, information was gathered on the quality of service provided by specific types of infrastructure and fees where applicable. Table 6 shows a mixed picture of infrastructure availability. Of particular importance to the livestock sector are the availability of cattle dips and slaughterhouses

Government Services

The availability of government services (see Table 6) may have a direct or indirect impact on food security. Four of the market centers surveyed *do not* have agriculture-related government services available. Less directly related, five of the centers do not have postal services, another five do not have a police post, and seven do not have educational ministry services. Local Government Administrative Offices are represented in a variety of structures. Future analyses will explore the relationship between infrastructure availability and food security in more detail.

Only seven of the market centers reported non-Governmental organizations (NGOs) active in their centers. Some of these organizations focus on social issues: street children (Dessie), childcare (Pasomile) and overall social issues including food security (Concern in Kemise and World Vision in Sulula and Ajibar). Environmental issues are addressed by NGOs in Kutaber (soil conservation) and Fitto (water).

Financial Services

Eleven of the market centers have Rural Credit and Savings Offices available. Five of the centers have banking service available (see Table 7). Only two of the centers have the availability of the new services of credit to microenterprises. Microenterprise credit is a differentiated form of rural credit, since microenterprises are often urban-based (as well as rural-based). Microenterprise loans are often for small amounts and collateralization requirements are frequently different from rural credit services. It should be noted that microenterprise services in Ethiopia are regulated in terms of interest rate, making the private (or NGO) provision of such services unlikely because they cannot meet market performance indicators of sustainability under the restricted interest rate. Availability of financial services may strongly influence the trader/transporter sector of the food security issue.

TABLE 5: INFRASTRUCTURE AVAILABILITY

Market Center	Elec-tricity	Stand Pipe Water	Piped Water	Tele-phone	Sewer-age	Bus Station	Cattle Dip	Slaugh-ter House
Dessie	yes	yes	yes	yes	.	yes	yes	yes
Bati	yes	.	.	yes	.	yes	yes	no
Kutaber	yes	yes	.	no	no	no	no	no
Pasomile	.	yes	yes	no	no	no	no	no
Bistima	.	yes	no	yes	no	no	yes	no
Wore ilu	yes	yes	yes	yes	no	yes	yes	no
Harbu	yes	yes	yes	yes	no	no	yes	no
Kemise	yes	yes	yes	yes	no	yes	yes	yes
Sulula	yes	yes	yes	yes	no	no	yes	no
Tita	yes	yes	no	yes	no	no	no	yes
Haik	.	yes	yes	yes	no	yes	yes	yes
Bokeksa	no	no	no	no	no	no	no	no
Wechale	yes	no	no	yes	no	no	no	no
AmbaM	yes	yes	no	yes	no	no	no	no
Tenta	yes	yes	no	yes	no	yes	yes	no
Fitto	no	yes	no	no	no	no	no	no
Combol.	yes	yes	.	yes	no	yes	yes	yes
Ajibar	yes	yes	no	yes	no	no	no	no
Akestaa	no	yes	no	yes	no	no	no	no

TABLE 6: AVAILABILITY OF GOVERNMENT SERVICES

Market Center	Post Office	Police Post	District Council	Kabele (#)	Munic -ipality	Courts	Min. Educ.	Min. Financ	Min. Health	Min. Agric.
Dessie	yes	yes	yes	20	yes	yes	yes	yes	yes	yes
Bati	yes	yes	yes	3	yes	yes	yes	yes	yes	yes
Kutaber	no	no	yes	1	no	yes	yes	yes	yes	yes
Pasomile	no	no	no	1	no	no	no	no	no	yes
Bistima	yes	yes	yes	1	no	yes	yes	yes	yes	yes
Wore ilu	yes	yes	yes	2	yes	yes	yes	yes	yes	yes
Harbu	yes	yes	yes	1	yes	yes	yes	yes	no	yes
Kemise	yes	yes	yes	2	yes	yes	yes	yes	yes	yes
Sulula	yes	no	no	1	no	no	no	no	no	no
Tita	yes	yes	no	1	no	no	no	no	no	yes
Haik	yes	yes	yes	2	yes	yes	yes	yes	yes	yes
Bokeksa	no	yes	no	1	yes	no	no	no	no	yes
Wechale	yes	yes	yes	1	no	yes	yes	yes	yes	yes
AmbaMar	no	no	no	1	yes	no	no	no	no	no
Tenta	yes	yes	no	1	no	no	no	no	no	no
Fitto	no	no	no	1	yes	no	no	no	no	no
Kombolcha	yes	yes	yes	12	no	yes	yes	yes	yes	yes
Ajibar	yes	yes	yes	3	yes	yes	yes	yes	yes	yes
Akestaa	yes	yes	yes	1	yes	yes	yes	yes	yes	yes

TABLE 7: AVAILABILITY OF FINANCIAL SERVICES

Market Center	Bank	Microenterprise Credit	Rural Credit & Savings
Dessie	yes	.	yes
Bati	yes	yes	yes
Kutaber	no	.	yes
Pasomile	no	no	yes
Bistima	no	.	yes
Wore ilu	yes	no	yes
Harbu	no	no	yes
Kemise	no	no	yes
Sulula	no	yes	.
Tita	no	no	no
Haik	no	.	yes
Bokeksa	no	no	no
Wechale	no	no	no
Amba Mariam	no	no	no
Tenta	yes	no	no
Fitto	no	no	no
Kombolcha	yes	no	no
Ajibar	no	.	yes
Akesta	no	.	yes

Social Services

There is a reasonable, though mixed, level of availability to social services (see Table 8) in the various market centers surveyed. All but one (Fitto) had access to a hospital, health center or clinic. Over half of the centers had a skills-training center available. All of these services can be posited to be indirectly, but importantly, related to food security issues.

TABLE 8: AVAILABILITY OF SOCIAL SERVICES

Market Center	Skills Training	Senior High Sc.	Junior High Sc.	Primary Schools	Hospitals	Health Centers	Clinics	Pharmacies
Dessie	yes	yes	yes	.	yes	yes	yes	yes
Bati	yes	yes	yes	14	no	yes	yes	yes
Kutaber	yes	yes	yes	1	yes	no	yes	no
Pasomile	no	no	no	2	no	yes	no	no
Bistima	yes	no	yes	1	no	yes	yes	no
Wore ilu	yes	yes	.	2	.	yes	yes	.
Harbu	yes	no	yes	1	no	no	yes	no
Kemise	yes	yes	yes	2	yes	yes	yes	yes
Sulula	no	no	yes	1	no	no	yes	no
Tita	no	yes	yes	1	no	no	yes	no
Haik	yes	yes	yes	2	no	yes	yes	yes
Bokeksa	yes	no	yes	1	no	no	yes	.
Wechale	.	no	yes	1	no	yes	no	no
Amba Mar.	yes	no	no	1	no	no	yes	no
Tenta	no	no	yes	1	no	yes	no	no
Fitto	no	no	yes	1	no	no	no	no
Kombolcha	yes	yes	yes	5	no	yes	yes	yes
Ajibar	no	yes	yes	2	no	no	yes	yes
Akestा	yes	yes	yes	1	yes	no	yes	no

Commercial Services

Table 9 a,b,c give specific counts of each commercial function by market center. The clear dominance of Dessie and Kombolcha come through strikingly. The tables are also useful for identifying urban specialization. From Table 9c it can easily be seen that Bokeksa is a market center specializing in pottery, and from 9a that Bati has a specialty in gold-smithing (appropriate to its trading role). Kutaber plays a major role in livestock trading.

Several of these commercial services are directly related to food security. All of the market centers had at least two grain mills, but six of them did not have a licensed crop trader. Only three has oil mills and only three had a livestock trader, although varied size livestock markets are common on market days. Only seven had at least one butcher. These last few elements of data indicate there are some serious commercial constraints to trading and processing food in many of the market centers.

TABLE 9A: SPECIFIC COMMERCIAL FUNCTIONS BY MARKET CENTER

Town	L SI	S SI	G a	PS	Ph	Bu M	W W	Ca Sp	La	GS	Sta	PP	Be S	SU	BS	M W	Ra/ WR	HS	Pho	TR	We	G M	O M
Dessie	1	92	21	5	20	39	-	-	-	-	-	-	14	14	38	39	21	16	-	-	30	3	
Kombolcha	6	-	13	5	8	3	11	3	1	3	3	1	2	-	-	-	6	4	5	13	1	21	2
Haik	-	-	1	1	2	-	-	-	-	-	-	-	-	-	5		2	3	-	-	26	1	
Kemise	-	-	2	1	6	-	6	-	-	1	-	-	2	-	-	-	4	2	2	5	4	12	1
Bati	-	-	-	1	3	2	1	-	-	3	-	-	-	1	-	1	1	2	3	1	-	18	1
Were Ilu	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	1	9	2	-	-	9	-
Kutaber	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	4	1	-	-	9	-	
Ajibar	-	-	-	-	1	-	-	-	-	-	2	-	-	-	6	-	3	1	-	-	-	7	-
Wechale	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	1	-	1	-	4	-
Akesta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	1	-	-	4	-	
Harbu	-	-	2	1	2	-	-	-	-	-	-	-	-	-	-	-	1	2	1	-	13	-	
Bokeksa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	1	2	-	-	-	6	4
Tenta	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	3	-	-	2	1	-	-	5
Sulula	-	-	-	-	1	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	2
Ambamariam	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	4	-	-	-	3	-
Bistima	-	-	-	-	1	-	-	-	-	-	-	-	-	-	3	-	1	2	-	-	-	4	-
Fitto	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	6	-	-	-	4	-
Tita	-	-	-	-	1	-	-	-	-	-	-	-	-	-	4	-	2	-	-	-	-	2	-
Paso Mile	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	2

LSI= Large scale industry

SSI= Small scale industry

Ga= Garage

GS= Goldsmith

PS= Petrol Station

Sta= Stationery

Ph= Pharmacy

PP= Printing press

BuM= Building Materials

BeS= Beauty salon

WW= Wood work

SU= Souvenir

CaSp=Car spare part

BS= Black smith

La= Laundry

GM= Grain mill

OM= Oil mills

HS= Hides and skin

Pho= Photography

TR= Tire repair

Ra/WR = Radio and watch repair

MW= Iron work

We= Welding

TABLE 9b: SPECIFIC COMMERCIAL FUNCTIONS BY MARKET CENTER (continued)

