POVERTY AND FOOD SECURITY IN ETHIOPIA: SOME EVIDENCE FROM WOLLO

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1. BACKGROUND

Poverty and food insecurity are the greatest challenge for Ethiopia. Poverty is manifested in many forms including low income (estimated at $100 per capita), poor access to basic health services and safe drinking water (only about 24% have access to safe water), high infant mortality rate and low life expectancy. However, poverty in Ethiopia is mainly expressed in terms of its worst form: food poverty and starvation.

Food availability on per capita basis declined from around 200kg in 1979/80 to 150 kg in the early and mid 1990s (MEDaC, 1999)[2]. The situation in recent years remains unchanged. For instance, per capita production of major food crops[3] in 2000/01 and 2001/02 was 162 kg and 148 kg, respectively. Similarly, the number of people vulnerable to drought has been increasing. People in some areas where drought was not a problem until recently are now increasingly vulnerable to drought. At the same time, people in areas where transitory food insecurity has been the predominant problem increasingly suffer from chronic food insecurity[4], which is related more to poverty rather than to temporary shocks.

The number of people who depends on food aid is increasing continuously. For example, only about 1.5 million or not more than 5% of the total population of the country suffered from drought induced food insecurity problem during the imperial regime in 1960's or early 1970's; by mid 1984, the figure increased to 7 million or

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[2] However, average growth rate of per capita food production has been improved in recent years. This can be seen from the improvement in the declining rate (rate of deterioration) of per capita food production. For example, the rate of per capita food production worsened from -0.84 in 1970s to -1.98 in 1980s and then improved to -0.64 in1990s (FAO, 2001). However, this improvement was too small to change the declining trend in per capita food grains production.

[3] This includes Teff, Wheat, Maize, Barely and Sorghum which accounts for about 85% of total area covered by the three major food crops (cereals, pulses and oil crops).

[4] Some Weredas in western Haraghie and Arsi were became vulnerable to drought in 2002/03 for the first time, while about 35% of the Wollo population received food aid annually between 1997 and 2001.

17.4% of the total population. In 2003, it increased to 14.5 million or 22% of the total population that is estimated at 69 million (see Annex 1). The whole population that was believed to be food insecure (of which most are characterized by temporary or transitory food insecurity problem) during the mid 1980's estimated now to suffer from chronic food insecurity.

Likewise, food aid has become increasingly important in saving life and narrowing the ever growing gap between food supply and demand. Ethiopia has been receiving food aid annually to fill the gap for more than three decades. However, the role and sustainability of relief programs have become increasingly controversial. In some parts of the country where relief has been provided for more than three decades, the problem of dependency syndrome has reached to its highest level and emerged as one of the major hindrance for effective implementation of local development programs. The current debate on the role of aid to Ethiopia and alternative ways to support her endeavors to achieve food security at household levels have partly emanated from this limitation of relief programs which have been carried out for so long in some areas of Ethiopia like Wollo.

Many decades of aid related development activities such as food-for-work programs in chronic food insecure areas has also failed to stop the process of environmental degradation and the rehabilitation of natural resources such as agricultural lands, soil and forests which are the basis for sustainable agricultural production.

Food aid has also become increasingly controversial even at international level. Its supporters claim that it plays a major role in feeding the poor to prevent severe food insecurity and saving lives when emergencies arise. Its delivery is justified by the view that it is a valuable macro-economic resource to fill the gap between demand and local supply and to provide a balance of payments and budgetary support. However, an increasing number of critics argue that food aid has contributed to dependency at the institutional and household levels. They point to the disincentive effects of food aid on agricultural innovation, intensification and diversification (Masefield, 1996).

2. OBJECTIVE OF THE STUDY

The study tries to assess the food security situation of farmers in South and North Wollo of the Amhara National Regional State (ANRS). It describes and analyzes the level and dynamism of food insecurity and poverty, and tries to understand what explains these problems (from micro-perspective) and recommend what should be done to reduce food insecurity and poverty in the study area. Based on lessons from

previous development programs, the study will also identify policy measures to address the problem.

3.   DATA AND METHODS OF DATA ANALYSIS

Data collected for an impact assessment study of cash for relief (CfR) project were used in the study[5]. The CfR program emerged from the experience of using food both as relief resource and incentive material to undertake natural resources conservation activities and other public works such as feeder road and water development. The CfR project was carried out in 2002 by SC-UK in six Weredas of North and South Wollo Zones. However, it was started in 2000 as pilot program in Legeambo and Mekete Weredas.

The sample size of the study was 646 households residing in 12 peasant associations of Legambo and Mekete Weredas of South and North Wollo, respectively. About 75% or 495 sample households were project participants (i.e. beneficiary of the CfR program) whereas 151 households were non-beneficiaries of the program.

Descriptive methods employed to explain the level and extent of food insecurity and poverty problems in the area, while regression models enlighten the contributing factors and point out possible actions to be undertaken by farmer, the government or non-government organizations to improve the food security situation of farmers in the area.

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[5] Interested readers could get a copy of the main report of the CfR impact assessment study from the EEA/EEPRI.

4. POVERTY AND FOOD SECURITY

4.1. Poverty and poverty indicators

Poverty in Ethiopia is not a new phenomenon. History tells us that the majority Ethiopian people has suffered from poverty and poverty related problems like malnutrition and disease for a very long period of time. The question at hand is, however, whether poverty and poverty related problems are reached their climax and start to stabilize or decline or are they still growing. There are conflicting reports on this issue. For instance, a study conducted by the World Bank in 1999 using data from national accounts, consumption surveys and food price trends concluded that poverty was decreased in rural Ethiopia in the nineties (World Bank, 1999). However, this was contrary to public opinion gathered during the process of drafting the poverty reduction strategy paper (PRSP) by independent institutions like EEPRI and Forum for Social Studies. Moreover, a recent study carried out in Northeastern Highlands of the Amhara region by IDS and SC-UK pointed out the growing number of rural households that appeared to be unable to make ends meet, even in good rainfall years (IDS and SC-UK, 2002). According to data obtained from the regional DPPC office of the Amhara region about 1,306,976 people or 35% of the total population of North and South Wollo Zones received food aid every year between 1997 and 2001. In terms of household, the relief program estimated to cover more than 50% of the households that reside in the two Zones. This also indicates the worsening welfare situation of the population in the study area.

Poverty in the study area exhibits itself in many forms but mainly in terms of lack of access to sufficient food and high vulnerability even to minor weather related shocks. The main causes of poverty are lack of productive resources, low productivity and low income.

