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RESEARCH WITH FARMERS

Lessons from Ethiopia

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Preface

Agriculture is the mainstay of the Ethiopian national economy, accounting for over 40% of the national gross domestic product, over 90% of the national foreign exchange earnings and over 85% of the national labour force. Despite its great importance as well as potential, agriculture remains unproductive. Although a host of factors account for the low agricultural productivity, the availability and use of improved agricultural technologies constitute the major limitations to date.

Experiences from the developed countries as well as from some of the developing countries clearly show that modern agricultural technologies play a crucial role in raising agricultural productivity. It was in light of this truth that the Ethiopian government took tentative steps to organize a national research scheme some three decades ago. Over the years, the national research organizations have carried out numerous experiments to identify technologies that may contribute to increased productivity of crops and livestock under various agro-ecological conditions. It is sad to note that these technologies have contributed very little to raising agricultural productivity, especially in the small-scale farming sector that accounts for over 95% of the cultivated land and over 90% of the total production in Ethiopia.

This state of affairs raised the obvious need for reassessing the research objectives, goals and strategies of the national research system. A cursory glance shows that adoption of agricultural technologies by farmers is minimal. The reason for this could be traced to (1) the inadequate availability of 'appropriate' technologies, (2) farmers' unawareness of the technologies that have been identified for their areas, (3) unavailability of the necessary inputs and supplies as and when needed by producers and (4) policy issues that discourage technology adoption.

It is with these circumstances in mind that the Institute of Agricultural Research (IAR), as the organization responsible for national agricultural research, recast its organizational structure and resource distribution to address this pressing issue. Besides strengthening its agricultural economics research programme, it also created a new division to address the linkages between technology generation and

activities should be prepared by a committee with representatives from both organizations. Research-extension liaison committees have been set up between IAR and the Ministry of Agriculture; such committees should also be established with the Ministry of State Farms, Coffee and Tea Development.

- *Incorporate a farming systems approach into projects.* Although it was started over 13 years ago, the Coffee Improvement Project has only recently started working with smallholders, who account for 95% of Ethiopia's coffee production. The project adopted a 'target-dominated' approach based on achieving physical targets, e.g., the number of hectares planted, rather than an approach based on advising farmers about recommended practices (CIP 1987). Instead of persuading farmers to voluntarily participate in project activities, farmers were required to participate, even when they could not obtain any benefits from doing so. Future projects need to incorporate a farming systems approach, that is, be based on farmers' felt needs, and to involve farmers in their preparation, execution and evaluation. Project interventions need to be evaluated, ex-ante and ex-post, from farmers' own points of view. Incorporating a farming systems perspective into project implementation can help ensure that projects contribute to improving farmer welfare, increasing productivity and benefiting the nation as a whole.

Finally, this chapter highlights the usefulness of diagnostic surveys in providing information for policy makers. Whereas the surveys began by focusing on technological interventions, they were modified to examine the impact of government policies on small-scale coffee production and to propose policy changes. In the two years following publication of the first informal survey results, several of the survey report's policy recommendations were adopted, e.g., the disbandment of the commonholdings and the forced labour practices. While it is impossible to ascertain the influence that these reports had in effecting policy changes, it is known that the reports were distributed and discussed among concerned officials.

Chapter Fourteen

Socioeconomic Constraints to Increasing Maize Production

Legesse Dadi, Wilfred Mwangi and Steven Franzel

Maize is a relatively recent crop in Ethiopia, first introduced in the 16th century, but its cultivation has increased rapidly because of its high yield potential. As is true of the cereal sector as a whole, the country's self-sufficiency in maize has been declining over the years. Consequently, maize is one of four crops given national priority, the others being wheat, sorghum and barley (Dejene *et al.* 1987). Substantial resources are being allocated to support research and extension on it. However, socioeconomic constraints tend to limit maize production and the adoption of new production technologies.

This chapter examines Ethiopia's maize subsector, including production trends and practices, marketing, utilization and socioeconomic constraints faced by farmers. The findings are based on farm surveys conducted by interdisciplinary teams of the Institute of Agricultural Research in maize-growing areas including Legesse *et al.* (1987) (see Chapter 4), Kassahun *et al.* (1988, 1989), Tilahun and Teshome (1987) (see Chapter 9) and Raya (1988). Three of these five studies included both informal and formal surveys; the other two were based on informal surveys. Secondary information from institutions concerned with the maize sector was also consulted.

