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Goals and Strategies of Peasants in the Central Highlands of Ethiopia

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Abstract

Multidisciplinary research methods such as observatory, participatory and multivariate regression analysis were employed to examine goals and strategies of two peasant communities in the Central highlands of Ethiopia. Continuing the family tradition of participating in social networks is found to be a universal normative goal of most study farmers. Securing subsistence food requirements and goals that may be used to characterise higher level of standard of living were ranked next to the normative goal. Five major goals were examined in relation to the normative goal. Furthermore, strategies identified by households were grouped into opportunistic, risk-minimization and long-range planning.

Statistical analysis of relationship between the five goals and strategies indicate that i) most strategies are relatively important in attaining goals selected for statistical analysis, ii) strategies which are proven to be useful from prior experience of other producers prior to this study tend to have a stronger relationship with the current goals of decision-makers (e.g. pesticides and fertilizer), iii) the ranking of goals and strategies recognize region, enterprise and experience-specific comparative advantages of peasants, and iv) producers rank strategies hierarchically and goals ranked high in the hierarchy are valued high on subsequent goals (e.g. securing subsistence on livestock husbandry). Development projects could successfully increase the attainment of securing food self-sufficiency if they properly identify comparative advantages of farmers and regions, and examine the compatibility of intervention strategies with the goals and strategies of peasants.

Goals and Strategies of Peasants in the Central Highlands of Ethiopia

Introduction

The success of development strategies depend on their compatibility with the hierarchy of means of attaining goals of households. If strategies are ill-fitted in this regard, or inappropriately introduced, failure is almost inevitable.

Development programs in Africa rarely recognize the goals and strategies of households. Consequently, intervention strategies often fail to attain their objectives. Despite the mirage of development projects, Africa's food self sufficiency ratio has declined from 98% in the 1960's to about 86% in the 1980's, and continued to decline in the 1990's (Moock, 1986). Ethiopia is one of the countries that has experimented with a number of food production strategies (Ricket, 1991). Most development projects implemented in Ethiopia have failed to deliver promised increases in food production (See Kebede, 1988; Ricket, 1991).

The experience of several countries indicate that efforts that promote commodity-based strategies and disregard the goals of peasants are doomed to fail. Studies that examine household goals in less developed countries are few. To attain sustainable development, it is necessary to examine the goals of peasants and the strategies they employ to secure subsistence requirements. The present study argues that development projects or new technologies can contribute to sustainable increases in food production if they appropriately identify and relate to goals and strategies of peasants.

The present study is conducted in Selale and Ada districts of the Central highlands of Ethiopia. Crop and livestock production technologies were introduced by different development agencies. The present study is intended to examine the compatibility of goals and strategies of households who have adopted new agricultural technologies in the study regions. The study was also expected to provide useful information to government and development agencies dealing with the provision of cross-bred cows. Thus, adoption of cross-bred cows was used as a criteria to group farmers in test and control categories.

Selale farmers were instructed that inputs necessary for the management of cross-bred cows were available in their locality, and that they should take full responsibility for the management of such cows. Farmers in the Ada area, however, joined the International Livestock Research Center (ILCA) technology diffusion program voluntarily because it provided a relatively risk-free environment (e.g., subsidized cost of feed). The approach to diffusion of technologies in the Selale region, therefore, is different from that implemented in Ada area. Comparative analysis of the two sites is hypothesized to reveal significant differences in choices of goals and strategies. The present study is expected to information that would useful in the design and implementation of agricultural development strategies in the Central highlands of Ethiopia.

The Study Sites

The research was carried out over a period of 17 months in 1990-1991. The research sites are Selale and Ada districts of the central Ethiopian highlands. These two sites have similar farming systems and belong to the high potential cereal-livestock zone (Kebede, 1993; FINNIDA, 1989).

Selale is representative of the high altitude zone (more than 2000 metres above sea level) of the country. The major crops grown in Selale include oats, teff, barley, wheat, horse beans and field peas. The average farm size is 3.1 hectares, 30 percent of which is used as permanent pasture or grazing land with the rest cultivated. The average livestock holding is 3.5 cows, 1.8 oxen, 0.55 bulls, 1.8 young animals and 2.96 calves (FINNIDA, 1989). Farmers have extensive experience in livestock production than those in the Ada region.

Ada is characterized by mild weather and represents the country's large middle-altitude cropping zone (1500 to 2000 metres above sea level). The major crops grown include teff, wheat, barley, horse beans, chickpeas and field peas. The average farm size is 2.6 hectares. There is virtually no fallow land. The average livestock holding is 1.28 cows, 1.98 oxen, 0.50 bulls, 0.53 young animals and 0.84 calves (Gryseels and Anderson, 1983). Compared with the Selale region,

Ada farmers specialize more in crop production in which they have extensive experience.

A summary of selected socioeconomic characteristics of farmers in both study sites is presented in Table 1. The statistical analysis of this profile suggests that the two regions exhibit statistically significant differences with respect to the: i) number of household members who are independent, ii) number of years of schooling, iii) number of years of farming experience as an independent farmer, iv) number of livestock owned, vi) average income received from the sale of grain, livestock and fuel wood, vii) crop and grazing area, viii) amount of milk produced per household and ix) amount of grain produced (Table 1).¹

Ada farmers had more years of schooling and more years of farming experience. They gain most of their income from the sale of grain while Selale farmers rely mostly on sales of livestock and livestock products. The productivity of livestock (milk/cow) is higher among Selale farmers while Ada farmers produce greater crop yields per hectare.

