AGRICULTURAL POLICY IN ETHIOPIA'S ECONOMIC DEVELOPMENT: SCOPE, ISSUES AND PROSPECTS

PROCEEDINGS OF THE 6TH ANNUAL CONFERENCE OF AGRICULTURAL ECONOMICS SOCIETY OF ETHIOPIA

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Agricultural Economics Society of Ethiopia (AESE) is a non-profit making professional society established in 1995.

The objectives of AESE are to contribute to the development of Ethiopian agriculture by promoting research and development in Agricultural Economics, to promote the study of Agricultural Economics in the country's educational institutions, to promote agricultural research and assist in the dissemination of results, to provide fora for the discussion of problems of agricultural development, to promote the professionalism of agricultural economists and to enhance contacts among agricultural economists and other related professionals in Ethiopia and abroad.

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FOREWORD

At the time of preparations for the 6th Annual Conference, the moment was ripe to place issues of agricultural policy at the center of development debates in the country. The executive committee of the Society appropriately seized the opportunity when it selected the theme for the Conference to be *Agricultural Policy in Ethiopia's Economic Development: scope, issues and prospects*. This was not only because this theme was consistent with AESE's objectives, but also it was timely in a sense that it would be possible to contribute to policy dialogue and discussion at a time when strategic policy issues were in the making.

There was a strong desire to ensure relevance in content, comprehensiveness in coverage and rigor in quality of the materials to be presented. To these effects, apart from the contributed papers, key government and non-government organizations were requested to prepare papers on issues that relate to agricultural policy. Two of these invited papers, which were presented at the Conference, are included in the present Proceedings – one on Agricultural Extension and another on Agricultural Information Systems. We believe that continuous discussion and productive engagement on strategic issues among policy makers, practitioners and academia would significantly contribute towards policy development process; hence discussions should be encouraged.

A total of nine papers are included in the Proceedings. These papers address cross-cutting issues of policy including economic growth and entitlement, food security, natural resources use and conservation, land tenure and investment, pastoral development, extension, production incentives and export, and agricultural information system. Although much more remains to be desired in terms of broadening comprehensiveness, it is our firm and sincere belief that these papers would trigger policy debates—thus contributing towards the policy development process.

We would at this point like to extend our sincere appreciation for all the authors of these papers, but particularly so to the invited ones, for taking their valuable time in preparing the papers and bearing with our seemingly endless demands.

The Editors
August 2003
Addis Ababa
WELCOME ADDRESS

Demese Chanyalew
President, Agricultural Economics Society of Ethiopia (AESE)

Your Excellency Ato Belay Ejigu, Vice Minister of the Ministry of Agriculture of the Federal Democratic Republic of Ethiopia,
Invited Guests,
Members of the Agricultural Economics Society of Ethiopia,

Dear conference participants,

May I take this opportunity to say, on behalf of the Executive Committee, welcome to all of you to this 6th Annual Conference of the Agricultural Economics Society of Ethiopia (AESE). Indeed, we appreciate much your presence.

AESE organized such a conference in order to contribute to the fulfillment of its objective: contributing to the development of Ethiopian agriculture and providing fora for discussion of problems to agricultural development, two of six constitutional objectives of AESE.

Since its last conference, the AESE has participated in various fora and contributed, with communication, to government bodies on issues related to the above two objectives. Specifically, it received the Agricultural Policy zero draft from the Ministry of Agriculture (MOA) and gave an eight-pages review feedback to the Ministry. It has done a similar review and communicated to the Southern Nations Nationalities and Peoples Regional State Agriculture Bureau on the Region's Draft Policy on Rural Land Use and Administration. AESE members also participated on the workshop organized by Ethiopian Economic Policy Research Institute (EEPRI) to discuss the issue of Land Tenure and Agricultural Development in Ethiopia: The Need for New Thinking and a Pragmatic Approach in Dealing with the Problem. These are some of the works and participations the AESE carried out since its last conference.

The theme of this conference Agricultural Policy in Ethiopia’s Economic Development is timely as not only that various public and private institutions are doing works related to agricultural policy, but also that the Government of the Federal Democratic Republic of Ethiopia has issued a leading document entitled Rural Development Policies, Strategies and Instruments (RDPSI). This document has a wide coverage on Ethiopia's agricultural policies, strategies and instruments and has been discussed by experts almost in all public organizations in the agricultural sector. The discussion is still on going. As a professional, and member of this society, I say that the discussion and the debate on this document has to continue.
A policy compasses at least four elements: goals that may be established based on the beliefs and values contained in the economic system and the nation of concern; the means that are needed to attain the goals; agents and agencies that activate and control the means and a clear grasp and understanding of the constraints that may prevail during the implementation phase of the designed policy and the corresponding assumptions.

It is well known that any policy involves the political system on which the prevailing government is footed. On this basis, one may draw sharp distinctions among different systems of formulating policies and the differences in policies. The present rural and agricultural development policy that is designed and being discussed cannot be outside the aforementioned systems of policy formulation in general and agricultural policy formulation in particular.

Making policy is not a one-shot game. It is a process which starts from a felt need to change current state of affairs by creating public awareness and public acceptance movements on same proposed policies.

The process is not complete unless it incorporates a phase for the new or the ongoing policy evaluation, analysis and review at different stages of its formulation and implementation. This phase is needed as public policy making involves the concept of incrementalism, as each new decision is added to the old and the policy itself is built gradually using wise decisions and lessons from past mistakes.

Now, I would like to give my remarks specific to the agricultural policy, strategies and instruments.

As we know, agricultural policy applies to two broad sets of issues: one related to inputs the other to out puts. The policy on the input side involves use of land and other natural resources, agricultural credit, agricultural inputs of industrial origin and human resources employed in the agricultural sector. On the output side, the agricultural policy involves different laws, government rules and regulations that apply to these markets. For instance, it deals with issues such as price supports, marketing controls, and various forms of subsidies.

Rural Development Policies Strategies and Instruments (RDPSI) has the following strengths. It advocates a market-oriented capitalist economic system, and the desire to have policies, strategies and instruments formulated from within. Besides, it:

- recognizes the need for an integrated approach for rural development
- follows participatory approach
- recognizes the need to change perception of Ethiopia's workforce about work ethics, motivation and attitude
- recognizes education and training as a major strategic and instrumental means of development
- reconsiders the need for settlement programs
Welcome Address

- gives a new direction to agriculture and health extension systems emphasizes on diversification and specialization of production and recognizes the role of cooperatives in a transition economy.

Some of the weaknesses of the RDPSI are outlined as follows.

It is designed without adequate assessment of the status quo and the capacity requirement and a corresponding prioritization scheme. Though, as I indicated earlier, any policy is based on the politics of the prevailing government, a balance should be struck on this and economic and social aspects. It seems to aspire for a ‘big government’ even though it excludes subsidy to farmers. The policy on land tenure still needs further study and revision. Recent study by EEPRI states that 61% of interviewed farmers (about 8500 farmers were involved in the survey) think that the current land tenure system is good, while 72% of professionals responded to an opinion favoring a system based on free marketable land holding and 90% of them opted for a system that allows land to be used as a collateral. Such states of affair need further scrutiny and invite for a policy debate. About 61% of the farm household today has less than one hectare cultivable land, and agricultural land is a serious problem, where 44% of the farmers interviewed reported landholding of less than the amount required for minimum food production.

The policy reconsiders the need for settlement program. But the proposed program is restrictive. It gives permission only for intra-region settlement. The extension system is designed in such a way to make farmers move to technology centers than technology to go to farmers. With this, it considers a costly extension system in agriculture, health and other sectors. It fails to see subsidy in close examination with the issue of market failure. Subsidy in unproductive manner should be avoided. Food should not be used to subsidize farmer's income. But I don't see any rationale to exclude subsidy to stabilize markets and to facilitate the transfer of primary agricultural commodities from surplus to deficit areas, as well as to support farmers who are hit hard by natural hazard and whose livelihood is eroded due to various reasons that subject them to hardship and poverty.

The cost of achieving the objectives of RDPSI need to be estimated and the plausible sources of finance, human resources and materials should be identified. For example, one of the strategies included in the RDPSI document is to select secondary school graduates and enroll them in three-year agricultural training colleges, and then assign at least three graduates to each rural kebele (one in crop, one in livestock, and another one in natural resources and irrigation). Similarly, on the rural health aspect, the RDPSI document states that there will be a health station in every area with about 5000 people. Furthermore, it envisages to build one health center for every 2500 people.
Recently, two colleagues and I made a preliminary study to estimate the budget requirements of such undertakings. We estimated that to assign three extension workers at each kebele, annual budget for only the salary should be in the range of 139.8 to 154.6 million Birr for the period 2001–2005.

The current total recurrent budget of MoA is about 55 million Birr. Besides, in 2002/3 fiscal year, the government plans to put about 350 million Birr to finance the activities of technical and vocational training centers. On the health side, it is estimated that staffing the health centers alone requires an annual budget of about 780.5 million Birr. If it includes supplies and operation expenses, it may require a budget of more than a billion Birr per year. The total recurrent budget of Ethiopia for health services for the last ten years has not exceeded 460 million Birr per annum. All these indicate the capacity of the economy to finance the RDPSI, without being dependent on external loan and aid, is minimal. This is a serious challenge to achieving one of the government’s goals, i.e. creating an independent economy. It entails deficit financing and a big government to implement RDPSI. But the trend in the economy is not that favorable to do so. The burden is still on agriculture, and increasingly we realize a trade and budget deficit (Table 1).

Table 1. Real GDP, budget deficit and expenditure status of Ethiopia, 1996–2000

<table>
<thead>
<tr>
<th>Year</th>
<th>Export/Import (%)</th>
<th>Budget deficit excluding grants (% of GDP)</th>
<th>Total expenditure (% of GDP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996</td>
<td>62.90</td>
<td>-5.20</td>
<td>24.20</td>
</tr>
<tr>
<td>1997</td>
<td>62.70</td>
<td>-6.50</td>
<td>25.30</td>
</tr>
<tr>
<td>1998</td>
<td>48.70</td>
<td>-10.50</td>
<td>29.90</td>
</tr>
<tr>
<td>1999</td>
<td>50.20</td>
<td>-13.50</td>
<td>33.00</td>
</tr>
<tr>
<td>2000</td>
<td>49.60</td>
<td>-9.80</td>
<td>29.70</td>
</tr>
</tbody>
</table>

Source: National Bank of Ethiopia, quarterly bulletin, Fiscal year series, Volume 17, No. 1; volume 15, No.4; Fourth Quarter 1999/2000; First Quarter 2001/02

Recently, agriculture accounts for 47% of the GDP—showing a slight shift from what it was five years ago (Table 2). However, this shift has not reduced the load on agriculture. The shift from agriculture to non-agriculture sector did not bring a change in the export share of agriculture and in overall macro measures of the standards of living.