Town	H o	RE/ SN	Pas	Ba	TR m	BB	TB	T& A	Pe	Bu	FrS	Ta	Tx	Car	We V	Ga	Re S	GT	ST	PP &S PT	B& HT	Cf T	LT
Dessie	57	211	-	13	94	181	174	-	39	20	27	45	281	17	-	78	643	172	85	47	18	217	24
Kombolcha	30	58	5	10	12	58	42	42	13	6	-	7	10		-	-	148	20	5	6	-	-	-
Haik	-	23	-	3	3	44	49	22	-	5	-	5	-	8	5	-	36	9	-	-	-	-	-
Kemise	16	13	-	-	24	18	11	-	-	2	-	2	-	-	-	3	124	14	-	2	-	-	-
Bati	6	21	-	2	37	20	18	15	-	1	-	3	8	5	4	-	132	36	2	2	1	-	-
Were Ilu	-	6	-	1	47	24	100	300	-	10	-	20	26	6	15	23	44	11	-	-	-	-	-
Kutaber	-	9	-	2	-	6	1	35	-	-	-	5	-	5	4	5	18	5	7	-	-	5	10
Ajibar	4	12	-	2	10	1	21	350	-	-	-	75	9	11	13	6	31	5	1	3	-	4	-
Wechale	-	5	-	1	4	4	40	30	-	2	-	15	-	-	20	-	10	4	-	-	-	-	-
Akesta	4	10	-	1	3	2	3	120	-	-	-	6	-	2	5	-	11	2	-	-	-	-	-
Harbu	3	7	-	3	6	7	15	8	-	-	-	15	29	-	-	3	30	15	1	1	-	-	-
Bokeklsa	-	11	-	-	2	-	2	7	-	-	-	5	-	2	25	-	24	-	-	-	-	-	-
Tenta	2	16	-	1	4	7	31	30	-	2	-	10	-	10	7	-	4	1	-	-	-	-	-
Sulula	-	3	-	-	-	1	2	20	-	-	-	1	-	4	3	-	6	-	-	-	-	-	-
Ambamariam	-	10	-	-	6	2	4	290	-	-	-	4	-	3	9	-	4	-	-	-	-	-	-
Bistima	-	5	-	1	8	-	5	25	-	3	-	7	-	2	-	-	21	1	-	-	-	-	-
Fitto	-	3	-	-	3	-	2	150	-	-	-	4	-	5	5	-	6	7	-	-	-	-	2
Tita	-	6	-	-	5	-	2	30	-	-	-	5	-	30	10	-	15	-	-	-	-	-	-
Paso Mile	2	1	-	-	3	1	2	5	-	-	-	2	-	4	4	-	3	-	-	-	-	-	-

Ho= Hotel

Re/Sn = Restaurant
/Snack bar

BB= Buna bet

TB= Tej bet

TRm= Tea room

Tx = includes ready made cloths and cloth fabric sales

Pas=Pastry

CfT= includes coffee retailers and wholesalers

Ba=Bakery

T&A= Tella and Araki

Pe = Pension

Bu= Butcher

FrS= Fruit shop

Ta= Tailor

WeV= Weaver

PP&SPT= Pepper and spice trade

Tx= Textile

Car=Carpenter

Ga= Gasoline

ReS= Retail shop

GT= Grain trade

ST= Salt trade

B & HT= Butter and Honey trade

CfT= Coffee trade

LT=Livestock trade

TABLE 9c: SPECIFIC COMMERCIAL FUNCTIONS BY MARKET CENTER (continued)

Town	C o T	T b T	In T	Ya	Po	Bar	Mu S	WS	K W	Sw S	Dr S	Ty S	SS	SR	Bi H	Gro	B& M	Sto	KS	FM	LF	HP C
Dessie	6	-	5	226	-	16	-	-	8	6	9	-	112	-	-	-	4	6	20	-	-	
Kombolcha	1	-	-	1	-	5	6	-	-	-	-	1	10	1	2	13	-	1	-	-	-	
Haik	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
Kemise	-	1	-	-	-	3	4	2	-	-	-	-	-	-	-	5	-	-	-	1	-	
Bati	-	-	-	-	-	2	2	-	-	-	-	-	-	-	-	-	3	-	-	-	-	19
Were Ilu	-	-	-	24	-	-	-	-	-	-	-	-	9	-	-	1	-	-	-	-	-	-
Kutaber	16	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
Ajibar	-	-	-	10	-	3	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-
Wechale	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Akesta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Harbu	-	-	-	2	-	4	3	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-
Bokeklsa	-	-	-	-	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tenta	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulula	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ambamariam	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bistima	-	-	-	-	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fitto	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tita	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paso Mile	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

CoT= Cotton trade
 TbT= Tobacco trade
 InT= Incense trade
 Ya= Yarn
 Po = Potters
 Bar= Barbers
 MuS= Music shop

WS= Wood selling
 KW=Kitchen ware
 SwS=Sweaters shop
 DrS=Driving school
 TyS=Typing school
 SS= Shoe shine
 SR= Shoe repair

SSh=Shoe shine
 BiH= Billiard house
 Gro = Grocery
 B&M= Bed and mattress
 Sto= Store
 KS= Kebele shop
 HPC=Horse pulled cart

Factors Directly Related to Food Security

When local officials were asked “has the town experienced food shortages or problems?” only one official (in Tita) said no. Tita is the only market center in the study area located in the *dega* agro-ecological zone. From these replies it may reasonably be implied that food security is a concern throughout most of the study region. These shortages and/or problems were blamed on shortage of rain, pests and, in two cases, market price increases. Shortage of rain was the most often mentioned cause of the problems, however.

All of the market centers experiencing problems had received food aid from the DPPC. Relief was offered periodically, with periods ranging from once a month to once a year. The most common periods were every two to three months. In the majority of cases the food was offered as either food for work or some combination of food for work plus free distribution. There was one case where it was distributed only to the very poor and one case where it was only distributed to the disabled and weak. In addition three centers mentioned receiving food help from Save the Children and two from the Ethiopian Red Cross Society. It is clear food aid has become a part of life in South Wollo. Urban market centers play a major role as the locus of the distribution of this aid.

The Urban Hierarchy

The urban hierarchy of the study region is dominated by the “twin cities” of Dessie, the major city and capital of the South Wollo region, and Kombolcha, an industrial and commercial hub. These cities are located within about 10 kilometers of each other “as the crow flies,” but Dessie is located at the top of an escarpment and Kombolcha is located about a 1000 meters in altitude below on an outwash plain near a large river. Highway #1 from Addis Ababa winds tortuously up the escarpment from Kombolcha to connect these two twin cities. Dessie houses the region’s administrative offices and Kombolcha provides the region’s main airport.

The next tier of the hierarchy is comprised of a set of secondary cities which serve more restricted hinterlands and provide a lesser range of functions than do Dessie and Kombolcha. Kemise is located on highway #1 near the south edge of the study area and Wechale holds a similar location on Highway #1 at the north edge of the study area. On the east edge of the study area is Bati, a remarkable town resting on top of the rift valley escarpment (and astride Highway #2). In Bati, the pastoral Afars come up the escarpment from their rangelands in the valley below to trade livestock for other necessities. Their starkly different appearance gives the town an exotic air. It also makes it an important nexus for livestock/agricultural trading. Ajibar is somewhat of a secondary city in the south-western part of the study area where the mountainous terrain disrupts the possibility of a regular system based on central place-theoretic notions. There are no isotropic planes here. One other secondary city is Haik, which is located north of Dessie and on Highway #1. Haik’s location on a large lake makes it a major regional market center for fish products.

The South Wollo Urban Hierarchy

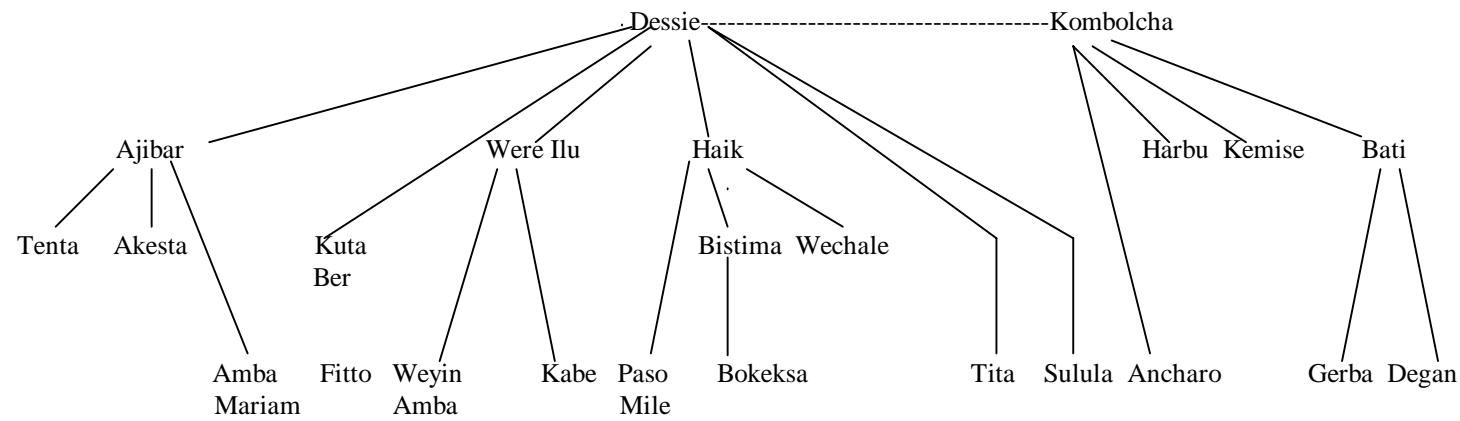


Figure 2: The South Wollo Urban Hierarchy

As appropriate to the title of this report, this hierarchy (Figure 2) has been derived by addressing the issues of functions and linkages. Functions were derived from urban inventories that documented the number of different types of private business and government functions that are available in each market center. This function count determines “level” of the hierarchy. Linkages, as determined by origin-destination analyses of traders and transporters and by other forms of geographical analysis, provide the data to determine the interactions between the centers. Initial linkages are shown in an interaction matrix (Table 10) which is a simple combination of the traders’ origin-destination matrix (Table 20) with the transporters’ origin-destination matrix (Table 12)

TABLE 10: INTERACTION MATRIX

TO:

	D e s s i e *	A d d i s s e A b	H a m b o l d i o b t i d i r a r m a	K o m b o n d i a s t i a r m a	D u l d i a r i m a	W o n d i a r i m a	G o n d i a r i m a	B i s t i a r m a	B a t i f a s M e	N e f a s M e	W e r e I l u	K u t a b e r	A t a y e	W e c h a l e	H a r b u	K e m i s e	T e n t a	B o k e s a	D e l a n t a	S u l u l a	F i t t o	B a h i r D a r	O t h e r				
FROM:																											
Dessie*	x		4	6		1	1	4	6		1	1	4	5	3	3	1	1	1		9		4				
Addis A	24	x	17	2				2	5	1		7		2	7	6			1					1			
Haik	2		x					1											1								
Kombol*	5			x		1			5																1		
Dubti		1			x																						
Woldia	1			1		x																					
Gondar	2					x			5						1										1		
Bistima	1							x											2								
Bati	1								x																		
NefasM	1			1						x																	
Were ilu	9	2	2								x					1		1									
Kutaber	2										x																
Ataye												x															
Wechale	2							1					x														
Harbu		1		2					1					x													
Kemise		1		4	1				1						x												
Tenta																x											
Bokeksa										1							x										
Delanta																		x									
Sulula	1																	x									
Fitto	5																		x								
BahirDar			3					1					1							x							
Other	5		2	1				2						1	2										x		

*Data from Dessie and Kombolcha are incomplete and will be revised after the next round of surveys

TRADERS AND TRANSPORTERS

Traders and transporters work between market centers and are key agents in the distribution of food. We know from the market survey that the great majority of both buyers and sellers in the periodic markets come from the locality of the market center hinterland. The market-survey well documents the *rural-urban linkages* that exist within the study area. It is the traders and transporters who perform the wholesaling functions that provide *urban-urban linkages* between market centers. This survey documents those linkages, especially as they are related to food distribution.