4.1.1 Shortage of productive resources

Farm resources and household assets are important indicators of poverty in the farming system of the study area. Size of farm land, labor and livestock and fertility of soil have important implications on households' food security status and poverty level, especially during normal agricultural years. During drought years, livestock, a major asset that can be easily liquidated, is more important in terms of implying better access to food.

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Table 10: Average ownership of productive resources in South and North Wello, Ethiopia

Variable		Obs	Mean	Std. Dev.	Min	Max
Land (ha./HH)		644	0.68	0.30	0.13	2.00
Per capita Land		577	0.23	0.19	0.02	1.75
LABOR (ME)		644	1.84	1.00	0.40	6.10
HH size (AE)		644	3.01	1.52	0.60	8.98
Livestock (TLU)		646	1.33	1.41	0.00	10.53
OX (No.)		443	0.47	0.65	0.00	4.00

Percent of HHs having no ox = 61%

Of the sampled households, 94% owned 1 hectare or less, while the average farm size was 0.68 hectare. On per capita basis, average farm size is as low as 0.23 ha. About 61% of the farmers reported that they have no ox, while average ox ownership is only 0.47.

Table 11: Distribution of farm land among sampled farmers

Land in hectares	Freq.	Percent	Cum.
<=0.13	12	1.86	1.86
0.19	1	0.16	2.02
0.25	70	10.87	12.89
0.38	13	2.02	14.91
0.50	192	29.81	44.72
0.63	7	1.09	45.81
0.68	40	6.21	52.02
0.75	150	23.29	75.31
0.88	1	0.16	75.47
1.00	119	18.48	93.94
1.13	1	0.16	94.10
1.25	20	3.11	97.20
1.38	1	0.16	97.36
1.50	14	2.17	99.53
1.75	2	0.31	99.84
2.00	1	0.16	100.00
Total		644	100.00

In general, available farm resources are too small to provide adequate food and income for an average household. A study conducted recently on the farming system of the study area reported that households that owned less than 0.5 ha are categorized as destitute households which are unable to meet basic needs. Households with farm sizes in the range of 0.5 to 1 ha and above 1 ha are classified as vulnerable and viable, respectively (IDS and SC-UK, 2002). Based on this single indicator classification, data collected from the field indicate that about 14.9% of sampled households are destitute, 79% are vulnerable and 6.1% of them are poor farmers. Even though categorizing households based on a single factor (land) has its own limitation, it can indicate roughly the extent of poverty with respect to current level of productivity and ownership of productive resources.

4.1.2 Low access to non-farm and off-farm activities

Almost every farmer in the study area looks for non-farm employments to supplement family food requirements. However, data collected from farmers indicate that not more than 50% of sampled households could get employment opportunities in any year, including a year when food-aid induced employment opportunities are increased. During the survey year, about 44% of households had access to off-farm or non-farm employments. The average annual gross income from these activities was Birr 550 and 239 for valid cases (i.e. households having access to non-farm activities) and an average household, respectively. Compared to total household income, this income from non-farm or off-farm activities is only 11.3% (see Table 3).

Table 12: Income from non-farm and off-farm activities in Legeambo and Mekete Weredas

		Legeambo	Mekete
Households having access to non-farm income sources		180 (45.6%)	103 (41.0%)
Mean non-farm income (Birr/annum)	for households with access	624	475
	for all sampled households	284.40	194.90
Estimated mean gross farm income (Birr/annum)		1897.7	2069.0
Share of non- and off-farm income in total household income	for households with access	24.7%	18.7%
	for all sampled households	13%	8.6%

4.1.3 Low level of productivity

One of the reasons for poverty and food insecurity is low productivity. The productivity of the major farm inputs (land and labor) in Ethiopian agriculture is very low. Data collected from sampled households indicate that about 20% of farmers produce only 3 or less quintals of wheat-equivalent grain during a year they consider normal. More

than 60% of the sampled farmers reported that they produce 9 quintals or less per hectare. This level of productivity is very low even compared to the national average.

Land degradation and declining soil fertility are the direct cause of low land productivity, while extreme poverty which induces cultivation of marginal and degraded land using primitive technologies is the indirect cause. Moreover, inadequate institutional support in terms of agricultural extension and marketing services also contribute to declining productivity and income of farmers.

Table 13: Land productivity in cereals production during normal year (quintal of wheat equivalent[6] per hectare of cultivated land)

Production (qt./ha)	Households		
	Freq.	Percent	Cum.
< 3	128	19.97	19.97
3.00–6	150	23.40	43.37
6.01–9	109	17.00	60.37
9.01-12	87	13.57	73.94
12.01-16	62	9.67	83.61
16.01-20	39	6.08	89.69
>20	66	10.31	100.00
Total		641	100

4.1.4 Low income and food consumption

Poverty is mainly manifested in terms of low income and food consumption. Households' ability to command a minimum level of consumption is usually computed based on income. This minimum level is commonly known as the poverty line. It is computed based on an income level that accepted by the government of the FDRE as sufficient for minimum food and non-food consumption expenditure for an adult person residing in rural Ethiopia.

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[6] The various food crops produced in the area were expressed in terms of their wheat energy equivalent. The major food crops of the area are barely, wheat and maize, sorghum, lentil, peas, beans, vetch and flax.

Table 14: Estimated level of poverty in south and north Wello, Ethiopia[7]

			Good (Normal) year	
			Legambo	Meket
Average HH size in AE[a]			3.58	3.52
Average consumption expenditure[8]	Per capita food and non-food consumption expenditure (for year 1999/00) (Br.)		995	995
	HH minimum food and non-food consumption expenditure		3562.1	3502.4
Average Production and income[a]	Food crops product ion	All food crops (qt.)	9.03	10.64
		Weighted average price (Br./qt. food crop)[9]	190	175
		Estimated annual income from crop production (Birr)	1715.7	1862.0
	Average income from off/non-farm activities (Br./annum)[10]		624.0	475.0
	Average income from livestock sales (Br./annum)		182.0	207.0
	Total income (Br./annum)		2521.7	2544.0
Estimated percent of population living below poverty line			58.4%	54.8%

[a] Weighted average for beneficiary and non-beneficiary households.

The level of poverty in the study areas is extremely high. The percent of population living below the poverty line under good agricultural year is 58% in Legambo and 55% in Mekete Weredas. Accordingly, the percentage of population living below poverty line in the study areas is well above the national level by 12.5% in Legambo and by about 10% in Mekete Weredas.

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[7] The level of poverty is calculated based on minimum consumption level for rural Ethiopia based on the 1995/96 HICE which is also used by the government in its 1999/00's exercises to determine the level of poverty line. It is remembered that the basket of consumption goods considered in the calculation of the poverty line was identical in the 1995/96 and 1999/00 calculations.

