Enhancing Land-Use-Efficiency through Appropriate Land Policies in Ethiopia

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Introduction: In most of the developing countries, land is the primary means of production used to generate a livelihood for a family. Therefore, size of the holdings and security thereof affects the household's income, and their incentive to work and to invest. Accordingly, land policy in developing countries is considered as a crucial part of the overall development policy that government needs to stress on for rapid economic growth and poverty alleviation. Although there is wide recognition regarding the importance of land policy in agrarian development, there is no clear and universally applicable blueprint as to what an appropriate land policy should be. Researchers have tried to define certain basic principles and thereby achieve a land policy that will generate higher levels of productivity in agriculture. It is felt that an ideal land policy should emphasize owner-operated family farms with freely operating land markets to permit land transfers to more efficient and productive users.

In the last two decades, most countries in sub-Saharan Africa have been undertaking land reforms to promote productivity in agriculture and thereby generate rapid economic growth, encourage a more sustainable management and reduce poverty. Ethiopia is one of the few countries in Africa that has not made significant changes in its basic land policy since the radical land reform of 1975, resulting in poor performance of agriculture despite of numerous initiatives and measures undertaken by the government. Existing land tenure system and tenure insecurity has been identified as one of the most important factors contributing towards the poor performance of the sector.

The paper is devoted to study the existing land tenure systems and their impact on the agricultural development in the country based on available literature. The paper also highlights the various arguments presented in support of or against the current land policy. The paper also discusses findings from the rural household survey by looking at pertinent variables related to land policy and rural incomes and suggests some policy recommendations for the future. The specific objectives were:

1   *To study the country's existing land tenure system and surrounding controversial issues,*

2   *To assess the impacts that this system currently has on agricultural development and implications for poverty reduction at large.*

3   *To suggest various policy recommendations for enhancing land use efficiency.*

METHODOLOGY

Geographical setting of the study area:

North Wollo zone is situated in the Northeastern part of the country. It is one of the eleven administrative zones of Amhara National Regional State. The zone is divided into one town and eight rural weredas including Meket wereda that is selected for the purpose of this study on the ground that it can represent the high land weredas in the zone. This zone has high population pressure with low land holding. The average land holding in the zone is 0.78 hectare. Land scarcity is one of the crucial problems in the study area. Land as per constitution, is owned by the state and the farmers have a user right but they can not sale and exchange the land.

The sampling method: A multi-stage random sampling method was used to select farmers. Sample farmers were selected in two stages. In the first stage, a total of 4 peasant associations (PAs) were purposively selected from 35 PAs in the study district based on ease of accessibility, climatic condition, and consultation with the experts of Wereda Office of Agriculture and extension workers. Thereafter, a total of 110 farmers were chosen randomly. The number of farmers selected, were proportional to the number of households of each peasant association.

Sources and method of data collection: The relevant data in this study have been collected from both primary as well as secondary sources. Primary data were obtained from 110 randomly selected farmers. Towards this end, a structured questionnaire was designed, pre-tested to prove its fitness and was refined. Primary data were collected pertaining to crop and livestock activities in the study area. The required information was based on the actual farming practices of the sample farmers. Data were also collected on demographic variables; crop and livestock activities that are considered in production process; the amount of input required per unit of activity; the prevailing market price for each input and output; resources (land, labor, and capital) available on the farm for production purpose; family income and expenditure of sample farmers; food consumption (crops and livestock products) availability and requirement of farmers; type of activities performed by family labor particularly women and duration of the activities, and problems encountered in crop and livestock farming and their possible solution. The related secondary information was collected from the literature developed by various researchers and information documented at various

levels of Ministry of Agriculture, Planning and Economic Development Offices, NGOs, Serinka Research Centre, and other relevant institutions found in the study area.

Data analysis and analytical tools: Statistical tests are required to check whether observable samples are likely to have come from the same population, i.e. to know whether the sample differences occurring are statistically significant or not. Accordingly, mean, standard deviation, analysis of variance (ANOVA), t-statistic and homogeneity of variance with t-test were used. Cluster analysis was applied to obtain a relatively similar group of farms. In cluster analysis several methods are available for stratification of observation and all these methods perform the same task. Of all these methods, non-hierarchical cluster analysis is used in this study. Based on the survey result and statistical output the 110 household members were grouped into two. Group I denoted as High Income Group (HIG), consisting of 28 households and group II denoted as Low Income Group (LIG), consisting of 82 households.