The Trader/Transporter Survey

Enumerators surveyed 224 individuals of whom 181 were identified as traders and 42 as transporters. It should be noted that the methodology used was an opportunity sample, since only small numbers of those employed in these occupations are found in any given market center. Both occupations (traders and transporters) are male-dominated professions; all but one of the transporters interviewed are male and 89% of the traders interviewed are male.

Transporter Analysis

Most of the transporters interviewed (75.0%) do not own the transporter business but are waged employees. In almost all the other cases, the transporter owns the business (8 cases), or a family member owns the business. Almost all the owners live in the study area (see Table 11), with only four living in Addis Ababa. Demographics indicate they average 33 years in age (with only 15% being over 40), they are all urban residents, and have more than an elementary school education (median = 9 years), but only 5% have 12 years of education.

TABLE 11: TRANSPORTER OWNERSHIP RESIDENCY PROFILE

Transporter Owner Residence	#
Dessie	13
Haik	4
Addis Ababa	4
Kemise	3
Bistima	2
Kombolcha	2
Kemise	1
Fiche	1
Akesta	1
Weldia	1
Bati	1

N=42, 8 missing cases.

Transporters typically work as two-person teams. The wage varies widely, indicating the differences between drivers' and the drivers' helpers wages. Ranging from 150 birr to 1900 birr monthly (US\$1 = 7.6 birr at time of survey). The average wage is 835 birr (median 780 birr). Only one transporter hires part-time labor. Only a third of the transporters admit to having a bank account, mostly in Dessie (76.9%), with two in Bistima and one in Were Ilu, but none in Addis Ababa. Seasonality plays a major role. The rainy season results in transporters not being able to work their routes for one-third of the drivers. Slightly more than one-third (36.6%) of the transporters say they primarily transport goods, and the same proportion claim they primarily transport people. Slightly less than a third (26.8%) say they primarily transport both goods and people. When asked a similar question differently, exactly one-third of the transporters say they transport food items, while a slight majority (59.5%) say they transport people. It should be noted that people being transported often carry some goods to or from the market.

Further survey queries clarify a bimodal transport situation with regard to food items. A little over one-third (37.5%) of the transporters respond that 80% or more of what they carry are food items. Conversely exactly half the transporters respond that no more than 15% of what they carry are food items. Only two transporters argue that half of what they carry are food items. It is fair to say from these results that food transporters are a specialized group who make up a significant minority of the transporters surveyed.

Vehicles

All 42 transporters surveyed use a motor vehicle for transport (Toyotas and Isuzus made up 50% of the vehicles used). The average vehicle has been on the road 11.24 years, with several of them having twenty or more years in service. The resultant condition of these vehicles is relatively poor, based on observed experience during the fieldwork; it is not uncommon to see repairs being undertaken.

Transporter Business Life-Cycles

Transporters surveyed tend to be established businesses, with a range of up to 35 years in business, although 86% have begun in the last 10 years. Indeed 43% of the businesses established themselves during the years 1992-94, following the downfall of the Dergue. This business sector is characterized by high capital start-up costs (the purchase of a vehicle). Indeed, the average capital start-up cost was 156,543 birr (median 117,500 birr; US\$1 = 7.6 birr at time of survey). Survey respondents are not forthcoming with the sources of this initial capitalization. A majority (62.2%) of these respondents answer “other” to the question of where the initial capitalization “came from.” Another family member (35.9%) is the second most frequently-cited source of capital, and “credit/bank/other” account for only 11.6% of these high-priced business start-ups. So financing of the transport sector remains somewhat of a mystery.

The durability of this sector might be implied from the age of the vehicles (see above). It can be argued that these transporters have had ample time to explore and understand their geographical market. The exploration of the spatial aspects of this market reveals their choices.

TABLE 12: ORIGIN-DESTINATION MATRIX OF TRANSPORTERS
Destinations

Origins	Dessie	Addis A	Haik	Kombolc	Dubti	Woldia	Gondar	Bistiwa	Bati	NefasM	Were ilu	Kutaber	Ataye	Wechale	Harbu	Kemise	Tenta	Bokeksa	Delanta	Sulula	DeweBo	BahirDar	Mekele
Dessie	x		2	6		1	1	3	6		1		1	2	3	3		1	1				
Addis A		x		2						1						1	1		1				
Haik	2		x					1				1								1			
Kombolc	5			x		1			5					1		2	3						
Dubti		1			x																		
Woldia	1			1		x																	
Gondar	2		1				x																
Bistiwa	1							x												2			
Bati	1			1					x														
NefasM	1									x													
Were ilu			1								x					1		1					
Kutaber	2										1	x											
Ataye												x											
Wechale							1						x										
Harbu		1		2					1					x									
Kemise		1		4	1				1					x									
Tenta															x								
Bokeksa										1								x					
Delanta																			x				
Sulula	1																1				x		
DeweBo																	1					x	
BahirDar																							
Mekele																							

Spatial Factors in Transport

Transporters average 763 kilometers per week on their routes, although those primarily carrying food average more, 1046 kilometers per week. The average transport cost for general transport averages about 0.15 birr per kilometer (this transport cost which is the equivalent of US\$0.02/km is most likely the estimated variable cost of transport). Of the food transporters, two-thirds respond that they carry food from one market center to another. These transporters fall under the rubric of *arbitragers*, the word has its roots in French businessmen who understand the profits to be made by differential prices in spatially different markets. Only one carries food to a processing place and four carry food from farmers/traders to the market.

It is clear by looking at Table 12 of the origins-destinations of transporters' routes, that a hierarchy of urban-urban linkages exists. While some transporters range up and across the urban hierarchy as far as Addis Ababa, Gondar, Mekele and Bahir Dar, the majority of the trips are of a more local character either within the study area or to market centers on the fringe of the study area.

Trader Analyses

Traders are family run, owned and operated businesses, as opposed to transporters who tend to hire wage labor to operate their businesses. Owners are two-thirds (n=120) of the traders surveyed. Of the remaining one-third of the traders interviewed, all but 9 (5.0%) are family relatives of the owner. It is safe to say that a trader business is tightly held and controlled within the family.

Demographics indicate that the traders are highly varied in age, ranging in age from 14 to 80, with a variance much higher than that of transporters. Their median age, though, is similar, 30 years old for traders. Traders, too, are a relatively educated group. Although 9.4% have no education, the median trader has none years of formal education, and 19.5% claim to have finished 12 years of formal education. They are very dominantly urban, with only 5% saying their residence is rural. They tend to live in the study area, near their base of operations.

Traders surveyed cover a wide range of business efforts, from exclusively crop traders to veritable general stores traders, from very small-scale traders to hundred-thousand birr businesses (US\$1 = 7.6 birr), (see Table 13). These traders tend to work alone. Only 26 of the 181 traders surveyed hire full-time wage employees, and only 7 hire part-time employees. Only 31% admit to having a bank account (this may be on the low side for agricultural traders, but may be on the high side for livestock traders). The majority of which are located in Dessie (77.6%), and a few in Tenta, Bati and Were Ilu, but none in Addis Ababa. Their weekly sales range from very little to tens of thousands of birr (see Table 14). They trade

grains, pulses, coffee, salt, pepper, spare parts, building materials, and a wide assortment of goods (see Table 15).

TABLE 13: TOTAL PRICE OF TRADERS' STOCK

Price	< 1000 birr	1000 - <10,000	10,000 - <20,000	20,000-<100,000	100,000 &+
Number	30	82	16	23	9
Percent	18.8	41.2	10.0	14.4	5.6

US\$1 = 7.6 birr at time of survey

TABLE 14: AMOUNT SOLD BY TRADERS PER WEEK IN BIRR

Price	< 100 birr	100 - <1,000	1,000 - <2,000	2,000-<10,000	10,000 &+
Number	31	71	24	31	7
Percent	18.9	43.3	14.6	18.9	4.3

US\$1 = 7.6 birr at time of survey

TABLE 15: PRODUCTS SOLD BY TRADERS

Product	# of Traders	% of Cases	Product	# of Traders	% of Cases
Maize	44	37.3	Barley	3	2.5
Sorghum	32	27.1	Flour	3	2.5
Soap	24	20.3	Korerema	3	2.5
Sugar	23	19.5	Tea	3	2.5
Grass pea	22	18.6	Candy	3	2.5
Teff –white	17	14.4	Nails	3	2.5
Macaroni	14	11.9	Batteries	3	2.5
Cigarettes	12	10.2	Goat skins	2	1.7
Coffee	10	8.5	Sheep skins	2	1.7
Horse bean	10	8.5	Chick peas	2	1.7
Teff-red	9	7.6	Paint	2	1.7
Lentils	9	7.6	Cement	2	1.7
Soft drinks	8	6.8	Omo	2	1.7
Wheat	7	5.9	Etan	2	1.7
Abeshe	7	5.9	Oil	2	1.7
Shoes	6	5.1	Rice	1	0.8
Pepper	5	4.2	Kimem	1	0.8
Salt	5	4.2	Oats	1	0.8
Biscuits	5	4.2	Plastics	1	0.8
Clothes	4	3.4	Sandals	1	0.8
Cosmetics	4	3.4	Tondino iron	1	0.8
Correg. iron	4	3.4	Plain wood	1	0.8
Beer	3	2.5			

Crop-Specific Trading

While the sample becomes small when traders of specific crops are analyzed, notable patterns still emerge. Traders specializing in maize are abundant throughout the area, and the urban hierarchy in this sector is very evident. Slightly over half (15 of 29) of the maize traders procure their maize from the capital of Addis Ababa (see Table 16a). About one quarter of the traders (8 of 29) procure their maize from Dessie. Other maize sources are along the main route #1 from the south (2 from Harbu, 2 from Kemise). The only two other sources are from Bahir Dar and Nazerate.