[8] Data on per capita and average household minimum expenditure for food and non-food consumption was taken from a document prepared for the SDPRP by the Ministry of Finance and Economic Development of the FDRE.

[9] Average weighted price calculated based on price and production data collected from the household survey. The share of the various crops in total production was taken into account in the calculation of the average weighted price.

[10] Data on income from off-farm and non-farm activities for normal/good agricultural year was obtained from the survey result. But for drought year income from these activities is assumed to decline by 40% as the general economic activities in the area (except for activities related to food/cash aid operations) could weaken.

4.2   Poverty trend

Income has a direct impact on consumption and saving. Improved asset ownership and high income, which in turn allow savings to increase, offers a virtuous cycle to provide a buffer against future hardship; while the reverse process leads households to increased vulnerability to shocks such as drought. Most of households in the study area have little opportunity to make surplus and save for bad years. As mentioned earlier, even in good years, about 57% of the people live below the poverty line and the remaining 43% have little or no surplus to save for bad years.

Those households which have some opportunity to save for bad years usually keep their money in the form of livestock. They produce or buy livestock (particularly small ruminants) to sell and buy food grains during years of drought or to fill gap in food requirements towards the end of the agricultural year. Therefore, changes in the size of livestock of an average household could be taken as a proxy to indicate the dynamism of poverty and vulnerability of the society to drought.

Table 15: Change in the size of livestock (a proxy for the dynamism of poverty) in the past seven years (a situation in 2003 compared to 1996)

		Legambo	Mekete
HHs reported change in their livestock size		72.8%	61.5%
Reported change in livestock size during the past seven years	Increased (TLU/valid case)	0.27	0.11
	Decreased (TLU/valid case)	3.06	2.30
Net change during the past 7 years	TLU/valid cases	-2.79	-2.19
	TLU/sampled HHs	-1.95	-1.35
	Ox-equivalent/sampled HHs	-2.40	-1.69
Net change per year	TLU/valid cases	-0.28	-0.24
	TLU/sampled HHs	-0.20	-0.15
	Ox-equivalent/sampled HHs	-0.25	-0.19
N (Number of sampled households)		395	251

Farmers were asked to indicate the size and composition of their livestock during the survey year and to compare it with the situation some seven years ago. Table 6 shows the change in the size of livestock during this period. During the past seven years, 395 sampled households of Legambo Wereda lost on average about 79 TLU (in terms of oxen-equivalent, about 99 oxen[11]) of various livestock every year. In other

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[11] 1 TLU=1 camel, or 0.7 ox or cow, or 10 sheep or goats, or 0.5 Donkey or bull, or 0.45 heifer or or 0.7 mule, or 0.8 horse or 100 chicken (Hans E. Jahnke, 1982, quoted from EEA/EEPRI, 2002). alf,

words, during the survey year, on average four farmers own one ox or 12 sheep less than what they owned some seven years ago. In Mekete Wereda, the loss is a bit lower. About 251 farmers lost various livestock equivalent to 38 TLU (i.e. equivalent to 47 oxen) every year between 1996 and 2003. This is equivalent to a loss of 1 ox among every five farmers. In general, about 68.5% of households residing in the two Weredas reported change in size of their livestock. And when compared to what they owned five years ago (in 1998), the size of livestock of an average household during the survey year (2003) is only 54.6%. Previous studies also gave similar data on the worsening poverty situation of people in the study area. For example, a study by SC-UK reported that the size of livestock in 1992 increased for 14% of the farmers, remained stable for 15%, decreased for 42% and much decreased for 29% when compared to the trend level (SC-UK, 2003).

4.3. Agricultural production and food security
4.3.1 Analysis at household level (average household)

Peasants in the study areas produce various types of food crops, notably cereals and pulses. Compared to farmers in Mekete Weredea, crop production is less diversified in Legambo Wereda where crops like Teff, Maize and Sorghum are uncommon. Barely is the major crop grown by most farmers in both Weredas. Food crops production in a good agricultural year does not vary much between beneficiary and non-beneficiary households in Legambo Wereda where an average household produce about 9.3 quintals of various food crops. However, in Mekete Wereda, CfR beneficiary households produce on average 5 quintals less than what non-beneficiary households produce (Table 7). The share of Belg (minor) production season in total annual food crops production is as much as 50% in Legeambo Wereda, whereas in Mekete Wereda, Belg season is not much important.

Table 16: Crop production in the study areas (qt./ average household)

Wereda	Crops		Good agricultural year		Bad (Drought) year	
			Beneficiary	Non-beneficiary	Beneficiary	Non-beneficiary
Legambo	Cereals	*All cereals*	*7.03*	*7.01*	*2.83*	*2.62*
		Barely	6.29	6.06	2.47	2.27
		Wheat	0.74	0.86	0.36	0.34
		Sorghum	0	0.09	0	0
		Maize	0	0	0	0.01
	Pulses	*All pulses*	*1.92*	*2.32*	*0.68*	*0.91*
		Lentil	0.89	1.28	0.31	0.51
		Peas	0.69	0.79	0.25	0.30
		Beans	0.31	0.21	0.11	0.08
		Vetch	0.03	0.04	0.01	0.02
	Oil crops	*Flax*	*0.31*	*0.05*	*0.001*	*0.03*
	All Food crops		*9.26*	*9.38*	*3.51*	*3.56*
	Share of Belg in total production (%)		51.8%	56.5%	45.8%	49.7%
	N		303	92	303	92
Mekete	Cereals	*All cereals*	6.71	10.91	3.20	4.06
		Barely	2.44	4.06	0.81	1.38
		Wheat	1.26	2.30	0.50	0.70
		Teff	1.55	2.26	1.05	1.40
		Sorghum	1.31	2.27	0.79	0.50
		Maize	0.14	0.02	0.05	0.08
		Oat (Aja)	0.01	0	0.005	0
	Pulses	*All pulses*	1.78	2.56	0.79	0.76
		Lentil	0.20	0.49	0.04	0.21
		Peas	0.52	0.77	0.16	0.18
		Beans	0.93	1.08	0.28	0.28
		Vetch	0.13	0.22	0.31	0.09
	Oil crops	*Flax*	0.01	0	0.08	0.01
	All Food crops		8.50	13.47	4.07	4.83
	Share of Belg in total production (%)		17.5%	16.3%	13.2%	10.8%
	N		193	58	193	58

Survey data indicate that in Bad (drought) year, food crop production could decline on average by as much as 62% in Legambo Wereda and by about 58% in Mekete Wereda.

