A STUDY OF AGRICULTURAL PRODUCTIVITY IN CHILALO DISTRICT OF ETHIOPIA AND THE THIRD FIVE YEAR DEVELOPMENT PLAN

by

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CHAPTER I

INTRODUCTION

Ethiopia, an old and isolated Christian empire, is situated between 3° and 18° latitude and 33° and 48° longitude in the Horn of Africa. Her total area is approximately 472,000 sq. miles or slightly larger than the total area of Texas, Oklahoma and New Mexico. The empire is bounded by the French Somaliland and the Somalia Republic on the east; the Sudan on the west and northwest; the Red Sea on the northeast and by Kenya on the south.

Ethiopia is divided into different ecological regions. Elevations range from 370 feet below sea level to 600 feet above sea level in the lowlands of the eastern and northeastern portion; low flood plains in the southwestern provinces; and rugged mountain terrain with elevations of 1,500 to 10,000 feet above sea level in the central plateau. Population is rather sparse in the lowlands. The inhabitants are nomadic herdsmen in the east, and they live in camps and move with their herd from one waterhole to another; while in the western lowlands the inhabitants are settled in small villages scattered along river banks. They are occupied in fishing and slash-and-burn agriculture.

The uncertainty of rainfall, the prevalence of malaria and tsetse fly and the presence of hostile nomads have made the lowlands unacceptable for settlement. Most of the agriculturally oriented populace has been concentrated in the central plateau until recently.

Agriculture is the largest sector in Ethiopia's economy, accounts for about two-thirds of the gross domestic product, employs about nine-tenths of the labor force and provides nearly all the export earnings (53, p. 1).

The smallholder farms, on which 90 percent of the nation's population depends for its food supply, have been unable to raise their productivity due to many persisting problems. Unlike many developing Asian countries, Ethiopia does not face shortages in cultivable land. But, the cause of low agricultural productivity may be attributed to:

a) the uneven distribution of land among the working peasants and landlords,
b) the presence of a unique inheritance law which tends to keep land holdings diminishing after every generation (due to fragmentation),
c) undefined tenant and landlord arrangements,
d) insufficient infrastructure,
e) inadequate production inputs (seeds, fertilizers, etc.),
f) traditional power use, and
g) the presence of inflexible institutions.

However, with the introduction of modern technology and improvements made in public health, infant mortality and death rates have been reduced so greatly that population is increasing at a rapid rate. The progress made in agricultural productivity has not been dramatic enough to keep up with this increase in population. This lag has brought some areas to near famine. Ethiopia, once a net exporter of food grains, has moved into being a net importer in recent years.

During the past twenty years, many strategies have been developed to modernize Ethiopia's agriculture and bring her economy up the ladder of development. At first, without adequate preparation for the take-off, development planners, meaning well in their intentions of course, were rather hasty and thought of developing the agricultural sector overnight by introducing better but unadapted implements and mechanized means of farming; the necessary ingredients, i.e., trained manpower, production inputs, infrastructure, and proper institutions were lacking. The plans were never realized and remained only as plans.

Ethiopia is now in the third year of the Third Five-Year Development Plan. It cannot be said that some development has not taken place. However, the pace of development has not accelerated as fast as it might have. Agricultural constraints that were identified a decade ago have not yet been reduced. Peasant farmers, comprising 90 percent of the farming community, are still following traditional

means of cultivation; and the government seems to be losing keen interest in them, shifting its emphasis to other alternatives. The Third Five-Year Development Plan states: "The traditional areas of peasant subsistence farming . . . will yield only slowly to efforts made to modernize it . . ." and because of this, great emphasis is made, first, by diverting most resources to "the rapid development of large scale commercial agriculture" which is thought to bring a relatively rapid increase in agricultural exports." Second, the government will "concentrate on opening up settlement schemes and the cultivation of new lands in various parts of the country;" and third, take a so-called "most promising approach to the successful development of strategically selected areas--known as the 'package program' to develop peasant farming" (34, p. 192-193).

The feasibility of this Plan will be apparent by the deadline year 1973. Using empirical evidence, this paper is therefore designed to argue that the Third Five-Year Development Plan for Ethiopia's agriculture is rather ambitious for the present resource endowments of the country. And, in order to have a solid base for development, a more realistic and moderate approach which would have attacked the grass-root problems first, should have been taken.

The paper has five sections. Section One is descriptive in nature and is designed to acquaint the reader with peasant agricultural activities in Ethiopia. Section Two presents a marginal productivity analysis of those

productive factors involved in peasant farming, using the Cobb-Douglas production function based on data obtained from a case study of 33 peasant farms. This section will identify the bottlenecks that have caused low agricultural productivity and will designate possible areas of improvement. Section Three will question the appropriateness of the emphasis in the Third Five-Year Development Plan with regard to the agricultural sector, and examine the extent of the government's efforts in trying to modernize peasant agriculture. Section Four reviews the feasibility of the Third Five-Year Development Plan and attempts to indicate the pitfalls the development planners seem to have overlooked. Section Five will summarize the foregoing discussions and present the writer's opinion concerning development planning that could serve as corrective measures if any fruitful results are to be brought about in Ethiopian agriculture.

Sources of Data

Two kinds of data are used in this paper. The first set of data was taken from a Ph.D. thesis written by David A. G. Green, Department of Agricultural Economics, 1971. These data were obtained during an 18-month period from October, 1967, through March, 1969, where Green was serving as the agricultural economist for the African Mechanization Study team (MSU/AID afr. 459), and during which time the writer of this paper was assisting in conducting the survey. The second set of data was obtained

from the same area and during the same period where a case study of peasant farming was made in five different sub-districts of Huruta, Eteya, Gonde, Assella, and Sagure in Chilalo Awraja (District) in the South Central province of Arussie. Thirty-three farms were covered in the survey, and each farmer was interviewed three times. In this case study area, results of the survey showed that peasant land holdings on the average numbered 5 hectares (relatively higher than the national average of 3 hectares or less), but the variation in size was not so great as to show differences in the performance of peasant farming from other areas.

The readers and prospective researchers should be reminded of the limitations of the data and the precautions that should be taken in using these data for future research work. The data are not aimed to, and do not provide, empirical information on certain institutional problems discussed in this paper. Such information was and still is difficult to obtain, and a separate study is needed to provide adequate empirical evidence. This does not mean, however, that this study is not objective. The assumptions and frank discussions presented here are not from hearsay, but are the evaluations of the author that have been obtained after five years of service in the government, including three years of intensive traveling within the country and frequent personal contacts with citizens that are well versed in the stated problems of the country. The author takes full responsibility for the contents of the discussion.

CHAPTER II

PEASANT AGRICULTURE--THE PROBLEM AREA

Attempts will be made here to acquaint the reader with traditional peasant farming, the nature of the farmers' existence and the problems with which they are confronted. Peasant farmers, however traditional and illiterate they may be, are responsive to changing conditions and conscious of what is happening around them, but their activities and progress have been restrained by existing social, economic and institutional bottlenecks. The discussion will focus on two major areas of interest: resources and productive practices.

Resources

1. Land

As already mentioned, one of the critical factors hampering the development of peasant agriculture is land tenure. Three types of land tenure systems predominate in the country:

a) Traditional family tenure,

b) Rented or absentee landlordship,

c) Government land ownership.

a) Traditional Family Tenure

Traditional family tenure is characteristic of the northern part of the country. The average size of cultivated area per family is very small, generally three hectares or less. Very few families cultivate five or more hectares. The problem is aggravated by the presence of a unique inheritance law whereby, if the owner of a holding dies without leaving a legal will (which is very common), the heirs then take over the land under uncertain conditions. Heirs, both rightful and fraudulent, appear to file claims in the courts. The process of defending titles is expensive and time consuming and, even if claims are won at court, no compensations are received by the claimant for the cost of the title defense. Even if the heirs peacefully settle their disputes, the land is broken up among heirs creating the problem of fragmentation and uneconomic units of production. Under these agrarian structures, small farmers, though hard working and with potential productive capacity, find it extremely difficult to operate. Without a legitimate and secure title to use as a collateral to obtain credit, the necessary inputs needed for production can often not be secured.

b) Absentee Landlordship or Rental Tenure

Absentee landlordism or rented tenure is typical of the southern portion of the country. No clearly written or defined landlord-tenant arrangements exist. Arrangements are made solely between the landlord and tenant as dictated by the landlord, usually on a share cropping basis. The

landlord provides the land, while the tenant is responsible for the supply of the inputs of production like labor, seeds, work stock, and implements. The distribution of farm income between landlords and tenants varies from one region to another. But, it can generally be taken for granted that the tenant is at a disadvantage. Because of their uncertain situation, tenants do not have the incentive to take risks and invest capital in the farm. There is fear of being evicted from the farm at any time the landlord feels like doing it without prior warning. This again accounts for the absence of capital investment in peasant agriculture.

c) Government Land Ownership

Land titles are not registered in a uniform manner. The government, therefore, does not have knowledge of the exact size or location of its holdings. In general, if a piece of land is not owned by anyone, it is the government's property. Many of the government lands are found in the lowlands inhabited by nomadic tribesmen. These tribes, because of their nomadic nature, cannot have claim to any tract of land; therefore, by default, the government becomes the owner.

Ethiopia does not face problems of scarce cultivable land. In fact, land is in abundance. The major problem has been and still is the geographic distribution of the productive people, i.e., the men on the land. The population involved in agriculture is concentrated in the central plateau and here arable land is populated beyond the level of efficiency.

How to move the people from the densely populated plateau into the uninhabited fertile lowlands has recently been the subject of controversies. The issue is very delicate and involves cultural, economic and political dimensions. The problem is introduced here, but will receive detailed consideration in later sections.

2. Labor

No intensive work has been done on migration of labor or the presence of a redundant labor force on peasant farms. Case studies such as the one made in Chilalo have indicated that, on an average sized holding of 8 hectares, the average size of the family was 6.3 persons. Of this, 3.2 persons were children and 3.1 persons adults (including women whose activities could vary from the common household chores to weeding and helping during harvest).

Table 1 shows the labor operational requirements for an average 5.1 hectare farm to be 2107.91 man-hours to perform the five basic operations of plowing, planting, weeding, harvesting and threshing. The Central Statistics Office has found in its studies that only 35 percent of the rural population who are active and productive, are between the ages of 20 and 50 years (22). Several interviews with farmers have indicated the problem of labor shortages at peak seasons. All these lead us to believe that labor surpluses do not exist.