Design of the Study

Several crop production technologies are introduced in the study sites since the 1960's. However, introduction of cross-bred cows took place not only recently but also implemented by different agencies with relatively different approaches to technological introduction. Furthermore, this research was conducted to provide information on the socioeconomic feasibility of cross-bred cows. Therefore, it was felt appropriate to compare farmers who have adopted cross-bred cows (test) and those who did not (Control). These farmers may have adopted any combination of crop-production augmenting technologies.

¹. Household members who are capable of working without supervision are categorized as independent or "workers" (age 15-60) and those who have to be supervised are considered dependent or "consumers" (age <15 and >60).

Table 1: Selected Characteristics of Selale and Ada Farmers

		Selale		Ada		F-Value	Prob>F ^{1/}
		N	Average	N	Average		
No. of Household Members who are:	Dependent	173	4.47	41	4.29	0.412	0.469
	Independent	207	1.75	48	1.5	4.52	0.03*
Education of Household Head (yrs)		55	2.5	23	3.6	5.671	0.001*
Experience (years):	Dependent	176	11.24	50	13.44	0.044	0.83
	Independent	176	24.58	50	27.88	4.173	0.04**
Income (Ethiopian birr) from Sale of:	Grain	203	230.27	49	828.6	65.46	0.006*
	Livestock & Livestock Products	194	451.4	22	203.11	1.09	0.058**
	Fuel wood	169	343.58	31	63.97	13.84	0.004*
Expenses (Ethiopian birr) for	Purchase of food	214	268.2	50	228.14	2.366	0.125
	Clothing	205	114.49	39	106.09	0.309	0.579
Milk production (in liters) per Month:	Local cows	193	56.9	35	42.6	6.79	0.05**
	Cross-bred cows	66	320.35	14	186.29	5.76	0.011*
Area under (hectares)	Crop	217	2.5	52	2.3	19.56	0.001*
	Grazing	208	0.8	37	0.2	26.29	0.006*
Livestock Number		165	10.89	16	5.18	0.69	0.016*
Crop Production ('00kg)		217	14.88	52	21.41	2.98	0.05**

1/ * and ** refer significance at 1 and 5 percent respectively; the F-values test differences in the average values of socioeconomic characteristics between Selale and Ada farmers.

2/ Household members who are capable of working without supervision are categorized as independent or "workers" (age 15-60) and those who have to be supervised are considered dependent or "consumers" (age <15 and >60).

Households which received cross-bred cows and were selected for this study in the Ada and Selale areas numbered 26 and 89 respectively.² A confidence level of 95%, coefficient of variation of crop and milk yields of 96 percent and precision level of $\pm 20\%$ resulted in a sample size of 89 farmers for the Selale region. For the Ada region, however, time and financial resources limit the number of test farmers to only 26. Comparison of average values of socioeconomic variables derived from a district-wide survey by the Ministry of Agriculture and average values of similar socioeconomic characteristics calculated from test farmers showed that the two data set are approximately the same. Therefore, the small sample size for the Ada region will not bias the foregoing analysis.

After determining the sample size, the need to use farmers who joined various programs as test groups necessitated the use of systematic selection of the control group.³ A method was designed such that all test farmers were compared with farmers who exhibit similar socioeconomic characteristics (control farmers) but were different in ownership of cows (for details see Kebede,1993).

The control farmers were to have a comparable number of oxen, cows, sheep/goat, family size, age (farming experience), education, annual farm income and farm size (crop and grazing) with the test farmers. Moreover, the two groups had to exhibit similar ethnic, climatic and geographical characteristics. To accomplish this task, a three-step procedure was followed. Firstly, a group of farmers involving political leaders and elders in each peasant association were asked questions such as, "With whom do you think farmer "A" compares with respect to income,

². Prior to selection of the control group, the sample size was determined according to the following procedure. The sample size (N) is given as: $N = (KV)^2/D^2$, where D is the largest acceptable difference (in percent) between the estimated sample and the true population parameters. K is a measure of confidence (in terms of the number of deviations from mean) with which it can be stated that the result lies within the range represented by plus or minus D and V is the coefficient of variation of yields.

³. The programs in question were those operated by the International Livestock Centre for Africa (ILCA), FINNIDA (Finnish International development Agency) and MOA (Ministry of Agriculture, Ethiopia).

livestock holdings, living standard, etc., except that he does not own cross-bred cows?".⁴

Secondly, each test farmer was asked questions such as, "To whom do you think you are comparable with respect to income, livestock holding, family size, etc., except that you own cross-bred cows and the other farmer does not?". This method of identify a control farmer is difficult and socially controversial.⁵ Nevertheless, it would provide a clue to identifying control farmers.

Thirdly, 150 farmers who did not receive cross bred cows were interviewed with respect to the above socioeconomic characteristics. The results were compared with background socioeconomic data obtained from test farmers. Combination of the above three steps enabled identification of control farmers that were used in the present study.

Methods of Analysis

Analysis of household decision-making requires, among other things, identifying the objectives of household resource allocation strategies, and the kinds of production knowledge and information processed in making those decisions. Knowledge of goals and objectives of farmers provides an important basis for understanding their preferences for, and choices among, various farm adjustment strategies. Such information is valuable in estimating the acceptability, to farmers, of various intervention strategies.