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Table 17: Production and consumption (Food balance sheet) of an average household in the study area

Wereda			Good agricultural year		Bad (Drought) year	
			Beneficiary	Non-beneficiary	Beneficiary	Non-beneficiary
Legambo	Annual food (energy) production in wheat equivalent (qt.)		8.94	9.32	3.5	3.6
	Annual food (energy) requirement in wheat equivalent (qt.)		8.76	10.21	8.76	10.21
	Annual food (energy) balance from own production (before expenditures require for non-food purposes)	Shortage/surplus in wheat equivalent	0.18 qt.	-0.95 qt.	-5.26 qt.	-6.67 qt.
		Shortage/surplus in months	0.25	-1.11	-7.17	-7.76
	Annual cash expenditures (for food and non-food purposes)[78]	Birr/annum	931	931	372.4	372.4
		In Wheat equivalent (qt./annum)[79]	5.6	5.6	2.3	2.3
	Estimated cash income from off-farm/non-farm business (Birr/annum)[80]		591 (3.58 qt. wheat)	734 (4.49 qt. wheat)	354.6 (2.15 qt. wheat)	440.4 (2.7 qt. wheat)
	Estimated income from livestock sales (Quintal of wheat equivalent/HH) [81]		0.40	1.3	0.40	1.3

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[78] Average household cash expenditures for food and non-food purpose were calculated based on data collected from baseline study conducted in South Wollo Highland Belg FEZ by SC-UK. The report classified the community according to their wealth status into better off, middle, poor and very poor households who constitute 20%, 35%, 25% and 20% of the population respectively. Their annual cash expenditure is 1550 Br., 1000 Br., 725 Br., and 450 Br. In bad (drought) periods, cash expenditure was assumed to decline to 60% as households are forced to reduce their expenditures and consumption patterns.

[79] Based on various survey conducted in the study area, the price for one quintal of wheat is taken as 165 Br.

[80] Farmers' income from off-farm and non-farm activities was recorded for an average (normal) year. Income from these activities during bad or drought year is assumed to be 60% of the average year.

[81] According to a study made in the study areas, livestock sales could produce an average income that could purchase 1.3 and 1.6 quintal of grain in S.Wollo and N.Wollo respectively.. Any sales over and above natural increase matched by corresponding purchases of younger animals. But income from livestock sales is concentrated in a few hands. Roughly 60% of income from the sale of oxen and cattle and 90% of income from sales of shoats goes to the 20% of

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	Annual food (energy) balance from own production and other incomes (including other expenditures)	Shortage/surplus in wheat equivalent (qt.)	-1.44	-0.7	-5.01	-6.21
		Shortage/surplus in months	*-1.96*	*-0.81*	*-6.9*	*-5.83*
	N		303	92	303	92
Mekete	Annual food (energy) production in wheat equivalent (qt.)		9.62	14.04	3.8	4.16
	Annual food (energy) requirement in wheat equivalent (qt.)		7.79	10.15	7.79	10.15
	Annual food (energy) balance from own production (before expenditures require for non-food purposes)	Shortage/surplus in wheat equivalent	1.83 qt.	3.89 qt.	-3.99 qt.	-6.01 qt.
		Shortage/surplus in months	2.8	4.6	-6.23	-7.01
	Annual cash expenditures (for food and non-food purposes)	Birr/annum	931	931	372.4	372.4
		In Wheat equivalent (qt./annum))	5.6	5.6	2.3	2.3
	Estimated cash income from off-farm/non-farm business (Birr/annum)		421 (2.6 qt. wheat)	654 (3.96 qt. wheat)	252.6 (1.53 qt. wheat)	392.4 (2.38 qt. wheat)
	Estimated income from livestock sales (Quintal of wheat equivalent/HH)		0.48	1.6	0.48	1.6
	Annual food (energy) balance from own production and other incomes (including other expenditures)	Shortage/surplus in wheat equivalent (qt	-0.69	3.85	-4.28	-4.31
		Shortage/surplus in months	*-1.06*	*4.62*	*-6.6*	*-5.1*
	N		193	58	193	58

households with the largest holdings of these animals (SC-UK, 1993). Based on these data and our survey results, assumptions made that livestock income from livestock sale of beneficiary households is only 30% of non-beneficiary households' income from livestock sale.

The study tries to analyze the level of food security in the study area. As the analysis is going to be made for average households, sampled households were grouped into four groups based on their location and participation in the relief (CfR) program. Self-sufficiency level (food balance sheet) was computed for average households from every group. Table 8 shows the capacity of the average household to feed its members in drought and normal (good) agricultural years. This was computed by comparing production and income[82] data with food and non-food consumption requirements.

Production and other economic data collected from sampled households and other secondary sources indicate that average households participated in the relief program (CfR) in both Weredas and an average non-beneficiary household in Legeambo could not feed themselves even in good (normal) agricultural year. They suffer from food shortage for a period of 1 to 2 months in a year that is considered normal (or good) by them. Only the average non-beneficiary household from Mekete Wereda could feed his/her household and have some surplus that could satisfy its consumption for about 4 to 5 more months.

None of the average households could feed themselves in bad (drought) years. Average households could be subjected to food insecurity problems for 6 to 8 months long. If one assumes that households should get cash to spend for their non-food requirement by selling part of their produce but also made another generous assumption that their cash requirement could reduce to 60% when compared to the normal year, the period of food shortage in drought year could narrow marginally to 5 to 6 months (in both Weredas).

The bad news is that farmers' prediction of the frequency of drought is very high. Most farmers' predict that drought could occur every two years and imply their demand for major relief operations that could last for 6 to 8 months one year after the other.

4.3.2 Analysis at community level

Food security is a function of own production including cash income, size of household and consumption requirement including cash expenditure for non-food purposes. As most households in the study areas are chronically food insecure, the amount of aid that supposed to be shipped into the area annually could also be considered as a factor that affect the level of food security. In this study, the level of food security at community level is estimated based on farmers' information on their

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[82] Income from livestock sales and off/non-farm activities were considered.

farm production and income including remittance and non-farm and off-farm income, and secondary data on food and cash (for non-food purposes) requirement of households. To account the decline of non-food expenditures and cash income during drought years, non-farm income and cash expenditures are assumed to decline by 40% during drought year (when compared to their level in normal years).