This chapter also seeks to show how micro-level information, originally intended for use by researchers, can be useful for a more general audience including policy makers, managers of agricultural support services and planners. Thus, whereas the objective of each of the above surveys was to examine constraints in a particular area, this chapter generalizes the results over Ethiopia's maize-growing areas as a whole. The constraints discussed include those related to technologies, institutions and policies affecting maize production.

Maize Production: Structure and Trends

In Ethiopia maize ranks first among the major cereals in production and yield per hectare and fourth in total area (Table 2.1). It is widely grown in the eastern, southern, central, southwestern and western mid-altitude parts of the country. It

Table 14.1. Maize area, production and yield by type of farm 1987

Sector	Area '000 ha	Area %	Production '000 t	Production %	Yield t/ha
Main season meher, 1987					
Small farmers	781	71.3	1502	76.5	1.92
State farms	59	5.4	179	9.1	3.03
Producer cooperatives	58	5.3	97	4.9	1.66
Minor season belg, 1988					
Small farmers	192	17.6	179	9.1	0.93
State farms	0		0		–
Producer cooperatives	4	0.4	7	0.4	1.83
Total	1094	100.0	1964	100.0	

is an important crop representing 40–50% of the total production of the western region (EMA 1988).

Maize is produced on three types of farms in Ethiopia: small farmers, producer cooperatives (PCs) and state farms. Compared with the other two sectors, state farms use more modern production technologies such as improved seeds, commercial fertilizers, herbicides, tractors and combine harvesters.

In 1987 small farmers cultivated 89% of the total maize area and accounted for 86% of the maize produced (CSA 1989a). State farms account for 6% of the area and 10% of production. Producer cooperatives contribute less than 3% of the maize area and production (Table 14.1).

Table 14.2 shows annual growth rates in area, production and yield of maize over various periods. In the 40-year period between 1948–50 and 1985–87 maize production in Ethiopia increased from 0.16 million to 1.45 million metric tons. The average production growth rate for that period was 5.8%. The major source of growth in maize production was through expansion in area, which grew at 3.53% annually. The growth in area was especially dramatic between 1948–50 and 1961–63, averaging 9.24% annually over the period.

A large number of farmers have shown great interest in growing maize because of its high yield potential (Dejene *et al.* 1987) and because as a food crop it matures early. However, as indicated in Table 14.2, from 1961–63 to 1985–87 growth in area under maize and hence growth in maize production declined significantly. In fact the maize area was reduced between 1970–72 and 1979–81. Many factors account for this decline: the droughts of 1974–75 and 1984, lack of oxen and seed in the years following, unavailability and high price of inputs.

The growth rate in maize production for the period between 1961–63 and 1985–87 has been on average less than the currently estimated population growth rate of 2.9% per annum. But this is in keeping with the general picture of food production in Ethiopia. For instance, from 1973 to 1984 food production grew by

Table 14.2. Maize area, production and yield annual growth rates (%)

Period	Area	Production	Yield
1948–50 to 1961–63	9.24	10.46	1.22
1961–63 to 1970–72	1.17	2.77	1.59
1970–72 to 1979–81	–1.29	2.90	4.19
1979–81 to 1985–87	0.86	2.50	1.65
1948–50 to 1985–87	3.53	5.80	2.27

Source: FAO production data from annual yearbooks

2.1% while the population grew by 2.9%. The maize production growth rate over the same period was 1.5% (ONCCP 1988). Hence maize production as well as food production in general has not been keeping pace with population growth.

As shown in Table 14.3 the average maize yield in Ethiopia is high relative to that of most countries in eastern and southern Africa and sub-Saharan Africa as a whole. This has been mainly due to (1) the high yields realized by the state farms, on average 2.3 t per hectare compared to 1.6 t and 1.2 t by the peasants and producer cooperatives respectively, (2) favourable weather and (3) a concerted effort to promote the use of modern inputs in high-potential areas where maize is a major crop. However, the yield is low relative to that of other developing countries. For the period 1983–87 it was on average 79% of their yield.