⁴. A peasant association is a geopolitically delimited association of peasants covering an area of about 400 hectares. Political leaders are farmers who, through democratic election processes, were elected to take administrative positions within a peasant association.

⁵. Evaluating the economic well-being of other farmers would force farmers to think as if they were intruding into private life of others. This is not a socially acceptable norm. However, options were explored with groups of farmers and they suggested that this method could be feasible if used in conjunction with step one.

The guiding principle of a household's decision-making is his/her objectives set in hierarchical order (Barry, 1984; Berry, 1986; Barlett, 1980; Cary and Holmes, 1982; Norman, 1980; Hyden, 1983). As noted elsewhere, household goals may include securing family survival, maximization of farm income, safeguarding future income, gaining recognition and prestige as a farmer, building a big house, livestock husbandry, belonging to a farming community, feeling pride of ownership, gaining respect for doing worthwhile job, and independence and freedom from supervision (Eisemon and Nyamete, 1988; Cary and Holmes, 1982). These studies identified family survival as the primary objective of households.

The objectives or goals of households vary depending on resource endowments, access to non-farm produced inputs, authority and support services from relatives. To attain their goals, households employ several strategies. These include, among others: i) planting more than one crop and raising different classes of livestock, ii) purchase of household equipments and livestock, iii) engaging in off-farm work, iv) storing, saving or selling various kinds of liquid or fixed assets, v) sending children to school, and vi) investing in livestock or crop production increasing technologies.

There are many field methods for identifying goals and strategies of producers (see Barlett, 1980; Ortiz, 1983; Ellis, 1988; Barry, 1984). These include observation, participation, visual representations (e.g., cards that bear pictures of goals) and interviews. Each of these methods have their own advantages and disadvantages. Gladwin (1980) contends that it is possible to identify the goals and strategies of households with the help of decision trees and argues that elimination by aspects is too simplistic an approach for this purpose (see also Tversky, 1972).

Decision trees require subjects to demonstrate the ability to retain and recall information. Coleman (1983), however, has shown that non-literate farmers cannot remember all conceivable goals, strategies and selection criteria applied because of memory biases. Group discussion with farmers in the Ada and Selale regions revealed that with the passage of time it is difficult for households to recall all the criteria they used in the selection of goals and strategies. Thus,

application of sophisticated decision trees and probabilistic calculations in identification and stepwise selection of goals and strategies of households in the Ethiopian highlands may not be a feasible method. Instead, this study concentrates on those goals and strategies that can be recalled by decision makers.

The present study employs multidisciplinary research methods in identifying goals and strategies of households, and examine their relationships. Observation of daily activities of households, participating or working with households, conversation, group discussions and open ended questionnaires are some of the anthropological and sociological research methods employed in the study. Studies in cognitive psychology indicate that in situation where the level of literacy is not high to comprehend written text or verbal communications, visual presentation of contents of a message may increase the cognitive ability of informants and accuracy of responses to questions. The present study uses goal bearing cards that will permit households to rank their goals according to the order in which they would like to attain them. Socioeconomic data from study farmers are collected from interviews. Finally, the relationship between goals and strategies are examined using multivariate statistical procedure (see Kebede, 1993).

The goals of decision makers may determine the choice of strategies or vice-versa (see Cary and Holmes, p.144-145). Other studies argue that clear separation of means (strategies) from ends (goals) is difficult (Lutz and Lux, 1979). The problem of distinctiveness of goals and means is further complicated by the social and economic decision-making environment. The study in Selale and Ada regions of Ethiopia implemented interview and group discussion methods to determine whether goals shape strategies or vice-versa. Once the direction of "causality" is established, the structural relationships between goals and strategies of households are examined.⁶ Intervention strategies can make the best use of financial and physical resources by focusing on those strategies which are strongly related to the goals of households.

⁶. Statistical analysis of causal relationships involves longitudinal data. In the absence of this type of information, logical explanation of responses to open-ended questionnaires could be used.

Studies of peasant economies reveal that strategies of households could be classified into opportunistic (short-term), long-range planning, risk-minimization, survival, etc (Eisemon and Nyamete, 1988; Cary and Holmes, 1982). The strategies identified through observatory-participatory methods, interview and the use of cards in this study will make use of the above categories in classifying goals of Ada and Selale farmers.

To examine the degree of association or structural relationships between household resource allocation strategies and goals, a multivariate regression model with dummy variables is employed (Cary and Holmes, 1982).

The model can be specified as:

$$Y_{ijk} = \alpha_{j1} + \sum_{c=1}^q \beta_{jc} O_{ijc} + \sum_{d=2}^v \theta_{jd} S_{ijd} + \sum_{e=1}^r \delta_{je} R_{ije} + v_{ijk}$$

$$\text{for } i=1 \dots n, j=1 \dots p, k=1 \dots w, c=1 \dots q, d=2 \dots v, e=1 \dots r, (c,d,e) \in K$$

where Y_{ijk} is individual “i’s” ranking of j^{th} goal on k^{th} strategy, α_{j1} (intercept) is the rank on strategy 1 for j^{th} goal, β_{jc} , θ_{jd} and δ_{je} are weights, O_{ijc} is a dummy variable (0,1) categorizing opportunistic strategies (c), S_{ijd} is a dummy variable categorizing strategic or long-range strategies (d), R_{ije} is a dummy variable categorizing risk management strategies (e) and v_{ijk} is residual error term.