Specification of the LP model:

The objective of the model is to maximize the land productivity and hence individual farmer's income from his existing land holdings. The model was specified in terms of its objective function, activities and constraints.

Maximize $Z = \Sigma c_j x_j + \Sigma c_j^* x_j^*$ objective function

    Subject to

$\Sigma a_{ij} x_j \leq b_i$ constrained equation

x_j and $x_j^* \geq 0$ non-negativity constraint activities

Where, Z =   Gross margin

             c_j =   Price of production activities

             x_j =   Level of jth production activity

c_j^*	=	Price of non production activity
x_j^*	=	Level of jth non production activity
a_{ij}	=	the ith resource required for a unit of jth activity
b_i	=	the ith resource available with the sample farmers
j	=	refers to number of activities from 1 to n
i	=	refers to number of resources from 1 to m

The constraints:

Land:

$\Sigma a_{ij} x_j \leq OL$,

$\Sigma a_{ij} x_j \leq SL$

$\Sigma a_{ij} x_j \leq OP$

$\Sigma a_{ij} x_j \leq EL$

Where OL, SL, OP and EL is the amount of owned land, share land, own pasture land and eucalyptus tree land holding respectively.

a_{ij} is the area of crop land required for jth activity

RESULTS AND DISCUSSION

Ethiopia's Land Tenure System: An Overview

Land tenure system up to 1974: Private tenure was recognized as the most dominant system. Under this system land was sold and exchanged; however, given that all the land was originally state property and that private holders had no absolute rights, this was different from the general concept of a freehold system. Serious land concentration, exploitative tenancy and insecurity have characterized the private tenure system.

Land tenure during 1974 – 1991: The 1975 land reform by the Derge has been considered by many as a radical measure that has abolished tenant - landlord relationships in Ethiopia. The reform was designed in terms of distribution of private land to the tiller; prohibitions on transfer-of-use rights by sale, exchange, succession, mortgage or lease, except upon death and only then to a wife, husband or children of the deceased.

Current land tenure and problems thereof: After downfall of the Derge, Transitional Government of Ethiopia had declared that the right to ownership of rural and urban land, as well as of all natural resources, is exclusively vested in the state and in the people of Ethiopia. "Land is a common property of the Nations, Nationalities and peoples of Ethiopia and shall not be subject to sale or other means of exchange". There was a consensus that the current system, because it does not guarantee security of tenure and undermines incentives, has detrimental effects on agricultural productivity and natural resource conservation, does not provide incentives for investment in improvements.

The current debate on land tenure and policy: The land tenure system has been a controversial issue in Ethiopia: The advocates of the existing land policy believe that if the farmers are given the right to own land privately and are allowed to sell, many farmers will become landless and exposed to various hardships. The critics argues that the existing land tenure arrangements has contributed towards increased degradation of farmers' land resulting in soil erosion and poor productivity level of various crops. Recent World Bank report says, strengthening people right to

own land and secure land tenure is a precondition for productivity increases in agriculture. Farmers with ownership right and secure land tenure are more likely to make long-term investment in their land.

Farm income: The main sources of income for the farmer were derived from both farm and non-farm activities. Based on the existing farm situation and prevailing price levels, farmers of HIG and LIG were obtaining 4491 and 2176 birr as gross margin to meet all expenses such as subsistence requirements, clothing, land tax, hiring of labor and other variable input expenses etc. (Table 1). The LIG farm income was not covering all his expenses. So, the farmer in this group is expected to reduce either the variable costs or subsistence requirements, which may lead to undernourishment. The LIG farmer to cover his expenses needs additional income from non-farm activities. Among the various types of farm activities (Data not shown) that are currently performed by the farmer, wheat contributed 33 per cent of farm income. Though the contribution of livestock and eucalyptus tree enterprises was very small yet this was an additional source of farm income. The income of the farming population closely follows the patterns observed for size of holdings. When disaggregated by cropping pattern, wheat ensured highest per capita household income followed by teff. Hence, availability of land and crops grown were major factors determining the household income. The rather low level of income of farmers in Ethiopia has obvious implications for the poverty situation that prevails in the country in general and in the rural population in particular.