Table 2. Share of agriculture from average annual per capita GDP, 1984–2000

<table>
<thead>
<tr>
<th>Period</th>
<th>Share of agriculture (%)</th>
<th>Mid-year population (millions)</th>
<th>Per capital GDP (Birr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1984–1989</td>
<td>51.71</td>
<td>44.15</td>
<td>261.62</td>
</tr>
<tr>
<td>1990–1994</td>
<td>53.24</td>
<td>52.10</td>
<td>222.26</td>
</tr>
<tr>
<td>1995–2000</td>
<td>46.93</td>
<td>60.80</td>
<td>253.46</td>
</tr>
</tbody>
</table>

at constant factor cost

Source: Ministry of Economic Development and Cooperation.
During the last ten years of the Derg's regime, the average export share of industrial products was 8.8% as compared to its share recently, which is 2.8% (Table 3). This indicates that the structural shift taking place in Ethiopia is not from productive agriculture to a productive industry, but from productive agriculture to non-productive service sector.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Coffee</td>
<td>61.3</td>
<td>64.1</td>
</tr>
<tr>
<td>Oilseeds</td>
<td>1.7</td>
<td>3.9</td>
</tr>
<tr>
<td>Hides &amp; skins</td>
<td>14.4</td>
<td>11.6</td>
</tr>
<tr>
<td>Pulses</td>
<td>2.8</td>
<td>2.4</td>
</tr>
<tr>
<td>Chat</td>
<td>2.2</td>
<td>8.1</td>
</tr>
<tr>
<td>Agriculture Total</td>
<td>82.4</td>
<td>90.2</td>
</tr>
<tr>
<td>Industrial products</td>
<td>8.8</td>
<td>2.8</td>
</tr>
</tbody>
</table>

Source: Tura Kebede, in Birritu, No. 79, Nov. 2001–Jan, 2002

The contribution of the service sector to the country's GDP increased slightly from an average of about 354.8% in the years 1980–1990 to an average of about 38.1% in years 1991–1997. However, most of the increased contribution goes to the 'public Administration' sub-sector.

In recent past, the economy has not shown significant changes in terms of the purchasing power of the people, literacy level, food security and other measures.

Purchasing power of the Ethiopian people was continuously deteriorating from 1996–2000. The country was increasingly becoming unable to finance its imports with exports. The budget deficit was on rise with an increased expenditure measured in percentage of the GDP.

One recent study reported that food grain deficit, estimated based on an average 2.25q per person per year (which is the equivalent of 2100 kilo calorie per person per day), was 1.04q. Put in other terms, in the last nine years, we were able to produce only 1.21q food grain per person per year compared to the required 2.25q per person per year.

Even with a modest estimate of average grain yield of 11.5 q ha\(^{-1}\), the country is covering only about 54% of its total food crop requirement. Its dependence on food aid is high, and I guess this will escalate with the current drought problem facing the nation.

Simply, this quantified assessment of the status quo gives some insight on the ongoing policy design and implementation debate. Here, emphasizing the need for
training of agricultural economists, I recommend that capacity assessment study be conducted.

This year, a colleague and I have presented the need for agricultural economics training on third conference of Organization for Social Science Research in East Africa (OSSREA), and reported the closure of the degree program in our country while other regional countries are expanding their degree programs in agricultural economics and related subjects. Why this happened has not received an answer. Still, AESE strongly believes that there is a need for an Agricultural Economics first-degree program training in Ethiopia. Its location can be decided considering the rules of comparative and competitive advantage. All of us must continue to sensitize the government and the public on this issue.

Finally, I would like to congratulate members of the AESE who, through their continuous support, fully financed this conference.

With these remarks, Your Excellency Ato Belay Ejigu, Vice Minister of the Ministry of Agriculture, may I take the opportunity to invite you to give us opening statements.

Thank you.
OPENING SPEECH

His Excellency Ato Belay Ejigu
Vice Minister of the Ministry of Agriculture

Distinguished Workshop Participants,
Ladies and Gentlemen,

It is with great pleasure that I am giving an opening statement at the 6th Annual Conference of the Agricultural Economics Society of Ethiopia organized under the theme *Agricultural Policy in Ethiopia's Economic Development: Scope, Issues and Prospects*.

Africa represents the world's most serious development challenge notwithstanding international concern and strong efforts in individual countries to promote economic and social development.

Sustainable development in the continent is of major concern as various reports have indicated that GDP in Africa has dramatically declined over years. Apparently, all efforts made so far including structural adjustment policies could not reverse the exponential escalation of poverty and gradual socio-economic and political events. The development strategies coined so far have not achieved their goals and rather resulted in worsening poverty, famine, environmental degradation, massive displacement of people and greater dependence on international economic systems, and marginalization and stagnation of the African economy.

Experiences in Ethiopia show that adverse changes in climate, combined with technological, institutional and environmental factors, have led to poor economic performance. In addition, policy-induced stagnation of agriculture and internal conflict during the 1970s and 1980s resulted in food deficiency that affected millions of people and led to starvation. Agricultural development of Ethiopia also suffered from seasonal structural problems.

The country's ability to attain food security and to provide effective social and economic services to its people is also being challenged by the rapidly increasing population.

Cognisant of the aforementioned formidable challenges, the Federal Democratic Republic of Ethiopia has introduced a new economic policy with the objective of doing away with the past-misguided policies.
Workshop Participants,  
Ladies and Gentlemen,

The economic reform program adopted in 1992 with the objective of replacing the previous centrally planned economy with market-oriented economy system and the implementation in line with the principles of decentralization, autonomy, competition, efficiency and profit maximization has steadily improved the overall policy environment in the agriculture sector.

Thus, the government adopted the Agricultural Development-Led Industrialization (ADLI) Strategy as a major policy framework for economic development. By way of implementing ADLI Strategy, environment conscious agricultural intensification is accepted as one option for raising agricultural production towards attaining food security. Accordingly, an agricultural package program that consists of the dissemination of agro-ecology-based improved agricultural technologies has been implemented since 1995. Results achieved so far in terms of increasing production and productivity of major staple food crops are encouraging. The lesson learnt is that properly planned and implemented package program can be effective to help overcome food insecurity challenges in Ethiopia.

On the other hand, to accelerate technology generation, address newly emerging priorities and ensure sustained agricultural research funding, the government has continued its support to consolidate the Ethiopian Agricultural Research system. Recognizing the need for coordinating different institutions contributing to the development of agriculture, the Government has established the Ministry of Rural Development to ensure better co-ordination and integration of the sector.

Considering the need for the development of appropriate packages to bring about economic transformation in rural areas, several packages intended to serve targets of different levels are under preparation. In developing these packages, technical suitability, inputs availability, profitability and marketability were considered. Successful outcome of these would depend on the capacity built in rural setting to assure full implementation.

On the basis of the newly adopted civil service reform, strategies have been set to efficiently utilize the existing human power along with creating better capacity of human resources management. Moreover, enough attention is given to technical and vocational training to produce skilled and competent staff at grassroots level. Added to this, efforts are made to establish and strengthen training institutes that are tailored to technical and vocational training. The technical and vocational training program is designed to improve access to relevant practical training in agriculture for youth who leave school at tenth and eighth grades, respectively.
Opening Speech

Workshop Participants, Ladies and Gentlemen,

The Government also adopted policy and institutional reforms to develop efficient marketing system in 1990s to overcome the inappropriate marketing and pricing policies of the Derg Regime. The reforms included liberalizations of input and output marketing system, which operate in a free market economy, removal or input subsidies, and deregulation of prices. Due to these reforms, it seems that inter-regional flow of products, efficiency of marketing system and barriers to grain trade entry and production level of major crops have improved. However, despite efforts made to reverse the problems of agricultural marketing, Ethiopia is still facing difficulty in establishing sustainable marketing system for agricultural products and inputs.

Workshop Participants, Ladies and Gentlemen,

Among efforts made to create favorable policy environment, the food security strategy is the most commendable than others in terms of attacking the prevailing poverty. Poverty reduction is a top priority agenda of the Ethiopian Government. To this end, the preparation of Poverty Reduction Strategy Paper (PRSP) is near to completion. Both Food Security and Poverty Reduction strategies are further complemented with a comprehensive Rural Development Policies Strategies and Instruments opted to realize the optional use of both labor and land resources as primary engines of economic development.

The long-term development strategy, therefore, seeks to deploy just enough labor that will enable maximum use of the production capacity of resources through adopting farming methods and technologies that are not labor displacing. An important mechanism that would enable to introduce labor-intensive strategy is training the agricultural labor force and effective skill transfer.

Similarly, the development strategy acknowledges that accelerated and sustained agricultural development can be brought about only if we consider the variations in agricultural activities being carried out in different agro-ecological zones and are able to identify development opportunities existing in various agro-ecologies.

Furthermore, the development strategy encourages transforming the rural economy to market-oriented economy.

Workshop Participants, Ladies and Gentlemen,

Once again, this workshop is organized at a time when the government of the Federal Democratic Republic of Ethiopia commits itself to poverty reduction and
overall development. Thus, the government believes that agricultural development efforts need to be integrated and coordinated.

Furthermore, it recognizes that coordination is required not only among the activities within agriculture but also with the rest of the socio-economic sectors. One sector cannot score rapid growth without the support of others. Managing these activities in an integrated and coordinated manner requires knowledge of opportunities that could be created by one sector for the other, and employing a strategy that would enable effective use of those opportunities. In this regard, your contribution as a society is very important. Moreover, a society like AESE should play a significant role in the economic transformation process by creating center of excellence in its professional society, arranging a platform of discussions during formulation process of policies and strategies and serving as a knowledge source in that professional area.

Finally, I would like to extend special thanks to the organizers for inviting me to open this conference. Wishing you successful deliberation, I declare this workshop officially open.

Thank you.
CHALLENGES OF ACHIEVING AGRICULTURAL DEVELOPMENT IN ETHIOPIA: A MACRO-POLICY PERSPECTIVE

Abebe Haile Gabriel
Ethiopian Civil Service College

Introduction

Ethiopia has been categorized among the poorest of the poor countries in the world. Its socioeconomic feature is dominantly rural and agricultural. Agriculture, industry and service sectors contribute 51.5, 10.7, and 37.8%, respectively, to the GDP (UNDP, 1998). There are trends of decline in the share of agriculture in total GDP, while share of the service sector has been increasing, and share of the industrial (particularly manufacturing) sector showing sign of neither improvement nor decline. By all standards, agricultural performance has been very poor; productivities of land and labor are low. As most of the country’s resources are tied in this less productive sector, returns and incomes have been low. Incidence and severity of poverty is among the highest in the world and the majority of the poor reside in rural areas partly because about 85% of the country’s population is rural and agricultural.

Two important points could be highlighted from this statement. One is the significance of bringing about agricultural development for achieving an overall economic development, in which the instrumentality of the agricultural sector, that is, agriculture as a follower and resource-provider in which the functionality and role of agricultural surplus in intersectoral linkages is to be emphasized in the overall economic transformation process. Here, agricultural constraint manifests itself in several ways. The second is bringing about agricultural development for improving the living standards of rural and agricultural population. This considers the agricultural sector not as a source of surplus but as a subject of development in its own right and perhaps as a leading sector. These two viewpoints are somehow different but not mutually exclusive. The first one treats economic development as a function of agricultural development and intersectoral interdependence and

1 Given the fact that 85% of the population resides in rural areas, and that incidence of overall poverty being about 60%, assuming that the distribution of poverty between rural and urban areas is symmetrical, then every 51 rural people out of a total of 60 has a probability of being poor, whereas every 9 urban people of the total 60 has a chance of being poor.

2 See, for example, Ricardo (1932) for food supply constraint; Lewis (1954) for labor supply, Kalecki (1976) for financing development.
Abebe Haile Gabriel

linkages, the second concerns intrasectoral possibilities and implications for agricultural development. This elaborates the importance of achieving agricultural development for a better overall economic performance and poverty reduction.

The development strategy that the Ethiopian government is pursuing (ADLI) strongly hinges on the conviction that it is possible to effect agricultural development that improves the livelihood of those engaged in the sector and provides the impetus for fast and sustainable overall economic development. It is also anchored on the presumption of there being strong inter-sectoral linkages, particularly between agriculture and non-agricultural sectors. Besides, a smallholder peasant route is resorted towards achieving the desired pace and pattern of development. However, such considerations could invite many questions like the following. What are the requisite factors that must be in place for bringing about agricultural development? What forms would the intersectoral linkages take and how strong would they be? In what ways would the peasant route facilitate a faster and broader agricultural and rural development process more than alternative routes (e.g., capitalist-farming path) could do? What constraints does the Strategy have in the Ethiopian context? What would be the impact of local conditions as well as global processes at play on the feasibility of such considerations? All these questions draw attention to the Development Policy.