Table 18: Food security situation during normal (good) and bad agricultural years (percent of sampled farmers)

	Normal (good) year			Drought (Bad) year		
	All sample	Legeambo	Mekete	All sample	Legeambo	Mekete
Food secured HHs[83]	54.66	53.16	57.03	19.72	19.75	19.68
Food insecured HHs	45.34	46.84	42.97	80.28	80.25	80.32
N	644	395	249	644	395	249

Table 19: The degree of food security (aid requirement) in the study areas Legeambo and Mekete Weredas)

Food security situation of sampled households (aid requirement)	Normal year		Drought year	
	Number	Percent	Number	Percent
Satisfy 25% or less of their food from own sources (require food aid for 9 or more months)	61	9.47	253	39.29
Satisfy 26 – 50% of their food (require aid for 6 up to 9 months)	85	13.20	135	20.96
Satisfy 51 – 75% of their food (require aid for 3 up to 6 months)	88	13.66	82	12.73
Satisfy 76 – 100 of their food (require aid for 3 or less months)	58	9.01	47	7.30
Satisfy 100%+ of their food (Food secured households)	352	54.6	127	19.7
Chronically food insecure population	292	45.4	517	80.3

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[83] Food secured households are households which can produce sufficient food from their own farm to feed their family. Similarly food insecured households are households which could not meet part of their family food requirement from own production.
Please note that he number of food secured households in normal agricultural year was estimated at 86% in previous draft report which was based on average household production and consumption data computed from four types or group of households. This approach is wrong as it significantly affected by the distribution of sampled households in the four groups. Compared to the previous estimate of 86%, the present estimate (55%) is correct as it is calculated considering all households.

The above table shows that poverty in the study areas is extremely high and mainly expressed in terms of its worst form – food poverty. During a year considered normal and drought only one out of every ten and one out of four households, respectively, could meet only 25% of their food requirement. In other words, 10% and 39% of the sampled farmers need food aid for 9 or more months during normal and drought years, respectively. The percentage of chronic food insecure people (or households which could not meet part of their family food requirement from own source during a normal year) is 45%, while during drought year about 80% of the people need food aid for a period of 6 to 8 months (Table 10).

5.   FACTORS AFFECTING CEREALS PRODUCTION, FOOD INSECURITY AND POVERTY (HOUSEHOLD LEVEL ANALYSIS)

5.1   Determinants of output and food security

Many households in the study area have suffered from food insecurity problems for a very long period of time. While environmental degradation and drought are the principal causes of periodic food insecurity, lack of productive resources has increasingly led many households into chronic food insecurity problems. There are many households that depend on food aid even in normal year. This type of production environment has its own peculiar feature that many households produce any positive amount, but there are also other households who produce nothing because of lack of productive resources, mainly land. According to Hog and Lunde (2002), the Tobit model is an appropriate technique to run a regression of dependent variable that is essentially continuous over a range of values but also takes on zero (the threshold value) with positive probability over a number of explanatory variables.

A non-linear (Cobb-Douglas) production function was estimated to identify the determinants of farm output. The Cobb Douglas production function model is, therefore, estimated using Tobit regression because of the truncation of the data set. The tobit model fits a model of dependent variable on independent variables where the censoring values are fixed (Hog and Lunde, 2002). The shorter version of the functional form adopted and estimated is:

$Y=f(X,Z)$ and in log form

$LnY_i = \sum \beta_j lnX_{ij} + \sum \alpha_j lnZ_{ij} + \gamma + \mu_i$

Where: Y   is quantity of output (cereal production)

X   is a vector of physical inputs including land, labor and ox

Z   is a vector of other factors that affect the operation of a farmer like age,
ex,

engagement in land rental market, off farm activities etc.

γ and μ are constant and error terms, respectively.

The independent variables that believed to affect the level of farm output are broadly classified into four groups:

i.   Physical inputs – land, labor and ox. While capital has little contribution in subsistence mode of production of the study area, measuring any capital stock used in the production process is also difficult. However, cultivated land and ox/oxen used in the production process could be used as a proxy for capital stock. Due to lack of data, fertilizer use was not incorporated in the regression model. The impact of these variables is presented in column 1 of Table 11.

ii. The characteristics of farm manager (household head) – age, sex and level of education. Together with physical inputs, the impact of these variables is presented in column 2 of Table 11.

iii. Factor (land) market – its existence and farmers' ability to command scarce resource. Specifically, land rented-in and land shared in was considered[84].

iv. Non-farm income – remittance, participation in off-farm activities and income from such activities. The result could indicate or measure the existence of interaction and linkage between farm and non-farm sectors.

The result of the regression model of the CD production function is reported in Table 11. Column one presents the estimate of the simple CD production function in which only physical inputs are included. The model provides that land and ox which could also be used as a proxy to indicate capital stock are found important to explain the variation in the level of production among sampled households. The coefficient for land is statistically significant at 1%. However, the coefficient for ox is relatively high but significant only at 5% level.

Age and sex of household head are found statistically insignificant to explain observed variations in output. However, the coefficient for level of education of the household head is found negative and significant at 5% level. Although difficult to interpret from theoretical point of view, this may be because of the negative correlation between literacy level of the household head and ownership of productive resources which are more important in explaining existing variation of output.

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[84] About 17.2% and 13.3% of sampled households rented and shared farm land, respectively, from others every year.

As mentioned earlier, the role of factor market and impact of improved access to land are analyzed by incorporating the amount of land rented-in or shared-in into the model. The coefficient for land shared-in is high and significant at 5% level. Moreover, the coefficient for labor becomes significant when access to farm land is relaxed through land-sharing arrangement. On the other hand, land rented-in is found statistically insignificant.

The result reveals two important facts about the farming system of the area. First, land sharing could increase cereals production by improving the efficiency of resource utilization at community level. It helps to offset the negative effect created due to mismatched ownership of key farm inputs (land and labor) by different households. Second, land sharing is found advantageous than land renting. The fact that land sharing becomes more important than land renting indicates that peasants in the study area face problems related to production risks or shortage of complementary inputs of one or another type. In general, the result indicates that land rental markets should be supported and encouraged by policy makers.

Whenever they design development projects, government and non-government - institutions should also consider these facts. For instance, farmers need institutional support in the form of insurance against potential production risks to challenge the high-risk high-production alternative available for some farmers. For instance, rainfall insurance is helpful for farmers who use technologies like fertilizer at recommended level on their farm or rented land.

Extension institutions should also be flexible and capable enough to deal with different problems confronted by different farmers. In this regard, extension agencies should focus on improving the efficiency of the most scarce resource[85]. For instance, farmers who face land shortage should be supported differently from farmers faced labor shortage. Land shortage, for example, could be compensated to some extent by enabling farmers to grow high-value crops or through the use of land saving technologies like chemical fertilizers that will increase the return per unit area. On the other hand, labor saving technologies are more important for labor scarce families like female-headed households. Even though, questions remain how effective and comprehensive it will be, the recently designed household or family based extension program of the government is a step in the right direction.