Farm productivity: The low level of income of farm households is a result of both the small size of landholding and the low level of productivity in Ethiopian

agriculture. As can be seen from Table 2, average cash income per hectare of cultivated land (an indicator of land productivity) averages Br 1173 and Br 454 on HIG and LIG holding respectively. Average gross margin per labor force employed and available (a proxy measure of labor productivity) stands at Br1.45 & 1.05 /man-hour on HIG and Br 1.12 & 0.67 on LIG holdings. This again is a clear indication of the close link between size of holding and labor productivity in Ethiopian agriculture. Coming to the farm size and household food security, the average holding size in the study zone (0.78 hectares) was not enough to produce sufficient food for their families.

Optimal *land management practices*: About two-third of land area is regarded to be potentially suitable for agricultural production and less than 10 per cent of this potential land has been cultivated which is estimated as about 7 million hectares in any one-crop season. Around 95 per cent of the cultivated land is under smallholder farming and the rest under state/commercial farms. The country has not been self sufficient in food and chronically dependent on food aid. Of various reasons responsible for food deficit, low/poor land productivity is the most crucial. The average yield for grain crops has remained around 11 quintals per hectare. This meager land productivity is not because of the poor soil fertility rather as a result of ill management of the limiting factor of production i.e. land. The issue of tenure security seems to be a more important consideration for farmers than the particular form of ownership. One of the key issues related to land tenure is the degree to which the tenure arrangement encourages sustainable farm practices. It is generally believed that a more secure tenure system provides the necessary incentives for

farmers to manage their land more efficiently and invest in land improvement. Assessment of better land management is evaluated in relation to farm practices such as crop rotation, terracing, fallowing and tree planting. In general, the prevailing land management practice does not encourage agricultural sustainability in the country. Therefore, security of tenure is more important than those of plot size or land availability.

Farm productivity:

The optimal land management practices for both income groups showed a significant change in the production pattern, resource use, farm income and returns to farm resources over the current practices. The model favored wheat for both income groups. The result is compatible with farmers' enterprise prioritization for food security goals together with the consideration of production per unit area. The area allocated to wheat was increased by 77 per cent and 50 per cent for HIG and LIG, respectively over the existing practice. Model, selected crops with fertilizer for own-land crops. There was no change in the utilization of the total area of land in both the farm groups, except the variation in the reallocation of area among different crops. The labor employment was increased by 3 per cent in HIG and 45 per cent in LIG farms. Similarly, oxen power utilization increased by 9 per cent and 23 per cent on these farms.

Farm Income:

The optimal farm practices indicated the improvement in farm income. More specifically, under reallocation of resources, the overall gross margin per hectare (GM/ha) improved by 9.4 per cent for HIG and 8 per cent for LIG. Similarly, cash income (CI) improvements

were also observed by 20.5 per cent for HIG and 49 per cent for LIG. The result showed that the low-income group was more benefited than the HIG (Table 3).

Resource Productivity:

The land productivity increased in optimal base model by 9.4 per cent and 8 per cent for HIG and LIG, respectively (Table 4). In case of labor productivity, gross margin per man hour (GM/MH) for employed persons were increased for HIG more because the increase in farm income was higher than the increase in labor usage from the existing practice. But for LIG the increase in farm income was lower than the increase in labor usage. The GM/MH for available persons increased by 8.6 per cent and 7.5 per cent for HIG and LIG, respectively and cash income per man- hour (CI/MH) for employed was increased by 16 per cent and 5.5 per cent for HIG and LIG, respectively.