The need for transforming the agricultural sector from its current low productivity status to a high productivity level is beset with many challenges that must be met. The objective of this paper was to analyze some of these challenges.

Overall Context and Nature of the Challenges

Peculiarity of the peasant household as an economic unit

The peasant household is distinct from other economic units in fundamental ways: it integrates in a single institution decisions and activities regarding production, consumption, and reproduction overtime (Sadoulet and de Janvry, 1995 and links several functions of livelihood, security, welfare and promotion that are vital for sustenance of the family. Unlike other economic units, it does not sack a member of the family in case of under (un)employment (due to illness and under or over age, for example). Therefore, labor is relatively immobile since farm is a home as well as a place of work. Neither does the household formally sub-divide its income
amongst its members. The household strives to ensure both employment and means of sustenance for the family.

Ox-plow technology has undergone no major improvement since its history. In 1960s, Monetary value of farm implements ranged between birr 7.50 and 69.00 in Hararghe (average 30.58) (Denils et al. 1965); and between birr 4.25 and 14.00 in Arsi (Leander, 1969). Another estimate on initial costs (at market values) of twelve components of the plow and its ancillaries in Arsi shows that it was between birr 134 and 153; and, after accounting for depreciation (using straight line method), annual costs of these implements ranged between birr 29 and 40 (Abebe, 2000). Pickett (1991) states that "...a crude production function suggests that 16 q of crop per annum come from combining one hectare of land with the labor of three persons, one ox, and implements to the value of US$13", which would approximate (at the time) between birr 30 and 45. Much of this cost is attributed to very few metallic components that claim over one-half of the total. Since fixed capital is small, most of the value added might be attributed to labor (both human and oxen). Moreover, there is a tendency towards an internal reproduction of plow components marked by high degree of self-sufficiency in provision of both human and draft labor, variable inputs (like own seeds and manure) and fixed assets (farm implements), with external dependence playing a marginal role. Only chemical fertilizer is purchased, and even this is very limited as less than 15% of rural households in highland use it. About 2% of the total apply improved seeds, 5% apply herbicides, and 1% of the total use pesticides (Pickett, 1991).

Whether or not traditional plow has been a constraint on increased production is debatable given the smallness of cultivable land available for households on the one hand and the operative capacity of this technology on the other. A single yoke of oxen can plow a quarter of a hectare per day; and for an average cultivated land of about one hectare, a pair of oxen seems to be more than adequate. However, since many households do not meet the minimum, inadequate access to the technology itself seems to be a constraint rather than its capacity. Oxen ownership or its lack will have serious repercussions, among other things, on determining the capacities of households to access other resources including land itself (McCann, 1995).

Peasant livelihood significantly depends on natural factors as bio-physical and climatic factors significantly condition agricultural production. Since production in Ethiopia is essentially rain-fed, this limits the number of growing seasons that in turn dictate the rhythm of agricultural activities as well as employment. Long periods until crops ripen cause many households to go hungry. Seasonally, food supply is erratic while consumption demand is regular—resulting in under-

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3It goes without saying that intrahousehold distribution of wealth, income and power could be asymmetrical. Such issues are addressed in bargaining models and in gender studies like Ellis (1988).
consumption in many of the seasons. This implies that employment, farm-returns, and consumption are not evenly distributed throughout the year.

Perhaps as strategies of achieving the diverse household objectives and perhaps as adaptation mechanisms, households are engaged in small-sized but multiple occupational activities including crops production, livestock rearing and various non-farm employments. Both at household and community levels, rural livelihood is characterized by high degree of self-sufficiency in relation to its linkage with external forces (like urban dynamics, markets and policy). Peasant surplus is either non-existent or is meager and seasonal. Fassil (1993) showed that peasants marketing as high as 50% of their produce are likely to be small in number. Even in ‘surplus producing’ regions (Arsi, Shewa, and Gojjam), which are located very close to large urban markets, the rural producers generally offer for sale less than 20% of most types of the crops produced. This is not a sign of the presence of surplus since, for most part, their produces may feed them tor only six to nine months of the year (Mesfin, 1986). According to Gebremeskel et al., 1998), about 79% of annual grain sales occur immediately after harvest when prices are low.

Challenge of reducing burden of people engaged in agriculture

Agricultural labor force, which is 85% of the country’s workforce, is producing national wealth of only about 50% of the total. This indicates not only the existence of huge resource wastage but also that agricultural employment has not been remunerative at all in strict economic sense. Partly due to land tenure policies and practices, and partly due to lack of alternative productive employment opportunities, the agricultural sector has been a sanctuary for most of the population. Frequent land redistribution practices have definitely raised the expectation of securing access to farmland, however small and fragmented it may be by staying around. Hence, many of the rural youth have resorted to early marriages and sat tight until next round of redistribution.

While land productivity levels (yield per unit area) are extremely low, the major source of poor labor productivity in agriculture has been the presence of too many people working on land, just as much as the archaic technological base on which agricultural production is organized. The issue of achieving an agricultural development is about increasing production and productivity, thereby improving the livelihood of people engaged in agriculture, and about facilitating overall economic progress as well. Where too many people are eking their living out of land the size of which could not be expanded at will and at a low productivity level, it will be difficult to foresee any improvement in the lives of agricultural workers; this situation would also retard overall economic development.

Therefore, socioeconomic transformation process should entail a progressive decline of the proportion of people working in and living directly on agriculture in
relation to the non-agricultural workforce. In fact, if labor productivity in agriculture is to increase, and if any agricultural development is to facilitate development of non-agricultural sectors, agriculture must produce surpluses within the sector itself. This may occur if less people could produce more agricultural output; that is using better methods of production and thus necessitating transfer of more labor force away from agriculture to be productively employed in non-agricultural sectors.

Dualistic growth models attempted to conceptualize, although partially, the role of agriculture in the process of industrialization in the context of inter-sectoral linkages, with the seminal work of Lewis (1954) that provided a major theoretical ground for the transfer of ‘unlimited supply of surplus labor’. The model describes how surplus rural labor, the supply of which is perfectly elastic, could be productively absorbed in modern sectors and thereby contribute to economic development. Dualistic models assume that such labor transfer and accumulation is possible as a continuous labor transfer to modern sectors tends to result in a labor shortage in agriculture, it would therefore induce technological progress in order to maintain food production levels. The implication of such models is that growth can only be self-sustaining if agricultural productivity increases through technological progress (Hayami, 1997; Hayami and Ruttan, 1985; Jorgenson, 1967; Ranis and Fei, 1961).

However, to say that many people should move away from agriculture is not sufficient. Otherwise, rural or agricultural problem would transform itself to an insurmountable socioeconomic problem since rural-urban migration as such does not help to solve the problem in a sustainable way. We have to find answers to questions such as where the migrating people will go, what they will do, what they will get, and what their impact on increasing productivity will be. Clearly, the agricultural sector remains to be the largest employer for sometime to come in this country, although at low levels of productivity and returns.

**Challenge of transforming poor performing non-agricultural sectors into dynamically growing sectors**

Most urban centers, including many big ones, have been playing mainly a residential function for government employees and those that follow to serve them (like hotels, bars and kiosks) rather than an economic function. So, let alone serving as growth nodes for the rural hinterland, they have failed to transform themselves into dynamic growth centers. They are entangled with many problems—sanitation, infrastructure, health and educational services and housing are all at their poor and degenerating levels. Until very recently, there was no urban and/or industrial development policy worth the name. Discussions on workshops and conferences that deliberate on urban issues are often beset with different complaints that agriculture was given undue attention by the government almost to the exclusion of all other sectors. Recently, much effort is being exerted to improve
the governance of urban areas through, among other things, streamlining political and managerial functions. Roles of urban centers as dynamic growth nodes have for the first time been rightly articulated to such an extent that they determine the success of ADLI. However, bringing about such a transformation could be quite onerous.

Therefore, the issue of rural-urban migration needs to be revisited in this context. Especially if it involves the poor segment of the rural population, the problem becomes more intractable. Countries that successfully facilitated the rural-urban migration have done so in the context of a high and growing demand for labor in expanding non-agricultural sectors. In Ethiopia, if there was any expansion in non-agricultural sectors, it was in the services sector (mainly hotels). This sector could not absorb rural labor in any meaningful manner. Added to this are the mismatch in investment (Abebe, 2001) and the rate of urban unemployment which itself is so huge that it could not be absorbed in the urban sector. Hence, the prospect of massive rural-urban migrants to find employment and be utilized in a productive employment is remote.

Domestic markets for agricultural products are very narrow—boom cropping years are often followed by depressed prices. Cereal production, for example, increased between 1999 and 2000 crop years by 19% and prices declined by up to 40% (MoA, 2001). Peasants found it difficult to sell their products since the prices offered were extremely low. This may partly be because agricultural products are not processed before they are sold to the consumer; they are marketed as soon as harvested without any transformation (processing). Such practices have made storing of agricultural products difficult for peasants since most of the products are perishable; while peasants generally lack the necessary infrastructure and practices to keep them for long time without being damaged. Since most peasants are also directly or indirectly forced to market their products in few months after harvest, excess supply would bid prices low. In absence of institutional mechanisms that would balance demand and supply so that prices are stabilized for most of the years, most peasants lose.

However, one should not lose sight of the important reasons that lie underneath such a crises; i.e., the weak purchasing power of consumers (both rural and urban). The largest market for agricultural output resides within the rural sector itself; First of all, it is the agricultural households that lay the first claim on output by retaining the big share for consumption. Second, households who run food deficit seasonally get their shares either through markets or credit within the agricultural sector. Marketed surplus is therefore a residual in the production and consumption decisions of peasant households—they do not produce primarily for sale. Therefore, when environments permit increased production, most peasant households tend to dispose off their products on the market and often at the same time. Most of the people residing in urban areas are also poor that they may not generate sufficient demand to mop-up the surplus in supply by raising their level of
purchases even though their level of consumption remains low by many standards. In addition, the peculiarity of agricultural products would suggest that demand elasticities of price are very low—a very significant change in prices would only result in a less than proportionate change in quantity demanded.

**Challenge of fitting-in well in a global ‘competitive’ setting**

Global forces at work, trends and changes in macropolicy context and so on would affect local processes. The pattern of change seems to be swinging in favor of free markets, good governance (plural democracy), transactional corporations and the like. Specifically, the change includes shifts from command to free markets and privatization, from local control to globalization on the one hand (at more global level) and from centralized to decentralized system on the other (at national level), as well as from ‘government does all’ to ‘partnership’ (government, non-governmental organizations, private sector).

Such trends have been at work in some African countries since early 1980s; and in Ethiopia, many of their elements have been in utterance since late 1980s, and formally adopted in early 1990s. What was started with ‘keeping houses in order’ in the framework of structural adjustment programs is gradually evolving into a globalized world order with the emergence of World Trade Organization (WTO). Incidentally, it would be useful to carefully watch the pattern of shift in intents and actions at major quarters that are able to make a difference. The once strongly craved for revitalization of the agricultural sector in poor countries through all rounded support, which was claimed to have suffered under previous regimes, seems to have lost its flavor in the face of free competitions with multinational as well as transnational corporations.