TABLE 16a: REPORTED PROFIT, PRICE AND COSTS FOR MAIZE TRADERS BY CASE WITH ORIGIN IN ADDIS ABABA (birr per 100kg)

Origin	Purchase Price	Transport Cost	Destination	Selling Price	Profit
Addis Ababa	120	16	Dessie	140	4
Addis Ababa	110	15	Kutaber	140	15
Addis Ababa	110	16	Kutaber	140	14
Addis Ababa	125	17	Kombolcha	144	2
Addis Ababa	115	18	Wechale	140	7
Addis Ababa	103	20	Kemise	126	3
Addis Ababa	110	16	Harbu	130	4
Addis Ababa	116	16	Harbu	135	3
Addis Ababa	110	19	Harbu	132	3
Addis Ababa	115	18	Haik	138	5
Addis Ababa	105	20	Haik	135	10

US\$1 = 7.6 birr at time of survey

Why Low Trader Margins?

The data in Table 16a seem to indicate that most traders have a good idea of prices and costs and are working on a fairly fine profit margin. Of greatest interest is that the profit margins are generally in the single digits. Of some interest to this study is the fact that profit margins, indeed based on a limited sample, seem to display some variation based on access. Those with profit margins of below five percent are all in areas of high access—Dessie, Kombolcha, and the cities south of Dessie on Route 1—Kemise and Harbu. Cities north of Dessie (the road deteriorates at this point), show profit margins of 5% and above. Of cautionary note due to the limited sample, profit margins to the market at Kuta Ber (only about 20 km from Dessie, but not on a paved road) are in the double digit range for the two cases reported.

One possible explanation for the reported low trader margins is that traders have few alternative income prospects. Thus the opportunity costs for labor are extremely low. Traders may have few other opportunities to earn incomes, so competition is high and pressure on margins is excessive. There might also be such poor buying power on the part of

consumers that traders have to accept small margins because they can only charge so much. Further exploration of this potentially important finding will be explored in future fieldwork.

Table 16b reports maize traders with origins other than Addis Ababa, primarily Dessie. Again, profit margins are low (and likely data reportage errors explain some of the anomalies).

TABLE 16b: REPORTED PROFIT, PRICE AND COSTS FOR MAIZE TRADERS BY CASE WITH ORIGIN IN OTHER THAN ADDIS ABABA (birr per 100kg)

Origin	Purchase Price	Transport Cost	Destination	Selling Price	Profit
Dessie	127	4	Wechale	135	4
Dessie	130	18	Ataye	150	2
Dessie	130	18	Ataye	150	2
Dessie	130	25	Masha	150	-5
Dessie	128	25	Mekedela	155	2
Dessie	133	15	Fitto	153	5
Dessie	135	16	Fitto	153	2
Dessie	130	17	Fitto	150	3
Bahir Dar	110	28	Haik	143	6
Bahir Dar	95	25	Wechale	140	20
Bahir Dar	105	28	Haik	135	2
Nazerate	115	22	Bati	140	3

US\$1 = 7.6 birr at time of survey

Sorghum is the second most traded grain commodity. Much of the grain that reaches the study area originates in Addis Ababa (Table 17a.) Again, ‘reported’ price and costs lead to a calculation of profits that represents a very low profit margin. No distinct spatial pattern of profits is discernible from Table 17a.

TABLE 17a: REPORTED PROFIT, PRICE AND COSTS FOR SORGHUM TRADERS BY CASE: ADDIS ABABA ORIGIN (birr per 100kg)

Origin	Purchase Price	Transport Cost	Destination	Selling Price	Profit
Addis Ababa	130	15	Kombolcha	150	5
Addis Ababa	130	14	Kombolcha	150	6
Addis Ababa	140	17	Haik	160	3
Addis Ababa	135	17	Bati	150	-2
Addis Ababa	130	16	Dessie	150	4
Addis Ababa	130	16	Kombolcha	150	4
Addis Ababa	128	16	Kombolcha	150	6
Addis Ababa	132	17	Kombolcha	152	3
Addis Ababa	136	16	Harbu	155	13
Addis Ababa	135	16	Harbu	150	9
Addis Ababa	139	19	Harbu	160	5
Addis Ababa	135	27	Haik	155	-7
Addis Ababa	130	15	Kombolcha	150	5
Addis Ababa	130	14	Kombolcha	150	6
Addis Ababa	140	17	Akesta	160	3
Addis Ababa	135	17	Akesta	150	-2

US\$1 = 7.6 birr at time of survey

TABLE 17b: REPORTED PROFIT, PRICE AND COSTS FOR SORGHUM TRADERS BY CASE: OTHER THAN ADDIS ABABA ORIGIN (birr per 100kg)

Origin	Purchase Price	Transport Cost	Destination	Selling Price	Profit
Dessie	153	4	Harbu	159	2
Dessie	150	18	Ataye	170	2
Dessie	150	25	Masha	170	-5
Dessie	146	15	Fitto	170	9
Dessie	150	16	Fitto	170	4
Dessie	150	25	Mekedela	173	-2
Dessie	140	3	Haik	160	17
Gondar	115	24	Bati	145	11
Gondar	125	25	Wechale	155	10
Gondar	120	30	Bati	153	3
Bahir Dar	105	28	Bistima	140	7

US\$1 = 7.6 birr at time of survey

Table 17b shows the pattern of crop trading for traders not originating in Addis Ababa. The fact that traders are reaching markets in the study area from as far away as Gondar and Bahir Dar is of great interest to the study of factor markets (as is the curious, and perhaps questionable, empirical result that their profit margins are so low). Indeed, Bahir Dar is traditionally a surplus zone, and there maybe historical trade relationships based on South Wollo's occasional deficit seasons.

A smaller sample of teff traders reveals a different picture. Shewarobit, Worena and Wechale were the primary sources for this preferred staple, although traders who make a secondary market in teff tended to procure it from Addis Ababa. The typical pattern of purchase/sale is of local purchase and sale to the Dessie/Kombolcha markets.

Table 18 presents segmented data from the survey, for which results are incomplete.

TABLE 18: REPORTED PROFIT, PRICE AND COSTS FOR TEFF TRADERS BY CASE
(birr per 100 kg)

Origin	Purchase Price	Transport Cost	Destination	Selling Price	Profit
Shewarobit	260	9	Kombolcha	275	6
Wechale	250	4	Dessie	265	11
Addis Ababa	235	20	Kutaber	260	5
Dessie	205	15	Fitto	222	2

US\$1 = 7.6 birr at time of survey

For the completion of this study, these data are needed from throughout the study area, with a focus only on food traders. While the price data are inherently inexact, they still show enough consistency that significant information of statistical relevance can be gathered from them if they are more spatially representative and available in greater numbers.

Market Center-Specific Crop Trading Reports

It is too early, given the data available, to offer useful data on market center-specific crop profits and trading patterns. Nonetheless, it may be possible to do so after further data gathering. A hint of what might be possible from the data is shown in Table 19 for a few selected market centers.

TABLE 19: CROP TRADING FOR SPECIFIC MARKET CENTERS

Kombolcha

Crop	Source	Purchase Price	Transport Cost	Selling Price	Profit
Teff white	Sheworabit	260	8	275	7
Teff white	Sheworabit	265	8	280	7
Red teff	Sheworabit	185	12	200	13
Sorghum	Addis Ababa	130	15	150	5
Sorghum	Addis Ababa	130	16	150	4
Barley	Addis Ababa	105	15	170	50

Harbu

Crop	Source	Purchase Price	Transport Cost	Selling Price	Profit
Sorghum	Addis Ababa	135	17	155	3
Sorghum	Dessie	153	4	158	1
Grasspea	Debre B.	105	16	122	1

Kuta Ber

Crop	Source	Purchase Price	Transport Cost	Selling Price	Profit
Teff White	Addis Ababa	170	15	220	15
Maize	Addis Ababa	110	16	140	24
Wheat	Addis Ababa	110	15	140	25
Sorghum	Addis Ababa	140	20	165	5

Bati

Crop	Source	Purchase Price	Transport Cost	Selling Price	Profit
Sorghum	Addis Ababa	135	17	150	8
Maize	Nazaret	115	22	140	13
Sorghum	Gondar	115	24	145	16
Grasspeas	Addis Ababa	106	14	128	8

Seasonal Aspects

The majority of those traders responding note some seasonal fluctuation in their business, with either winter being good (49.6%) or summer, which is the rainy season, being bad (17.6%). Only a small minority of respondents argue the reverse, that summer is good (16.0%) or that winter is bad (2.3%).

Trader Business Life-Cycles

Many of the businesses surveyed have been established for some time. They range in age up to fifty years, with a mean of 7.85 years and a median of 5.0 years in business. New businesses, a year or less old, account for 22.2% of the businesses surveyed. Thus a large number of these traders were in business during the previous regime, and have survived the change in government.

Initial capitalization also varies widely. The range is from 10 birr to 750,000 birr (US\$1 = 7.6 birr at time of survey). This may sound dubious, but we did interview people who had started as orphan boys selling chewing gum on the streets. A few large traders skew the results: the average is 10035 birr, but the median is only 1000 birr. From these results, it appears that business entry is reasonably open to anyone who can compile enough initial capital to begin work. There is no significant correlation ($R^2 = 0.06$) between when the business started and initial capitalization.

Spatial Factors in Trade

As can be seen from Table 20 there is quite a distribution of origins and destinations between traders. It would be premature to draw conclusions at this time about spatial patterns of trade, since many trader surveys remain to be undertaken.

TABLE 20. TRADERS ORIGIN-DESTINATION MATRIX

SELL TO:

BUY FROM:	Dessie*	Addis A	Haik	Kombol*	Dubti	Woldia	Gondar	Bati	NefasM	Were ilu	Kutaber	Ataye	Wechale	Harbu	Kemise	Tenta	Boeksa	Delanta	Sulula	Fitto	BahirDar	Other	
	D e s s I e *	A d d i s A b	H a m b o 1 *	K o m b t i	D u b t i	W o l d i	G o n d a	B i s t i	B a t i m a	N e f a s M e	W e r e b e r	K u t a b e r	A t a y e 1 e	W e c h a 1 e	H a r b u	K e m i s e	T e n t a k s a	B o k e s a	D e l a n t a	S u l u l a	F i t t o	B a h i r D a r	O t h e r
Dessie*	x		2					1			1	3	3			1			9		4		
Addis A	24	x	17					2	5		7		2	6	5								
Haik			x																				
Kombol*				x																			
Dubti					x																		
Woldia						x																	
Gondar							x		5					1									
Bistima								x															
Bati									x														
NefasM									x														
Were ilu	9	2	1							x													
Kutaber											x												
Ataye											x												
Wechale	2											x											
Harbu													x										
Kemise														x									
Tenta														x									
Boeksa															x								
Delanta																x							
Sulula																	x						
Fitto	5																	x					
BahirDar			3					1						1		1	1			x			
Other	5		2	1				2													x		

* Data from Dessie and Kombolcha are incomplete and will be revised after the next survey.