Marginal Value Product of Major Resources under optimal farm practices:

The marginal value (shadow price) of land is Birr 1305 and 960 per hectare for HIG and LIG, respectively. The marginal value of land for LIG was small compared to HIG, due to the inadequacy of capital available for farmers in the LIG hindering the cultivation of highly productive crops. Working capital has marginal value of Birr 1.837 and 2.7 for HIG and LIG respectively. Labor has marginal value of 0.24 per person per hour. This implies that the values of the objective function would increase by these amounts if an additional unit of these resources were made available. However, the price of labor in the study area is still higher than the obtained marginal value, implying that it is not profitable to hire the labor (Table 5).

CONCLUSION AND POLICY IMPLICATIONS

The study hints that the problems faced by Ethiopian agriculture are very much related to the existing landholding system, though not exclusively. Issue of tenure security is a more important consideration than the particular form of ownership. Government action to increase tenure security and transferability of land rights can significantly enhance rural investment and land productivity. The size of the holding is of considerable importance. With minor exceptions, larger size holdings perform better than smaller size holdings. The farmers' involvement in land transactions despite restrictions by law suggests that a suitable land policy will facilitate the operation of formal land markets to enable better allocation of this important resource. A conducive environment must be created to encourage rural land markets in view of their role in improving resource allocation, efficiency, productivity and mobility. Policy-makers and agricultural development experts must give serious consideration to the fact that there is limited room for intensification with the prevailing mini-plots operated by subsistence farms. Ways and means must be sought to create viable farm sizes that will enable economic use of farm input in a way that leads to increased intensification in a dynamic and sustainable manner. Although the issue of rural land tenure is a major component of agricultural and rural development in Ethiopia, the problem of agrarian transformation should be looked at from a wider and long-term perspective. Given these findings, the government needs to revisit its land policy in order to devise an appropriate policy framework that addresses the problem of the agricultural sector.

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Table 1 Sources of cash income of the sampled farmer (Birr.).

Particulars	HIG	LIG	Overall
Gross Margin	**4491**	**2176**	**2765**
Crops	3625	1552	2080
Livestock	663	443	499
Eucalyptus tree	203	181	187
Off-farm income	711	230	352
Total income	5202	2406	3118
Farm cash income	2064	354	789
Net cash income	1588	6	409

Table 2: Marginal value productivities of land and other resources, sampled holdings (Birr).

Resource productivity	HIG	LIG	Overall
Land: (GM/ha)	2552	2790	2684
Land: (CI/ha)	1172	454	766
Labor: (GM/MH)			
Labor employed	1.45	1.12	1.18
Labor available	1.05	0.67	0.79
Employed: (CI/MH)	0.67	0.18	0.34
Working capital	985	470	601

GM, CI, MH stands for gross margin, cash income and man hour

Table 3: Enhanced farm income with optimal farm practices, sampled holding (Birr)

Income	HIG		LIG		Overall	
	Current	Optimal	Current	Optimal	Current	Optimal
Gross margin	4491	4914 (9.4)	2176	2349 (8)	2765	3002 (8.6)
Cash income	2064	2487 (20.5)	354	527 (49)	789	1026 (30)

Figures in the parentheses are the percentage increase.

Table 4: Marginal value productivities of land and other resources with optimal farm practices, sampled holdings (Birr).

Productivity	HIG		LIG		Overall	
	Current	Optimal	Current	Optimal	Current	Optimal
Land: (GM/ha)	2552	2792 (9.4)	2790	3011 (8)	2684	2914 (8.6)
Land: (CI/ha)	1173	1413 (20.5)	454	676 (49)	766	996 (30)
Labor: (GM/MH)						
Labor employed	1.45	1.54 (6)	1.12	0.74 (-34)	1.18	1.03 (-13)
Labor available	1.05	1.14 (8.6)	0.67	0.72 (7.5)	0.79	0.85 (7.6)
Employed: (CI/MH)	0.67	0.78 (16)	0.18	0.19 (5.5)	0.35	0.34 (9.6)

GM, CI, MH stands for gross margin, cash income and man hour
Figures in the parentheses are the percentage increase/ decrease.

Table 5: Shadow prices of limiting resources with optimal farm practices, sampled holdings.

Resources	HIG	LIG	Overall
Cropped land (Birr/ha)	1305	960	1048
Labor (Birr/MH)	0.24	0.24	0.24

MH: Man-hour