Table 1. Labor operational requirements on an average farm 5.1 ha. in Chilalo Awraja--1968

Crop	Crop Area ha.	Number of Operations	Operations									
			Plow		Planting		Weed		Harvest		Thresh & Winnow	
			Man-hour/ hectare	Total Man-hrs.	Man-hr./ha	Total Man-hrs.	Man-hr./ hectare	Total Man-hrs.	Man-hr./ Quintal	Total Man-hrs.	Man-hr./ Quintal	Total Man-hrs.
Wheat	1.58	3	24.27	115.04	50.00	79.00	95.51	150.91	12.10	172.06	7.12	101.25
Barley	2.09	3	24.27	152.17	50.00	104.50	94.74	198.01	12.90	269.61	6.46	135.01
Maize	.29	3	24.27	21.11	50.00	14.50	95.00	27.55	13.44	62.36	3.75	17.40
Teff	.27	4	24.27	26.21	50.00	13.50	100.00	27.00	12.59	23.80	8.57	16.20
Flax	.41	1	24.27	9.95	50.00	20.50	81.00	33.21	7.67	95.31	9.06	26.00
Peas	.10	3	24.27	7.28	50.00	5.00	97.22	9.72	17.36	13.89	8.33	6.66
Beans	.36	3	24.27	26.21	50.00	18.00	97.22	35.00	17.36	50.00	8.33	23.99
Total	5.1			XXX		XXXX		XXX		XXXX		XXX

Source: Taken in part from Ph.D. dissertation by D. A. G. Green, Department of Agricultural Economics, Michigan State University, 1971.

3. Capital

In peasant farming, capital investments are almost negligible. A brief look at Table 2 shows the inventory of tools and equipment on an average peasant farm in Chilalo. Apart from the items listed in this table, very few of the assets on the farm can be considered as productive capital investments. Items not listed in the table are: the farm home--made of wood and hay obtained from the farm and a few pounds of nails used for construction. Roofs are usually thatched with straw obtained from fields; grain cribs are made from tree branches; and fences are made from local material. The direct costs that can be accrued to these constructions would be the time spent by the farmer to build them. A total of $103.74* accounts for capital investments made on an average farm. This can help explain the simpleness of peasant farming and why production does not go past the subsistence level (Table 2).

Production Practices

1. Hoe Culture

"Hoe culture" or hand-powered agriculture is practiced in simpler societies, particularly in the lowland river basins of the southwest, where tsetse fly infestation is

*All currencies used in this paper are U.S. dollars. U.S. $1.00 = ETH. $2.50 or ETH. $1.00 = U.S. $0.40.

prevalent and prevents the raising of work stock; or on marginal areas and steep slopes which make it difficult to operate with animals. In this system of farming, man is both the producer and director of power, and because of this,

> his activities as a director are greatly limited since most of his energy is used in meeting the demand for power, . . . the farmer's total capacity to work the land is dependent primarily upon how many able bodies can be employed during the time period for key operation (38, p. 1-1).

The only tools to aid the farmer in his operations are the "challa" or straight hoe to till the soil, and the machete to clear the brush. This is the simplest form of all farming systems in the country, and surveys have shown that farm sizes under this system range between 0.1 and 0.6 hectares per holding (38). Their agricultural produce is never channelled into a market economy.

2. Ox Culture

"Ox-powered culture" is more advanced than the one mentioned above and is the most predominant type of farming system in Ethiopia. Here, the farmer does not directly use his energy in the production of power, but directs the energy produced by his oxen. His operations are limited because of the smallness and low nutritional level of his oxen who do not have the power to pull improved or heavier machinery; and the primitive nature of the plow which does nothing more than scratch and stir the surface soil. Using a local plow and a pair of oxen, a farmer's output of work in plowing

has been rated as 26.39 hours per hectare,* depending on the strength of his oxen. On the average, field sizes on this type of farming range from 2 to 5 hectares. However, the area where the case study was made, holdings were larger on the average, ranging between 5 and 8 hectares, with the average field in crops being 5.1 hectares.

Description of inventory. The simpleness of this farming system can be observed by examining the inventory of tools and equipment--(Table 2) which is typical of an average sized farm.

Except for the shovel, saw, axe and pick axe, no modern tools can be observed in the inventory of farm tools. The major item in the list of equipment is the local plow, which

> consists of a bent wooden plow-beam, in front connected with a yoke by means of a rope or leather strips, at the back slightly widened and with a vertical hoe. To each side of the beam a flat triangular piece of wood is pinned forming a kind of sledge. Through the beam-hole a stick is constructed in such a way that the upper end of the stick serves as a handle for the plower. To the lower end is affixed a steel plow-point. The front points of the sledge parts and the stick with the plow point are held together in an iron ring, and this is attached to the plowbeam by means of leather strips. The Ethiopian plow belongs to the category of the breaking plow. It does not turn the soil but breaks it (33, p. 153)

thus lacking the mould-boarding characteristics.

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*This observation was made by the writer in a field survey in Chilalo Awraja, April, 1968.

Table 2. Inventory of tools and equipment on an average-sized farm of 5.1 ha. in Chilalo Awraja, 1968.

Equipment	Number	Unit Acquisition Price	Total Cost
		U.S. Dollars	U.S. Dollars
Oxen	2	36.00	72.00
Donkey	1	12.00	12.00
Plow	3	2.80	8.40
Ox Sledge	2	0.72	1.44
Sickle	6	0.65	3.90
Hoe	5	0.40	2.00
Shovel	2	0.50	1.00
Saw	1	1.00	1.00
Axe	1	0.80	0.80
Pick Axe	1	1.20	1.20
TOTAL			$103.74

Source: Taken in part from Appendix B, Ph.D. dissertation by David A. G. Green, Department of Agricultural Economics, Michigan State University, 1971.

3. Cropping Pattern

Agricultural production in the highland plateau is completely dependent on soil and climatic factors. Soils good for one crop may not be good for another, and even if the soil is good, the climate may not be suitable. These factors, therefore, determine the type of crops grown, the time of planting and harvesting. One of the major limiting

factors in agricultural production is the amount and timing of the small rains occurring in the highlands usually during March; and the big rains (July to September) that have great variations in volume and to a lesser degree in timing. The cropping pattern and kinds of field operations must fit into a certain calendar to achieve the near optimum planting date. (This information has not been gained through research, but rather from years of experience in the tradition.) (See Table 3 on climatic data and calendar of operations.)

As illustrated in Table 4, fields are distributed among different crops according to importance to the farmer. Crop rotation is well known to the Ethiopian farmer and, depending on the type of soil, different rotation systems are followed. The field is then sown with wheat or barley followed with teff (eragrostis abyssinica)* legumes, wheat, barley; then fallowed from five to fifteen years depending on the availability of other cultivable fields to support subsistence. If commercial fertilizers were available, more fields could be brought under crops simultaneously instead of fallowing some. This alone would bring a dramatic change in agricultural production and release the pressure of food shortage.

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*A highly priced cereal and the most important grain crop for domestic consumption; belonging to the graminae family. An annual indigenous, self-pollinated grass, 40-80 centimeters high, with upright or slightly curved, fine, hard stalks. The leaves, 25-45 centimeters long and 1-4 millimeters broad, are soiled at sprouting. The inflorescence is formed by penicles of 15-35 cm. The seeds are extremely small--about 1-1.5 mms. in length and 0.75-1.0 mms. in width--but they are firm and heavy. They weigh about the same as wheat per hectoliter. There are around 2,500-3,000 grains to a gram (29, p. 181.).

Table 3. Climatic data and calendar of operations, Chilalo, 1968

Item	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.
Seasons	Small rains				----------Wet----------							
Rainfall (1967)[a] (mm)	0.5	85.3	45.5	87.5	69.7	172.9	149.8	140.3	66.8	65.3	--	1.3
Mean temperature °C												
Maximum	24.1	24.3	23.3	22.7	22.4	19.4	18.6	19.1	20.5	19.6	19.6	21.4
Minimum	8.6	10.2	11.4	11.0	10.4	11.1	10.5	10.0	10.5	6.5	6.5	6.4
Crop operations (by month)												
Wheat		--plow (3 times)------			plant		---------weed----------			harvest		
Barley		--plow (3 times)------			----- plant		---------weed----------			harvest		
Maize	plow (2-3 times) plant------						---------weed----------			harvest		
Teff	plow (4 times)--				----- plant		------weed----------			harvest		
Flax (linseed)		plow (1 time)-------			plant		---------weed--------			harvest		
Peas		plow (1 time)----------			plant		------weed----------			harvest		
Beans		--plow (3 times)-------				plant	------weed----------			harvest		
Fallow							break soil, plow, soil burn,			plow (many times)		

[a] Chilalo Agricultural Development Unit, "Results of Trials and Observations of Field and Forage Crops at the Kulumsa Farm and in Asella" (mimeographed) (Addis Ababa: Swedish International Development Agency, June, 1968), p. 5.

Soil is an important factor and may dictate the operations of the farmer. FAO, Freedom From Hunger Campaign trials have shown that the amount of phosphorous, which is an essential element in plant growth, is very low in most cultivated lands of Ethiopia which have been under crops for years (23). In the north and northeastern parts of the central provinces, since commercial fertilizer is not used, phosphorous is depleted from the soil every cropping season. In order to replenish it, a unique feature is introduced in the cultivation method called "guai" or soil burning.

> New long-fallowed grassland is broken in with the plow in the dry season. This process involves first scratching the ground in several directions to dislodge the turf and gathering the sods into numerous heaps of about three feet in diameter . . . A small pile of cowdung is then placed on the windward side of each mound and set afire. The fine soil in the mound is gradually pulled over the burning dung until all the soil, grass and weeds have been burned. It is later spread out evenly over the field. The area is then plowed about two times . . . This raises the pH sometimes as much as 0.2 or 0.3. The nitrogen in the organic matter is sacrificed in order to get more phosphorous available (33, p. 141-142).

4. Field Operations

a) Plowing

Plowing is commonly started during the month of March after the soil has been softened by the small rains. Because of the primitive nature of the plow, fields have to be plowed three to four times (depending on the type of crop to be grown) in order to have a very good seed bed. The farmer's source of power is his pair of oxen; and his

equipment is the simple local plow that was mentioned earlier. Farmers are always faced with shortages of power and, in order to overcome this, they usually organize themselves into a simple form of cooperative called "Wonphel" in which members are obliged to work for each other as a team. Plowing is one of the most difficult operations and accounts for the smallness of cultivated fields in any one holding.

b) Planting

After the plowing operation is completed, the seed is broadcast by hand and the plow is again used for covering up the seeds, with the exception of "teff" in which case the seed is covered by trampling it with feet of men and animals (see Table 4 for seed rates).