THE PERIODIC MARKET

All of the towns surveyed had an active periodic market, although some were orders of magnitude larger than the average. Rough assessments of market activity were gathered in several ways before the actual inventory and count of sellers took place. First, the head enumerator paced-off the perimeter of the market to get a measure of its physical extent—this yielded the measure of perimeter meters. We also estimated market attendance, by doing an estimated head count of both buyers and sellers. Finally, where possible, the average amount of fees collected on market days was tallied.

Dessie's dominance in the urban hierarchy is clearly displayed in the size of its periodic market. The average smaller market center market has a perimeter of around 400 meters. Attendance estimates also vary to a high degree, with many markets drawing a thousand or more, while the smallest ones draw only about 250 people. It will be interesting, when the data collection and analyses are complete, to see whether these market size data have any relationship to the working of the food marketing system in the region. These are good data and will eventually be mapped in a future stage of this project.

Market days vary systematically throughout the study area and they have been recorded for further use and analysis. Most market centers have only one market day, although five have two and Bistima and Tita have three (indicating that the number of market days is *not* necessarily a function of urban size). A schedule of market days is provided in Table 21.

TABLE 21: STUDY AREA MARKET CENTERS & MARKET DAYS

Market Center	Wereda	Market Day(s)
Dessie	Dessie	M,W
Tita	Dessie	M,W,F
Wechale	Ambosel	Sa
Were Ilu	Were Ilu	Tu
Kuta Ber	Kuta Ber	Th
Kemise	Jaffe Gulana	Th
Bati	Bati	M
Gerba	Bati	None
Degan	Bati	None
Tenta	Tenta	Th
Ajibar	Tenta	Sa
Amba Mariam	Tenta	Tu
Harbu	Kalu	Sa
Kombolcha	Kalu	W, Sa
Ancharo	Kalu	Th
Bistima	Were Baba	M
Bokeksa	Were Baba	Tu
Haik	Tualer Dere	F
Sulula	Tualer Dere	Th
Paso Mile	Tualer Dere	W
Weyin Amba	Were Ilu	Do not know
Akesta	Were Ilu	Do not know
Kabe	Were Ilu	Do not know
Fitto	Do not know	Do not know

Non-Food Businesses in the Periodic Market

The periodic market provides an opportunity to many small non-food businesses. Some of these businesses, while non-food, are agriculturally- or natural resource-related. While the market surveys show that the great majority (>90%) of people attending the market have food as their primary purpose, it is clear that multiple objectives are in force, and non-food businesses provide an important niche in the market system, and provide an important outlet for farm-related merchandise. Table 2 shows the inventory of non-food businesses in the periodic markets surveyed.

Many of the non-food items in the periodic market are related to agricultural and livestock production or natural resource extraction. Ropes are often made from sisal plants grown expressly for this purpose. Baskets are made from local grasses and fuel wood is usually locally sourced, as is the timber to make much of the household furniture. Pots

frequently are made from local clays, and hides and skins are related to the livestock market. These businesses, then, depend very much on natural resources for their survival.

TABLE 21: *Non-Food Business in the Periodic Market: # of Sellers*

Market Center	Used Clothes	Shoes	Ropes	Farm Implm.	Fuel Wood	Baskets	Pots	HH Furnitr	Hides & Skins
Dessie	215	34	30	1	29	1	7	3	17
Bati	66	12	31	14	62	.	1	13	6
Kutaber	58	4	42	10	14	16	41	3	4
Pasomile	0	0	0	0	17	0	.	14	.
Bistima	38	23	40	8	73	0	33	41	.
Wore ilu	.	.	.	.	.	.	.	.	.
Harbu	56	41	83	28	181	15	38	29	5
Kemise	25	19	8	21	0	5	0	0	0
Sulula	7	8	4	0	73	0	13	9	26
Tita	3	.	1	1	17	.	2	12	1
Haik	98	40	52	3	227	16	85	6	17
Bokeksa	11	6	14	1	27	0	23	21	10
Wechale	27	2	10	23	91	0	23	13	.
AmbaMar.	0	0	0	0	3	0	.	.	.
Tenta	10	9	23	7	1	5	15	.	.
Fitto	18	2	13	5	0	13	14	316	.
Kombolcha	127	39	4	13	340	8	65	48	.
Ajibar	8	5	36	9	67	11	16	21	14
Akesta	24	2	36	9	0	0	7	8	19

A THEORETICAL MOMENT: SPATIAL STRUCTURES OF CROP PRICES AND FOOD SECURITY

Geographers have provided a wealth of theoretical insight and empirical evidence which leads us to expect that food prices will vary spatially in a predictable manner. Simple initial analyses argue that prices for food will include transport costs, that transport costs vary with distance, and thus the price of food will vary with distance from its sources. A century ago, the German geographer, Heinrich von Thunen, theorized and empirically demonstrated that, using this knowledge, one could predict land use in a region by simply knowing some information about crop prices in the market, transport cost structures and crop yields. Over the last century, Thunen's theoretical contribution has been enhanced as scholars added complexity to his simple geometric framework of concentric circles. In Ethiopia, an important land use study was done around Addis Ababa by Ron Horvath three decades ago.

The analyses of this project will eventually attempt to incorporate many of complexities in order to understand the affect of the environment and differential access on food security. It is now possible to allow transport costs to vary as road presence or absence and road quality varies. It is also possible to incorporate different environmental conditions that may affect fertility. The future use of Geographical Information Systems (GIS) in this project will greatly facilitate these analyses.

A Geographical Theory of Crop Surplus/Deficit

Adding to our thinking about agriculture prices, we will be making certain arguments about how the spatial structure of food prices serves as a good indicator of food security at any given time. Simply, one can easily tell by the geography of food prices which way food is moving. Is it going from the center out to the periphery? Or is it coming from the periphery to the center for distribution outside the region or to areas within the region which cannot grow the crop? It stands to reason that if prices are lower in the crop-growing periphery than in the center for a specific crop, there is evidence it is moving towards the center from the periphery. This would be evidence in support of a crop surplus in the hinterland (periphery). Conversely, if a specific crop's spatial structure of food prices was such that it could be grown in the region, but that the price was higher in the periphery than in the center of the region, then this could be seen as evidence of a food shortage in that crop and that food is moving to hinterland residents who are facing a deficit. This simplified logic does not yet include many other complexities, such as the function of wholesaling and the impact of food aid on prices. Nonetheless, its inherent spatial logic should be robust enough to hold essentially true in our analyses after the inclusion of appropriate complexities.

South Wollo's Spatial Structure of Crop Prices

Inspecting the geographical aspects of the prices in Tables 22a and 22b for major crops reinforces preliminary conclusions made during the market survey. It seems clear at the time of this initial survey (July to September 1998) that the markets were serving a primary function of exporting surplus grain to other parts of the country (e.g., the favorable agricultural zones of Were Ilu and Fitto). The price of all three varieties of teff in Dessie is above the average price in the region. In times of surplus, the urban hierarchy acts in reverse, moving surplus from the lower order centers up the urban hierarchy. In times of deficiency (e.g., during our follow up surveys this year), we expect the urban hierarchy to work as a linkage feeder system to the lower order urban centers in the region. The year 1999 should prove a stark contrast to 1998. The *belg* seasonal rains failed in many areas of the region in 1999. Data currently being collected and analyzed should show interesting contrasts to the previous non-drought year.

The price of teff in the lower altitude non-teff growing areas (e.g., at Bati) is, however, higher than average, reflecting transport costs. The price of maize is relatively constant throughout the region, possibly indicative of a primarily local market for this staple, and the ability to grow it in several agro-ecological zones. For most grains and pulses, however, prices in Dessie are higher than average. High variances exist in the prices of fruit throughout the region, indicating local areas of specialization. We should caution, at this time, that our price data are not complete and need to cross-checked against price data from the market surveys (which follow).

Prices for livestock (see Table 23) vary substantially throughout the region. The price for oxen varied from 400 birr in Bokeksa to 1000 birr in Harbu and for sheep from 30 birr in Bokeksa to 140 birr in Dessie (US\$1 = 7,6 birr at time of survey). This seems also to reflect some urban hierarchical linkage effect.

TABLE 22a: CROP PRICES PER KILOGRAM BY MARKET CENTER

Market	white teff	mixed teff	red teff	Barley	white wheat	mixed wheat	black wheat	Sorghum Yellow	Sorghum Red	horse beans	lentils	field peas	chick peas	maize	oats	finger millet	linseed
Dessie	2.70	2.46	2.40	1.82	2.28	.	1.95	1.92	1.28	1.72	3.83	2.45	1.89	1.38	1.20	.	.
Bati	2.78	2.48	1.88	1.44	.	2.00	1.84	1.52	1.75	2.40	2.25	2.40	2.03	1.44	.	.	2.70
Kutaber	2.72	2.56	2.40	1.72	2.18	1.87	2.08	1.45	1.52	1.61	3.40	2.15	2.00	1.31	1.05	.	1.25
Pasomile	2.72	2.56	2.40	.	2.20	.	.	2.08	2.00	.	.	2.25	2.25	1.42	.	.	2.75
Bistima	2.48	2.40	2.25	1.46	.	.	2.03	2.25	2.00	2.00	3.30	2.24	1.80	1.40	.	1.75	.
Wore ilu	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Harbu	2.52	2.36	2.25	1.49	.	1.95	2.02	2.27	2.06	1.98	3.20	2.19	1.81	1.42	1.08	1.70	2.52
Kemise	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Sulula	.	2.38	2.38	1.52	2.00	2.00	.	.	1.67	1.84	3.30	2.24	1.80	1.40	.	.	3.60
Tita	2.25	2.10	2.03	1.33	2.08	.	.	1.67	.	2.00	3.45	.	2.25	1.32	1.00	2.00	.
Haik	2.48	2.40	2.25	1.52	2.00	.	.	1.67	1.67	1.84	3.30	2.24	1.80	1.40	.	.	3.60
Bokeksa	2.50	2.25	2.30	1.55	2.08	.	2.00	1.70	1.54	1.70	3.41	2.25	1.90	1.45	.	.	.
Wechale	2.44	2.25	2.18	1.37	1.92	.	1.92	1.41	1.37	1.84	3.38	1.43	3.38	1.36	.	2.10	3.60
AmbaMaram	2.70	2.16	2.10	1.40	1.95	.	1.95	1.50	.	1.86	.	.	.	1.32	1.00	.	.
Tenta	2.22	2.16	2.10	1.40	2.01	1.83	2.14	1.50	1.98	1.71	2.61	1.71	1.71	1.35	.	.	.
Fitto	.	2.16	2.10	1.33	2.14	.	2.14	1.50	.	1.82	3.00	1.71	.	1.35	.	.	.
Kombolcha	2.16	.	1.62	.	2.14	.	.	.	.	1.65	3.60	1.43	1.89	1.35	1.08	.	2.53
Ajibar	2.33	2.30	2.25	1.30	2.25	.	2.25	1.45	1.82	1.80	2.82	1.71	1.80	1.38	1.00	.	.
Akesta	2.88	2.72	2.56	1.60	.	2.31	.	.	.	1.65	3.62	1.98	1.20	1.80	.	.	.
AVERAGE	2.53	2.36	2.20	1.48	2.09	2.03	2.03	1.71	1.72	1.84	3.23	2.03	3.11	1.40	1.06	1.89	2.82