For small economies such as Ethiopia’s, there seems to exist little choice other than joining the bandwagon earlier than later and exploring different options in which it may derive some benefits out of it. Otherwise, the ‘treadmill effect’ would be pernicious and irreversible. As an exporter of primary products the demand elasticity of which is low and with narrow markets on the one hand, and as one of the many countries that compete for foreign capital inflows on the other, the country should not lag behind. The challenge is to restructure the economy in a manner that responds favorably towards the global market trends while at the same time taking the necessary precautionary measures to minimize the negative aspects. Ethiopia’s production must compete not only with externally produced goods and services in domestic markets, but also in external markets owing to the available cheap labor. The challenge in this respect is that of tuning production technique in favor of the resource endowment patterns and production lines Ethiopia could market. A complete overhaul of our work ethic is necessary as success can only be achieved through hard work and not through some quick fix approaches.
Challenge of developing a comprehensive integrated agricultural development policy

Some attribute the poor agricultural performance to absence of an agricultural policy; others blame it on weak implementation capacities; still others cite the prevalence of wrong policies and their impacts. It is thus important to outline the different policy aspects that govern property relations including ownership (land and other factors), exchange (factor and product markets, prices, consumer goods), production organizations (institutions, markets and services), human development (education and health), infrastructure (communication technologies, transportation), support systems (input supply, subsidy, taxation), and so on. Added to these are also policies that govern use and conservation of the environment, settlement, and poverty alleviation. It is important that policies are harmonized and geared towards promoting intersectoral as well as interregional integration, especially in the context of political and administrative decentralization and trends of globalization as well.

Land access and ownership

In present day Ethiopia, land is said to be the collective property of the Ethiopian people and the state. This has been enshrined in the 1995 Constitution in which access to people who wish to live on agriculture is theoretically and in principle ensured. Short of instituting private property in land, regional governments like those of Amhara and Oromiya regions, for example, have been attempting to provide security for land use through ratifying different instruments. One of the challenges in this regard is to design a land use policy that provides sufficient security for farmers in order for them to make meaningful long-term investments on land. Striking a balance between policy ‘distinctiveness’ (reflecting specific contexts) and policy ‘commonality’ (reflecting harmonization) would also be necessary. This area, controversial as it were, has not been elucidated sufficiently.

Agricultural factor and product markets

The only significant shift in policy is the confirmation that free markets would prevail in markets of agricultural inputs and outputs both of which seem to have been liberalized, but with mixed impacts. Liberalized output markets fetched better prices for peasants as compared to previous levels; whereas, liberalized inputs markets raised inputs prices (e.g., fertilizers). Ultimately, the impact on balance would depend on the marginal productivity of the input factor and its profitability at given prices. However, the challenge is the limitedness of capacity of the market to deliver the right signals since markets for several factors and products are either not fully developed or missing altogether. Peasants’ supply response has been inelastic (Abebe, 1998)—implying that unless production is geared towards market needs, talking of free markets would become peripheral. In addition, availability of consumer goods in rural areas would play important roles in affecting peasants’
decisions of production, consumption and supply. Presently, most agricultural producers are engaged in consumption of self-produced goods and services. This would seriously impede the degree of monetization of the rural economy in particular and the development of the market economy in general.

**Rural institutions**

Agrarian institutions shape the manner in which agricultural markets evolve and mediate their impacts in several ways. Where individual peasants are not in a position to either sufficiently respond to market signals or unwilling and/or unable to take risks, then institutions will play roles of creating and maintaining the necessary capacity, absorbing shocks and the like. Several traditional institutions (saving, insurance, cooperation) abound in rural areas. However, their capacity to bring about meaningful changes is negligible. There are perceivable gains to be derived from forming and running service cooperatives; and there are some policy directives for the establishment of these cooperatives. A missing element would be how to make rural credit available in a manner suitable and manageable for those who need it. The challenge would be how to link formal institutions with informal ones for effective delivery of services and for capacity building.

**Human resource development**

The most important factor that determines the level of development of any country is the quality of its human resource base, which reflects the educational level as well as its health status. Ethiopia is inhabited with a majority of rural population and is one of the countries where the distribution of educational and health facilities is extremely scanty. Hence, it is no surprise that a significant proportion of its population is illiterate and plagued with several diseases; this itself is a reflection of the severity of malnutrition. This is without mentioning that the country has been unable to feed its population and is desperately dependent on food aid. A human resource base characterized by malnourishment, ill health, and illiteracy cannot be expected to become a dynamic force of development. It is therefore important that measures be taken to reverse the situation.

The government has adopted, among other things, a food security strategy, a poverty reduction strategy, a policy of free primary education for all as well as a health policy that focuses on prevention of diseases. However, more specific actions are necessary in some areas. For example, if the level of education matters for an improvement of agricultural productivity, what has been achieved in terms of farmers' education? When investment in education is recommended based on research results indicating education level of the household head as significant variable (often this refers to formal education), little attention is paid to the type of education or its link with farming. Several questions could be posed. These include: in which specific ways would education affect farm productivity? How is information transmitted and how could peasants get it? How many newspapers and newsletters are there that target the smallholder farmers and what is their distribution like? How many peasants have access to radio broadcasts and to what
extent is the transmission appropriate in terms of time, content, etc. to peasants? In general, what kind of education are we talking about and what are the limitations of our agricultural extension education systems?

**Rural infrastructure**

Rural areas are characterized by extremely poor infrastructure. According to some estimates, about 75% of farms are more than a half-day walk from an all-weather road. Average road density is estimated to be 21 Km per 1000 km² of land (0.43 Km per 1000 people) (FDRE, 1996)—these figures are significantly lower than what has been obtained elsewhere. Peasants must either use pack animals or carry their produces on their long march to the nearest market. Rural centers that have telecommunication networks are very few. Therefore, a full market-oriented production organization on the part of peasants is incumbent upon the extent to which this hurdle could be lowered significantly. Still, the number of peasants who use improved methods of agricultural production (seeds, other inputs) as well as the extent of use of these methods are small.

**Peasant support systems**

Currently, peasants particularly those encompassed in extension package programs, receive some support mainly in terms of expertise advices. Fertilizer subsidies have been withdrawn based on the argument that their use had been profitable. As a result, there was not-sufficient economic or social justification to continue subsidizing peasants rather than utilizing the resource where it would bring better and meaningful economy-wide impacts (e.g., road construction). While comprehensive studies on the profitability of fertilizer use are still lacking to make informed judgment, there are disquieting reports that peasants are finding it difficult to continue to use fertilizers in the face of their ever-increasing prices against declining product prices. This would require designing different support programs to make the process of agricultural development a sustainable one.

**Environmental concerns**

In Ethiopia, agricultural production and rural livelihood are directly dependent on natural environment (biophysical and climatic). The production process is characterized as a process of constant human interaction with the natural environment. In this process, the manner in which resources are utilized would determine the sustainability of rural livelihood system itself.

**Settlement issues**

In highlands, settlement patterns follow scattered homesteads; and in much of the lowlands, pastoralists seasonally migrate in search of water and grazing areas for their cattle. In such patterns of human settlement and movement, it becomes very difficult to reach basic services for large portion of the population. Hence, there needs to be a clear settlement policy that considers continuous consultations of all stakeholders to raise awareness of its benefits, reach agreement and initiate actions on voluntary basis and provide sustainable support.
Having done all these, a big challenge remains to be that of linking growth with entitlement objectives at household, community, regional and national levels. This demands seeking ways of how agricultural output could be increased and what factors would determine improvement of access to it by the majority.

Meeting the Challenges of Achieving Agricultural Development

Peasant neglect as a definitive feature of past regimes

Peasant agriculture remained underprivileged for several reasons. The most popular version is given by what is called the ‘Urban Bias’ argument advanced by Lipton (1982) in which he hypothesized that policy makers are urban-based and therefore have vested interest in disproportionately allocating investible resources to urban centers to the neglect of rural sectors. Also others share the argument that politicians have little interest in developing the rural areas where disorganized peasants who could have little impact on the political spectrum live. These arguments would lead to the conclusion that peasant agriculture in particular and rural development in general will remain to be underprivileged unless the peasantry is well represented in the state structure. A somewhat related view from different angles could also be found in the ‘mode of production’ literature that treats peasantry as a transient social category, hence it mattered little since the development of capitalist relations in agriculture would eventually transform the peasantry into capitalist farmers and wage workers through social differentiation.

Ethiopia’s peasant agriculture has historically received less attention from political powers. During the Imperial times, the drive for modernization had marginalized the peasantry. Derg also was quite impatient to convert Ethiopian peasantry into rural proletariats. The dualities that emerged both in agriculture and in the overall economy (‘modern-traditional’, or ‘socialist-pre-socialist’ forms) because of conscious moves on the part of successive governments had excluded the majority of the peasantry from the mainstream development orbit. The present government has vowed that agricultural development becomes the priority agenda and will take on a peasant path (smallholder agriculture). It also claims that the peasantry’s interests are well represented in the government.

Agriculture-industry linkages as determining factors of agricultural development

The success of ADLI Strategy hinges on the extent to which agriculture can really make a difference. The pace and extent of the drive to industrialisation would be
determined by the success of the agricultural sector in financing industrialisation and in backing up the drive to industrialization through generating effective demand for the industrial sector. The most important linkages in the short-run could remain to be:

- whether surplus food (since this is a wage good) can be produced in desired magnitude without a serious rise in its price; otherwise, it will reduce industrial profit and stifling incentive for industrial investment
- whether domestic raw materials and inputs would make a significant portion of industrial raw materials so that the industrial value-added would be meaningful
- whether the economic transformation process is supported by a vibrant export sector and
- whether the industrialization drive is supported by effective and rising demand for its products.

This has many implications. The primary factor that led to failure of industrialization strategies in the past has been lack of effective demand; inter-sectoral backward and forward linkages have been secondary while foreign markets had not been penetrated easily.

Infusing dynamism among the different sectors implies that incomes would improve in all sectors. For a successful economic transformation to take place, the rural economy should move from a more self-sufficient and subsistent sector to a more specialized and market-dependent one.

### Conclusions and Recommendations

It is important that the following aspects be considered if agricultural development in Ethiopia is to be a success.

- An enabling legal and institutional framework should be created and elaborated based on careful scrutiny and evaluation of facts.
- Sufficient, accurate, and up-to-date information and database (for policy) needs to be generated.
- As the general background is massive poverty, empowerment needs to be considered as a key element in policy designs and implementations. Agricultural development is more than growth of agricultural output that it cannot be dealt with adequately if isolated from poverty alleviation; hence, poverty alleviation must be a central issue. Agricultural development must be viewed in broad perspectives of rural development. In a situation where the peasantry is incapacitated, the central question must be how to create and expand its capacity for increased production and poverty alleviation.
Challenges of Achieving Agricultural Development in Ethiopia: A Macro-policy Perspective

- The role of the State must be re-examined in the face of a general argument for the State to rollback. In the Ethiopian situation, the State cannot afford to be a bystander in the process of agricultural development. It is not the concern on whether the it should have a role in economic life of this country that is crucial; rather, it is on whether other alternatives (markets) could have the necessary capacity to adequately address the challenges faced. As long as there is an agreement on meeting the challenges, it is a question of choosing a better alternative—and, as things stand now, it seems to be the case that government is situated favorably well to play as big partner with the private sector and other actors.

- Strategic industrial sub-sectors that would maximize value addition with an export orientation need to be comprehensively identified and supported. This would have far-reaching ramifications on resource use, productivity, quality, market access, and competitiveness of the concerned firms and the country in general.

- To this, one must consider the fact that, in Ethiopia, drought is no more a natural hazard that comes unexpectedly as it is becoming a natural event with partly predictable prevalence pattern. Concerted effort is necessary at all levels (household, community, country) to ensure water availability for sustainable agricultural production.

Generally, a shift is required from what is called a ‘fire fighting’ or crisis management to a strategic approach.

Essentially, development and change are outcomes of a dynamic interaction of structure, action and responses (SAR). Conventional wisdom has it that peasants rationally respond to opportunities, technology brings about growth possibilities, free markets deliver right prices, and institutions and structures are given. Since the focus is only on the action and the response, the structure that links and determines these is either left out of analysis kept at penumbral position, or at best reduced to an index of ownership variables. In addition, factor reallocation to achieve better results (often calculated on profit criterion) is suggested without properly addressing the reasons as to why the farmer could not do that in the first place. Often, such a reallocation might entail expansion of area to be cultivated with a crop and a reduction of another; but whether or not there is a mechanism that allows this is often left out of the picture.