Maize production practices

Maize is produced mainly under rainfed conditions by small farmers using few or no purchased (modern) inputs. They use rudimentary implements such as a

Table 14.3. Maize area and yields in Ethiopia and selected countries of eastern and southern Africa, 1983–87

	Maize area 1983–87 (million ha)	Maize yield 1983–87 (t/ha)
Ethiopia	0.81	1.73
Tanzania	1.69	1.16
Kenya	1.50	1.55
Zimbabwe	1.30	1.27
Malawi	1.16	1.15
Zambia	0.57	1.84
Sub-Saharan Africa	13.76	1.15
Developing countries	78.71	2.19

Source: FAO production data from annual yearbooks

wooden plough with a small metal tip (the *maresha*), an ox yoke and shovels. Generally, irrigation is not used in maize production, but farmers with access to irrigable land produce maize in the off season using either open-furrow irrigation or residual moisture on bottom fields. In distribution of fertilizer and seeds the government gives priority to PCs and state farms. Thus they use more fertilizer and improved seeds per hectare than peasant farmers, the majority of whom have no access to fertilizer, improved seed or other modern production technologies.

Table 14.4 shows data on cultivated areas by farmers in 10 maize-producing areas of the country. The area cultivated per farmer is small, ranging from 0.7 to 3.5 ha. On average the maize share of cultivated areas ranges from 21% to 59% in the main maize-producing regions of the western, central and southwestern zones. In some highland areas with altitudes of 2000 m and above such as Bale and Gojam, maize is a backyard crop and the area allocated to it is small.

Maize production depends heavily on animals, mainly oxen, for draught power. Most maize farmers use a pair of oxen for land preparation, seed covering and cultivation commonly known as *shilshalo*. Maize fields are ploughed 2–5 times (Table 14.5). As 70% of the farmers own fewer than two oxen (Awoke

Table 14.4. Area cultivated per household and maize share in different regions of Ethiopia

Region	Major crops	Total area cultivated per farm (ha)	Maize area per farm (ha)	Maize area (%)
Western				
Bako	maize, tef, noug	1.60	0.75	50
Mana and Goma	coffee, maize, enset	0.70	0.15	21
Asendabo	maize, sorghum, tef	2.50	1.40	56
Central				
Nazret	maize, tef, sorghum	2.50	0.75	30
Southwestern				
Sidama lowland	maize, enset, haricot bean	1.18	0.70	59
Sidama highland	enset, maize, coffee	0.78	0.28	36
Areka	maize, enset, haricot bean	1.40	NA	NA
Sinana	barley, wheat, emmer wheat	2.50	NA	backyard crop
Northwestern				
Adet	tef, barley, maize	1.74	0.19	11
Bahr Dar Zuria	finger millet, tef, maize, noug	3.50	0.75	21

Source: Various diagnostic survey reports, Institute of Agricultural Research; data compiled from the years 1985 through 1988 depending on the report
NA = not available

1988), they obtain a pair from neighbours in exchange for labour, grain or cash. The hoe is the major tool for preparing land in a few areas, such as the Sidamo highlands in southern Ethiopia. State farms and a few PCs use tractors.

Improved maize composite varieties are most commonly used on farms around the research centres, hybrid seeds exclusively by the state farms. A survey in the Bako area indicated that 40% of smallholders and all PCs grew improved maize varieties (Legesse *et al.* 1987). However, some of the improved varieties were obtained by farmers many years ago and have degenerated over the years. In the Nazret area 67% of farmers grow Katumani, an improved variety (Tilahun and

Table 14.5. Maize production practices in Ethiopia

Region	Ploughing Meth.	Ploughing Freq.	Variety†	Planting method	Weeding method	Harvesting method	Farmers with fewer than two oxen (%)
Western							
Bako	oxen	2–3	local/ improved	broadcast/ row	hand/ oxen	dehusking/ stooking	65
Mana and Goma	oxen	3–4	local/ improved	broadcast	hand/ oxen	stooking	>50
Asendabo	oxen		NA	NA	NA	stooking	NA
Central							
Nazret	oxen	2–3	improved local	broadcast	hand/ oxen	dehusking	37
Southwestern							
Sidama lowlands	oxen	3	local/ improved	broadcast	hand/ oxen	NA	NA
Sidama highlands	hoe	1	local/ improved	NA	hand	NA	
Areka	oxen	3–5	NA	NA	NA	NA	96
Sinana	oxen	NA	local	NA	NA	NA	<50
Northwestern							
Adet	oxen	NA	local/ improved	broadcast	hand/ oxen	NA	68
Bahr Dar Zuria	oxen	NA	local/ improved	broadcast/ row	hand/ oxen	NA	35
State farms	tractor	1–2	improved	row	herbi-cides/ hand	combine-harvester/ hand	–

Source: Legesse *et al.* 1987; Kassahun *et al.* 1988, 1989; Tilahun and Teshome 1987; Raya 1988; Getahun and Tenaw 1990; Alemayehu and Franzel 1987; Aleligne 1988; Aleligne and Regassa 1989
† the proportion of farmers using improved varieties is small except in the Nazret area, and the varieties are mixed with the local ones
NA = data not available

Teshome 1987). But the overwhelming majority of Ethiopian farmers use local varieties, usually selecting seeds from their own fields at the time of harvesting.