TABLE 22b: CROP PRICES BY MARKET CENTER (CONTINUED)

Market	niger seed	sun-flower	Red pepper	green pepper	coffee	cotton	Orange	lemon	Banana	onion	garlic	fenu-greek	vetch	Gesho	potato	eggs
Dessie	.	.	9.00	9.00	14.00	.	0.25	0.07	0.25	3.00	3.50	.	2.30	.	1.75	0.30
Bati	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Kutaber	1.20	0.95	.	.	.	.	0.20	0.10	.	.	.	.	.	.	.	.
Pasomile	.	.	10.00	.	.	.	0.10	.	.	.	.	.	.	.	.	.
Bistima	.	.	10.00	.	13.00	.	0.10	0.03	0.15	.	.	.	.	.	.	.
Were ilu	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Harbu	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Kemise	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Sulula	2.75	.	8.00	.	.	.	.	.	.	.	.	.	.	.	.	.
Tita	.	.	9.00	.	14.00	.	0.25	0.08	0.25	3.00	3.50	.	.	.	.	0.50
Haik	2.70	.	.	.	.	.	.	.	.	.	.	2.40	1.28	.	.	.
Bokeksa	.	.	7.00	.	.	.	0.10	0.01	0.08	.	.	.	.	.	.	.
Wechale	3.60	.	.	.	15.00	5.00	0.25	0.03	0.02	.	.	.	.	.	.	.
AmbaMarim	.	.	.	.	.	.	0.25	0.20	.	.	.	.	.	.	.	.
Tenta	.	.	9.00	.	13.00	.	0.10	.	0.15	.	.	.	.	.	.	.
Fitto	.	.	12.00	.	8.25	.	.	.	.	.	.	.	.	.	.	.
Kombolcha	.	.	.	.	13.70	3.75	0.15	0.10	0.25	.	.	1.24	.	1.00	.	.
Ajibar	.	.	11.00	.	15.00	4.00	0.30	0.05	0.20	.	.	.	.	.	.	.
Akesta	.	.	7.00	.	12.00	.	0.25	.	0.25	.	.	.	.	.	.	.
AVERAGE	2.56	0.95	9.20	9.00	13.11	4.25	0.19	0.07	0.18	3.00	3.50	1.82	1.79	1.00	1.75	0.50

Prices either by kg or count.

TABLE 23: LIVESTOCK PRICES PER ANIMAL BY MARKET CENTER

Market	ox	cow	Mesina	Bull	gidder	Calf	Sheep	Ram/goat	billy goat	donkey	mule	Horse
Dessie	650.	375.	800.	260.	160.	70.	140.	180.	60.	60	900.	150.
Bati	600.	450.	550.	400.	300.	200.	45.	200.	50.	.	.	.
Kutaber	750.	450.	500.	300.	300.	100.	.	.	.	150.	800.	200
Pasomile	.	.	.	.	.	.	.	.	.	.	.	.
Bistima	450	275.	500.	375.	200.	100.	60.	275.	60	65.	750.	150
Were ilu	.	.	.	.	.	.	.	.	.	.	.	.
Harbu	1000.	700.	900.	300.	300.	175.	70.	225.	50.	185.	.	.
Kemise	.	.	.	.	.	.	.	.	.	.	.	.
Sulula	.	.	.	.	.	.	100.	75.	.	.	.	.
Tita	.	.	.	.	.	.	.	.	.	.	.	.
Haik	800.	750.	.	400.	200.	160.	60.	200.	50.	.	.	.
Bokeksa	400.	125.	.	150.	100.	50.	30.	120.	40.	120.	.	.
Wechale	.	.	.	.	.	.	85.	170.	65.	.	.	.
Amba Mariam	.	.	.	.	.	.	.	.	.	.	.	.
Tenta	600.	400.	350.	400.	275.	120.	60.	125.	45.	.	.	.
Fitto	600.	350.	.	175.	.	150.	60	120.	45.	.	.	.
Kombolcha	.	.	.	.	.	.	35.	35.	56.	.	.	.
Ajibar	.	.	.	.	.	.	40.	170.	43.	.	.	.
Akesta	600.	550.	500	400.	300	175.	50	70.	.	.	.	.
AVERAGE	645.	442.50	585.71	316.	237.22	130.	64.23	151.15	62.42	116.	816.67	166.67

Spatial Structure of Crop and Livestock Sales

While some crops could be considered staples in the region (e.g., teff, maize, lentils) and are available in most markets, others are relatively geographically specialized in nature and main markets exist for them. For example, Tables 24a and 24b indicate that Haik specializes in onions, Bistima in oranges, Kutaber in horse beans, Bokeksa in sorghum, Harbu in bananas and mixed wheat, and Bati in fenugreek. These geographical differences in the study area are as expected, given the agro-ecological zonation of highlands in the west and lowlands in the east. It is important to emphasize that the spatial structure of markets is seasonal. We might expect to find more geographical variation during harvest seasons when crops are perishable, versus during the season of the survey when many crops are durable. Table 25 shows the varied activity of livestock sales in the region.

Sources of Crops and Livestock in the Market Centers

In the urban inventory, enumerators determined the primary source for each type of crop and livestock commodity in each market center. For most grain and pulse crops in the great majority of market centers (over 80%), the food was procured from the locality of the market center. For teff, only two of the market centers surveyed were reported as having acquired the teff from Addis Ababa, all others acquired it from the locality or from Kombolcha in one case. Maize, which is multi-sourced, is the exception to the locality rule. One-third of the market centers were reported as having acquired their maize from Dessie, and four centers reported getting maize from a combination of Addis Ababa and Gonder. Unfortunately, it was impossible at this time to determine linkages further up the geographical food chain, e.g., the traders in Dessie may well have procured maize from outside the region (further surveys of Dessie traders are planned). Discrepancies between market surveys reported earlier and trader surveys will hopefully be rectified in this year's research effort. Dessie is also the major source of red pepper and coffee sold in the market centers of the study area, and may also be a source of maize in the markets.

Almost all livestock for sale at the time of the survey were from sources in the locality of the market centers selling them (see Table 25). Externally-sourced livestock was less than five percent of the total primary sources reported for market centers. These data, and the data on livestock prices, may indicate that the inter-urban livestock market has not fully developed.

TABLE 24a: CROP SELLERS BY MARKET CENTER

Market	White Teff	mixed teff	red teff	barley	White wheat	mixed wheat	Black Wheat	sorghum yellow	sorghum red	horse beans	lentils	Field peas	chick peas	maize	oats	finger millet	lin-seed
Dessie	9	47	2	29	28	x	31	19	14	35	11	11	30	123	7	.	.
Bati	99	31	22	32	.	11	31	40	27	6	23	18	12	90	.	.	20
Kutaber	26	27	64	40	11	55	11	38	51	183	18	14	21	200	12	.	12
Pasomile	17	23	9	.	1	.	.	44	7	.	.	3	5	25	.	.	7
Bistima	15	37	26	9	.	.	46	18	27	15	7	6	6	55	.	6	.
Wore ilu	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Harbu	128	72	43	20	.	108	56	.	37	.	15	9	32	240	23	18	27
Kemise	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Sulula	.	24	25	12	2	21	.	.	7	12	9	14	13	82	.	.	10
Tita	7	14	15	9	3	.	.	2	.	9	8	.	11	17	4	15	.
Haik	13	41	26	39	47	.	.	101	70	30	22	24	6	139	.	.	8
Bokeksa	4	15	.	8	14	.	5	54	14	16	14	9	24	43	.	.	.
Wechale	78	25	41	11	31	.	3	42	7	75	23	33	26	79	3	6	12
AmbaMaria	1	2	7	13	2	.	4	4	.	4	.	.	.	18	2	.	5
Tenta	9	15	34	27	24	9	17	1	11	9	11	12	16	51	.	.	9
Fitto	.	1	14	121	12	.	3	13	.	5	12	4	.	49	.	.	.
Kombolcha	50	.	10	.	13	.	.	.	.	18	33	21	23	89	46	.	17
Ajibar	3	24	17	19	30	.	14	16	24	13	9	14	14	35	4	.	.
Akesta	6	37	15	13	.	23	.	.	.	8	9	16	42	57	.	.	.
AVERAGE	31.00	27.19	23.13	26.80	16.77	37.83	20.09	30.15	24.67	29.20	14.93	13.87	18.87	65.27	12.63	11.25	12.70

TABLE 24b: CROP SELLERS BY MARKET CENTER (CONTINUED)

Market	Niger Seed	sun-flower	red pepper	Green Pepper	coffee	cotton	orange	Lemon	banana	onion	garlic	fenu-greek	vetch	Gesho	potato	eggs
Dessie	.	.	24	32	23	.	.	.	.	64	4	.	85	.	31	17
Bati	15	11	65	5	41	22	.	25	.	60	41	59	.	.	.	.
Kutaber	19	11	76	36	35	.	4	8	17	35	16	.	.	14	.	.
Pasomile	.	.	10	14	24	.	3	.	8	.	.	.	.	5	.	.
Bistima	.	.	52	47	182	.	48	13	28	22	19	.	.	.	.	.
Wore ilu	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Harbu	.	.	86	.	15	.	33	30	110	31	10	.	.	.	.	.
Kemise	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Sulula	8	.	38	.	33	.	.	.	.	23	19	.	.	24	.	24
Tita	.	6		11	17	.	3	.	2	12	5	.	.	3	.	.
Haik	31	.	6	9	39	.	.	12	.	116	73	3	39	.	22	.
Bokeksa	.	.	84	53	85	.	17	8	15	23	23	.	.	14	.	.
Wechale	15	.	15	4	12	9	3	11	20	34	21	.	.	.	.	.
Amba Maram	.	.	63	7	11	.	5	4	2	.	.	.	.	3	.	.
Tenta	.	.	.	.	43	.	8	.	14	23	15	.	.	.	.	.
Fitto	.	.	35	61	101	.	.	.	.	8	4	.	.	8	.	.
Kombolcha	.	.	46	.	127	26	20	15	15	.	.	75	.	23	.	.
Ajibar	.	.	.	.	19	15	24	32	13	.	.	.	.	.	.	.
Akesta	.	.	18	.	11	1	13	.	.	.	.	.	.	.	.	.
AVERAGE	17.60	9.33	44.14	25.36	48.12	18.00	15.08	15.80	22.18	37.58	20.83	45.67	62.00	11.75	26.50	20.5