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[85] This should not be confused with the government development strategy that says Ethiopia should follow a strategy that puts emphasis for the utilization of its abundant resource – labor. This may be true at national or community level. However, at household level, every household should maximize its return to its scarce resource. Extension institutions should also support farmers in that way.

In column 4, remittance and off-farm activities are introduced into the model to see the role of non-farm activities in farm production. Compared to households not participated in off-farm or non-farm employment opportunities, farm households that have external income in the form of remittance and off-farm income have a higher probability of producing more cereals. The result, therefore, may indicate the existence of linkage between farm and non-farm activities. However, the amount of income from off-farm activities is more important than the mere participation in off-farm activities which is also positive but statistically not significant.

In general, the result shows that off-farm employments and labor migrated from the area have a positive contribution to agricultural production. However, as land belongs to the government and migration has a risk of losing land use rights, migration is not a simple decision for Ethiopian peasants. Therefore, government should provide various incentives to encourage migration out of the farming sector. This could be implemented by providing long term tenure security to farmers migrating to other areas in search of employment or paying some money to those who voluntary abandon their farming occupation and totally hand over their farm land to the local administration. In parallel, effort should be made to create labor intensive employment in the non-farm sector to absorb the excess labor in the rural (farming) sector.

Table 20: Tobit estimates: Dependent variable: Output

	Column 1:		Column 2:		Column 3:		Column 4:		Column 5:	
	Coeffi cient	t- value	Coeffi cient	t- value	Coeffi cient	t- value	Coeffi cient	t- value	Coeffi cient	t- value
Constant	14.34	7.09	15.82	3.87	14.13	3.41	12.82	3.05	2.707	0.43
ln (Land)	2.31	1.87*	2.18	1.77*	1.85	1.47	1.93	1.55	0.577	0.81
ln (labor)	2.70	1.89	2.67	1.88	3.01	2.09**	3.26	2.22**	-0.878	0.37
ln (Oxen)	4.80	2.22**	5.27	2.47**	3.74	1.67*	3.63	1.56	5.82	1.35
Age			0.08	1.23	0.01	1.33	0.01	1.34	0.021	0.41
Sex			1.64	0.59	1.25	0.45	1.54	0.56	1.005	0.37
Head education			-0.79	1.99**	-0.62	1.54	-0.52	1.29	0.797	1.55
Land rent-in					0.04	0.03	0.03	0.02	-0.645	0.31
Land share-in					4.05	2.02**	4.17	2.06**	-1.514	0.34
Remittance							7.41	2.27**	30.46	.
Off-farm participation							0.77	0.57		
Income from off-farm activities									0.0045	1.78*
	Number of obs=168		Number of obs 168		Number of obs=159		Number of obs=155		Number of obs = 89	
	LR chi2(3)= 12.29		LR chi2(6) = 18.12		LR chi2(8) = 18.03		LR chi2(11) = 22.95		LR chi2(12)= 20.03	
	Prob > chi2 =0.0064		Prob > chi2= 0.0059		Prob > chi2= 0.0210		Prob > chi2= 0.0180		Prob > chi2= 0.0665	
	Log likelihood = -585.58688		Log likelihood = -582.6723		Log likelihood = -549.00348		Log likelihood = -533.3385		Log likelihood = -301.1958	

*, **, *** indicate significance level at 10%, 5% and 1% respectively.

On the other hand, a logit model was run to find out the determinants of food insecurity (during normal year). Data collected from the study area indicates that about 43% of households could not feed themselves even in a year considered normal. Therefore, it is important to identify factors that determine food security (during normal years) in the farming system of the study area. Different variables were hypothesized to determine food security. As independent variable, the level of own food production, household size and its composition, non-agricultural income in the form of remittance and off-farm income, age, sex and the level of education of the household head, size of livestock owned and year of first aid were entered into the model. The dependent variable is the level of food security of a household which is expressed as a dummy variable where 0 represents households that could not fulfill the food requirement of their members and 1 otherwise.

As expected, the level of food production significantly reduces the probability of becoming food insecure. On the other hand, household size increases the chance of falling into food poverty. The result is positive and significant for all age categories. Apart from production enhancing interventions, the new food security strategy of the government should incorporate family planning as one of its priority area in the fight against food insecurity.

Even though, the coefficient for remittance and off-farm income are positive, there is no statistical justification to support that households' having access to off-farm activities and remittance are better-off in terms of food security. On the other hand, age of household head increases the probability of falling into food poverty. Even though the coefficient is very low, it is significant at 10% level. The result implies that the probability of falling into food poverty is high for households headed by seniors (old age) than those headed by youngsters. Sex of household head (i.e. being female-headed or male-headed household) and the level of education of the head were found statistically insignificant to explain variations in the level of food security.

Having large size of livestock has little or no effect on the probability of being food insecure. The coefficient is very small and also statistically insignificant. This is a surprising result as households in the area keep any of their savings in livestock which could be liquidated any time the household face food shortage. Another explanatory variable that is entered into the model was the year a household received its first food aid. The objective is to look households' capacity to regain food security after they lost it for the first time. Even though, the coefficient is not significant, it is positive and may indicate the positive association between year of first food aid and food insecurity which in turn implies the difficulty households faced to regain their food security status after they lost it. Therefore, there is no justification to support that vulnerability to drought in the community is stabilized or declined after 3 or more decades of soil and water conservation and environmental rehabilitation activities carried out through NGO's relief-related and other regular development programs of the government.