Since clean and certified seeds are not available, more seeds are sown per hectare than actually are needed in order to guarantee adequate germination and withstand the competition with weeds.

c) Weeding

No chemical or mechanical means of weed control is practiced. Weeding operations are done by hand and with the aid of the hoe in corn fields. The number of weedings depends on the type of crop grown, the intensity of weeds and the availability of a labor force to do it. The competition of crop seeds and weeds in some areas is very high, and in some places 30 percent of the growth in a given area may be weeds. Weeding is a crucial factor and all previously

Table 4. Land distribution among crops; seed rate and cost of seeds on an average farm of 5.1 ha. in Chilalo, 1968.

Crop	Land ha.	Seed Rate q/ha.	Amount of Seed Used q.	Price of seed $/q.	Total Seed Cost $
Wheat	1.58	1.15	1.82	8.20	14.90
Barley	2.09	1.16	2.42	5.60	13.58
Maize	.29	.60	.17	4.00	.70
Teff	.27	.50	.14	9.80	1.33
Flax	.41	.74	.30	15.00	4.55
Peas	.10	1.31	.13	5.20	.69
Beans	.36	.90	.32	5.00	1.62
TOTAL	5.10	--	--	--	37.37

Source: Taken in part from Appendix B, Ph.D. dissertation by David A. G. Green, Department of Agricultural Economics, Michigan State University, 1971.

performed operations could come to nothing if the farmer is faced with a labor shortage and cannot do his weeding on time. All members in the household, including women and children, participate in this operation. (Refer to Table 5 for a summary of labor operational requirements.)

d) Harvesting

This operation is commonly done with the help of a sickle. The output of the farmer is so limited that great haste has to be made in gathering all mature crops before any changes in weather conditions occur.

Table 5. Summary of annual total costs for inputs (excluding financial charges) on an average sized farm of 5.1 ha. in Chilalo Awraja, 1968.

Input Crop	Labor		Seed		Sacks	Rent	Depreciation		Total Inputs		Total Value
	Non-cash	Cash	Non-cash	Cash	Cash	Cash	Non-cash	Cash	Non-cash	Cash	
	dollars										
Wheat	17.91	13.00	14.90	--	1.42	39.10	3.72	3.39	36.53	56.91	93.44
Barley	24.90	18.07	13.58	--	2.09	51.72	4.92	4.49	43.40	76.37	119.77
Maize	4.14	3.01	.70	--	.46	7.18	.68	.62	5.52	11.27	16.79
Teff	3.11	2.25	1.33	--	.19	6.68	.64	.58	5.08	9.70	14.78
Flax	3.25	2.35	4.55	--	.29	10.15	.96	.88	8.76	13.67	22.43
Peas	1.25	.91	.69	--	.08	2.47	.23	.22	2.17	3.68	5.85
Beans	4.44	3.22	1.61	--	.29	8.90	.85	.77	6.90	13.18	20.80
TOTAL	59.00	42.81	37.36	--	4.82	126.20	12.00	10.95	108.36	184.78	293.14

Source: Taken in part from Appendix B, page 278, of Ph.D. dissertation by David A. G. Green, Department of Agricultural Economics, Michigan State University, 1971.

e) Threshing

A flat surface on the ground is pasted with a mixture of hay, cowdung and mud to make a threshing floor. The harvest is then spread on this floor and animals are driven around in circles, trampling it with their hooves to separate the grain and the straw. The hay that is large is separated from the seed by hand and/or a wooden fork (two tooth) and the chaff is then cast in the air with a wooden spade called "Laayda," by which process the heavier seed remains at the bottom and the lighter chaff on top and to the sides. Several repetitions of this process finally leave the seeds separated. The amount of broken seeds and the presence of weed seeds is very high because of the unselective threshing and cleaning process.

5. Transport and Storage

The winnowed seeds are placed in sacks and goat skin bags and are transported on donkey or human backs to the farmer's back yard where the sacks are emptied into cribs. No proper weighing is done, and the farmer has no precise knowledge of the capacity of his cribs or amount of his yields. The crib is the farmer's only storage facility until the grains are consumed or marketed. These cribs are made from branches of trees constructed in a basket-like fashion which are then cemented with a mixture of soil, cowdung and hay. Poor construction material and the inefficiency of the cribs poorly protects the grain from rodents, insect pests and loss of

weight due to loss in moisture. Table 5 presents a summary of the inputs that have gone into the cultivation of 5.1 hectares of land under various crops in the case study area. Table 6 presents a summary of total production and market values of the products while Table 7 presents a summary of the budgets for a 5.1 hectare of cultivated land. Notice on Table 7 the net income after taxes is $22, which is left to the farmer after a year's hard labor.*

The above chronological presentation, simple as it may look, illustrates the persisting problems of peasant farming in Ethiopia. So far, very little has been done in the way of solving these problems facing the farmer. It would be very hard and, in fact, unjustifiable to expect the peasant farmer to show any progress considering his limited present resource endowments and opportunities. In truth, he deserves great respect and admiration for having continued to survive, regardless of all the handicaps.

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*Note: All prices are 1968 Asella prices calculated from 1968 Addis Ababa Market prices after transportation and handling charges have been deducted.

Table 6. Summary of total crop production from an average farm of 5.1 ha. valued at 1968 Asella market price.

Crop	Area ha.	Yield		Market Price $/q.	Value
		q/ha.	Total q.		
Wheat	1.58	9.00	14.22	8.20	116.60
Barley	2.09	10.00	20.90	4.80	100.32
Maize	.29	16.00	4.64	4.00	18.56
Teff	.27	7.00	4.32	12.00	51.84
Flax	.41	7.00	2.87	8.00	22.96
Peas	.10	8.00	.80	5.60	4.48
Beans	.36	8.00	2.88	4.40	12.67
TOTAL					327.43

Source: Taken in part from Appendix B, Ph.D. dissertation by David A. G. Green, Department of Agricultural Economics, Michigan State University, 1971.

Table 7. Summary of Budget for 5.1 ha. farm--Chilalo, 1968.

Item	Amount
Gross Income	$330.35
Less Total Cost	293.14
Net Returns	37.21
Net Income Before Taxes	37.21
Less Taxes	14.42
Net Income After Taxes	$ 22.79

Source: Taken in part from Appendix B, Ph.D. dissertation by David A. G. Green, Department of Agricultural Economics, Michigan State University, 1971.

CHAPTER III

PRODUCTIVITY ANALYSIS--USING COBB-DOUGLAS PRODUCTION FUNCTION

The Data

The data used in this study were obtained during a case study of peasant farms in Chilalo, for the 1968-69 crop year. Thirty-three farms were randomly selected and three visits were made to each farm during different field operations. The questionnaire used in the interviews provided for the measurement of the dependent variable Y (gross crop income) and the independent variables:

X_2 - land, in hectares (cropped)

X_3 - labor, in months

X_4 - productive cash expenses, in dollars

X_5 - machinery and equipment in dollars

X_6 - draft animals, in dollars

Gross crop income was a measure of actual production from fields under crops during 1968-69 crop year as reported by the farmer and expressed in dollar terms at the going market price at the Assella market.

Land (X_2) was measured in actual hectares under crop at that season. Any land leased out or left fallow was not included.

Labor (X_3) was measured in labor months. Data was obtained by asking the farmer the number of months each operation required and the number of people involved in the operation. Men, women and children were involved in some cases--women's work output was rated 2/3 of a man's, and children below age 15 and above 7 years were given a work output rate one-third of the men.

Productive Cash Expense (X_4) is a measure of the farmer's cash outlay for seeds, fertilizers, etc. In the majority of cases, farmers furnished their own seeds (usually left over from the last season's yield and saved for seeding purposes). These were valued at salvage prices plus storage costs and interest (the opportunity cost of the dollars they would have received had they sold their seeds at harvest and invested the money elsewhere).

Machinery and equipment (X_5) is a measure of the inventory of farm equipment used for production, valued at replacement market price in the nearest market as reported by the farmer. For those items made on the farm, cost estimates were calculated on materials used and the labor hours involved.

Draft animals (X_6) is a measure of the value of the draft animal employed in the field for production purposes. The source of power was an oxen-drawn plow (a pair of oxen is considered as one set), and the value of the animals reported was what the farmer considered his animals were worth, what he could have purchased them for, or sold them for.

Fitting the Cobb-Douglas Function to the Data:

By fitting the Cobb-Douglas function to the input-output data, we will be able to estimate the marginal value products for the categories involved.

The function used in this study is of the type

$$(1)\quad Y = aX_1^{b_1} X_2^{b_2} \ldots X_n^{b_n}$$

It is linear in the logarithms and can be written as:

$$(2)\quad \log Y = \log a + b_1 \log X_1 + b_2 \log X_2 + \ldots b_n \log X_n$$

The fitted Cobb-Douglas function in logarithmic form for the total survey is:

$$\log y = 1.778248 + (.925884)\log X_2 - (.309136)\log X_3 + (.082137)\log X_4 + (.102604)\log X_5 + (.101609)\log X_6$$

The fitting of the function was done with computer programs using least squares regression techniques and calculating several statistics including the b_i's and their significance levels determined by "t" tests.

The exponents (b_i's) in the equation are the elasticities of the dependent variable (Y) gross crop income, with respect to the independent variables (X_i's). The value of these b_i's indicate the percentage change in gross crop income associated with a one percent change in the respective input category associated with the b_i, holding all other inputs constant. The constant log "a" is the intercept on the log Y axis.

The marginal value products of the input categories (X_i) were calculated directly from the exponents by using the formula (3) $MVP_{x_i} = \frac{b_i Y}{X_i}$, where Y, the estimated gross crop income, is the antilog of log Y in equation (2), and X_i is the quantity of the input under consideration (i = 1,....,n). The marginal value products of the geometric mean quantities of the inputs computed using equation (3) are presented in Table 8.

Table 8. Marginal value productivities of indicated geometric mean quantities of inputs used on thirty-three farms in Chilalo, Ethiopia, 1967-68 crop season.

Input Category and Unit	Geometric Mean Quantity of Inputs	MVP ($) Dollars
X_2 Land (in hectares)	4.97	65.54
X_3 Labor (in months)	21.97	-4.95
X_4 Productive Cash Expense (in dollars)	63.79	0.45
X_5 Machinery Equipment (in dollars)	52.14	0.69
X_6 Draft Animals (in dollars)	124.55	0.29

The resultant regression coefficients (b_i's) and associated standard errors (σb_i), and level of significance are shown in Table 9. The sum of the regression coefficients (b_i's) was .903098 indicating decreasing returns to scale.