Nationwide less than 10% of smallholders use chemical fertilizer, although in some localities the figure is over 50% (Table 14.6).

Some farmers use farmyard manure to improve the fertility of their fields. Many assign their most fertile fields to maize production (Legesse *et al.* 1987, Aleligne and Regassa 1989). For example, farmers in the Adet and Bahr Dar areas grow maize around their houses, where the crops benefit from the application of manure and household refuse.

Weeding practices vary from area to area. Some farmers hoe their maize. In most locations farmers also cultivate with oxen one to three times. According to farmers oxen cultivation removes weeds, reduces lodging and conserves moisture. It is done on both row-planted and broadcast maize. Most farmers supplement cultivation with slashing.

Maize Price and Market Outlets

Small farmers and PCs produce maize mainly for their own consumption. However, they market a substantial amount to meet financial needs. In the Bako area,

Table 14.6. Rate and percentage of farmers using fertilizer on maize in Ethiopia

Region	Farmers using fertilizer (%)	Average rate (kg/ha)		Recommended rate (kg/ha)	
		N	P_2O_5	N	P_2O_5
Western					
Bako	23	10	25	41	46
Mana and Goma	5	–	–	NA	NA
Asendabo	> 50	14–18	25-46	NA	NA
Central					
Nazret	0	0	0	NA	NA
Southwestern					
Sidamo	32	2–9	6–23	69	92
Areka	NA	18	46	NA	NA
Northwestern					
Bahr Dar and Zuria	NA	10–18	23–46	NA	NA

Source: Aleligne and Regassa 1989; Raya 1988; Legesse *et al.* 1987; Kassahun *et al.* 1988; Kassahun *et al.* 1989; Tilahun and Teshome 1987; Getahun and Tenaw 1990
NA = not available

in favourable years that amount ranges from 40% to 50% of total production per household (Legesse and Asfaw 1989). State farms produce for the domestic market.

Maize is usually sold through three channels: (1) Farmers sell their marketable surplus directly to consumers in open markets. (2) Farmers sell to service cooperatives (SCs). SCs serve as agents of the Agricultural Marketing Corporation (AMC), which buys maize for distribution to consumers in cities in grain form. Until 1990 farmers in many areas were required to deliver quotas of grain to SCs for which they were paid fixed, relatively low prices (Chapter 16). In 1990 the quotas were lifted. (3) Farmers sell to private traders who may market the maize locally or transport it to other areas of the country. The marketing channels for grain have shifted sharply in recent years. In 1982 service cooperatives acting as agents of AMC handled 38% of grain marketed. In 1987, the volume handled by service cooperatives rose to 80% and that by private traders fell to 13% (Faught 1988). Table 14.7 shows maize purchased by AMC over five years. Since 1990 with the lifting of quota sales the private sector's market share has increased. Private-sector marketing of maize in the Bako area is described in Chapter 17.

Maize is stored in local stores, sacks and other containers for consumption or for later sale. Some of the stores are made of stick and mud reinforced with tef straw and cow dung. Some are made of bamboo strips and other wooden materials. The eastern part of the country uses underground pits. Maize seeds are usually stored on the cob in well-aerated places or fumigated with smoke to control weevils. These kinds of storage result in substantial loss from weevils and rodents. Farmers in the Bako area reported 25% to 33% loss in less than six months from weevils (Legesse *et al.* 1990). Others have estimated 16% to 20% loss in maize grain stored for one year (ECA/ICIPG 1987).

Recently many off-farm stores with larger capacities than those used on-farm have been constructed by SCs, state farms, the Relief and Rehabilitation Commission and AMC.

Table 14.7. Volume of maize purchased by AMC

Year	Peasants (t)	State farms (t)	Total (t)	Percentage of total		Maize as % of total cereals
				Peasants	State farms	
1983/84	4 275	7 556	11 831	36.1	63.9	28.9
1984/85	944	6 545	7 489	12.6	87.4	32.3
1985/86	2 990	8 210	11 200	26.7	73.3	25.7
1986/87	5 891	13 630	19 521	30.1	69.9	31.6
1987/88	8 031	13 017	21 048	38.1	61.9	36.9

Source: AMC 1990

Maize Utilization

Maize in Ethiopia is used mainly for making *injera,* bread and porridge, and for malting and brewing. The fresh cob is roasted or boiled and the grain eaten. The leaves are used as animal feed and the dried stalks as firewood for cooking. Except in rare instances, maize grain is not used for feed.