Statistical analysis using the above equation may not reveal the importance of all strategies that may be associated with the goals of households. Therefore, a descriptive analysis of goals and strategies of households is also carried out.

Results of Descriptive Analysis of Goals and Strategies

The frequency distribution of forty-five farmers (16% of the sample farmers) indicated that eighty-four percent of them selected their goals before choosing strategy (ies) (see also Anderson, et al., 1977; Dunn, 1984; and Kebede, 1993). The average age of these households was 42 years. The average age of households which selected strategies prior to goals was 32 years. The average age for all study farmers was 41. The results from the frequency distribution was discussed with extension agents, farmers of different age groups and social standing. The conclusion that emerged from these discussions supported the findings from the frequency distribution. Thus, it can be concluded that most farmers chose goals before strategies, and this pattern of decision-making was observed among farmers who were about 40 or more years of age. Once this simple method of assessing causal relationship was accomplished, the next step was to identify strategies which played significant roles in attaining the goals of the decision makers.

The participatory-observatory method with individual and group of farmers indicate that the goals of producers include to: i) secure subsistence requirement, ii) be wealthy or rich by way of increasing crop and livestock production, iii) building a big house, and iv) maintain family tradition of participating in social networks. This method was used on few farmers and may not represent all the goals of the study farmers. The strategies followed by producers are sending children to school, adopting technologies (purchase of improved seed fertilizer, pesticides, cross-bred cows and veterinary service), avoiding risk of losses and being friends with extension agents, increasing crop land, trading, off-farm work, planting more than one crop, raising more than one class of livestock, saving, sending children to school, storing grain and running for political office.. Producers encounter constraints such as declining farm size, accessibility to resources, limited employment opportunities, biases of extension activities towards well-to-do farmers, unfavourable terms of trade for agricultural products and risk embodied in lump-sum investments (e.g. cross-bred cows).

Results from Visual Identification of Goals

Several group discussions with farmers of different age group, staff of Ministry of Agriculture, FINNIDA and ILCA, farm visits and interviews were used to identify goals of households in the two study sites. The results of this combined approach to identification of goals indicated that most goals of households fall into 17 categories.

Seventeen cards bearing most of the goals of households were prepared and presented to farmers for ranking. Producers were instructed to suggest goals which they felt were left out. Producers were briefed on what each card represents and asked to rank them in the order in which they would like to attain them. A frequency distribution of goals was generated and percentage of farmers that chose specific goals was calculated. The results of ranking of goals is presented in Table 2.

It is difficult to examine the relationship between all goals and strategies that individual farmers use to attain them. As an ongoing evaluation process, group discussion with peasants that represented seventy-five percent of the sampled farmers indicated that the first five goals represent high priority goals of study farmers (see Table 2). These goals were chosen by an average of at least 80 percent of producers in both study areas. These goals were selected for detailed statistical analysis. The goals chosen were to: i) secure family survival, ii) expand cattle production, iii) building big house, iv) increase in grain production and v) producing more milk and butter.

Study farmers were asked to elicit strategies that they would employ to attain each of the six goals. These strategies were elicited using an open ended questionnaire. Similarly, strategies that were identified by seventy-five percent of producers in both regions were chosen to examine their structural relationship with the five goals selected for statistical analysis. Strategies elicited from interview include purchases of improved seed, fertilizer, pesticides, medicine to control

Table 2. Rankings and Percentage Distribution of Goals by Region

Rank of Goals	Study Regions			
	Selale		Ada	
	Test	Control	Test	Control
	Percentage			
1. Securing family survival	98	97	97.5	99
2. Cattle husbandry	91	85	75	74
3. Building big house	89	87	91	89
4. Increase grain production	83	79	95	92
5. Producing more milk and butter	89	81	71	68
Average (goals 1 to 5)	90	86	86	84
6. Be a good farmer	73	71.5	74	78
7. Rasing sheep and goats	78	71	66	63
8. Going to Church	66	61	57	54
9. Seeing children married or geeting good job	45	49	51	49
10. Becoming leader of self-help group	31	33	24	21
11. Gaining respect and prestige	52	22	23	17
12. Be business man or open Shops	24	39	53	45
13. Purchasing valuables such as radio/watch	15	19	22	31
14. Start fattening of oxen and sheep to increase income	37	34	45	49
15. Raising more horses	51	38	14	12
16. Maintaining current income	22	15	31	17
17. To create intimacy with traders or city people	19	18	28	31

Source: Summary of Rankings from Visual Representation of Goals, 1991 (see Kebede, 1993).

animal disease and cross-bred cows, expansion of farm size, trading, off-farm work, planting more than crop, raising more than one class of livestock, saving, sending children to school, storing grain, running for political office and increasing asset holdings.

The percentage of Selale and Ada farmers that chose securing family survival and building a big house seem to be similar (Table 2). However, large percentage of Selale farmers chose cattle husbandry and producing milk and butter. On the other hand, most Ada farmers chose increases in grain production. The implication of this result is that producers tend to favour a goal that recognize the comparative advantage of regions and their experience. That is, Selale farmers prefer livestock husbandry because of the comparative advantage of the region and extensive experience of producers in livestock farming. On the other hand, Ada is a grain belt relative to Selale and that farmers of this region have a long tradition of growing crops.