Examination of the standard errors of the b_i's and their respective t scores indicated they were significantly different from zero at the .05 percent level for land (b_2),

Table 9. Regression coefficients (b_i's), their standard errors (σb_i's) and level of significance at the geometric mean organization--33 farms, Chilalo, Ethiopia, 1968-69 crop season.

Input Category	b_i	σb_i	Significance Level
Land	.925884	.064322	<0.0005
Labor	-.309136	.084509	0.001
Productive Cash Expense	.082137	.038885	0.044
Machinery and Equipment	.102604	.048186	0.042
Draft Animals	.101609	.065998	0.132

0.1 percent for labor (b_3), 4.4 percent for productive cash expense (b_4), 4.2 percent for machinery and equipment (b_5), and 13.5 percent for draft animals (b_6).

The simple correlation between the input categories is shown in Table 10. The input categories all showed a high correlation with gross crop income except for labor, which was not as highly correlated.

The multiple correlation coefficient (R) was computed to be .9814, which, with a sample size of 33, five independent variables and one dependent variable, would be expected to be this high in five percent of the cases in similarly drawn samples with a true (R) of .90 (43) (25).

The coefficient of determination (R^2) was .9632, indicating that 96.32 percent of the variation in the logarithm of the dependent variable (Y) estimated gross crop income, was associated with the independent variables

Table 10. Simple correlations between dependent and independent variables and between input categories (all farms).

Variables	Variables					
	X_1	X_2	X_3	X_4	X_5	X_6
X_1	1	.96542	.13311	.69178	.52094	.59952
X_2		1	.25259	.64531	.52067	.55091
X_3			1	.08794	.46574	.20952
X_4				1	.18269	.49300
X_5					1	.41354
X_6						1

included in the study. The unexplained variance of 3.68 percent was probably due to independent variables such as weather, managerial ability and institutional influences no measureable. The effect of these variables on log of gross crop income is assumed to be randomly distributed.

The logarithm of gross crop income at the geometric mean was 2.54553, the antilog of which is $351.80 (see Table 11). The standard error of estimate ($\bar{S}$) of the dependent variable was .047755. Under the conditions

prevailing in the 1968-69 crop year and assuming a random distribution, log Y would be expected to fall between 2.54553 $\pm$ .047755; for the organization of the farms at the geometric mean in 67 percent of the cases or in natural numbers, between $392.00 and $315.60. Therefore, an average of one out of every three farmers would be expected to have gross crop incomes greater than $392.00 or less than $314.60.

In our analysis of simple correlations, labor is positively correlated with gross crop income (Y). In the partial correlation we find that labor is negatively correlated with gross crop income. If labor (X_3) is regarded as the variable production factor (assuming the others fixed), the relationship between gross crop income (Y) and labor (X_3) is negative, meaning that gross crop income (Y) decreases as labor (X_3) is increased. Thus, when we take into account the influence of the other variables, as labor (X_3) increases, gross crop income decreases. The reduction is such that as gross crop income increases, labor (X_3) decreases. The explanation for this apparent contradiction is that a more efficient substitute for labor is found among the other inputs. We suspect these substitutes are machinery and equipment (X_5) and draft animals (X_6) as seen from the positive correlation between labor and machinery and equipment and draft power. Additionally, the partial correlations

Table 11. Input categories and gross crop income (in logarithms and antilogarithmic form), regression coefficients (b_i's) and marginal value products of the inputs, at the geometric mean organization--33 farms, Chilalo, Ethiopia, 1968-69 crop season.

Input Category	log $\bar{X}_i$	Antilog $\bar{X}_i$'*	b_i	log Y	Antilog Y	MVP_{x_i}
X_2	.69638	4.97025	.925883	2.54553	351.80	65.54
X_3	1.34183	21.97	-.309136	2.54553	351.80	-4.950
X_4	1.80474	63.79	.082137	2.54553	351.80	0.453
X_5	1.71718	52.14	.102604	2.54553	351.80	.6923
X_6	2.09534	124.55	.101609	2.54553	351.80	.2870

*Units: X_2 Land in hectares; X_3 Labor in months; X_4 Production Cash Expense in dollars; X_5 Machinery and Equipment in dollars and X_6 Draft Animals in dollars.

between gross crop income (Y) and both these inputs are positive, whereas the partial correlation is negative for labor.

Testing the Regression Coefficients Against the b_i Necessary To Equate MVP and MFC

Rather than test the regression coefficients for significance against the null hypothesis, we will compare them with the regression coefficients necessary to yield marginal value products equal to a set of minimum expected returns. On the basis of visits with farmers and extension agents in the area, the following input variables were drawn up to exhibit reasonable minimum expected returns.

Land--cultivated/hectare	$69.70/hectare
Labor/month	15.00/month
Production Cash Expenses	1.05/$1.00 of expenses
Machinery and Equipment	75% on investment
Draft Animals	40% on investment

1) The minimum expected returns to land were based on 7 percent interest charge, taxes ($1.70/hectare at time of survey), and a 10 percent risk factor with land valued at $400/ha (1968-69 crop season).
2) The minimum expected return on labor was based on the going wage rate ($15.00/month).
3) The minimum expected return on production cash expense was a return of a dollar plus a 5 percent

interest per dollar spent on farm inputs such as seed and fertilizer.

4) The minimum expected return on machinery and equipment was based on the knowledge that most of the machinery and equipment are prepared on the farm from local materials such as wood, leather and bamboo which, under adverse tropical weather and physical conditions, has a very low life expectancy and can be expected to have a 75 percent return on the investment.

5) The minimum expected return on draft animals is based on the assumed fact that all the draft power used on the farms under study is animal power. In the absence of feed, properly balanced rations and lack of veterinary services, we can expect a low life expectancy; therefore, we have attached a 40 percent rate of return on investment.

The b_i's required to yield this set of minimum expected returns were tested against the actual regression coefficients to see if they were significantly different from the established b_i's.

The regression coefficient or standard b_i^* which will yield a minimum or reservation marginal value product was obtained by solving the equation:

$$MVP_{x_i} = \frac{b_i^* Y}{X_i}$$ for b_i^* after the required minimum MVP has been decided on and substituted in the following

equation at the optimum organization,

$$MVP_{x_i} = MFC_{x_i}, \text{ and } b_i^* = \frac{MVP_{x_i} \cdot X_i}{Y} = \frac{MFC_{x_i} \cdot X_i}{Y}$$

The estimated b_i was then subtracted from the standard b_i^*, and the difference divided by the standard error of the estimated b_i. Table 12 compares the estimated regression coefficient and the regression coefficient necessary to yield the minimum expected returns, which are equal to the marginal factor cost at this level of organization. This was done by using the "t" test:

$$t = \frac{\hat{b}_i - b_i^*}{\sigma b_i}$$

where $\hat{b}_i$ = estimated regression coefficient

b_i^* = the b_i necessary to yield the minimum return or MFC

$\sigma\hat{b}_i$ = standard error of the b_i

This showed that the estimated b_i's were not significantly different from the b_i's necessary to yield minimum returns, at the 5 percent level, except for labor X_3 and productive cash expenses (X_4) which were significant. On the basis of this analysis, it would appear that there is a misallocation in the resources used at the geometric mean. While it is essential to satisfy the level of efficiency where MVP and MFC are equal, two of the inputs--labor and productive cash expenses--are misallocated, i.e., more of these is used than is actually needed. This is probably due to over-estimation of some of the inputs used in production.

Table 12. Comparison of the estimated b_i's and the b_i's required to yield minimum marginal value products.

b_i	Estimated b_i's	b_i's to Yield Minimum Return	Difference $b_i - b_i^*$	Standard Error	t Value	Level of Significance at 5 percent
b_2	.925884	.984677	- .058793	.064322	.91404	Not significant
b_3	-.309136	.936754	-1.245890	.084510	14.74251	Significant
b_4	.082137	.190391	- .108254	.038885	2.78395	Significant
b_5	.102604	.111157	- .008553	.048186	.17749	Not significant
b_6	.101609	.141610	- .040001	.065998	.60609	Not significant

The statistics show that there is labor redundancy at the geometric mean organization. This is a measurement of labor use for the whole year, and it does not say anything about the existence of excess labor or labor shortages at particular seasons in the year. However, the writer also believes that the measurement for labor for the whole year is incorrect due to the fact that the data used in the analysis were obtained from interviews from farmers and not directly measured by the writer. There is a possibility of misreporting because farmers seldom keep records and all their reports come from what they could recall.

On top of this, there is a difference in interpretation of labor use by the researcher and by the farmers. To the researcher, the amount of labor used is a measure of the actual number of people involved, and the time spent on a particular operation; while to the farmer, the amount of labor measured is the number of people present at the scene. It does not matter to the farmer whether the people present do actually take part in the operations or stand around and chat, cheer or tell stories to the people performing the operations. To the farmer, the willingness and good will of his neighbors to be physically present at his farm during the important operations of weeding, harvesting and threshing are considered as participation per se. This, therefore, raises a difficulty of exactly measuring the actual amount of labor used in the year, and can definitely cause distortions in measurements.

If, on the other hand, errors were not made in estimation, it would indicate that expenditures on labor and productive cash expenses are being made at more than the efficient level of organization.

In order to bring the level of production to the efficient level of organization, one of two things could be done: a) reduce the use of these inputs that are misallocated and substitute other inputs, b) raise the level of productivity of labor and productive cash expense which have a very low level of productivity by changing their quality. Either of these alternatives can be pursued. We have seen in our analysis of partial correlation the existence of substitutability between labor on one hand, and machinery and equipment and draft animals on the other where the latter two variables had a higher productivity than labor. Substitution would be rational if we were to ignore the second generation problems of labor migration and unemployment. If, however, these considerations are brought into focus, the second approach, i.e., raising the productivity of labor (by improving the quality of the input) by further education and training would be more favorable. Productive cash expenditure could be expected to bring more returns than at present by making the needed cash expenditures on high-yielding, good-quality seeds and the use of chemical fertilizers.

The marginal productivity analysis has given us empirical evidence that there is a need to reorganize the

production process if a higher productivity level is to be achieved. In Chapter II, we discussed a chronological presentation of peasant agriculture and its problem areas. Such problems are numerous. Changing one area and tackling only one problem at a time will not bring about a dynamic and modern agricultural sector. There is a great need for the introduction of a package of technologies or change into the present traditional system. The remainder of this chapter will demonstrate that the situation of peasant farming is not completely hopeless. Productivity can be raised to a higher level without making complete structural changes.