There have been tendencies to limit discussions on some isolated issues without considering the more fundamental ones. Apparently, the government has declared that agricultural development in this country will take on the smallholder peasant route in a context of capitalist development. It remains to be a challenge for us, as professionals, to set the stage for a thorough analysis of capitalist development and the dynamics that it sets in motion for agricultural development and alleviation of rural poverty in the Ethiopian context.
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FOOD SECURITY IN ETHIOPIA REVIEW OF POLICY, STRATEGY AND PROGRAM

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Introduction

An overall review of food security in Ethiopia requires a brief look into the economic policy and development strategy of the country and then assess the food security strategy and program in relation to the economic policy and development strategy.

Before reviewing the Economic Policy and Development Strategy of Ethiopia, it is important to briefly assess the food security situation of Ethiopia.

Ethiopia is the poorest country in the World. Ethiopia’s GNP per capita is only USD 100 while for the rest of Africa; the figure is more than USD 500. If we use per capita GNP for ranking, Ethiopia's rank is 206th out of 206 countries of the world. If one has to define poverty as an income of one Dollar per day, nearly 31.5% or 20 million Ethiopians fall below the poverty line (Annex 1). If the definition of poverty is to be taken as an income of two USD per day, nearly 76.5% or 48 million Ethiopians fall below the poverty line. If we take malnutrition as the measure of food insecurity, the malnutrition of children under age five is 48%, whereas the percentage for the rest of Africa is below 33% (Medrek, 2001).

According to official data sources, per capita food output of the country has been declining for nearly over 30 years and the ability of the country to feed its population, growing at about 3% per year, is deteriorating from bad to worse. The output per capita was 180 kg in 1980, 150 kg in 1990 and 97 kg in 1994 (Medreke, 2001). The decline in output jumped in absolute terms to 30 kg from 1981 to 1990 and to 53 kg from 1990 to 1994. This is a decrease of food output by 45% from 1985 to 1998. Amount of average food aid was 700,000 mt per year. While food aid per capita per year in Ethiopia is 12 kg, it is 9 kg for nine Saharan countries (Hansjorg, 2000).

Leaving the food deficit situation aside, other indicators of development are also alarming. Infant and child mortality rates are the highest in Africa. Life expectancy is the lowest in the world. The countries human development index ranking has
worsened over the years. Only 26% of the population has access to safe drinking water and less than 8% has access to sanitation. The comparable figure for Africa for both indicators is 48% (Hansjorg, unpublished). Furthermore, HIV/AIDS is complicating the matter.

**Ethiopia's Economic Policy as Related to Food Security**

The necessity of Ethiopia's new economic policy was dictated by the change of the Socialist Economic Policy to Free Market Economic Policy. Ethiopia's economic policy document is divided into two major parts. The first part, which is a background to the policy, deals with the main features of the state of the economy and injuries done to it by the Socialist-oriented past government. This part specifically analyzes the state of the economy, the major causes of economic crisis, the need for a new economic policy, and characteristics of the new economic policy. In its second part, the economic policy paper addresses sectoral policies in the areas of agriculture, industry, trade, finance, transport and communication, mining and energy, urban development and construction and social affairs.

Even though these broad areas of change and development have indirect positive contribution to the issue of food security, the part of the economic policy directly linked with food security is the agricultural policy.

It is stated in the policy document that agriculture is the pillar of Ethiopia's economy providing the country with employment, foreign exchange earning, source of raw material for industry and source of food for the population. The Agricultural Policy is well covered and detailed but, for the purpose of this review, the Policy will be assessed under the following four topics: peasant agriculture, resettlement, modern large-scale farming and natural resource conservation and utilization.

**Peasant Agriculture Policy**

The majority of the country's population is engaged in peasant agriculture, which is a major source of agricultural output. The government's agricultural policy gives top priority to this sub-sector and has declared that the sub-sector needs unreserved effort and support for its development. Its production performance for the last 10 years was not impressive due to natural and other problems.
One outstanding issue regarding peasant agriculture is the question of land ownership. In the Agricultural Policy, the government recognizes the political and economic nature of land ownership, but differs it stating that the question will be settled by referendum. That did not materialize until now. On the other hand, some argue that land is a factor of production like capital and it should be exchanged. Land should not be considered as 'sacred cow'. In Ethiopia, land is a scarce factor of production like, capital, labor and entrepreneurship are. The notion of not subjecting land to be exchanged goes against the logic of capitalism and is not supported by the history of agricultural development and after all romanticizing the transitory class, the peasantry is theoretically unattainable (Yizhak, 2000). Allan (2000) supports this argument and the way forward for food security issue is land privatization. Others argue that land ownership should remain under state and public ownership with guaranteed use right. Supporters of this view state that farmers, by transferring their land, will become landless (due to concentration of land including that of poor peasants) and even poorer. They also believe that businessmen and elites, by buying land from farmers, will lead poor peasants to eviction, migration and political unrest (Allan 2000). This argument implies that transfer of land ownership from the state to the individual farmer will aggravate food insecurity.

An event that generated controversy is the land distribution that took place in the Amhara National Regional State in late 1990s. Although the distribution was called for to correct the past ‘discriminatory allocation of land’, it had political motivation rather than economic and social consideration. The land distribution, though controversial, was positive when considered from food security point of view as landless farmers got land.

**Resettlement Policy**

There is a long history of resettlement in Ethiopia, specially the spontaneous form of settlement, from the northern part of the country to the southern part. Planned resettlement is, however, recent and narrow in scope. The driving forces of resettlements (spontaneous or planned) are mainly economic, political, and environmental in nature. The economic policy document criticizes the resettlement program of the Derg regime from the point of view of the way it was implemented. In principle, the present government believes that resettlement is one of the ways to achieve food self-sufficiency. If properly implemented, a resettlement program will have positive contribution to food security.

The policy states that voluntary resettlement which will not create conflicts between settlers and local population would have to be carried out to relieve land shortage due to population pressure and to increase food security. In reality, no resettlement program has been carried out in the last 10 years except the small
one-time resettlement scheme implemented in Dansha. Ethiopia is not a land scarce country. It has arable land of over 57 000 000 ha, of which less than half is cultivated with annual and perennial crops. This condition calls for a carefully planned resettlement program to increase agricultural output and reduce food insecurity. The government’s Second Five Year Development, Peace and Democracy Program states that before a settlement program is launched, national regional states should identify and select areas suitable for settlement and development. Basic physical and social infrastructure need to be fulfilled before a settlement program to make settlement sustainable. Whether this is going to be implemented or not is to be seen in the future. Be it on small-scale or large-scale, resettlement will increase food security in the country and bring about development in the long-run.

Modern Large-scale Farming Policy

In the Agricultural Policy, it is stated that the role of state farms will be reduced and the establishment of modern commercial private farms will be encouraged after making economic, financial and managerial analysis of the profitability of such farms. It has been stated to disposed off the already established state farms in any of the following four ways:

1. distributing state farms to farmers residing around the farms, or
2. giving commercial farms to agricultural laborers employed on the farms if the measure does not lead to conflict with the local community, or
3. giving state farms to private investors on concessionary basis or be returned to the local people after selling the assets on the farmlands or
4. maintaining state farms as state farms, if necessary.

The reason for being operated is strategic. It can be run by domestic or foreign private capital. The closure of state farms did bring about food insecurity as it was providing 5% of agricultural output of the country. The closure of state farms had also aggravated food insecurity as it left many agricultural laborers jobless.

The Agricultural Policy recognizes the decisive role private capital plays in the development of large-scale modern farming. It is stated that the state will create enabling conditions to encourage both domestic and foreign private investment. The Policy states that the following four main points will be addressed. First, the state will provide land in non-inhabited areas on concessionary basis either individually or jointly. Second, the state will make land available to private investors after ascertaining that the provision will not result in eviction or affect interests of the peasants, nomads and shifting cultivators. Third, it will provide incentives in the form of, for example, accesses to bank credit and tax benefit to
encourage the participation of private capital in modern large-scale farming. Fourth, the state will create enabling conditions for the expansion of modern large-scale private farming by expanding physical and social infrastructure (ibid).

In reality, except the third point, the rest three are practically impossible to achieve. Specially the second point is impossible to achieve as there is no land that does not touch the interests of peasants, shifting cultivators and nomads. The fourth point is very difficult to achieve as expanding physical and social infrastructure requires huge capital outlay. Achievements recorded in the last 10 years in establishing modern private large-scale farms in the country were insignificant. The few private large-scale farms established are handicapped by bureaucrat red tapes and hence the opportunity to increase food security in the area of commercial farming is endangered.

Natural Resources Conservation Policy

The basic concept underlying the conservation and utilization of natural resources is the carrying capacity of nature. The question of natural resources conservation and rational utilization is the most urgent issue to be addressed in the context of the state of natural resource of the country. The Policy specifically mentions three areas for which policy has to be formulated in the future: soil conservation, water conservation and forest resources development along with livestock resource development (ibid). These three are very important variables to increase food security in the country. One of the most food insecure segments of the society in Ethiopia is the nomads and there is an urgent need to have policy, strategy, and program for livestock development. Regarding the other natural resources, it is not exaggerating to commend that we should not pass the limits of the carrying capacities of our soil, water, pasture and forest lest we will die.

Lowdermilk, one of the pioneers of resource conservation, has put this concern as follows.

Thou shalt inherit the holy earth as a faithful steward, conserving its resources and productivity from generation to generation thou shalt safe guard thy fields from soil erosion, thy living waters from drying up, thy forests from desolation and protect hills from overgrazing by the herds, that thy descendants may have abundance forever of any shall fail in this stewardship of the land, thy fruitful fields shall become sterile stony ground of wasting gullies, and thy descendants shall decrease and live in poverty or perish from the face of the earth (Yizhak, 2000).
This quotation emphasizes the issue of natural resources conservation. In any case, the land ownership issue discussed earlier also puts limitation on individual farmers to engage in conservation and protection of the natural resources of environment. With proper policy, strategy and program, these areas, if given attention, will greatly promote food security in the medium and long-terms.

**Ethiopia's Development Strategy as Related to Food Security**

The development strategy document begins by describing the backwardness of the country mainly due to political and economic factors. The problems are deep-rooted and structural. The solution lies in the structural transformation in the productivity of peasant agriculture and streamlining and reconstructing the manufacturing sector to make use of the extensive natural resources and human power the country has. The development strategy known as Agricultural Development-Led Industrialization Strategy was devised to provide an all-embracing framework for attaining the given objectives of development. The source of ADLI is the Economic Policy of the country, to which it is organically linked.

It is stated in the development strategy paper that peasant agriculture will be provided with special support assumed to promote food self-sufficiency, raise the living standard of the people, generate foreign exchange, create employment and increase availability of raw materials for industry (MOPED, 1993). Any improvement in these areas will increase food security. The special support envisaged to improve farmers and pastoralists’ livelihoods is outlined as expansion of construction of rural roads, expansion of distribution and use of fertilizers and improved seeds, expansion of extension service to farmers and pastoralists (ibid). Agriculture plays a key role to bring about improvement in the economic development of the country. The priority given to the sector is consistent with and appropriate to the existing condition. The strategy proposed is broad enough to harness science, technology and extension to overcome the vagaries of nature and humans. However, ADLI claims that past strategies of development, specially the export-led strategy, and import-substitution strategy were a failure. The claim is weak as it is not backed by strong reasoning and the failures are caused by the chronic and transitory challenges of recurrent drought, war and erratic weather conditions.