Statistical Relationship of Goals and Strategies

In using dummy variables as explanatory variables, an equation with an intercept term which is the value of the reference category is convenient because it facilitates the interpretation of the coefficients (see pages 7-8; Kennedy, 1985). In this study, the strategy of "*continuing the family tradition of active involvement in a village life or social networks*" is used as the reference base or intercept.⁷ The dummy variable's coefficients are interpreted as the extent to which behaviour in one category (e.g. planting more than one crop in the category of risk minimization) deviates from the reference base. If the variable's importance to the ranking of a particular goal is higher than participating in social networks, then the coefficient will be negative. Conversely, if the contribution of a strategy to the ranking of a goal is less than participating in social

⁷. The reason for the choice of this goal as a reference category is that almost all other goals are ranked differently by individual farmers. Regardless of the choices or ranking of goals, all farmers would like to maintain family tradition of participating in social networks. Comparison of goals identified by individual farmers with this generally acceptable goal of peasants would indicate how high or low the study farmers rank their specific goals relative to the normative goal.

networks, then the coefficient will be positive. In addition to t-test of the statistical significance of individual coefficients, the importance of all strategies to the overall ranking of a goal is tested using the F-ratio.

To investigate the structural relationship between goals and strategies, the following approach was followed. Interviews and group discussions reveal that strategies employed by households fall into three categories. They are: i) maintaining or increasing current food production levels or standard of living (opportunistic), ii) securing subsistence or risk minimization and iii) long-range planning. The discussion of statistical analysis follows these categories.

In all regressions, the dependent variables are the five goals discussed above. Furthermore, group discussions with farmers revealed that attainment of one goal can serve as a means to satisfy other goals (see Kebede, 1993). For instance, securing subsistence may provide a buffer or an incentive for households to take actions to satisfy the goals of building a big house and livestock husbandry. The goals which enter as regressors with other strategies indicate sequentiality of decisions. The result of this sequentiality is presented in Table 4. The analysis is carried out for each region by test and control group.

Opportunistic Strategies and Household Goals

In a previous section, increasing the productivity of resources such as land, livestock and labour, and expansion of land were suggested as a means to increase food production. Expansion of area cannot alone provide a lasting solution to food production problems in the Ethiopian highlands. Nevertheless, restriction of the farm size as a result of the 1975 land reform could be changed such that producers with adequate resources could cultivate more land. In identifying opportunistic strategies to satisfy the goal of securing subsistence requirements, therefore, both

Table 3. Relative Importance of Opportunistic, Risk-Minimization and Long Range Planning Strategies ^{1/}

	Securing family survival				Cattle husbandry				Building big house			
	Selale		Ada		Selale		Ada		Selale		Ada	
Categories	Test	Contro	Test	Contro	Test	Contro	Test	Contro	Test	Contro	Test	Contro
Opportunistic Strategies												
Intercept	1.85*	1.85*	1.67*	1.89#	1.61*	0.51	1.38*	2.26*	0.19*	0.35	1.07*	1.30*
Improved Seed	0.03	-0.04	-0.36*	-0.44#	-0.03	-0.12	-0.05	-0.04	-0.12	-0.01	-0.08	0.91
Fertilizer	-0.47*	-0.46*	-0.32*	-0.49*	-0.04	-0.24*	-0.75*	-0.48*	-0.67*	-0.73*	-0.37#	-1.05*
Pesticides	-0.67#	-0.67*	-0.22#	-0.69#	-0.44#	-0.37	-1.47*	-0.13	0.21	-0.11	-0.86*	-0.32*
Crossbred Cows	-0.45#	-0.26#	-0.02	-0.13	-0.76*	-0.34*	0.2	-0.13	-0.46*	-0.19#	-0.08	-0.17#
Veterinary Service					-0.01		-0.01					
Farm Size	-0.48#	-0.42#	-0.54*	-0.62*	-0.67*	-0.33#	-0.61*	-0.08	-0.09	0.23	-0.22#	-0.59#
Risk-Minimization Strategies												
Trading	-0.46*	-0.43*	-0.68*	-0.89*	-0.04	-0.02	-0.13	0.11#	-0.01	-0.07*	-0.01	-0.11
Off-farm work	-0.04	-0.04	-0.35*	-0.24*	-0.04	-0.01	0.11*	-0.08	-0.19*	-0.14*	-0.28*	-0.30*
>1crop	-0.03	-0.03	-0.26*	-0.54*	0.55*	-0.88*	-0.21	-0.32	-0.14	-0.12	-0.19	-0.16
>1livestock	-0.46*	-0.45*	-0.04	-0.06	-0.77*	-0.67*	-0.07	-0.08	-0.32#	-0.16	-0.51*	-0.35
Long-Range Planning Strategies												
Saving	-0.46*	-0.25#	-0.94#	-0.77#	-0.47#	-0.55#	-0.06	-0.10#	-0.38*	-0.28#	-0.29	-0.31*
Sending Children to School	-0.04#	-0.14#	-0.36#	-0.17*	-0.04	-0.09	-0.06	-0.05	-0.46*	-0.88*	-0.19	-1.09*
Store Grain	-0.06*	-0.16*	-0.08*	-0.07#	0.23#	-0.27*	-0.58*	-0.31#	-0.02	-0.02	-0.03	-0.04
Running for political Office		-0.06#	-0.07*	-0.01	-0.01	-0.31#	-0.35#	-0.02	-0.03	-0.18#	-0.40#	-0.34#
Asset Accumulation		-0.22	-0.33	-0.21	-0.52	-0.01	-0.67*	-0.95*	-0.84#	-0.76*	-0.42#	-0.49#
N	88	127	25	26	88	127	25	2688	127	25	26	88
R2	0.94	0.93	0.97	0.97	0.7	0.6	0.9	0.9	0.58	0.49	0.88	0.8
F-Ratio	5.8*	4.5*	7.1*	4.1*	7.9*	6.2*	2.1#	1.5	5.8*	7.4*	6.6*	4.8*

1/ The values are partial regression coefficients and lower weights indicate higher importance.