The few areas that have affected the productivity of peasant farming and that need serious consideration are:

(1) Land: This topic will receive detailed attention in later chapters, but here we will try to show the part it plays as a limiting factor in productivity.

The small size of cultivated fields (holdings) has limited the efficient production of crops. Tenant farmers, because of their undefined tenure arrangements with landlords, are hesitant to make any major investments in the farms they operate, and have little incentive to go into new ventures or introduce modern ideas. Even if they do want to introduce new inputs to their production system, they cannot use the land as collateral to obtain the money for buying needed inputs. The

government's actions in land reform will help solve this problem.

(2) Capital: This is very closely related to the problems of land tenure; when land tenure problems are solved, raising capital will not be a major problem provided the proper institutions are made available and their terms of credit are more favorable.

Presently, there is a myth among credit agencies that it is very difficult to reclaim back loans made to peasant farms because a high percentage of the money borrowed goes for subsistence family consumption. Even though it may not be possible to empirically disprove this myth in this paper, one cannot deny the existence of money lenders who are making fortunes by lending money to peasant farmers at high interest rates.* However, the fact that most of the farmers who have borrowed money are still in farm operation lends credence to the theory that they can and do repay their loans. The present attitude of credit agencies towards peasant farmers must be changed, and, if the administration of credit is made through a well-organized extension service and the credits are made "in kind" rather than in cash, we feel that reclaiming loans will not create serious problems.

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*Interests charged by merchants in Setit Humera, Northwestern Ethiopia, are reported to be 100 percent (35).

This approach, if followed properly, will not only guarantee that loan agencies will get their money back, but it will also have the additional effect of committing the farmers to acquiring modern inputs.

(3) Labor: Some labor redundancy seems to exist during four or five months in each year, with labor bottlenecks at peak seasons. In general, the productivity of labor is low among peasant farmers, and our marginal productivity analysis has confirmed this in the case study area, even though we tend to disagree with this, due to reasons mentioned earlier. Our analysis has also shown that the marginal product of labor does not even cover its marginal factor cost.

As farm laborers become more mobile (using better transportation facilities), and better job opportunities are available in other areas, rural people will migrate in order to receive opportunity costs in other areas. This raises the problem of congesting urban areas with an unskilled labor force. The solution, therefore, is an intensive training program to raise the skill level of rural laborers, which will, in turn, help increase agricultural productivity on the farms. It will also prepare a trained labor force that can compete for jobs in industrial areas.

(4) Production Practices: Farm tools made on the farm (animal drawn as well as hand tools) are very inefficient for the kind of work they are subjected to. This again is a factor contributing to the low productiveness of peasant farming. Research on improving hand tools and animal-drawn implements can greatly help increase the efficiency and timeliness of field operations.

(5) Cropping Pattern: Commercial fertilizers are not used by peasant farmers at all. Farmers believe they can improve the fertility of the soil by burning it. This practice, in truth, destroys the organic matter and all microbial activity so essential for plant growth. Moreover, fields that are cropped for three to four years at a time become very low in fertility, and in order to replenish the fertility, they are fallowed from 5 to 8 years. This reduces the amount of land that is readily available for cropping at any one season. Introducing chemical fertilizers will: a) help bring in these fallowed fields under cultivation; b) eliminate the tedious work of soil burning; c) use the time or labor-hours saved from soil burning in some other operation; d) make the redundant labor force more usable and productive; and e) help farmers raise their cropping intensity by many more times than is presently realized.

(6) Seeds: Crop yield per hectare is very low in all peasant farms because of the use of low-yielding indigenous varieties of seeds. Since no seed cleaning is performed, crop seeds are often intermixed with weed seeds. In addition, many of the seeds do not germinate because they are damaged by the trampling of animal feet during threshing or because of the unevenness of the maturity dates. Improved, high-yielding, clean and certified varieties of seeds--if distributed among farmers through effective adaptive methods and demonstrations and combined with better cultural practices--will definitely help increase yields.

All these factors affect productivity directly. If these areas are properly administered, we can expect peasant farming to be very productive and to satisfy the food grain requirements of the country within the very near future.

CHAPTER IV

THE APPROPRIATENESS OF THE EMPHASIS IN THE PLAN

According to the Third Five-Year Development Plan for agriculture, the government's policy is to stress and emphasize the rapid expansion of large-scale commercial farming by diverting most resources toward such development. This policy is rationalized by the fact that peasant farmers have been deemed slow in adopting modern technology, regardless of the government's efforts to modernize.

There is no question that productivity of peasant farming in Ethiopia is low and this fact has been assumed in this paper. The objectives are, therefore: (1) to determine the extent to which peasant farmers are slow and unresponsive to change; and (2) to examine the extent of governmental efforts made toward modernizing peasant farming. We can then decide whether or not the recent step the government has taken is justifiable. For a better understanding of the argument, it is helpful to divide the investigation into three parts: (1) physical resources, (2) people, and (3) institutions.

Physical Resources

For many hundreds of years, the farmers of Ethiopia have been forced to take refuge in the rugged terrain of the central plateau. In the west, they have been consistently threatened by the Turks and other Moslem invaders; in the east and the northeast by the desert; in the east and southeast by malaria and warlike nomads; and in the south and southwest by malaria and tsetse fly. The temperate climate of the higher elevations provided health and refuge to these peaceful settlers, and population expanded and led to division and subdivision of the fertile cultivable land. The pressure for more land led to the cutting of forests and settlement over marginal, less-desirable agricultural land. These people settled and subsisted on the land for centuries.

The fertility of the soil was not replenished as fast as it was being depleted by: overgrazing; cultivation of the same piece of land from one year to another without any use of commercial fertilizers; and soil erosion, caused by torrential rains typical in the higher elevations. Farmers on their part, as rational managers, have employed the best techniques known to them to keep the land as productive as possible. Contour farming and the presence of terraces along steep slopes typically found in the plateau are living evidences of their ingenuity. The land, in its present condition, thus cannot yield any higher produce using present technology.

This is the extent of the understanding of the development planners upon which they base their analysis. They feel that peasant farmers are hard to convince to use modern inputs of production. They see no future in this land as far as agriculture is concerned; and, in fact, they strongly feel that it is a waste of time and resources, both human and financial, trying to solve problems in this area. Instead they have strongly recommended the settlement of the fertile lowlands of the country, through large-scale mechanized farming.

People

> People play a two-fold role in development planning. First, the purpose of development is its effect on people. Secondly, the people are also a resource and as such are an important input. People are on one side of the development equation as inputs (or resources) and simultaneously on the other side of the equation as recipients (or beneficiaries) of the development (26, p. 19).

An estimated 90 percent of the total population of Ethiopia live in rural areas, and about 78 percent of this population is permanently settled. The level of literacy is low for all practical purposes. Can illiteracy account for low productivity? Are cultural patterns and religious dogma barriers towards modernization?

When the case study of peasant farming that was mentioned earlier was conducted, the 33 farmers who were interviewed were subjected to these questions in different ways to learn the attitudes toward the above subjects. Out of the 33 farmers interviewed, 12 were illiterate; 17 had church school education (mainly reading the literature in "Geez," the official language) and 4 had third-grade

education. All sent their school-age children to nearby schools unless labor bottlenecks arose during weeding and harvest, then the children had to stay at home to assist in the family labor. Some even complained about the distances that their children had to travel in order to get to school, and about the shortages of teachers and classroom space in the schools. This is an indication that the farmers are aware of their changing environment.

To test their attitudes toward change, they were asked the following questions.

Q. "How would you react if a qualified advisor who has concrete 'scientific' reasons, approached you and suggested that you alter your date of planting?"

Response	No. of respondents
a) Would appreciate advice and consider it carefully with the intention of accepting it.	4
b) Ask advisor for more information .	21
c) Would regard advice as doubtful and probably not accept it	5
d) Would reject advice and consider it as utter nonsense	3

About 65 percent of these farmers were rather hesitant in their responses. Any rational manager who was in the situation would be acting the same way. In the summary of budgets, Chapter 1, Table 7, the annual net income was shown to be $22.79 which is almost negligible, meaning that the risk margin is very small. These farmers are at the furthest extreme of the "golden mean of management." Whatever action is to be taken must be made after serious planning to the

best knowledge of the farmer. Their problem is not a matter of making profits or incurring losses, but rather a matter of survival or starvation. They would, therefore, be very hesitant to involve either themselves or their investment in new techniques whose payoffs are not certain. They, therefore, cannot be labelled as unresponsive to change; instead "cautious" should be the right word to characterize them. Much praise has been made and many documents can be cited on the attitude of peasant farmers in Ethiopia. The following citation is a typical summary of the comments:

> It was stated earlier in this document and is repeated for emphasis that Ethiopia's rural people, although primarily illiterate, are intelligent. Their actions are both rational and efficient within the limitations they face.
>
> They are not adverse to change in farming practices if they are convinced of the value of change. They are hard workers, and in existing circumstances they know their jobs well. Still, they are not able under present limitations to increase their productivity to meet the increasing need for agricultural product (26, p. 19).

Out of the 365 days of the year, it is said that 239 days are holidays--mostly related to church activities. To find out whether culture and religious practices were limiting factors in development, several questions were raised during the interview. A representative sample question is presented below.

> Q. Apart from Sundays and major national or social holidays, which Saint's days do you celebrate during the year?
> R. One or more important holidays were mentioned.
> Q. Suppose, on this holiday you mentioned, when you are feasting with your friends and relatives, the extension agent comes to your home with something that is very special to you, let us say 50 kilograms of an excellent variety of seeds and a very good fertilizer.

Suppose he tells you that you have been selected from among all other farmers and these seeds and this fertilizer have to be applied on your farm today. You know today is a very important holiday to you, but the gift from the agent is also equally important and cannot be ignored; what then would your reactions be?

Response	No. of respondents
a) Accept the gift with pleasure, get up, hitch your oxen, prepare the field and sow the seeds, apply the fertilizer immediately.	16
b) Hesitate and try to convince the agent that you do it tomorrow	10
c) Refuse to do it today and tell the agent that your holiday is more important to you than the gift	8

It was interesting to note that the importance of religious holidays had become a waning interest and did not greatly effect the operations of the farmer. Each farmer had his rationalization. The majority of those who said they would accept the gift without hesitation were either Moslems (to whom the holiday had no religious meaning) or poorer farmers whose holdings were small and who spent their time in the fields whether it was a holiday or not. The farmers whose responses were negative were either very old, or were financially well-to-do landlords, who were distinguished in the society.