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	Coefficient	z-value	Coefficient	z-value	Coefficient	z-value	Coefficient	z-value	Coefficient	z-value
Constant	-1.157	5.45	-0.648	3.44	-0.851	2.64	-0.851	2.37	-0.347	0.48
Output (cereals production)	-0.113	-7.43***	-0.102	-7.06***	-0.140	-5.38***	-0.146	-5.38***	-0.203	-4.02***
Household size (Adult equivalent)	0.655	9.19***								
Number of children less than 7 years old			0.359	4.10***	0.495	3.40***	0.540	3.55***	0.830	3.28***
Number of persons between 7 - 14 years			0.443	4.89***	0.430	2.99***	0.428	2.93***	0.768	2.89***
Number of persons between 15 – 50 years			0.331	3.83***	0.497	3.31***	0.521	3.26***	0.795	2.88***
Number of persons above 50 years			0.405	1.44	0.381	0.73	0.417	0.80	0.892	1.01
Remittance					-0.346	-0.45	-0.310	-0.41	0.414	0.28
Off-farm income					-0.000	-0.14	-0.000	-0.19	-0.001	-2.16**
Age of hh head							0.003	1.86*	0.003	1.92**
Sex of hh head							-0.216	-0.59	-0.695	-1.05
Education of hh head							-0.000	-0.72	-0.001	-0.62
Size of livestock									-0.001	-0.78
Year of first aid									0.010	0.18
	Number of obs 646 LR chi2(2) = 146.57 Prob > chi2= 0.0000 Log likelihood = -371.6992		Number of obs 646 LR chi2(6) = 115.13 Prob > chi2= 0.0000 Log likelihood = -387.4156		Number of obs = 277 LR chi2(8) = 70.07 Prob > chi2= 0.0000 Log likelihood = - 153.297		Number of obs = 277 LR chi2(11) = 74.88 Prob > chi2= 0.0000 Log likelihood = - 150.889		Number of obs = 139 LR chi2(12)= 62.16 Prob > chi2= 0.0000 Log likelihood = -64.458	

*, **, *** indicate significance level at 10%, 5% and 1% respectively

5.2 Determinants of dependency on food aid (participation in relief programs)

Ethiopia's food insecurity problems become deep-rooted through time. It is also increasingly associated to structural problems in the economy rather than to short-lived shocks such as drought. Presently about 2.5 million people suffer from food insecurity problems in Amhara National Regional State (ANRS) even in normal agricultural year (ANRS, 2003). More than 733,900 people are unable to feed themselves and depend on food aid within North and South Wollo alone in 2002. The majority of these people has suffered from structural food deficit (SC-UK, 2002). Therefore, it is important to examine factors that determine participation in relief program (or vulnerability to drought). A logit model was formulated where dependency on food aid in recent years is used as dependent variable. It is a dummy variable where 1 represents participation in relief program in the past five years and 0 otherwise. The model is expected to reveal the existence of any relationship between the expected disincentive effects of food aid on production process or the fairness of the targeting process.

The result reveals that households' food production capacity does not affect the chance of participation in relief programs. It implies that vulnerability to drought is high in the community and varies little among households. On the other hand, household size reduces the probability of participation in relief programs. However, when household members were grouped into four groups based on age and running a model using these groups, only the number of people between 15 and 50 is found to significantly reduce the chance of participation in relief programs (during drought periods). This result is not favorably compared with the output of the earlier regression model that tells us that the chance of falling into food poverty during normal/good years increases with household size including to the size of adult labor. One possible explanation could be that households with more adult labor (aged between 14 and 50) were more excluded from relief programs than households with more children (less than 14 years) or older people. On per capita basis, smaller households may benefit more in relief programs than larger families. If this is true, it may also explain partly why large families benefit less from relief programs.

With the exception of year of first aid, all other variables were found statistically insignificant to explain variation in participation in relief programs. The probability of households to participate in relief programs (i.e. their dependency on food aid) vary directly with year of first aid. The result implies that households having long history of food aid have little capacity to get out of this situation due to their deteriorated capacity to produce sufficient food or increased dependency on food aid.

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Table 13: Logit estimates: Dependent variable: Participation in relief programs during drought year

	Coefficient	z-value	Coefficient	z-value	Coefficient	z-value	Coefficient	z-value	Coefficient	z-value
Constant	1.386	6.85	0.799	7.14	0.829	4.14	0.995	4.10	0.631	1.37
Output (cereals production)	0.012	0.69	0.009	0.45	-0.006	-0.42	-0.005	-0.38	0.051	0.22
Household size (Adult equivalent)	-0.172	-3.01***								
Number of children less than 7 years old			-0.018	-0.34	-0.066	-0.59	-0.024	-0.21	0.173	0.81
Number of persons between 7 - 14 years			-0.054	-1.02	-0.121	-0.85	-0.086	-0.58	0.336	1.22
Number of persons between 15 – 50 years			-0.118	-2.37**	-0.084	-0.60	-0.025	-0.17	0.032	0.12
Number of persons above 50 years			-0.169	-1.05	-0.658	-2.20	-0.656	-2.17	-0.992	-2.01
Remittance					-0.158	-0.37	-0.120	-0.28	-0.436	-0.64
Off-farm income					-0.000	-0.33	-0.000	-0.54	-0.000	-0.15
Age of hh head							0.000	0.07	-0.000	-0.06
Sex of hh head							-0.334	-1.45	-0.120	-0.28
Education of hh head							-0.000	-0.21	0.001	0.28
Size of livestock									0.000	0.23
Year of first aid									0.120	2.43**
	Number of obs 646 LR chi2(2) = 9.16 Prob > chi2= 0.0103 Log likelihood = -384.1057		Number of obs 646 LR chi2(6) = 10.05 Prob > chi2= 0.1225 Log likelihood = -383.6597		Number of obs = 277 LR chi2(9) = 6.46 Prob > chi2= 0.6936 Log likelihood = - 153.353		Number of obs= 277 LR chi2(13) = 8.62 Prob > chi2=0.7346 Log likelihood = - 152.2729		Number of obs = 211 LR chi2(12)= 19.44 Prob > chi2= 0.0784 Log likelihood = -33.481	

*, **, *** indicate significance level at 10%, 5% and 1% respectively.

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6. SUMMARY AND RECOMMENDATIONS

The level of poverty in Ethiopia is not only a major challenge to her future growth but also become a threat to its stability and peace. Moreover, Ethiopia became synonymous with aid, particularly, food relief that has exceeded what is normally considered as a "relief" because food aid became part and parcel of the rural culture and way of life in some parts of Ethiopia, resulting to dependency syndrome. This is partly reinforced by the state institutions that are operational for the last three decades.

Poverty in the study area exhibits itself in many forms but mainly in terms of lack of access to sufficient food and high vulnerability even to minor weather related shocks. Available farm resources are too small to provide adequate food and income for an average household. Of the sampled households, 94% owned 1 hectare or less, while the average farm size is only 0.68 hectare. On per capita basis, average farm size is as low as 0.23 ha. About 61% of the farmers reported that they have no ox, while average ox ownership is only 0.47. In general, the major causes of poverty are lack of productive resources, low productivity and low income.

The level of poverty in the study areas is extremely high and mainly expressed in terms of its worst form – food poverty. About one fifth and half of sampled farmers in the study areas could meet only 25% of their food requirement during a year considered normal and drought, respectively. In other words, 20% and 50% of the sampled farmers need food aid for 9 or more months during normal and drought years, respectively. The percentage of chronic food insecure people (or households which could not meet part of their family food requirement from own source during a normal year) is 45%, while during drought year about 80% of the people need food aid for a period of 6 to 8 months.