* and ** refer to significance at 1 and 5 percent levels respectively.

Table 3 (continued). Relative Importance of Opportunistic, Risk-Minimization and Long Range Planning Strategies ^{1/}

Categories	Increase grain production				Producing more milk and butter			
	Selale		Ada		Selale		Ada	
	Test	Control	Test	Control	Test	Control	Test	Control
Opportunistic Strategies								
Intercept	1.49*	1.73*	1.89	0.55*	0.74	0.59	1.44#	0.46
Improved Seed	-0.09	-0.01	-0.15	-0.19	0.09	0.08	0.12	0.13
Fertilizer	-0.48*	-0.36*	-0.81*	-0.91*	-0.39#	-0.24#	-0.49#	-0.45#
Pesticides	-0.07	-0.36	-1.06	-0.82	0.06	0.01	0.16	0.12
Crossbred Cows	-0.71*	-0.56*	-0.08	-0.08	-0.89*	-0.71#	-0.64*	-0.54#
Veterinary Service	-0.03		-0.04		-0.12#	-0.21	0.05	-0.05
Farm Size	-0.7#	-0.79*	-0.84*	-0.84*	-0.52#	-0.49#	-0.46#	-0.31
Risk-Minimization Strategies								
Trading	-0.23#	-0.21#	-0.36*	-0.34#				
Off-farm work	-0.19*	-0.14*	-0.01	-0.01	-0.15	-0.14	-0.15	-0.43
>1crop	-0.53*	-0.48#	-0.76*	-0.64*	-0.59*	-0.43*	-0.75*	-0.83
>1livestock	-0.45*	-0.33*	-0.15	-0.12	-0.80*	-0.51#	-0.17	-0.12
Long-Range Planning Strategies								
Saving	-0.15	-0.29#	-0.81*	-0.44#	-0.59*	-0.61*	0.57#	-0.51#
Sending Children to School	-0.57#	-0.09#	-0.54#	-0.92*	-0.34	-0.41	0.17*	-0.12#
Store Grain	-0.61*	-0.53#	-0.88*	-0.80*	-0.43	-0.31	-0.12	-0.12
Running for political Office	-0.53#			-0.06	-0.18	-0.15*	-0.03	
Asset Accumulation	-0.53#			-0.98*	-0.51*	-0.45#	-0.48	
N	127	25	26	88	127	25	26	
R2	0.73	0.66	0.88	0.92	0.62	0.54	0.85	0.73
F-Ratio	10.0*	7.1*	2.5#	1.1	7.8*	2.5#	6.1*	3.1#

1/ The values are partial regression coefficients and lower weights indicate higher importance.

* and ** refer to significance at 1 and 5 percent levels respectively.

approaches were considered.

The strategies employed to achieve the goal of securing subsistence among the study farmers are classified into intensive methods (e.g. purchase of improved seed, fertilizer, medicine to control livestock disease and cross-bred cows) and extensive methods (e.g. expansion of area). The results of the analysis of the structural relationship between these opportunistic strategies and various goals are presented in Table 3.

Most of the strategies are important in achieving the five goals selected for statistical analysis. Compared to participation in social networks (the intercept term), most strategies satisfy the goal of securing subsistence as indicated by the low or negative signs of the regression coefficients. Nevertheless, only fertilizer and pesticides show a consistent and statistically significant importance in both regions and for both groups of farmers. Expansion of area seems to be slightly more important strategy in an area where crop farming is the dominant enterprise (e.g. Ada)(Table 3).

Planting improved crop varieties is not widely practised in Selale area. This strategy is not significantly associated with the goal of securing subsistence in that region but is quite important in the Ada region. Expansion of area is valued highly by test farmers of both regions in satisfying most goals, including those of animal husbandry. Increasing crop production with the help of fertilizer is also valued significantly in satisfying this goal. This may be explained by the relationship between crops and livestock production systems in the Ethiopian highlands, where they compete for physical and financial resources, but the income generated from one enterprise helps the expansion of the other. Farmers of Selale region make use of the expansion of area to satisfy the goal of cattle husbandry and milk production; while that of Ada to increase grain production and/or secure subsistence.

The strategies of purchases of fertilizer and cross-bred cows are relatively more important and statistically significant in attaining the goal of building a big house relative to other

strategies. Purchases of cross-bred cows and expansion of area in Selale, and expansion of area and fertilizer in Ada regions are highly valued in satisfying the goal of increasing grain production. Cross-bred cows, fertilizer and expansion of area are important in attaining the goal of increasing milk production in both study sites.