Cereals provide 69% of the calories in the Ethiopian diet. Maize contributes 27% of the calories from cereals (CIMMYT 1981). It is widely consumed in eastern, western and southern Ethiopia, mainly in the rural areas. Low-income urban dwellers also consume maize because it is much cheaper than the greatly preferred food crop, tef. Maize flour blended with 90% wheat flour is used for breadmaking in urban areas. Its use for industrial purposes is not common.

Table 14.8 indicates the consumption of maize in Ethiopia over the last 25 years. It has more than doubled. The per capita maize consumption has also increased steadily over the same period, and the annual growth rate per capita has been 0.74%. There has been a major decline in the annual growth rate of per capita maize consumption in recent years from 0.93 during the 1970s to 0.38 in the 1980s, mainly because of the drought of 1984–85, which resulted in substantial decline in production.

At present maize is generally not a preferred food in Ethiopia. Even maize producers who consume maize as a staple prefer tef (Legesse *et al.* 1987). In spite of this attitude, the increase in rate of demand for maize is directly proportional to the population growth rate. Per capita income growth rate is another important factor that can potentially increase the demand for maize. However, given the zero growth rate for the 1965–86 period (World Bank 1988), the demand for maize will be determined mainly by the population growth rate.

Ethiopia has remained fairly self-sufficient in maize production over the period 1961–63 to 1985–87. Consumption is bound to increase given the high rate of population growth, especially in maize-producing areas where maize is a staple.

Table 14.8. Maize consumption and self-sufficiency in Ethiopia (annual averages)

Period	Total maize consumption ('000 t)	Per capita consumption (kg)	Consumption growth rate per capita (%)	Self-sufficiency (%)
1961–63	691	27	–	100
1970–72	912	29	–	100
1979–81	1232	32	–	99
1985–87	1470	33	–	99
1961–63 to 1985–87	–	–	0.74	–

Source: FAO production data from annual yearbooks

Socioeconomic Constraints for Peasant Farmers

The socioeconomic constraints discussed here concern peasant farmers, who produce more than 86% of the country's maize. The principal constraints include unavailability of improved maize seeds and fertilizer, low maize prices, lack of draught power, inadequate credit and weaknesses in research and extension linkages. The constraints are not ranked in their order of importance because a major problem in one area might not have the same importance in another.

Farmers' local varieties tend to be low yielding and in some areas are poorly adapted to the environment. A number of maize varieties have been released for commercial cultivation in different regions of the country, but the total seed quantity being multiplied by the Ethiopian Seed Corporation, research centres and state farms is too small to satisfy the demand (Benti 1988a). For all crops the amount of improved seeds produced in the country covers only 2% of the cultivated land (ONCCP 1988). Besides, sometimes the small quantity of seed produced does not reach the farms on time. All improved maize seed is distributed through the Ministry of Agriculture. The farmers find its price prohibitive (66 birr/100 kg). Its price ratio to maize price ranges from about 1.5 : 1 to 3 : 1, depending on the season and the area. Given the unavailability of improved maize seed, its high price relative to maize price and the unavailability of the improved seed preferred by the farmers (Faught 1988), farmers usually opt for growing local varieties. Poor soil fertility is also a problem in most areas. Fertilizer is not distributed efficiently in the country and in many cases not in time for planting maize, which is planted earlier than other crops. In the Bako area where this problem frequently occurs farmers must either delay their maize planting or plant without the fertilizer.

Before the 1990 policy changes, farmers commonly complained that the fixed maize price of 22 birr/100 kg was low relative to fertilizer prices and did not encourage them to purchase improved inputs to produce more maize. The ratio of fertilizer (DAP) price to official maize price was 4.1 : 1. For individual farmers, on-farm maize fertilizer trials at 35 sites over the years 1984 to 1987 showed that at the fixed AMC prices, fertilizer was profitable at only 3% of the sites. At the local market prices, which were over twice as high as the fixed prices, fertilizer was profitable at 72% (Franzel *et al.* 1989). Hence it would appear that the elimination of AMC's fixed prices in 1990 would encourage the use of fertilizers.