According to the Agricultural Development Strategy formulated, three sequential phases of agricultural development are presented. In the first phase, the use of massive improved seed distribution is advocated to increase agricultural output. In
the second phase, small-scale irrigation development, expansion of agricultural infrastructure, and application of biochemical and technological inputs are called for to increase agricultural output. In the third phase, employment of the expanding rural labor force in non-agricultural activities is considered to improve the living standard of the rural mass (Hollis and Tullis, 1987). So far, no significant improvement has taken place as stipulated in the Agricultural Development Strategy. The Strategy needs to analyze traditional agriculture, which is characterized by subsistence nature deficient nutrition, low yield and output, limited cultivated area, rain-fed agriculture, use of unimproved seeds, low level of production inputs, use of hand implements, traditional agro-forestry, overgrazing, land degradation and desertification. The sector requires the transformation of peasant agriculture from traditional practice to improved traditional practice that take place where agricultural research, extension and technology are strongly linked with appropriate land tenure system, marketing, good terms of trade and agricultural production subsidy.

Ethiopia’s Food Security Strategy

Food Security is an entitlement or access to balanced food basket of 550 to 800 kg wheat equivalent per capita per year, or 2,200 to 2,500 kcal per day or cash equivalent of that (FDRE, 1996). In Ethiopia, consumption per day is about 1,700 kcal. This is much below normal intake. In a country like Ethiopia, the main source of food security is the agricultural sector. Thus, in the Ethiopian context, one can interpret food security to mean food self-sufficiency, for all practical purposes, as 85% of the population lives in rural areas.

In late 1980s, domestic food production used to provide 1620 kcal per day. When one adds food import in the calculation, the intake reached 1770 kcal per person per day, which is 16% below the minimum accepted intake rate. Nearly 52% of the population in Ethiopia is food insecure and below poverty line (Middlebrok, 2000). Both chronic and transitory food insecurity situations are prevalent in the country. Chronic food insecurity is caused by high magnitude of unemployment in urban areas, while transitory food insecurity exists in rural areas. Per capita land holding and food production have markedly declined in the last two decades and worsened the food insecurity.

Number of Ethiopians exposed to starvation and death is reinforced by recurrent drought, war, declining agricultural productivity, and disrupted ecological settings. The strategy document lists the main causes of food insecurity as inadequate and variable rainfall, soil fertility degradation, conflict, transport and infrastructure limitation, land tenure problem, geographic diversity, lack of storage facilities,
poor nutrition and health, heavy workload and lack of attention to pastoralists' problems. Components of the Food Security Strategy are outlined in Annex 2.

The food security strategy has also touched upon key elements of economic growth and employment. It articulates the relations between macro-economic policies and population policies. It emphasizes and gives priority to agricultural and rural development and advocates agricultural production focusing on irrigation development and marketing infrastructure. It encourages rural enterprise through increased agricultural output, export, and diversification. Livestock development in pastoralist areas will be given special consideration to improve food security through developing an early warning system, improving livestock feed, encouraging cereal production, providing better veterinary services, developing water supply, establishing processing plants and promoting better livestock management (FDRE, 1996).

The Food Security Strategy does not address the role of land ownership and adjustment to improve food security. It does not also mention anything on the role of commercial farms to the food security of the country. It does not present the role natural resource conservation and rational utilization play to reduce food insecurity though this aspect is dealt within the Food Security Program.

**Ethiopia’s Food Security Program**

Given the severity of food insecurity in Ethiopia, a consensus was reached to formulate a food security program. The Food Security Strategy aims at increasing agricultural production and improving access/entitlement to food while managing such crisis when it occurs in large magnitude.

The objective of the Food Security Program is to ensure access to food for vulnerable populations in the country. Criteria used in selecting 22 districts in Tigray National Regional State, 47 districts in Amhara National Regional State, 59 districts in Oromiya Regional National State and 33 districts in Southern Nations Nationalities and Peoples Regional State were environmental degradation, erratic rainfall, recurrent drought, deficit food production, poor infrastructure and poor access to safe water (MEDaC, 1998).

The major components of the Program are increased agricultural production (including livestock, fisheries and apiculture); small-scale irrigation; natural resource conservation, management and use; infrastructure development (rural road and marketing); credit service; health and education; water supply and capacity building (training, strengthening early warning, federal and regional food security efforts and data base).
The Food Security Program is well prepared in terms of financial requirement, administration, program management and organizational structure. Implementing and supervising body of the Program is named as Central Food Security Steering Committee (CFSSC) at the federal level whose function is decision-making, monitoring, evaluation and reviewing of the implementation processes at all levels. The CFSSC is composed of the Prime Minister’s Office (chair person), Ministry of Economic Development and Cooperation (member and secretary), Ministry of Finance, Ministry of Agriculture, Ministry of Water Resources, Disaster Prevention and Preparedness Commission and representatives from donors (ibid). The day-to-day routine operation of CFSSC will be carried out by the National Food Security Unit located at MEDaC.

Regional Food Security Steering Committee is composed of the Regional Government Social and Economic Affairs (Chair person), Planning and Economic Development Bureau (member and secretary), Finance Bureau, Agriculture Bureau, Water Resource Bureau, Disaster Prevention and Preparedness Bureau and representative from donor community.

In areas where the food security activities are going on, ecological stabilization is expected to take place. Furthermore, it is stated in the program document that the improvement in food security, health, education, extension, safe drinking water, crop production, soil and water conservation, capacity building, irrigation, credit and others in general will have positive economic and social impacts (ibid).

Economically, socially and physically backward national regional states of Gambella, Beneshangul Gumz, Afar and Somali; and urban areas that are characterized by chronic food insecurity (Annex 3), cities such as Addis Ababa, Dire Dawa and Gambella are not covered in the Program. This is weakness of the Food Security Program.

The major physical activities to be carried out by the Program in the selected districts are provided in the Document (Annex 4).

**Conclusions**

As it was stated in the overall review of this paper, be it in per capita GNP or per capita food production or in social indicator variables, Ethiopia's food security status is declining at an alarming rate against the high rate of population growth. This condition calls for an overall survival strategy. The logical line between policy and strategy and between strategy and program is quite impressive, but the implementation records show missed opportunity. In its content, the review presented the federal, sectoral, regional and macro-economic profile of the
economy as related to food security. The Agricultural Policy was reviewed from the viewpoints of peasant agriculture, large-scale farming, resettlement, and natural resource conservation. Issues regarding land ownership, land tenure, land distribution and agrarian reform are only tangentially touched in the document.

In the ADLI Strategy, the Agricultural Policy that will accelerate self-sufficiency in food production is given top priority.

The agricultural sector of the Economic Policy seems to recommend Mellor's technological approach to agricultural development to increase agricultural output and shies away from the question of treating land as a marketable factor of production.

The Food Security Strategy, which is based on the Economic Policy and Development Strategy, calls for voluntary resettlement program and the development of basic physical and social infrastructure. To meet food security in drought-prone and environmentally degraded areas, a coordinated agricultural development program focusing on soil and water conservation, afforestation, and livestock resource development is envisaged. The improvement of food security, agrarian reform, land tenure, including the selling and mortgaging of land, is not considered in the Economic Policy and Development Strategy.

The Economic Policy, Development Strategy, Food Security Strategy and Food Security Program seem well linked. The major failure is, however, implementation of the strategies and programs.

References


Hollis, W. L. and La Mont Tullis, F. (eds) 1989. Perusing Food Security Strategies and Obstacles in Africa, Asia, Latin America and the Middle East. U.S.A.

### Annexes

**Annex 1. Absolute poverty levels in different areas of Ethiopia**

<table>
<thead>
<tr>
<th>Reporting area</th>
<th>% of poor people</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tigray</td>
<td>57.9</td>
</tr>
<tr>
<td>Affar</td>
<td>51.8</td>
</tr>
<tr>
<td>North &amp; South Gonder</td>
<td>50.8</td>
</tr>
<tr>
<td>East, West Gojam &amp; Agew Awi</td>
<td>64.5</td>
</tr>
<tr>
<td>N. Wello &amp; Wag Hamra</td>
<td>60.0</td>
</tr>
<tr>
<td>S. Wello, Oromiya &amp; N. Shewa</td>
<td>52.7</td>
</tr>
<tr>
<td>East &amp; West Wellega</td>
<td>38.9</td>
</tr>
<tr>
<td>IL Lubabor &amp; Jimma</td>
<td>42.1</td>
</tr>
<tr>
<td>North &amp; West Shewa</td>
<td>36.1</td>
</tr>
<tr>
<td>E. Shewa, Arsi, Bale &amp; Barena</td>
<td>35.5</td>
</tr>
<tr>
<td>East &amp; West Hararghe</td>
<td>22.1</td>
</tr>
<tr>
<td>Somali</td>
<td>34.6</td>
</tr>
<tr>
<td>Benshangul-Gimuz</td>
<td>47.6</td>
</tr>
<tr>
<td>Yem, Keficho, Maji, Shekicho &amp; Bench</td>
<td>49.6</td>
</tr>
<tr>
<td>N. &amp; S. Omo, Derashe &amp; Konso</td>
<td>77.4</td>
</tr>
<tr>
<td>Hadiya, Kembata &amp; Gurage</td>
<td>52.2</td>
</tr>
<tr>
<td>Sidama, Gedeo, Burji &amp; Amaro</td>
<td>41.8</td>
</tr>
<tr>
<td>Gambella</td>
<td>41.8</td>
</tr>
<tr>
<td>Harari</td>
<td>13.3</td>
</tr>
<tr>
<td>Addis Ababa rural</td>
<td>40.4</td>
</tr>
<tr>
<td>Dire Dawa rural</td>
<td>36.6</td>
</tr>
<tr>
<td>Mekele</td>
<td>46.5</td>
</tr>
<tr>
<td>Bahir Dar</td>
<td>38.2</td>
</tr>
<tr>
<td>Gonder</td>
<td>33.9</td>
</tr>
<tr>
<td>Dessie</td>
<td>71.9</td>
</tr>
<tr>
<td>Jimma</td>
<td>29.3</td>
</tr>
<tr>
<td>Nazareth</td>
<td>29.3</td>
</tr>
<tr>
<td>Debre Zeit</td>
<td>44.2</td>
</tr>
<tr>
<td>Harrar</td>
<td>29.1</td>
</tr>
<tr>
<td>Addis ababa urban</td>
<td>30.0</td>
</tr>
<tr>
<td>Dire Dawa urban</td>
<td>24.6</td>
</tr>
<tr>
<td>Other urban</td>
<td>33.6</td>
</tr>
<tr>
<td>National</td>
<td>45.5</td>
</tr>
</tbody>
</table>

*Source: Getahun, 2000*
Annex 2. Components of the Food Security Strategy of Ethiopia

I. Economic growth and employment
   a) maintain sound macro-economic policies and population policies
   b) give priority to rural development, and focus on agriculture
   c) hold, or lower real food prices through:
      • increased production (short term: sustainable extension, inputs; medium term: research, credit, land policies)
      • lower-cost marking (roads, transport, competition policies)
   d) encourage rapid growth of small business enterprises that create jobs
   e) promote agricultural diversification and exports in support of food trade
   f) develop measures for regions with less reliable rainfall, and pastoral areas.