Although it is very hard to make generalizations for the economy as a whole from a small sample such as this, there seems to be a clear indication that wealthier, big landowners are more difficult to convince about new ideas than

are smallholders. Culture and religion seem to have a stronger control of the wealthier farmers than the smaller ones.

Institutions

So far, in our discussion no direct evidence can be found to support the label for the peasant farmers of "laggard in the development process," in order to hold him responsible for his unproductiveness. We should, therefore, direct our attention toward the skeletal framework of a society's structure, i.e. "institutions."

The absence of satisfactory progress in Ethiopia may be attributed to the lack of those essential institutions that sponsor a healthy agricultural economy. These institutions are not a private concern nor can they be created and handled by dedicated individuals. It is the concern of the government to create the necessary institutions and make the environment conducive for their survival and success.

Are these essential institutions available in Ethiopia? And if they are, have they been accessible to the farmers who need them so acutely?

A review of a few of the important institutions will give us the following picture.

1. Land Reform: Land reform is and has been the main topic of discussion among government officials, civil servants,

farmers and students all over the country, even before the first development plan was drafted. All the three plans have presented elaborate arguments for land reform.

The subject is very sensitive. Everyone seems to know what ought to be done, but no one has taken any initiative. The bulk of the land at the moment is in the hands of higher government officials, or powerful ethnic leaders. These people seem to have the power to counteract any move which would threaten their right of tenure (either legal or fraudulent). They also seem to have a great deal of influence on the peasantry. In some areas, they represent the Crown,* and are charged with the responsibilities of keeping law and order. It is, therefore, obvious that the government is hesitant to bring about a radical change in land tenure.

The Third Five-Year Development Plan has presented a seemingly reasonable approach to this problem. By imposing a progressive land tax, it is assumed that the land holders will be forced to put their land into production. It is said that this tax will "act as a negative incentive--in order to avoid the burden of the tax, or the loss of control of the land through being compelled to lease or sell it to other persons who are willing to cultivate it" (34, p. 196-197). Without going any further, a few comments may clarify the inappropriateness of this approach.

The registration of land titles does not have any uniformity. The land owner does not know exactly how big a holding he has and the government does not have a perfect

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*Ethiopia is under the rule of an Emperor.

knowledge of the geographical location or the size of each holding, because cadastral Surveys have not yet been conducted. Past experience tells us that there is a large number of land owners who have had their land tax requirements deferred for reasons which the writer does not wish to mention here. If these landlords have succeeded in getting a deferment of taxes in the past, is there any reason why they cannot be deferred from the new taxing system?

In order to impose a progressive land tax, the government needs to have complete information on the size and distribution of holdings. The land needs to be classified as very fertile, fertile, semi-arid, arid, etc. At present this classification and appraisal is performed by local low-level civil servants who are subject to biases. There is, therefore, a need for a large number of trained land appraisers, and adequate law enforcement facilities. We can conclude that the planners have assumed too much and their conclusions are far from reality, at least within the scope of the planning period.

2. The Ministry of Agriculture: The Ministry of Agriculture is the official government organization concerned with agricultural development for the Empire. It is composed of six major divisions: Livestock Production and Veterinary Services; Plant Production and Protection; Agricultural Extension Services; Forest Services; Education and Technical Assistance; and Provincial Field Services. While the skeletal framework seems to be sound, its activities have been

hampered by (a) a limited number of trained personnel, (b) insufficient funds and inflexible budgetary controls, (c) undefined lines of authority resulting in reluctance in decision making and delegation of authority, and the creation of bureaucracy; and (d) overlapping of responsibilities between the Ministry of Agriculture and other ministries or independent agencies. Agencies such as: the Ministry of National Community Development actively involved in the operations of cooperative and large-scale farms; the Ethiopian Coffee Board involved in coffee production and marketing; the autonomous Ethiopian Grain Corporation involved in the storage and distribution of grains; the Meat Board involved in livestock marketing; and several other research agencies that independently conduct their own research activities which all leads to lack of coordination and duplication of efforts.

Researchers in agriculture, mainly in the field of crop sciences, have in recent years been able to develop improved varieties of seeds, but the technology has not moved from the experimental plots into the hands of farmers to be used because of (a) the absence of seed multiplication centers,* and (b) the lack of a well-organized extension service to disseminate new technology among peasant farmers.

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*There was once a seed multiplication center in Kulumsa, Arussi which was on the point of dying because of insufficient funds. It was taken over in 1967 by the Chilalo Agricultural Development Unit (CADU), Swedish International Development Agency (SIDA), to serve as a research station in their package program.

The Agricultural Extension Department is merely a token organization in its present state. As of 1968, it enjoyed the services of 105 extension agents and supervisors serving 50,000 to 60,000 farmers in eleven provinces. Commenting on the condition of the extension department, a 1968 USAID agricultural sectoral analysis said:

> From the location where extension agents are now located, considering the limited means of performing their jobs (few roads and little means of transportation), and the limitations of their clientele (illiterate, no capital, etc), no more than 10 percent of the nation's farmers could possibly come under any direct influence of extension workers and probably no more than one percent could be influenced in a very significant extent. The lack of a well-managed, properly staffed and aggressive extension component has been a limiting factor in agricultural development, . . . to achieve one extension worker per 2,000 rural people would mean 11,000 extension workers would be needed in contrast to the approximately 100 available at present. If trained personnel had been available, many of the other factors hindering progress would never have developed (26, p. 36).

The situation remains today as it was in 1968.

3. The Ministry of Finance: Up to the present, the Ministry of Finance has been dictating the activities of every Ministry, by limiting the amount of funds drawn out at any one time, even though allocations for each Ministry are made at the beginning of each fiscal year. Lobbying is a common practice. This attitude needs changing. Each Ministry is charged with the responsibilities of prosecuting the assignment that is laid down for it. Confidence should be bestowed upon the officials of these ministries to be able to handle their finances reasonably. If need be,

improving the auditing system to check their accounts would be more efficient than patronizing them.

4. Transportation: At present, the country is serviced by 2,700 miles of all-weather roads, and 3,500 miles of dry-weather roads.* Out of the 99 "Awrajas" (districts) in the country, 36 do not have all-weather roads and less than 50 percent of the others are within 10 miles of an all-weather road which means that most of the farm produce has to be moved by pack animals or human resources (26, p. 39). This limits the amount of product coming to the market in bulk.

A 1969 USAID Survey of Ethiopia's agriculture presents a clear picture of the problem as follows:

> Although Ethiopia has been a net importer of grain, quantities produced locally would probably be sufficient to meet domestic requirements if the grain could be moved economically and in large enough quantities from Ethiopia's grain-surplus area in the interior to the deficit areas, mainly in the north. Because of the deficit area's proximity to the sea and the inadequacy of transportation between the north and the interior, it has often been easier and cheaper to import grain than to move it within the country (53, p. 22).

This again serves to prove that production is not the main problem as assumed by the planners, and unless transportation facilities are improved, the country will continue to import grains produced cheaper abroad.

5. Credit: Out of the few banks located in urban areas in the country, very few are involved in

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*Estimated from Transportation and Administration Map of Ethiopia, Imperial Ethiopian Mapping and Geography Institute, Addis Ababa: Artistic Printing Press, April 1968.

making production loans to farmers, and the recipients have always been large farm owners. The Development Bank of Ethiopia which was set up to meet these needs has in the past been completely inaccessible to small farmers. As a result of an unpleasant experience with small farmers in the past (15), the Bank has put the small farmer completely out of the credit picture. Instead of bluntly saying "no" to the peasant farmer in his request for credit, the Bank has made the terms of credit totally unfavorable to the applicant. A farmer wishing to take a medium-term loan from the bank has to show evidence of owning real estate in one of the major cities that is worth 200 percent of the amount of credit requested. Can one expect a peasant farmer to own real estate in any city worth 10 percent of the amount requested, let alone 200 percent?

6. Supplies and Services: In the second chapter, those essential elements, i.e., improved varieties of seeds, fertilizers, pesticides, and improved tools, that readily contribute to the increase in production of peasant agriculture, have been shown to be lacking. The insufficiency of capital on the part of the peasant farmer coupled with the lack of necessary infrastructure has limited the peasant farmer from using these inputs even if production inputs are physically present in the country. The need for services of farm supplies is very great and little can be expected from peasant agriculture unless these bottlenecks are systematically removed by respective development authorities.

7. Marketing: The problem of adequate transportation facilities has been mentioned earlier in this chapter. The amount of farm products coming into the market economy at any one time is not great enough to have a substantial effect on prices. Besides, a few well-established and prominent middlemen control the market thus leaving the farmer very little control in price setting. There is little competition and the farmer has very little bargaining power. The problems are not only how, when and what to produce, but where to sell what is produced. To protect the producer from these middlemen and provide improved marketing services, several specialized marketing organizations have been established: the Ethiopian Grain Corporation; the Livestock and Meat Board; the Ethiopian Coffee Board; and others. These and other institutions were established to provide stable market prices, keep farmers informed on market conditions and advise farmers on technical matters, but have not performed their jobs as well as they were designed to.

Market information is not widely disseminated and wide margins, market spread and seasonal price variation tend to go unchecked. The Moore and Madson Grain Marketing Study discovered that, during a single year, the price differential between two markets less than one day's haul apart was more than $2.00 per quintal (220 lbs.) above transportation and handling costs for more than 100 days.

> Extreme variations in prices can be seen from prices which exist on any given day; for example on May 24, 1968, in Neghelli (a town in southern province) 'teff' was selling for U.S. $28.80 per quintal, sorghum U.S. $26.80 and corn, U.S. $10.00. On the

> same day teff was selling for U.S. $12.80 in Debre Zeit (central province), sorghum for U.S. $3.20 in Humera Setit (northwest) and U.S. $3.60 in Dessie (north central province) and corn for U.S. $4.00-$4.40 in Awassa (south central province) a mere one day's hauling distance (26, p. 39).

8. Effective Demand: There is too much talk about increasing agricultural productivity both for self-sufficiency and exportation. Effective demand, the most important problem, seems to have been neglected by the planners. A review of the Development Plan indicates that the planners seem to have put production increase on one side of the equation, and population increase and nutritional needs on the other side of the equation, thus finding a disequilibrium (production trailing behind), it seems as though increasing production alone would equalize the equation.

The country is not very far from being self-sufficient in food grains. This can be achieved with very little effort. The problem to consider is the level of income of the consumers for these products. Unless an equitable distribution of income is made, people will not have the purchasing power to buy the food they need. The country has not yet reached a stage to be concerned about how many units of proteins and amino-acids are taken by an average person. Her greatest worry should be how to generate income for the people in order that the daily caloric requirements are met. This, however, does not mean that nutritional needs are to be neglected.