TABLE 25: LIVESTOCK SELLERS BY ANIMAL TYPE BY MARKET CENTER

Market	ox	cow	Mesina	bull	gidder	calf	Sheep	ram/goat	billy goat	donkey	mule	Horse
Dessie	200	120	3	86	57	30	118	10	33	12	41	15
Bati	.	.	.	.	.	.	.	.	.	.	.	.
Kutaber	65	20	2	30	45	38	.	.	.	5	8	15
Pasomile	.	.	.	.	.	.	.	.	.	.	.	.
Bistima	150	150	150	150	150	150	42	83	83	37	22	1
Wore ilu	.	.	.	.	.	.	.	.	.	.	.	.
Harbu	71	32	.	50	94	70	21	93	93	3	.	.
Kemise	.	.	.	.	.	.	.	.	.	.	.	.
Sulula	.	.	.	.	.	.	23	24	.	.	.	.
Tita	.	.	.	.	.	.	.	.	.	.	.	.
Haik	240	120	.	65	21	.	14	3	6	.	.	.
Bokeksa	156	35	.	24	19	47	27	4	57	12	.	.
Wechale	.	.	.	.	.	.	13	23	23	.	.	.
Amba Mariam	.	.	.	.	.	.	.	.	.	.	.	.
Tenta	.	.	.	1	1	3	15	28	28	.	.	.
Fitto	5	8	.	7	.	5	61	2	3	.	.	.
Kombolcha	.	.	.	.	.	.	145	80	18	.	.	.
Ajibar	.	.	.	.	.	.	47	19	56	.	.	.
Akesta	25	15	4	10	15	16	34	45	6	.	.	.
AVERAGE	114.00	62.50	39.75	47.00	50.25	44.88	46.67	34.50	36.91	13.80	23.67	10.338

MARKET SURVEYS

Periodic markets form the core of economic activity for many local places in Africa. As a locus of trade, these markets primarily serve hinterland residents who come to sell their surplus and buy needed commodities. Traders and transporters attend these markets to both buy surplus for sale in other market centers and to sell surplus from other market centers. The market surveys conducted targeted market participants who were not in the trader/transporter category.

Research Design and Implementation

The survey strategy was to sample sellers and buyers on a market day in a ratio of 2:1 to insure a strong data base on local sellers, prices and commodities available in particular markets. A total sample of 817 respondents was achieved, averaging more than forty in each of 20 markets. Of this number 274 were buyers and 543 were sellers. The sampling strategy could best be described as a stratified random walk strategy. For both sellers and buyers, the stratification was based on the commodity being purchased (in Ethiopia markets are spatially stratified by commodity being sold). Enumerators were instructed to enter a specific commodity sales area in the periodic market and then interview based on a random count (e.g., the 3rd, the 5th, etc.). The random counts were provided by the head of the enumerator team. After each interview they moved to a new commodity area and a new random count. The team leader of the enumerators determined which were the major commodities being sold in a given market and stratified the sample on site. A cross check for this stratification is available from the urban inventory survey. Buyers were also surveyed randomly. In the field it was quickly determined that buyers could easily be distinguished from sellers in most cases, since buyers were standing and sellers were sitting.

The purpose of the market survey is to provide information on the first stage of the rural-urban market linkage. Data are gathered to detail specifics of residential location, distance traveled, transport mode, rates of attendance, competing markets, commodities bought and sold and prices.

Access at the Local Market Center Level

The survey indicated that the overwhelming majority of market attenders (91.8%) walked to market. There were no significant differences between buyers and sellers in mode of transport used (see Table 26). Given the small number of non-walkers (66 spread over 5 categories), only walkers will be analyzed in the statistical testing. It should be noted that those market attenders performing a wholesale function are captured in the trader/transporter survey.

TABLE 26: MODE OF TRANSPORT OF SAMPLED MARKET ATTENDERS

MODE OF TRANSPORT	BUYERS	SELLERS	TOTAL	%
Walk	248	495	743	91.8
Bus	13	18	31	3.8
Animal Driven Cart	2	4	6	0.7
Taxi	7	10	17	2.1
Truck	1	5	6	0.7
Other	1	5	6	0.7
TOTAL	272	537	809	100.0

During the survey, respondents were asked two questions pertaining to distance traveled to the market center. The first question, distance traveled in kilometers, proved to be difficult to answer for most respondents and yielded too few reliable answers for analysis. The second question proved much easier to answer. It asked “How long does it take you to get to this market?” From the sample of 817 respondents, 668 valid responses to this question were received (225 buyers and 443 sellers), for a response rate of 82.5%.

Analyses of the market survey results indicate that the surveyed populace meet the expectations of the research design. They are largely local, largely walk to the market (91.8%) from the surrounding hinterland, and are largely involved in small scale trade. Compared to similar studies in Kenya and Zimbabwe, Ethiopians are much more likely to walk to periodic markets than their fellow Africans in the countries of Kenya and Zimbabwe (where the average percent who walk to market is around 50%).

The average time traveled (see Table 27) to reach the market was 109 minutes, but this result is heavily weighed by a few outliers. The median is a more accurate representation in this situation. Thus the typical participant traveled for about an hour to attend the market. Enumerators estimate that the average “ground speed” for a walker carrying a load is about 4-5 km/hour. Thus, the typical seller comes from an area averaging about 4-5 kilometers away. While buyers on average spent more time coming to the market, this difference is not statistically significant and buyers and sellers median times are equal.

TABLE 27: AVERAGE AND MEDIAN TRAVEL TIME TO THE PERIODIC MARKET

SAMPLE	AVERAGE TIME	MEDIAN TIME	SAMPLE SIZE
Buyers Sample	123.02 minutes	60 minutes	225
Sellers Sample	102.53 minutes	60 minutes	443
Total Sample	109.43 minutes	60 minutes	668

Further inspection of the data reveal that over 90% of the sampled market attenders traveled no more than three hours. Thus it can be argued that the effective spatial range of the 20 markets surveyed was in the neighborhood of 12-15 kilometers (see Figure 3).

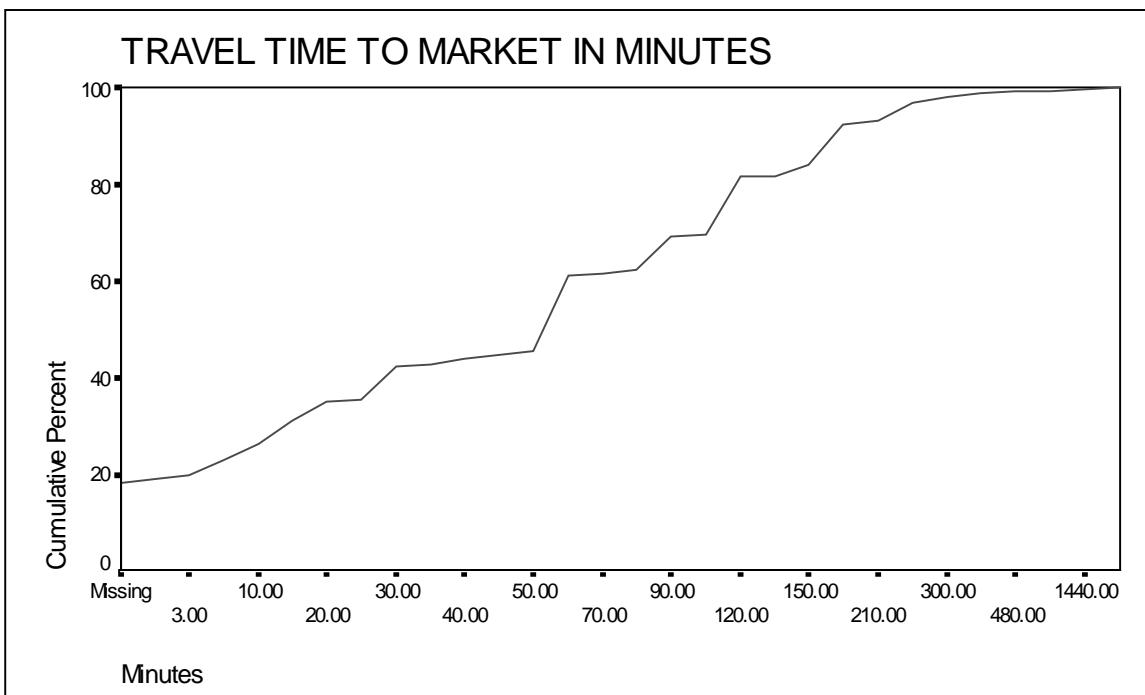


FIGURE 3. *Travel Time to Market in Minutes, Cumulative Percent*

The majority (57.9%) of sampled market attenders came to that market either every market day or once a week (see Table 28). Note, for most market centers there is only one market day, but for those who attend markets in centers where there are multiple market days, many attend all of the market days. Few came daily (2.1%). The results indicate that the typical sampled market attender regularly used that market. There was no major difference between buyers and sellers on frequency of market attendance.

TABLE 28: FREQUENCY OF MARKET ATTENDENCE

Frequency	Number of Attenders	%
Daily	17	2.1
Every Market Day	215	26.4
Once a Week	257	31.5
More Than Once a Month	138	16.9
About Once a Month	65	8.0
Rarely	123	15.1
Total	817	100.0

Problems affecting market attendance reflect the fact that the great majority of these people walk to market. Table 29 documents the mentions of these problems among the respondents (multiple mentions are possible). It is clear that the rains are the major cause of market center disruption of access. What will be of great interest in subsequent analyses, are the problems facing non-attenders. These problems should surface during household surveys later in the project.

TABLE 29: PROBLEMS AFFECTING MARKET ATTENDANCE

PROBLEM	# MENTIONING	%
Rains	302	37.0
Lack of Transportation	87	10.6
Lack of Infrastructure	203	24.8
Too Far	105	12.9
Other Problems	101	12.4

Using other markets by either sellers or buyers is a strong indicator of spatial market integration. There is a statistically significant difference (chi-squared significant at <0.01) between the use of other market places between buyers and sellers. While buyers split almost 50-50 on this question (136 use another market, 135 do not), slightly over 60% of sellers do not use another market. This result is another indicator of a probable crop surplus situation (refer back to the “Theory...” section). If there is a surplus, then food is flowing from the hinterland to the core and from there to other areas in the region or country that don’t grow that crop. In a functioning market system with a surplus situation, the market should “clear” for sellers of local crops. By “clearing,” we mean that the situation is normal and that supply and demand should work such that farmers bringing their crops to market should be able to sell them, meeting the demand of people in the locality and those from outside the locality seeking the food item. In a deficit situation we would expect the reverse to occur. There will be few “local” sellers and most sellers will have procured supplies from outside the region and work multiple markets. Thus during a deficit situation, we would expect sellers to use multiple markets more than during a surplus situation where the most local market should allow for market clearance from local sellers. The next round of analyses, taken this year during a famine situation, should provide a wealth of evidence clarifying these relationships.