II. Additional entitlement/access and targeted programs

1. Supplementary employment/income schemes
   a) link with priorities for rural areas, agricultural production marketing, natural resource management, and nutrition/health focuses (i.e. roads, irrigation, soil conservation, water supply and sanitation)
   b) link with low real food prices which support labor-intensive public works and job creation generally
   c) decentralize administration
   d) build on critical assessment of experience already available in Ethiopia
   e) develop sustainable financing plans (including donor assistance)

2. Targeted programs (for very poor and vulnerable groups)
   a) build on the successful Safety Net program
   b) establish strong monitoring arrangements
   c) focus especially on women
   d) plan graduation from targeted programs

3. Nutrition and health interventions
   a) children's immunization and diarrhea prevention
   b) nutrition education and family planning
   c) better weaning foods, micro-nutrients, school feeding programs

III. Emergency capabilities (to be maintained and strengthened)
   a) monitoring, surveillance, and early warning arrangements
   b) food and relief distribution capabilities

Source: MEDaC, 1996
### Annex 3. Classification of food insecure households in Ethiopia

<table>
<thead>
<tr>
<th>Type of insecurity</th>
<th>Rural</th>
<th>Urban</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic</td>
<td>Resource poor households, Landless peasants, Oxenless peasants, Poor pastoralists, Female-headed households, Elderly people, Disabled people, Poor non-agricultural households, Newly established settlers</td>
<td>Low income households employed in the informal sector, Groups outside the labor market, Elderly people, Disabled-headed households, Female-headed households</td>
<td>Refugees, Disabled people, Ex-soldiers</td>
</tr>
<tr>
<td>Transitory</td>
<td>Less resource poor households, Farmers and others in drought-prone areas, Pastoralists with few animals, Others in low production areas</td>
<td>Urban poor vulnerable to economic shocks especially those causing food price rise</td>
<td>Groups affected by temporary social/political</td>
</tr>
</tbody>
</table>

*Source: MEDaC, 1996*
Food Security in Ethiopia: Review of Policy, Strategy and Program

Annex 4. Major activities to be carried out by the Program in the selected districts

<table>
<thead>
<tr>
<th><strong>Agriculture</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Crop production</strong></td>
</tr>
<tr>
<td>Establishing farmers based seed multiplication</td>
</tr>
<tr>
<td>Supply of oxen</td>
</tr>
<tr>
<td>Provision of agronomic inputs (seed, fertilizer, insecticides, and Knapsack sprayers, for example) for demonstration</td>
</tr>
<tr>
<td>Input distribution (planting materials like sweet potato cuttings, cassava cuttings, Irish potato tubers and vegetable seeds)</td>
</tr>
<tr>
<td>Rehabilitation of laboratories</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Livestock</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Trypanosomiasis control</td>
</tr>
<tr>
<td>Parasite control</td>
</tr>
<tr>
<td>Vector control</td>
</tr>
<tr>
<td>Seed multiplication (Animal Feed)</td>
</tr>
<tr>
<td>Fodder production:</td>
</tr>
<tr>
<td>- on soil bund, contour, terrace and alley</td>
</tr>
<tr>
<td>- over sowing on grazing and exclusion land</td>
</tr>
<tr>
<td>Fodder multiplication nurseries</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Environmental rehabilitation</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Soil and water conservation</td>
</tr>
<tr>
<td>Bund construction</td>
</tr>
<tr>
<td>Terrace construction</td>
</tr>
<tr>
<td>Water ways construction</td>
</tr>
<tr>
<td>Cut off drains construction</td>
</tr>
<tr>
<td>Checkdam construction</td>
</tr>
<tr>
<td>Pond construction</td>
</tr>
<tr>
<td>Access road construction</td>
</tr>
<tr>
<td>Nursery establishment</td>
</tr>
<tr>
<td>Seedling production</td>
</tr>
<tr>
<td>Area to be planted</td>
</tr>
<tr>
<td>Watershed development</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Forestry</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Farm forestry</td>
</tr>
<tr>
<td>Community nursery</td>
</tr>
<tr>
<td>Seedling production</td>
</tr>
<tr>
<td>Planting</td>
</tr>
<tr>
<td>- woodlot</td>
</tr>
<tr>
<td>- homestead</td>
</tr>
<tr>
<td>- on farm land</td>
</tr>
<tr>
<td>- hillside</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Water supply</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Bore hole construction (deep)</td>
</tr>
<tr>
<td>Shallow well construction</td>
</tr>
<tr>
<td>Hand dug wells construction</td>
</tr>
<tr>
<td>Spring development</td>
</tr>
<tr>
<td>Reservoirs</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Rural road construction</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrated health service program (percentage coverage)</td>
</tr>
<tr>
<td>Family Planning</td>
</tr>
<tr>
<td>Environmental Health Service</td>
</tr>
<tr>
<td>Micro nutrient supplementation</td>
</tr>
<tr>
<td>Nutrition awareness (promotion programs)</td>
</tr>
</tbody>
</table>
**Irrigation (Small scale)**
Modern small scale irrigation
Traditional small scale irrigation

**Capacity building**
Building farmers' capacity in:
- irrigation
- pest management
- credit management (women)
- family planning (women)
- environment
- agriculture (general)

Building development agents' in:
- crop and livestock management

**Small scale credit scheme**
Provision of credit for:
- sheep and goat husbandry
- vegetable production
- petty trade

Establishment of farmers saving & credit groups

**Gender development**
Access to credit for woman
Supply of improved stoves
Grain mill installation

**Source:** MEDaC, 1996
CONTRIBUTION OF NATURAL RESOURCES AND ENVIRONMENTAL POLICIES TO ETHIOPIA'S AGRICULTURAL DEVELOPMENT

Kebede Tesfaye
Ministry of Economic Development and Cooperation

Introduction

Arguments based on the roles of human effort and ingenuity in creating usable resources tend to ignore the extent to which human economic activities rely on natural systems, which, in turn, can be damaged by human misuse. What is commonly recorded in economic statistics is that growth entails damage to biological capital such as fertile soils, forests and natural ecosystems. As a result, long-term benefits to society are undercut.

Environment consists of intricate ecological systems. Trees and grass, for example, not only provide fuel and fodder, but also build soil fertility and prevent erosion, and ameliorate climate change. They also provide water catchments and wildlife habitats. These systems are underpinning to human welfare and survival.

It is argued, however, that efforts to achieve economic growth and full employment in the long-run, and price stabilization and a viable balance of payments in the short-run may degrade the environment and natural resources management in the form of sustainable depletion of natural resources and increased waste emissions and energy use (Miranda and Muzondo, 1991). These phenomena have negative implications for agricultural development.

The objective of this paper was to reflect the need to meaningfully manage natural resources and the environment using synchronized policy and other supportive measures with the view to achieving a sustainable agricultural development path.
Conservation of Natural Resources and Sustainable Development: A Conceptual Framework

Views about the importance of sustaining resource use in developing countries and the value of conservation to these countries differ significantly. One view is that natural resources conservation is of very little value to these countries and they would best off by sacrificing their natural resources to attain economic growth, or extend period of their economic survival. The opposite view is that given the nature of the economies of many developing countries, the slim prospects of most of these countries for sustainable economic growth and the heavy dependence of their population on natural resources for their livelihood, conservation of natural resources should be a high priority for them if they act in their self-interest (Tisdel, 1993).

It is also argued that inhabitants of developing countries are much more dependent for their livelihood on living resources than inhabitants of developed countries. Most of the population in these countries is typically employed in agriculture, fishing, forestry and industries directly dependent on a living resource base (Todaro, 1981). Disturbances to the ecosystems on which these activities depend can have widespread economic consequences. This is one reason why any development having ecological effects in these countries needs careful assessment.

Facts of non-substitutability and irreversibility of many resources like carbon and some forms of life once they are lost demand that people become more cautious about depletion of the existing natural resources.

Natural Resources and Environmental Threats and Issues

Agriculture is the mainstay of the Ethiopian economy. It is known that the sector forms the basis of the foundation of Ethiopian economy and continues to do so in the future. The question is whether and how ecological costs may be reduced and the social and economic benefits sustained over time.

Ecological and environmental problems that were not fully perceived have emerged in the country with the rapid growth of agricultural activities to increase production so as to be able to feed the growing population, supply agro-industries with needed raw materials, and improve foreign exchange earning capacity of the country through increased production of exportables.
Areas in Ethiopia with sufficient rainfall and temperature have been under agriculture for thousands of years. Many crops scarcely known elsewhere in the world are extensively cultivated in Ethiopia. Crops are often grown on precipitous slopes with inadequate soil conservation measures. These methods of cultivation have already ruined fertile and productive areas in the North and East and all other areas of the country are now rapidly going the same way (EPA, 1997).

Major developments in the agricultural sector include crop production, irrigation development schemes and animal husbandry such as poultry and cattle rearing often involving the use of uncultivated land for intensive production. It is necessary to anticipate some of the potential natural resources and environmental consequences of agricultural activities in order to incorporate some safeguards and/or mitigative measures.

Considering the predominant smallholder agriculture, it is true that some improvements have occurred in farming efficiency due to improved supply of production requisites, and improved crop protection, marketing arrangements and infrastructure services. However, the prevailing farming practices have led to over-exploitation and degradation of natural resources on which agriculture itself ultimately depends.

Soil erosion is a major ecological catastrophe caused by slash and burn agriculture, deforestation and farming on steep slopes. It is severe especially in the highlands. When the soil loses its fertility, farmers will not have enough harvest. They lack sufficient income to meet their needs and poverty will reign over their life.

One of the major causes of the prevailing land degradation is deforestation. The spread of agriculture outside the traditional farming zones, overgrazing, the emergence of new settlements, and the increasing demand for fuel and construction wood material have been the major human-made causes of deforestation that contribute to the dwindling of the country's natural forest cover and resources (MEDaC, 2000). The Ethiopian Forestry Action Program of 1994 estimated the full value of forest depletion in 1990 at about Birr 138 million. Equally distressing is the issue regarding the destruction of the flora and fauna whose uses for medicine, genetic engineering and other productive activities cannot be disregarded.

In the lowlands of the country where livestock resources are predominant, the spread of cultivation has squeezed herders into ever more restricted areas—thereby causing overgrazing. The most serious impact of overgrazing is followed by reduced feed supply leading to under-nutrition and malnutrition of animals. Overgrazing has also caused increased surface runoff, erosion in steep terrain, reduction of ground water and reduction of water flow in streams and rivers.

Although irrigated agriculture represents only 4.6% of total cultivated area (Gizaw and Zekaria, 1989), there is evidence that inadequate use of technology in some
irrigated farms has caused serious environmental problems such as leaching of chemical products and salinization of arable soil. In particular, the accumulation of salts in the soil can lead to irreversible damage to the productive soil structure.

Where environmental abuse leads to loss of arable land, the effects are felt in declining incomes and in diminishing qualities of rural life; thus calling for a need to strike a more sustainable balance between agricultural activities, natural resources and the environment.

**Natural Resources and Environmental policies of the Country and Their Implications**

In order to properly manage natural resources, the government has issued various policies and strategies outlined as follows.

**Environmental Policy**
The objective of the Policy is to improve the living standards of the population by properly managing the environment in relation to the need to safeguard the interests of future generations.

**Soil and Water Conservation and Development Policy and Strategy**
The Policy aims at rejuvenating degraded land, ensuring efficient utilization of water resources and properly managing fertile areas to increase productivity and effect agricultural growth.

**Forestry Policy and Strategy**
It is commonly observed that the country's forest cover is diminishing at an alarming rate, creating unfavorable environmental conditions. The Policy, therefore, aims at reversing this trend in order to conserve fertile soils and maintain ecological balance.

**Rural Land Use and Administration Policy and Strategy**
The main thrust of this Policy is to delineate land resources by relevant aspects of utilization and lay a foundation for proper use of fertile land.

**Wildlife Protection and Development Policy**
The Policy is under review by the government. It must be noted, however, that it is an important policy dimension in view of its contribution towards maintaining biodiversity and developing the tourism industry.
Bio-diversity Conservation Policy and Strategy
It aims at meaningfully conserving and properly utilizing the genetic resources of the country.

These policies have the following implication for agricultural development. Although agriculture has remained to be the most important determinant of the country's economic fate, its performance had been dismal in the 1980s and early 1990s.