The planners seem to have left effective demand to the market system to solve itself. The shift in the Plan in emphasis of the producing units, i.e., from small-hold

farming to large-scale commercial farming seems to lead to a much more unequal distribution of income (by lowering the income level of peasant farms) and supplying the market with commodities for which demand does not exist.

Farmers cannot be expected to risk time and money to produce goods for an unsure or non-existent market. Price stability is recognized as one of the conditions that encourages bountiful production and adoption of improved technology. Price stability also lessens or eliminates risk; therefore, lending agencies can be more liberal, the flow of capital into agriculture is accelerated, and farmers will more readily increase production. In Ethiopia, price stability has been lacking and the farmer has been the predominant risk-taker in the system. Greater dissemination of price information, increased competition, the development of marketing cooperatives, and government assistance in stabilizing prices--all have a part to play in improving marketing services if Ethiopia is to increase her agricultural productivity (26, p. 39), and at the same time raise the income level of the peasantry.

9. Public Health: Much as been achieved in the field of public health, especially where great efforts have been made to combat smallpox and bring malaria under control. Most of the health services are concentrated in urban areas. Rural people cannot enjoy these privileges even if they can afford to bear the expenses, because these services are not available in their localities. Farm operations cannot be

carried out efficiently and productivity cannot be expected to rise when the health of the working labor force is poor.

Summary

This chapter began with the argument that the development planners have felt that the quickest way to raise Ethiopia's agricultural production would be through the encouragement of large-scale commercial farms and settlement programs. The planners seem convinced that traditional peasant farmers would respond only slowly regardless of efforts made by the government to modernize them. The discussions in this chapter not only tried to prove that the planners' conclusions are untrue, but also that whatever efforts have been made to help peasant farmers have not been accomplished effectively in order to have any impact. This has happened because of the lack of proper institutions and the failure of the government to allocate its funds efficiently.

CHAPTER V

SOME CONSIDERATIONS OF THE PLAN

The previous chapter concluded with the implication that the development plan did not seem to be realistic and identify itself with the existing agricultural problems confronting Ethiopia. This chapter will complete the writer's argument by reviewing the plan that is underway and is to continue in effect until 1973.

When dealing with large-scale commercial farms, one cannot refrain from mentioning the use of modern technology, i.e., mechanical means of cultivation, mainly tractors, improved varieties of seeds, pesticides and adequate infrastructure, which are complements to one another. The success of the scheme totally depends on the availability of these inputs at the right amount, place and time. The availability of these inputs has already been discussed. These are physical factors and can be made available if one is willing to sacrifice sufficient resources. But what about the availability of the skilled healthy manpower which is needed to conduct the research, disseminate modern technology, supervise credits, channel marketing activities and operate and service the tractors? These inputs cannot be purchased from the market, nor has there yet been a machine designed to

take in unskilled human beings at one end, supply them with the necessary knowledge in the assembly line and then drop them off at the other end fully trained for their respective jobs. These human ingredients are lacking from the production process and, until the country is ready with skilled manpower, the success of mechanized farming may be jeopardized. How these inputs are to be provided is one problem confronting the planners.

Even though 90 percent of Ethiopia's population lives in rural areas, only 35 percent of these are between the ages of 20 and 50 years who are productive and actively involved in the production process (22). The encouragement of large-scale commercial farming was intended to be labor absorbing and is expected to provide employment for rural migrants. Other industries do not have the capacity to absorb the unskilled labor force that has saturated the urban sectors at the moment. Rural farmers may migrate to these large-scale farms seeking employment. The cause of migration cannot be attributed to labor redundancy in peasant farming because all evidence seems to indicate that, in spite of their low productivity, labor shortages appear on peasant farms more than 7 months in the year and, even if they are redundant, they are still on the farm and a sort of equilibrium is in stage.

It seems very plausible that the diversion of most resources and the encouragement of large-scale mechanized commercial farms may be the cause of labor migration from

peasant farms thus creating a disequilibrium. The availability of credits; government subsidies on machinery, equipment and fuel, and the free accessibility of modern technology seems to favor large-scale commercial farmers over peasant farmers. Being out-competed in the production process, peasant farmers may be forced to close down their operation because it is not paying and work as wage earners elsewhere.

Two important questions can be raised here: (a) Are these large-scale farms really labor absorbing and would they be able to offer secure employment for both migrant rural farmers as well as those unemployed saturating the cities who may be migrating to the farms to seek employment? (b) Is the government financially adequate to operate a welfare program in order to support the unproductive rural people, remaining on their farms because of old age or lack of mobility, who have been deprived of their productive young people? This seems very unlikely, because even the most affluent economies have not been able to keep up with their welfare programs let alone a small emerging economy.

The principal participants in these large-scale farms are, of course, those who already are at high income levels. The approach the planners followed favors those in these high income brackets; the schemes raise their already high incomes. The existing disparity between wealthy and poor is, thus, only made greater. There is no income distributing effect incorporated in the plan.

The level of living of the peasantry is already low, and one can assume that peasant farming will continue to exist for years to come. However, each year, its existence will be dwindling to a very low level of subsistence. This eventually may reach a limit which may lead to peasant uprising, which is undesirable and unwanted at any time for the country. Have the planners considered this problem and thought of ways of coping with it?

Many emerging nations in Africa have made it a fashion to include the development of settlement schemes in their plans. With very few exceptions, almost all the settlement schemes have collapsed because of insufficient funds, lack of trained personnel, administrative red tape and shortsightedness in planning. Ethiopia was not an exception, and had included these schemes in her plans.

Among the popular ones, the Middle Awash Settlement scheme, which was designed to settle the nomadic "Danakil" tribesmen in the mid-eastern lowlands, has taken $24 million of the government's budget for its development for the period of 1968-1973 (as compared to $14 million that is allocated for the development of peasant farms). (34, p. 204) In the crop year of 1968, 600 hectares of land were brought under cultivation in cotton and corn, and all operations except weeding and harvesting were mechanically performed. Heavy, up-to-date machinery did the earth work in clearing the forest and leveling the ground. Sophisticated machinery was used in plowing, discing, leveling, canal construction and planting,

and spray campaigns against insect pests were done by airplanes. The farm manager had ordered 15 irrigation pumps that were needed to water the seed beds. But, the administration, based 180 miles distant at Addis Ababa, was willing to let him have only 9 pumps because they felt that the 9 pumps would do the job and this would reduce the additional cost of 6 pumps. This advice was supplied by white collar officers who lack field experience and could only interpret information provided in the dealer's manual. As a result of this, sufficient amounts of water could not be provided for the 600 hectares planted with seeds at the right time, thus yields were lower by 30 percent than was anticipated.*

The administrative staff were by no means agriculturalists and the concept of amount, time and place meant very little to them. Their main concern was to keep their account books indicating minimum expenditures. These kinds of false efficiencies in administration have hampered the activities of the scheme and, though the planners may not admit it, success is very doubtful. Even if the scheme succeeds and meets its production targets, it can only be considered a state farm rather than a settlement scheme because it has not served the purpose for which it was designed. The settlers have not participated in the project. The only place they appear on the scene is to weed the fields,

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*Incident observed by the writer during a mechanization survey of this scheme--African Mechanization Study, July 1968.

harvest the crops and perform the coolie work that is needed on a farm of such a size, labor which the scheme would otherwise have had to have hired elsewhere. The settlers never participate in the management; even if they were allowed a position, the technology would be too sophisticated because of their lack of understanding and their nomadic nature.

The development of these kinds of schemes were also designed to be labor intensive and provide employment for rural people, but, is it not a paradox to find the use of airplanes to spray chemicals instead of knapsack sprayers or even tractor-mounted spray booms which could employ more people in these activities?*

Under the sponsorship of the Swedish International Development Agency (SIDA), a package program was started in Chilalo Awrajo in the southeastern province of Arussi, known as "Chilalo Agricultural Development Unit" (CADU) in 1967. This program has called for a large number of extension agents concentrated in a limited area. The project is said to be progressing well, but, at what pace and cost, no one but SIDA knows. Is it not being a bit hasty in going into such ventures before the ones that have already been started have been proved successful?

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*Incidentally, this is not the only farm that is using airplanes for spraying. All large-scale private cotton farms in the country are using the most up-to-date air spraying techniques available. This technique may be economical from the managers' point of view. But the question here is, is it not contradictory to what is stated in the plan, and can the government prevent these managers from using other capital-intensive technologies which may also be economical.

A similar project is planned by USAID in the southern part of the central province, known as the Shashamanne Agricultural Project. The project has set aside $5 million to help finance 140 Ethiopian farmers in mechanized units of 40, 80 and 200 hectares. This area is identified as having shortages in laborers; and because of this, apart from other cultural practices, the use of mechanical harvesting is included--namely the use of combine harvesters, which again is capital intensive. The danger here is that the project is including only 140 participants which would make them the major crop producers in the area. What is then to become of the non-participant farmers who may face severe competition? What kind of employment will they find on these large mechanized farms? Will the participating farmers who are starting out with mechanical cultivation practices be willing to give it up and shift to the use of labor for their needed operations? And if this does not happen, what sort of subsidies are going to be provided to the non-participating small farmers in order to give them the incentive to stay on their farms and keep them as part of the production unit? These are unresolved problems and need serious consideration.

Many of the densely-populated countries, which once had food grain production deficits and great potential markets for Ethiopia's agricultural product, have or will be self-sufficient in the very near future. The advent of the Green Revolution has brought a considerable effect on agricultural productivity on participating countries. The planners have made it very urgent to boost agricultural

production to bring in export revenues. Does the planning commission believe that Ethiopia's agricultural production costs are low enough to compete in the world grain market? Even if production costs are low, do we have a guaranteed foreign market? On the other hand, is there such a large effective demand for food grains locally to make it a first priority in increasing productivity through the development of large-scale mechanized farms?

Ethiopia has been blessed with fertile, unsettled cultivable land. With the introduction of modern technology and improvements in public health, population is expected to increase rapidly every year. Is this not the right time to consider the problem of settlement and population growth seriously instead of encouraging the development of large-scale farms for the mere purpose of raising productivity through large-scale mechanization for an unknown market, thus exploiting the potential natural resources which will be greatly needed in the future, more than they are needed now? A country whose economy is completely dependent on agriculture needs to consider these problems very seriously, if development is expected to take place at a faster rate.

CHAPTER VI

SUMMARY AND CONCLUSION

We have discussed peasant farming in Ethiopia and identified problem areas and the extent of the government's efforts to improve the conditions. The low productivity of peasant farming was noted and it was also shown that illiteracy contributed very little or not at all to low productivity.