Risk Minimization Strategies

All strategies of risk minimization are ranked highly in the five goals relative to participation in social networks (Table 3). Sharply contrasting differences exist across regions. In the Selale region, engaging in trading and raising more than one class of livestock are statistically significant in satisfying the goal of securing subsistence. In the Ada region, however, all strategies are important and statistically significant except raising more than one class of livestock. Ada producers do not have adequate feed resources to support livestock husbandry. Therefore, raising more than one class of livestock is not the best-bet solution to minimize risk. With respect to the goal of cattle husbandry, planting more than one crop and raising more than one class of livestock are statistically significant for the Selale region but only off-farm income is significant for the Ada region. Off-farm work is ranked high in the goal of building a big house in both regions. Raising more than one class of livestock and growing more than one crop are consistently ranked high (and statistically significant) in the goal of increasing grain production.

Trading, planting more than one crop and raising more than one class of livestock are statistically significant in attaining the goal of increasing milk production in the Selale region. Trading and crop diversification are valued high in the attainment of this goal relative to the reference strategy in Ada region.

Long-term Resource Allocation Strategies

Strategic resource allocations include saving, sending children to school, storing grain, running for political position and asset accumulation (Table 3). Similar to risk minimization and

opportunistic strategies, these strategies are important in satisfying the five goals selected for analysis. Saving and storing grain show relatively more importance and statistically significant value in attaining most of the goals compared to other strategies. Running for political office is valued more highly and significantly among Selale farmers than Ada farmers in attaining most goals.

The F-ratio to test all categories of strategies indicates that most strategies are significant predictors of the rankings on all the goals of households. This significance is high for test farmers, and for the Selale region when the goals are livestock related, and for the Ada region when the goals are crop related.

Sequentiality of Choices of Goals

As pointed out in earlier section, most farmers chose goals which would help them to identify strategies that are most suited to attain them. Nevertheless, in a mixed farming system crop and livestock enterprises as well as goals associated with these enterprises are intertwined. Once securing survival is attained, it will be eliminated from the ranking while lower ranking goals are scaled up. Attainment of the goal of cattle husbandry imply that producers would have the physical (e.g., oxen input) and financial (sale of livestock) means to purchase crop production augmenting inputs. Thus, higher ranking goals contribute to attainment of lower ranking goals.

Sequentiality of goals is supported by the relatively greater importance of securing food, livestock husbandry and building a big house in satisfying the lower ranked goals when compared to the strategy of participating in social net works (Table 4). In most cases, the values of securing food and livestock husbandry are statistically more significant than building a big house. If securing family survival is obtainable, then farmers aspire to achieve other goals with confidence. Therefore, this strategy positively influences consecutive or preceding goals in the hierarchy.

Table 4: Sequentiality of Goals

Goals/Region/Farmers	Securing Food	Cattle Husbandry	Building Big House	Increase in Grain Production
Goal: Cattle husbandry				
Selale				
Test	-0.132**			
Control	-0.17*			
Ada				
Test	-0.109**			
Control	-0.118			
Goal: Building a big house				
Selale				
Test	-0.216**	0.194		
Control	-0.008	-0.107		
Ada				
Test	-0.008	-0.157**		
Control	-0.641*	-0.077**		
Goal: Increases in Grain Production				
Selale				
Test	-0.52**	0.747*	-0.157	
Control	-0.628	-0.65**	-0.114	
Ada				
Test	-0.886**	-0.441	-0.203	
Control	-0.728*	-0.365**	-0.257	
Goal: Producing More Milk and Butter				
Selale				
Test	-0.613*	-0.802*	-0.123	-0.241**
Control	-0.508**	-0.742*	-0.132	-0.401*
Ada				
Test	-0.419**	-0.528**	-0.274	-0.091
Control	-0.446**	-0.421	-0.167	0.112

* and ** refer to significance at 1 and 5 percent levels respectively.

Summary and Conclusions

Goals and strategies of households in Ada and Selale regions are investigated using observatory-participatory, interviews, display of goal bearing cards, and statistical analysis. The findings of the study identified important points for policy makers and development planners. All goals are important in their own right since individual farmers attach different criteria in their ranking. The study indicated that ranking of goals and strategies closely follow the comparative advantage of study regions and experience of farmers.

Selale farmers have the resources (e.g., large grazing area) compared to Ada. The region is traditionally known for livestock husbandry (Kebede, 1993). Producers not only have extensive livestock production knowledge but also believe that this knowledge is part of their cultural heritage. However, in light of the damage that increases in the number of livestock causes to degradation of land and vegetation, as well as the urgent need for increased grain production, emphasis of agricultural policy has focused on crop production augmenting inputs. As this study demonstrated increased production of grain is not the top priority goal of Selale farmers. Development plans that do not incorporate goals and strategies of producers in the design and implementation of intervention strategies may fail to succeed. This has been the experience of projects financed by the Ethiopian Ministry of Agriculture and several development agencies.⁸

Ada region has conducive environment to grow crops. Despite smaller farm size, farmers make use of crop production augmenting inputs. Furthermore, Ada farmers are known to be knowledgeable in growing crops. This knowledge or experience is enhanced by the proximity of the region to major markets and infrastructural services (e.g. road). The result of this study indicates that households rank crop production higher than livestock farming.