The regression model shows that access to productive farm resources principally to land and ox is significantly affects the level of farm production. However, labor becomes significant only when land shortage is relaxed through land-sharing arrangement. Moreover, the model depicts that sharing farm lands, non-farm income and remittance have positive and significant contribution to farm production. Other independent variables (like age, sex and education of household head and size of livestock ownership) that entered into the model were found statistically insignificant to explain observed variation in output.

Differences in cereals production among different households determine the level of food security. As expected, the probability of becoming food insecure varies directly

with households' food production capacity and indirectly with household size which increases the chance of falling into food poverty. On the other hand, age of household head increases the probability of falling into food poverty. Even though the coefficient is very low, it is significant at 10% level. The result implies that the probability of falling into food poverty is high for households headed by seniors (old age) than those headed by youngsters. Level of education of household head, sex (being female-headed or male-headed) and size of livestock were found insignificant in explaining the probability falling into food insecurity.

The regression model on the determinants of participation in relief programs gives further insight to our analysis. The result reveals that households' food production capacity does not affect the chance of participation in relief programs. It implies that vulnerability to drought is high and almost uniform within the community. On the other hand, household size reduces the probability of participation in relief programs.

The other interesting result from the model was that households with long history of aid have a positive association with participation in relief programs of recent years. This implies the deteriorated capacity of such households to get out of their dependency on food aid once they get in it. However, the result is statistically insignificant.

The following policy implications could be drawn from the present study:
1. The study areas, south and north Wello are chronically food deficient areas. Owning to this there has been, and still is, huge aid support from various organizations. However, relief operations could not stop asset depletion (especially) livestock in the area. Consequently, farmers in the area faced a continued downturn trend in poverty and food insecurity.
2. Access to productive resources (especially to land and ox) is found among the major constraint to increase production.
3. To ease the burden local people put on limited natural resources and contribute to a sustainable rural livelihood, well designed and implemented settlement program will:
   - have a positive role to attain the objective of food security in the area,
   - help to improve the conservation and rehabilitation of natural resources which is threatened by the short-term survival strategies of the poor. It can create conducive situation for development organizations to implement environmental rehabilitation programs on extremely degraded areas or areas abandon by settlers.

However, all this depend how efficient and dynamic agriculture is practiced both in the areas deserted or newly inhabited by settlers. Especially, the balance between agriculture, population and environment should not be left uncheck that will allow the current situation to be repeated itself after some years.

4. Rural land rental market is found helpful to facilitate access to scarce farm resources and counterbalance (or minimize) the negative impact created by mismatched ownership of complementary farm inputs among different households. For instance, many especially female-headed households in the area have land but not ox or labor, while others have excess labor but not land. This imbalance could be offset in the short run by facilitating the functioning of factor market.

5. Under the existing farming system of the study area, land-sharing is more important than renting land. Therefore, investigating the reasons why land-sharing is more preferable to land rental is important to encourage the latter which is more beneficial from the long-term perspective.

   5.1. If production risk is the sole reason, peasants should be supported to challenge to the high-risk high-production alternative available for some portion of the farming community. For instance, rainfall insurance is helpful for farmers who use technologies like fertilizer at recommended level on their farm or rented land.

   5.2. If poverty and shortage of complementary inputs of one or another type is the major reason, extension programs should be flexible enough to deal with different problems of different farmers. For instance, extension agencies could focus on improving the efficiency (return to) of the most scarce resource. Despite some doubt on how effective and comprehensive it will be, the present system of household or family based extension program of the government seems a step in the right direction. However, at community or national level, there must be parallel programs that focus on the creation of employment opportunities for excess labor existing in the farming sector.

6. Income from off-farm (or non-farm) activities and remittance has positive contribution to farm production. Therefore, government should encourage migration and facilitate the creation of non-farm jobs.

7. As so many farmers have uneconomical land holding size or extremely degraded land which could not provide sufficient food or livelihood, government should encourage migration. However, migration especially long-term migration may not be a simple decision for Ethiopian farmers as that may be cause peasants to lose their land use rights. Therefore, government should encourage migration by providing various incentives like by

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    7.1. providing long term tenure (land) security to farmers migrating to other areas in search of employment just like the government currently provides to peasants moved to different parts of the country under the resettlement program . The government allowed them a 3 year guarantee to continue with their land use right or to regain it if they decide to return to their original places.

    7.2. paying some money to those who voluntary abandon their farming occupation and totally hand over their farm land to the local administration.

    7.3. In parallel, effort should be made to create labor intensive employment in the non-farm sector to absorb excess labor in the rural (farming) sector.

8.   As variation in household size significantly affects the level of food security, family planning should be one of the priority areas in the fight against food poverty.

9.   Households headed by seniors (old people) are more likely to be food insecure. Therefore, they should get priority in relief programs.

10.   There is no evidence to support that households becoming dependent on food aid long-ago able to reduce their dependency in recent years. Rather there is some hint that implies that households having long history of food aid have very weak capacity to regain their food security status once they have lost it. On top of the deteriorated capacity of households to produce sufficient food, the increased dependency on food aid could also explain why most of food aid dependent households failed to regain their food security status.

11.   The study also indicates that food aid related environmental rehabilitation programs (mainly water and soil conservation projects) and other regular development activities that have been started three decades ago have contributed too little to change the situation. Therefore, despite its short-term role to prevent famine and social problems, the role of any non-stopping food aid should be revisited from long-term perspectives.

Annex 1: Drought/disaster affected population

YEAR	DISASTER/DROUGHT AFFECTED POPULATION (MILLION)	PROPORTION AFFECTED
1980/81	2.82	7.7
1981/82	3.70	9.8
1982/83	3.30	8.5
1983/84	4.21	10.5
1984/85	6.99	17.0
1985/86	6.14	14.5
1986/87	2.53	5.8
1987/88	4.16	9.3
1988/89	5.35	11.6
1989/90	3.21	6.8
1990/91	7.22	14.8
1991/92	7.85	15.6
1992/93	4.97	9.6
1993/94	6.70	12.6
1994/95	3.99	7.3
1995/96	2.78	4.9
1996/97	3.36	5.8
1997/98	4.10	6.8
1998/99	7.19	11.7
1999/00	10.56	16.6
2000/01	6.24	9.6
Average	5.37	10.3
2002/2003*	14.5	21.0

* Estimated.

Source: Mulat Demeke (2003)

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