The marginal productivity analysis in Chapter III has given us empirical evidence that there is a need to reorganize certain factors in the production process. It should be clearly understood that the sample size used in this study depicts only one region and is too small to permit us to make generalizations for the country as a whole. However, it seems reasonable to assume that peasant farmers in other areas of Ethiopia are faced with similar problems that have the same economic, social and institutional framework.

On the basis of the marginal productivity analysis, we have seen that resources are malallocated at the geometric mean level of organization. In order to satisfy the level of efficiency at the point where MVP and MFC are equal, two of the inputs (labor and productive cash expenses) were

forced to be in excess. It was also indicated that in order to bring the level of production to the efficient level of organization, one of two things could be done: (a) reduce the use of those misallocated inputs and substitute other inputs that are more productive, or (b) raise the level of productivity of those inputs by improving their quality. The analysis of partial correlation has shown the existence of substitutability between labor on one hand and machinery and equipment and draft animals on the other, where the latter two variables have higher productivity than labor. We are, therefore, faced with a choice between two alternatives. The first alternative is substitution, and it would be rational if we ignored the second generation problems of labor migration and unemployment. If, however, the alternative approach, i.e., raising the productivity of labor (improving the quality of the inputs) by further education and training, and making productive cash expenditures on better seeds and chemical fertilizers were taken, the dangers of driving unskilled rural people out of the farms into urban areas could be reduced and scarce capital could be allocated more productively.

The marginal productivity analysis has shown the possibilities of making peasant agriculture more productive by making adjustments in institutions and production practices without actually changing the overall framework of small-hold farmers.

Farmers were proved to be responsive and willing to follow better ways of farming than assumed by the plan. The shortcomings of the government in not providing the proper institutions at the right time and place in order to properly guide and provide needed services that could have aided the development process were also pointed out.

All evidence has led to the conclusion that, in order for plans to materialize, much foundation building is necessary. Trying to rush the plan into reality without making adjustments in the present political, economic and social framework will lead nowhere.

Bearing this in mind, the writer believes that, if some reorganization is made in the present plan and corrective measures are taken to avoid some of the pitfalls, there is still time to put the development of Ethiopia's agriculture on the right path.

Possible Areas of Improvement

At this point, it is reasonable to point out that it is impossible to avoid the subject of politics in a discussion concerning agricultural development. Therefore, a passing remark will be made here about this topic leaving the rest of the detail to the politicians.

The present system of government is constitutional monarchy. It is claimed that Ethiopia has enjoyed her freedom for the past three thousand years. Yet, as compared with other African countries formerly under colonial rule and enjoying independence only a decade or so, Ethiopia's

economic development ranks very low. And, comparing her with those countries that have been free for a long time, Ethiopia's level of development is still very low. From this, one can conclude that something is wrong with the system. One way of getting out of this dilemma is by bringing young Ethiopians who have been sent abroad and have acquired knowledge and new ways of doing things into the political scene and giving them a share in the decision-making process in their respective fields of training. Such a transition is of paramount importance for the future development and stability of Ethiopia's economy.

There are no official political parties as such in the country. It has a one party government. But, in actuality, there is underground group formation which has become a serious threat to the progress of the country in recent years. Feudalistic and conservative landlords who believe in maintaining the status quo are on one side, and radical, restless and discontented youth on the other side. There is also a third group (whose number is growing larger every year) that has no definite goals for the future of the country, but whose main interest is to act as a catalyst in stirring up the system and creating instability, thus leaving a feeling of fear and despair among the masses.

Progress cannot be made by direct confrontations and collision. The first step of the government in this area should be the formation of a bridge of communication among these groups to use their talents in a combined effort that

is very badly needed for the construction of the economy. It is the government alone through its policies that can create a feeling of nationalism in the minds of its people and fill their hearts with a hopeful, bright future, rather than a fatalistic, gloomy one. This can partly be accomplished by building the right kinds of institutions at the time and place required.

Land Reform

So far, fear of the uncertain future has prevented the materialization of land reform. The idea of land reform has been deliberated for the past twenty years and, unless it is acted upon and enforced by the government, which is equipped to do so if it has the conviction, further delays will only mean postponing the development of the economy. Therefore, cadastral surveys must be started as soon as possible.

Clear-cut definitions of titles, size of holdings, landlord-tenant relationships, inheritance laws and reasonable distribution of land among cultivators must receive immediate attention. Smallness of the size of cultivated land by many peasants has been identified as one of the limiting factors of productivity. This problem can be solved, if the government decides on some size beyond which any cultivable land cannot be subdivided either by sale, lease or inheritance. Once this is done, we judge it will be possible to pull those small "postage stamp-size" farms which are below

the level of efficiency out of the production system by deliberate and selective application of modern inputs and technology.

It is worthwhile to mention that it does not mean that once the problems of land reform are solved, growth will follow. As a matter of fact, land reform alone will not help in increasing agricultural productivity to any higher degree unless improvements in other areas like modern inputs of production, credit, roads, markets, public health and effective demand are instituted. The reader should, therefore, bear in mind that land reform is mentioned in several instances merely for illustrative purposes and not because it is the only important problem facing the country.

The Ministry of Agriculture

Up to the present, functions and activities which should have been played by the Ministry of Agriculture have been duplicated elsewhere by other ministries and agencies. This duplication must be rectified and all agricultural development activities must be channelled through and coordinated by the Ministry of Agriculture. This calls for a reorganization of the Ministry of Agriculture itself.

A sense of responsibility must be created among the personnel of this Ministry. The extension department needs a new orientation and must receive very serious attention. There is a great need for the increase of trained personnel and field technicians. This urgent need must be met and at the same time bureaucracy must be reduced to a minimum in

order to act promptly upon decisions already made. A line of authority must be clearly defined and responsible officials must have the authority and confidence to make decisions whenever needed. While improvements in accounting and auditing procedures need great improvements, budgetary controls should be more flexible in order to accomplish planned programs.

Agricultural Research

In the field of research, most of the emphasis has been devoted to problems of agronomy and livestock. Very little work has been done in the fields of agricultural economics and agricultural engineering. The Institute of Agricultural Research, which is a chartered and autonomous body, has been involved in recruiting most of its staff members and devoting its funds toward problems of agronomy and livestock. Its Agricultural Economics Department is understaffed and very weak. Because of the lack of trained people in the country in this field, even those who are available spend more than half their time as trouble-shooters or acting as committee members in ad hoc committees in other institutions, instead of conducting their own research activities. Basic farm management studies have not yet been begun. The Institute's agricultural engineering section is non-existent.

A good start is already made in the establishment of an agricultural research institute. It is the only institution in the country that has the sole responsibility of

channelling and coordinating research activities pertaining to agriculture. So far, its relations with other research agencies within as well as neighboring outside countries are very encouraging. But, the shortages of funds and lack of adequate research staff have bogged down its activities to some degree so far. Research is the backbone of development and all efforts must be made for its smooth running and functioning if fruitful results are expected. In order to clearly understand the problems confronting peasant farmers, farm management studies must be made with great detail and urgency.

Policy

The emphasis of the Third Five-Year Development Plan poses a great danger of creating a bimodal situation, i.e., few large-scale farms using expensive imported equipment involved in capital intensive techniques, and many small size farms traditional in their practices and use of inputs involved in labor intensive methods.

At this point in Ethiopian agricultural development, it is more reasonable to tackle problems that are already at hand, rather than to invite newer ones with which the country is not familiar. Large scale commercial farms, settlement schemes and package programs about which the country does not seem adequately informed or equipped at the moment require the "five essentials" of Mosher: (1) availability of product markets; (2) a constantly changing

technology; (3) local availability of supplies and equipment; (4) farm production incentives; and (5) local transportation, all of which are not presently available in Ethiopia. Even if these factors were available, one could not imply that their mere presence would make the application of these strategies economically and technically feasible. The choise is therefore between (1) a rapid increase in productivity by bringing such projects into reality only to be confronted by the distortions they create in the economy; and (2) a slower rate of increase in productivity using the already existing framework of peasant agriculture by making the necessary adjustments in the system. The latter seems to be more feasible and realistic. This does not imply that large scale farms should not exist; in fact, there is a great future for tractor mechanization and, in some areas, no progress can be made without it. All we are saying is that, since large scale mechanization involves large amounts of capital investment and requires well trained operators, adequate supplies of spare parts and services, very good transportation facilities and a very efficient administrative force, it seems a bit hasty to embark into such ventures without having prepared the necessary foundations for it.

Development planning should focus on the general welfare of the society, in the case of Ethiopia, the peasant farmers that make up 90 percent of the population rather than a handful of already privileged individuals, if some level of equity and social justice is really needed. If

this approach is followed, the Ethiopian small farmer who is a private entrepreneur and his own decision maker, will not only participate but will also feel proud to be identified as the mortar of his country's economic structure.

Bryceson's remarks on agricultural planning will serve to underline the writer's conclusion that the Third Five-Year Development Plan is too sophisticated for the present resource endowments of the country.

> There appears to me to be too much attention devoted by planners and by international organizations to the more spectacular grandiose development schemes, such as major dam construction and highly organized irrigation and settlement schemes. I suspect that it is the penchant that internation organizations have for such schemes that has led planners to pay them so much attention. They also have the advantage of being more compact and tidy and therefore easier to explain, to "sell." Be that as it may, experience has shown that such schemes are very costly in terms of physical, technical and financial resources. Their capital cost per acre is very high. The staff requirement is very high. On the other hand, their impact on the overall development picture too often is narrow, affecting directly only a small part of the population. Moreover, the benefits accrue over a very long term; it is not unusual for a period of ten to twenty years to be necessary before the return begins to be truly positive. Indeed, the big loss of what could have been done with those resources if they had been directed elsewhere.
>
> I am firmly convinced that, at this stage in our development, planners should concentrate on the improvement of what exists, as there is so much room for improvement there. They should make sure that the required inputs are available to the farmer at the right place in the right quantities at the right time. If this is done, then I am sure, that the production response can be widespread and, in the aggregate, large. What are these inputs? They are mainly equipment, and servicing facilities for the equipment, improved varieties of seeds, fertilizers, pesticides, and a quick efficient source of credit. Above all, the requirement is for an ever-present efficient extension service.

> This last does not mean a bunch of collar and tie men who descend on the farmer with a briefcase under arm and an aversion to getting their hands soiled. It means a corps of technical workers who live with the farmer in the villages, ride bicycles or motorbikes, and work with him to gain his confidence (8, p. 3).

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