In summary, the empirical findings from the structural association between household goals and strategies indicate that: i) most strategies are relatively important in satisfying household goals,

⁸ See Kebede, 1988; and Ricket, 1991.

ii) strategies which are proven to be useful by prior experience of other producers tend to have a stronger relationship with current goals of decision-makers (e.g. pesticides and fertilizer) compared to the reference or base-case strategy, iii) the importance of strategies related to livestock husbandry is higher in the Selale than in the Ada area, iv) strategies which help boost crop production are ranked higher on goals of Ada farmers than on goals of Selale farmers and v) producers rank goals strategies hierarchically, and that goals ranked highly in the hierarchy are valued high on the attainment of subsequent goals (e.g. securing subsistence on livestock husbandry).

Often when development strategies are identified, the beneficiaries of strategies are not consulted nor their goals and strategies examined. For example, research by ILCA and MOA endeavour to find ways of modernizing livestock farming in Ada region. However, farmers will be less willing to invest in lump-sum technologies such as livestock before attaining the goal of increased grain production.

Analysis of goals and strategies using not only statistical analysis but also using methods that are expected to reveal the "true" preferences or ranking of goals would help policy makers to design feasible development strategies. Empirical research in the study of goals and strategies of peasants employ only statistical analysis (Cary and Holmes, 1982). However, the application of multidisciplinary research tools, anthropological and sociological (observation and participating), cognitive psychology (visual comprehension of messages through objects) and economic (statistical analysis) have proved to be useful tools in identifying goals and strategies of households, and examining their relationship. Development strategies could benefit from substantive evidence on the implications of differences in comparative advantage of regions and farmers, and compatibility of intervention strategies with the goals and strategies of peasants.

References

- Anderson, J. R., Dillon, J.L. and Hardaker, J.B. Agricultural Decision Analysis. Ames: Iowa State University Press, 1977.
- Barlett, P.F. Cost benefit Analysis: A test of Alternative Methodologies, P.F.Barlett (ed), Agricultural Decision-making: Anthropological Contribution to Rural Development. New York:Academic Press, 1980, pp.137-160.
- Barlett, P.F., (ed) Agricultural Decision-making: Anthropological Contribution to Rural Development. New York: Academic Press, 1980.
- Barry, P. (ed) Risk Management in Agriculture. Ames:Iowa State University Press, Ames,Iowa,1984.
- Berry, S. Macro Policy Implications of Research on Rural Households and Farming Systems. In J.L. Mook (ed).Understanding Africa's Rural Households and Farming Systems. Boulder:West View, 1986, pp. 199-216.
- Cary, J.W., and Holmes, W.E. Relationships among Farmers' Goals and Farm Adjustment Strategies: Some Empirics of a Multidimensional Approach. Aust. J. of Agr. Econ. 26(1982):114-130.
- Coleman, G. The Analysis of memory Bias In Agricultural Labour Data Collection: A Case Study of Small Farmers in Nigeria. J. of Agricultural Economics, 1983, 34:79-86.
- Constable, M. Ethiopian Highland Reclamation Study: Summary. Ministry of Agriculture/FAO, Addis Ababa, Ethiopia, 1983.
- Dunn, D.W. Applied Decision Analysis. McGraw-Hill Book Company. New York, 1984.
- Eisemn, T.O., and Nyamete, A. Schooling and Agricultural Productivity in Western Kenya. J. of East African Research and Development. 18(1988):44-66.
- Ellis, F. Peasant Economics: Farm Households and Agrarian Development. Cambridge: Cambridge University Press, 1988.
- FINNIDA, Base Line Survey: Selale Dairy Development Pilot Project. Unpublished Report, 1989.
- Gladwin, C. A Theory of Real Life Choice: Applications to Agricultural Decisions. P.F.Barlett (ed), Agricultural Decision-making: Anthropological Contribution to Rural Development. New York: Academic Press, 1980. pp.45-84.

- Gryseels, G. and Anderson, F.M. Research on Farm and Livestock Productivity in Central Ethiopian Highlands: Initial Results, 1977-1983. ILCA Research Bulletin Report No.4, 1983.
- Hyden, G. No Short Cuts To Progress: African Development Management in Perspective. Berkeley: University of California Press, 1983.
- Hyden, G. The Invisible Economy of Small Holder Agriculture in Africa. In J.L. Mook (ed). Understanding Africa's Rural Households and Farming Systems. Boulder:West View, 1986. pp.11-35.
- Kebede, Y. Household Decision-making: The Case of Adoption of Technologies in Ethiopia. Unpublished Ph.D. Dissertation, Departments of Agricultural Economics and Anthropology, McGill University, 1993.
- Kennedy, P. A Guide to Econometrics. Massachusetts: MIT, 1985.
- Lutz, M.A. and Lux, K. The Challenge of Humanistic Economics. Menlo Park: Benjamin/Cummings, 1979.
- Mook, J.L. Understanding Africa's Rural Households and Farming Systems (ed). Boulder:West View, 1986.
- Norman, D.W. Rationalizing Mixed Cropping Under Indigenous Conditions: The Examples of Northern Nigeria. J. of Development Studies. 11(1980):3-21.
- Ortiz, S. What is decision analysis about? The Problem of Formal Representation. In S. Ortiz (ed). Economic Anthropology: Topics and Theories. Monograph in Economic Anthropology, No. 1., NY.: University Press of America, 1983, pp.249-300.
- Rickett, J. Economic Development in Ethiopia: Agriculture, the market and the State, OECD, Paris, 1991.
- Tversky, A. Elimination by Aspects: A Theory of Choice. Psychological Review. 79(1972):281-291.