It is important to remember that periodic market users are overwhelmingly local. Buyers in the market may use other markets primarily because the products they are seeking are not available locally. Thus we would expect that buyers use other market places more frequently than sellers in a normal market situation. If the market is working normally, sellers need only come to the nearest functioning market to sell their goods. There, wholesalers and other demanders should pay a fair price, and the seller should not need to seek further markets.

Profiles of Market-Attenders

Two-thirds of the market attenders classed themselves as rural-dwellers. Again there was little difference between buyers (62.9%) and sellers (68.0%) in their self-classification as urban or rural dwellers. It is interesting to note that even one-third of respondents classed themselves as urban dwellers. The residential situation in Ethiopia blurs urban and rural distinctions somewhat. People at times identify themselves as ‘resident’ of nearby urban areas, even though they live in essentially a rural setting. These results, however, are interesting, since they represent a lower population of rural dweller than that of Ethiopia in general. There are two possible explanations: 1) people overstate their ‘urbanness’ or 2) many rural dwellers do not use the market. One of the goals of this project is to explore the

degree to which the second explanation may be true. Do many rural dwellers simply not use local markets because they have limited access? What would be the implication of this fact on food security?

Crop Product Structure of the Markets

The great majority (95.2%) of the sampled buyers who are market-attenders came to the market to buy only food products. The demand side of the markets is shown in Table 30. Teff and maize are the most demanded crops in the region, although the fact that they are storable grains coupled with the seasonality of the markets, does not allow generalization across seasons. What is clear from Table 30 is that a wide variety of food products are demanded and provided for in the markets.

TABLE 30: CROPS PURCHASED BY SAMPLED BUYERS

CROP	#	%
teff	30	14.6
sorghum	14	6.8
wheat	14	6.8
maize	27	13.1
teff&zengada	2	1.0
wheat & maize	4	1.9
zengada	2	1.0
horse bean	10	4.9
salt	4	1.9
grass pea	22	10.7
barley	19	9.2
potato	2	1.0
coffee	5	2.4
pepper	7	3.4
onion	3	1.5
lentils	11	5.3
bean	10	4.9
nueg	2	1.0
abeshe	1	.5
adengwaare	1	.5
chick peas	3	1.5
butter	3	1.5
banana	1	.5
egg	2	1.0
tekel gomen	2	1.0
selit	2	1.0
carrot	1	.5
kimemakimem	1	.5

TABLE 31: CROPS AND LIVESTOCK SOLD BY SAMPLED SELLERS

CROP	COUNT	%
teff	48	9.9
sorghum	28	5.8
wheat	30	6.2
maize	48	9.9
wheat & maize	1	.2
zengada	9	1.9
horse bean	23	4.7
salt	15	3.1
grass pea	29	6.0
barley	28	5.8
potato	3	.6
coffee	14	2.9
boloke	3	.6
pepper	13	2.7
onion	16	3.3
lentils	21	4.3
bean	29	6.0
telba	12	2.5
nueg	7	1.4
abeshe	11	2.3
adengwaare	7	1.4
chick peas	21	4.3
butter	4	.8
banana	4	.8
papaya	2	.4
sweet potato	1	.2
chicken	2	.4
egg	2	.4
tekel gomen	3	.6
oil	3	.6
cow	4	.8
selit	2	.4
orange	4	.8
sheep	4	.8
goat	7	1.4
trengo	2	.4
carrot	1	.2
gomen zer	2	.4
sugar	7	1.4
kimemakimem	1	.2
keye sir	2	.4
karia	2	.4
honey	1	.2
beso	1	.2
shiro	1	.2
pepper floor	2	.4
sufe	1	.2
tomato	1	.2
oxen	2	.4
bull	1	.2
calf	1	.2

The supply side of the study area's regional market is somewhat indicated in Table 31. While this table gives some broad indicators of food products being supplied, it should not be used to indicate relative importance of suppliers, since it was somewhat influenced by the sampling protocol. It should be noted that this is an aggregate regional 'picture' of food production and that there wide variances (often indicated in other tables above) in this food production pattern. The crop reports at the end of the urban inventories will provide a more accurate depiction of actual food supply structures. Nonetheless, the importance of teff and maize, as was shown in the purchasers data in Table 30, is further supported by these data in Table 31.

Crop Price Structure of the Markets

Average prices for the top ten crops sold are displayed in Table 32. All the major crops sold at this time in the market are grains and pulses. They are largely sold by volume using standardized local containers (sahen, tassa, birchiko and kubaya) as units of measurement. At the moment, due to the use of different units of measurement, the comparability and analyzability of the data is substantially diminished. [Note: In the next stages of field research it will be necessary to convert each local unit of measurement for each crop by weighing it and computing the kilogram equivalents].

TABLE 32: MAJOR CROP PRICES IN BIRR AVERAGED OVER 19 MARKETS BY LOCAL UNIT OF MEASUREMENT

CROP	KILOGRAM	SAHEN	TASSA	BIRCHIKO	KUBAYA
Teff	--	3.51	2.99	0.85	1.00
Sorghum	1.83	2.62	2.17	0.50	2.17
Wheat	2.00	3.23	2.25	0.70	1.32
Maize	--	2.32	1.60	0.50	0.50
Horse bean	--	3.33	2.38	0.60	0.60
Grass pea	2.20	2.00	1.60	--	0.40
Barley	--	2.11	1.86	0.35	0.50
Beans	--	2.90	1.91	--	0.52
Lentils	3.00	4.94	3.23	--	1.49
Chick peas	--	3.09	2.17	--	--

US\$1 = 7.6 birr at time of survey. Prices obtained August/September, 1998.

Geographical Variation in Crop Prices

Substantial variation for the prices of major crops exists within the study area (see Table 33 for teff and Table 34 for maize). It will be an important aspect of this research to explain these price differentials. For example, the price per sahen of teff in Dessie is higher than at the other four locations in the region where the price was recorded by that unit of measurement. One possible interpretation of this result is that there existed at the time of the survey adequate grain in the region and that the best market strategy for locals was to export grain through Dessie.

The differentiation between less accessible centers with lower prices and more accessible nearby centers with higher prices may well indicate that grain is being stored and consumed locally versus being exported from the locality. In markets centers of low access, transport costs may dictate that the grain remains in the local market versus sustaining the transport costs that might make them noncompetitive in a buyers' market.

TABLE 33: VARIATION IN THE PRICE OF TEFF BY MARKET CENTER & UNIT OF MEASUREMENT

MARKET CENTER	AVG. PRICE /SAHEN	AVG. PRICE/TASSA
Dessie	3.77	---
Kutaber	---	3.60
Pasomile	---	2.55
Bestima	---	3.10
Boru Meda		2.40
Kombolcha	3.30	---
Tenta	3.52	2.87
Ajibar	---	3.62
Bokekesa	---	3.93
Sulula	---	3.00
Paso melle	---	3.45
Fitto	3.45	---
Were-ilo	3.55	---
Wechalle	---	3.00

Note: Prices obtained August/September 1998.

The price pattern for maize (Table 34) shows less variation, and the numbers on which the means are based are small, so not too much can be said about the patterns, although, given Dessie had no maize sellers surveyed, accessibility still seems to have an impact on prices.

TABLE 34: VARIATION IN THE PRICE OF MAIZE BY MARKET CENTER AND UNIT OF MEASUREMENT

MARKET CENTER	AVG. PRICE/SAHEN	AVG. PRICE/TASSA
Kutaber	3.60	1.60
Pasomile	2.55	1.70
Haik	---	1.68
Bestima	3.10	1.71
Boru Meda	2.40	1.70
Tenta	2.88	1.68
Bokekssa	3.93	2.00
Sulula	3.00	---
Paso Melle	3.45	---
Wechalle	3.00	---

Note: Prices obtained August/September 1998

These data and many other in this report give a sense of the potential contribution that can be made once data gathering and analyses are complete and once they are integrated with other complementary analyses (e.g., household surveys) and integrated with a Geographical Information System to enhance spatial analytical capability.

Preliminary Conclusions

Based on the first round of data collection in the region, some preliminary conclusions and findings can be made. These will be addressed and updated in subsequent field research.

- Market centers are located in diverse environments spanning five agro-ecological zones.
- Accessibility to larger market centers is a serious problem for food security links for at least three of the market centers that are one hundred or more kilometers from Dessie over rough roads.
- Urban inventories are intended to provide a ‘census’ of economic activities and the availability of services in a market center.
- The urban inventory survey is not yet complete, so the results reported here are largely descriptive.
- Infrastructure is provided in a varied mix in the market centers surveyed, with notable deficiencies.
- Government services are also provided in a variety of combinations. Of concern for food security, four of the market centers surveyed have no access to local services of the Ministry of Agriculture.
- Non-Governmental Organizations only operate in seven of the 19 market centers surveyed.
- Financial services are available in the majority of market centers. Microenterprise lending is available in only two of the centers.
- Social services are well represented in the market centers. All but one center has health services, and the majority of towns have skills training centers and other educational services.
- Commercial services related to food security are available in the market centers surveyed on a very limited basis.
- All but one market center reported experiencing “food shortages or problems.”
- Food aid was largely provided by the government, but was often considered ineffective.
- The spatial structure of crop prices indicates a region where in 1998 certain locations experienced marketable surpluses of important staple crops.
- Crop specialization zones are evident from the data.
- Livestock prices and availability are highly varied and geographically complex.
- The great majority of periodic market attenders walk to market.
- While the typical market attender walks for about an hour to get to the market, the great majority walk no more than three hours.
- The spatial range of the typical market is no more than 15 kilometers.
- The typical market attender frequents the market either every market day or once a week.
- Rains and lack of infrastructure were the major problems affecting market attendance.
- Buyers are more likely to attend another market than sellers. In other respects there is little difference in the behavior patterns of buyers and sellers.
- A wide variety of crops and livestock is available in the market, with grains and pulses dominating.

- There is an interesting geographical pattern of prices for major crops, that mainly shows the effects of differences in transport costs and surplus production areas.
- The trader/transporter survey reveals that surveyed participants are overwhelmingly from the study area.
- Transporters largely are hired wage labor, working in two-person teams, although the owners largely live in the study area.
- Transporters move both goods and people, and only about one-third surveyed specialize in transporting only goods
- Transporters tend to be established businesses, with high start-up costs, using well-worn vehicles.
- Transporter routes are well established, and seem to have been influenced by market mechanisms.
- Transport costs are relatively stable and even throughout the major points in the region, indicating a relatively market-based structure for accessible points.
- Traders are largely working owners, and if not, family members of the owner.
- Traders surveyed are highly varied in terms of business transacted and their demographic situation.
- Maize, sorghum, pulses, teff are dominant crops for traders.
- Spatial patterns of trading vary by crop.
- Reported profit margins for all crops traded are quite low (usually <5%), perhaps indicating that the market is quite competitive in trading from the main market centers, or that consumer purchasing power is very low and places downward pressure on trading margins.
- There is some indication that trading from less accessible centers results in higher profit margins.