A shortage of draught power also limits maize production. As 65% of farmers in the Bako area, 45% in the Adet area and 37% in the Nazret area have less than two oxen, they face serious draught power shortages, resulting in a reduced area being cultivated and in untimely land preparation and planting. Poor seedbed preparation, in turn, results in poor crop stand and heavy weed infestation.

Low cash income is a major factor limiting maize production. The credit for developing production is insufficient. The Agricultural and Industrial Development Bank extends credit to rural areas; loans to PAs are provided through legally recognized SCs. SCs and PCs that are not legally recognized cannot receive loans (Awoke and Hailu 1986). Since the locations of the bank branches are usually not

within the reach of farmers they are not encouraged to apply for loans. Loans are used for oxen or equipment or for developing infrastructure like grain stores.

Nearly all fertilizer supplied to small farmers is sold on credit through their PAs. If more than 5% of a PA's fertilizer debt is not repaid then credit is not extended to it the following year (personal communication with MOA staff). Moreover, farmers who are unable to settle their overdue debts on the previous year's loans are not allowed to receive a new loan (Awoke and Hailu 1986). If farmers have a poor season they can neither repay past loans nor obtain credit to allow them to increase production in the next season.

Weaknesses in research and extension programmes are also problems limiting maize production. In recent years many measures have been taken to improve and make the research and extension systems effective. However, they are still inadequate to the task of developing appropriate technologies and making them available to producers. There is a lack of a strong and well-coordinated research–extension linkage at the grass roots. For example, in some areas research and extension make contradictory recommendations, which clearly has a negative effect on the dissemination of research findings. The Research and Extension Liaison Committee has been established by IAR and MOA to bridge this gap. It is hoped that the committee will strengthen the linkage between research and extension.

Other socioeconomic constraints on maize production as identified through various surveys conducted by IAR's farming systems research teams include seasonal labour shortage and inadequate transportation and marketing facilities.

Conclusion

The growth in maize production in Ethiopia has been mainly due to the expansion of the area under the crop. This expansion has, however, declined substantially over the last 15 years and growth in production can now be expected to come mainly from increases in yields, which are generally low.

The majority of maize producers are small farmers who scarcely use any of the well-known yield-increasing technologies. These technologies such as improved seeds and chemical fertilizers will have to be made available to farmers in a timely and affordable manner. Lack of draught power is also a major constraint to maize production, a constraint that can be relaxed through provision of credit for the purchase of oxen.

Marketing infrastructure such as roads, transportation facilities and storage is essential for increasing maize production. At present the majority of peasant producers have limited access to these facilities. If peasant farmers are expected to increase their maize production through the adoption of modern technologies, improvements in infrastructure will have to be coupled with a lucrative incentive structure. Sustained increase in maize production will arrest the slowly declining self-sufficiency in maize for consumption.

Chapter Fifteen

Constraints to Increasing Wheat Production in the Smallholder Sector

Hailu Beyene, Steven Franzel and Wilfred Mwangi

This chapter examines constraints to increasing wheat production in Ethiopia, focusing on the smallholder sector, which accounts for 76% of total wheat production. First the role of wheat in the Ethiopian economy is outlined and production trends are assessed. Next production practices, marketing and utilization are discussed. Finally constraints to increasing production are presented. Most of the farm-level data presented are assembled from diagnostic surveys of five wheat-producing areas:

- Kulumsa, Arsi Region (Chilot *et al.* 1989, Chapter 11)
- Sinana, Bale Region (Alemayehu and Franzel 1987)
- Holetta, Western Shewa Region (Hailu and Mohammed 1986)
- Inewari, Northern Shewa Region (Hailu and Chilot 1989, Chapter 7)
- Sendafa-Aleltu, Northern Shewa Region (Hailu and Chilot 1989, Chapter 7)

The surveys were conducted by multidisciplinary teams of the Institute of Agricultural Research in collaboration with local extension staff. In addition, we also draw upon data from the Institute of Agricultural Research's on-farm wheat trials. As was true with the previous chapter, this one shows how data from several different surveys can be assembled in a manner useful for policy makers, planners and organizations serving the wheat subsector.

Role of Wheat in Ethiopia

Ethiopia is sub-Saharan Africa's largest producer of wheat, accounting for 57% of its 1.06 million hectares. However, Ethiopia's wheat yields over the period 1983–87 averaged only about 1.24 t/ha, as compared to 1.76 t in the rest of sub-Saharan Africa (FAO production data from annual yearbooks). This is partly explained by the fact that wheat is a traditional crop in Ethiopia, grown using traditional durum varieties and practices, whereas in most other countries it is of