During 1980–1990, growth of the value added of agriculture and allied activities averaged 1% per year (MEDaC, 1999). Agriculture, constituting crop and livestock sub-sectors (proper agriculture) grew by 0.8% on average; and forestry and fishing exhibited 2.6 and 4.6% annual average growth rates, respectively. In contrast to the population growth rate of 2.9% per annum, per capita agricultural value added had been declining at a little less than 2% per year over the period.

Agricultural value added reached an average annual growth rate of 4.6% per year for five post-reform years (1992–1996) (MEDaC, 1999). Accordingly, per capita value added in agriculture had been increasing at a rate of about 1.3% per year over the period. The highest growth rate recorded was 14% in 1995; this contrasted with the 3.7% decline in 1993. The fluctuation in the average growth rate of the economy can be attributed to fluctuation in the performance of the agricultural sector that accounts for almost half of the GDP. The lowest growth rate of GDP recorded in 1993 (1.7%) was largely the outcome of the poor performance of the agricultural sector.

Policy and other measures suggested towards sustainable development of agriculture
The most serious agricultural problems in Ethiopia include climatic change, soil degradation, biodiversity destruction and natural resources (such as forests). The root causes of these phenomena are population pressure, current patterns of production and consumption, technological incompatibility with current levels of economic activities and adoption of environmentally harmful short-term strategies that rely heavily on intensive use of natural resources. Particularly, population pressure has placed high demands on the available resources in order to meet basic requirements such as food, water, shelter and energy. The need to meet these necessities and the desire to improve the macro-economic environment, among other things, through increased export of agricultural commodities, have brought about natural resources utilization patterns and environmental degradation that have contributed to the current low agricultural development.

Thus, the following natural resources-and environment-related issues should be considered in the endeavor to achieve sustainable agricultural development.
Government action is essential for progress towards sustainable agricultural development. Therefore, governments should consider natural resources and environmental concerns to be an integral part of the basic principle of economic policy formulation. With this in mind, the agricultural impact of current and planned natural resources and environmental policies should be reviewed in relation to present and expected development patterns.

- National environmental policies can become successful when they relate to and support national socio-economic goals. Conversely, environmental policies designed in isolation of national goals are difficult to implement and frequently fail. Various implementation mechanisms such as ethical persuasion, direct (legal) regulations, and economic incentives can be instrumental in making environmental policies effective in supporting agricultural development (UNEP, 1988). Natural resources policies should be targeted at ensuring their efficient use for the benefit of human development and their important ecological role in sustaining ecosystems. It must be noted that the development of agriculture will tend to be sluggish when natural resources are misused by requiring more inputs to produce outputs, by over-utilizing or under-utilizing resources or by not conserving those resources that form the basis for the ecological functioning of local ecosystems.

- The role of biodiversity in maintaining ecological balance is crucial. A guiding principle in protecting biodiversity in a sustainable manner is to recognize, learn from and further support the role of rural populations in protecting, conserving and using biodiversity. In addition, there is a growing recognition of the ecological benefits of conserving threatened animal and plant species that play a great role in ecological balance.

- It is desirable to adopt an integrated agroforestry approach in which trees are grown for energy and crops are grown for food. This would improve soil conservation and allow rural communities to feed themselves at the same time producing energy supplies and raising living standards.

- Institutions directly or indirectly responsible for natural resources and environmental issues have inadequate resources and skills, little coordination amongst them, and no enforcement capacity. It must be noted that even if excellent laws exist and regulations and economic incentives are in place, it is only with the presence and assistance of appropriate institutions that any agricultural development initiative can succeed.

- When projects having to do with natural resources and the environment are evaluated, their main agricultural impacts should be considered. Social cost-benefit analysis should not ignore such impacts and ecological spillovers. In foreign aid projects too, it is important that these dimensions are considered.
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in order to design mitigative measures for their likely negative impacts on agriculture.

- A strategy for natural resources conservation and environmental protection that respects the agricultural sector will also require other supporting instruments such as improved statistical data, improved sectoral and spatial planning, and public information and education.

There are strong links between the concepts of basic needs and the environment and natural resources. Environmental and natural resources degradation, which has negative implications for agricultural development, is often caused by lack of adequate development. Many people in poor societies destroy their natural stock such as forest resources due to poverty and lack of alternatives for supplying food, shelter and energy.

Conclusions

Natural resources and environmental conservation goals must be compatible with agricultural development strategies though how to do this is a challenge. There are no recipes to incorporate this dimension into the development process. However, it is possible to make choices and decisions that will eventually promote agricultural development by understanding how the environment functions; by identifying what needs to be done to protect, conserve, enhance and preserve it on a long-term basis; and by linking agricultural development objectives with natural resources and environmental management activities.

Attaining agricultural development calls for an effective approach embodying considerable political commitment and focus on main agents and activities which damage the environment and deplete natural resources. It also requires a harmonious and balanced development of economic activities through the integration of natural resources conservation and environmental protection requirements into the definition and implementation of agricultural policies.

The effectiveness of these suggested measures would, however, depend on the practical arrangements for their implementation, which, in turn, demand better preparation of measures, more effective coordination with and integration into other policies and on the availability of a systematic follow-up.
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Problems and Prospects of Rural Land Policy in Ethiopia

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Introduction

Since 960s, rural land tenure problems have been noted as one of the causes of Ethiopia's development problems in general and agricultural stagnation and environmental degradation in particular. Inadequate access, tenure insecurity and all its consequences, diminution and fragmentation of holdings, inefficient allocation, and maladministration are among the frequently mentioned problems of Ethiopian rural land tenure systems since the Imperial time. The current Ethiopian government policy of state ownership of land, despite its official market economy policy and the persistence of other perceived sources of land tenure problems, has given the issue of land more importance both locally and among external agencies like international financial organizations and donors.

As a result, rural land tenure issues in Ethiopia remained as sources of differences among politicians, academicians, and other concerned parties. Presently, regardless of the 1995 constitutional provision of state ownership of land, land ownership and administrative issues are still hotly debated among political parties and other concerned bodies. The government tries to justify its position by referring to the need for protecting poor peasants from land eviction by way of market forces and all other consequences. Whereas, proponents of private land ownership argue for unrestricted rights of peasants on land and explain their apprehension that state ownership and administration of rural land in Ethiopia has contributed to the stagnation of agriculture and degradation of natural resources.

However, it seems that discussions on land tenure problems in Ethiopia and possible solutions to these problems are deficient. Hence, the objective of this paper was to contribute ideas to the land debate that may help for better understanding of the problems and for searching possible solutions.

Land Tenure Problems

Although important changes in social and political aspects of the land tenure system were introduced during the 1975 Land Reform (PNGE, 1975), literature on land tenure systems in Ethiopia show high degree of continuity than change
(Hoben 2001; Yigremew, 1999). Although the 1975 Reform was welcomed by many people and had accomplished its major objectives of abolition of landlord-tenant relations and distribution of land to peasants, what consecutively happened was criticized from different angles for letting inadequate access to land, tenure insecurity, diminution and fragmentation of holdings, inefficient allocation, and maladministration. Literature shows that these problems are not solved yet. The concern of this paper was, however, to highlight rural land policies of the present government.

After the fall of the military government in 1991, the rural land policy and administration continued in the same direction state ownership of land regardless of its announcement of free market economic policy. Article 40 Sub Article 3 of the 1995 Constitution provides that “The right to ownership of rural land and urban land, as well as of all natural resources is exclusively vested in the state and in the peoples 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 (FDRE, 1995)”. It is also stated that Ethiopian peasants have right to obtain land without payment and the protection against eviction from their possession (Article 40 Sub Article 4). Another important provision about property rights is Sub Article 7 which says that “Every Ethiopian shall have the full right to the immovable property he builds and to the permanent improvements he brings about on the land by his labor or capital. This right shall include the right to alienate, to bequeath, and, where the right of use expires, to remove his property, transfer his title, or claim compensation for it.” There is land redistribution in the current land laws as well. The 1997 Rural Land Administration Law (Proclamation No. 89/1997) by FDRE has provisions on distribution of holdings. Article 6 Sub Article 1 provides that distribution of holdings is the only way through which peasants lose their holdings.

There are some differences between the rural land laws of the Derg regime and that of the present government. The 1975 Land Policy prohibited lease and using hired labor to farm the land (though never respected). The maximum farmland to be possessed by a farmer was 10 ha. Present land laws allow leasing the land, but do not stipulate the maximum size of holdings by households. Another important difference in land administration of the new government and that of the Derg is that in the present land law, the federal arrangement vests regional administrations with the task and authority of land administration. Article 51 of the 1995 Constitution states that the Federal Government shall enact laws for the utilization and conservation of land and other natural resources and Article 52 states that regional governments have the duty to administer land and other natural resources according to federal laws. Such law was enacted in the July 1997 Rural Land Administration Proclamation No. 89/1997 and it vested regional governments with the power of land administration defined as “The assignment of holding rights and the execution of distribution of holdings” (Article 2 Sub Article 6). However, there
are more similarities not only in officially stated policies but also in practical land administrations of the two regimes.

If the 1996 Land Redistribution carried out in some parts of the country is taken as an example, land tenure issues have been more politicized: land redistributions were done in a more political and high-handed manner, peasant evictions and property confiscation were practiced under different pretexts. For example, regardless of constitutional provisions on land rentals, land transfer mechanisms are still constrained both by policy and in practice. The 1997 Rural Land Law of Tigray Region stipulates that rental arrangements regarding land cultivated with traditional technology should be limited to two years period. Similarly field studies show that in Oromiya (Fafchamps, 2000) and Amhara (Yigremew, 2001) peasants are officially allowed to rent out their plots for three and one year, respectively. Presently, land administration has also become more arbitrary than before as there are no detailed land use and administration laws and as land now is administered directly by the political authorities than by any technical authority and legal administrative units.

With such high degree of similarity among the land policies of the two governments, there are apprehensions that those tenure-related problems affecting the agriculture and resource management of Ethiopia have perpetuated. Following is a brief discussion of those real or perceived tenure-related problems.

Inadequate access to land

Although largely mitigated by the 1975 Reform, and regardless of continued land redistributions, access problems could not be settled in the long-run. Since then, there had been many ‘landless’ peasants (peasants who had not been granted access to land by the government). In some communities, such landless people, the majority of whom are young peasants, were reported to reach up to 50% of the total households in the areas (Bruce et al, 1994). Increasing of population pressure in already densely populated areas is commonly mentioned as a cause of the problem. Nevertheless, it is also felt that, in areas where there were no frequent land redistributions, there is a skewed landholding pattern that might have resulted in landlessness. Similarly, statistics about distribution of holdings at national level and studies like Bedassa (1988) suggest that regardless of the national average of about 1 ha of cultivated land per household, there are few holdings that measure 10 ha and even more. Rural women in general and female-headed households in particular are identified as one of the disadvantaged groups in terms of access to land. Some ethnic and religious minorities are still mentioned as having problems in access to land (Bruce et al, 1994).

For instance, a local-level study in Shewa, central Ethiopia (Yohannes, 1994) showed that in six communities with inventory of 2334 households, 13.8% were
landless; except in one of the communities that has landless 17.4%. Moreover, among landowner households, 37.6% were involved in land transactions—looking for additional arable land; while 70.7% of those landless households had not been involved in any land transaction—showing that the level of indirect access to arable land by the landless is extremely limited. Gavian and Amare (1996) reported that out of 1671 agricultural households in Arsi in 1994, 17% were found landless. Literature also shows that since 1975, mechanisms of access to land (except through government allocation) have been largely constrained by those restrictive policies on land markets and other mechanisms of land transfer (Abebe, 2000; Fafchamps, 2000; Gavian and Amare, 1996). Though these markets include land transfer through sales and other ‘illegal’ mechanisms, limited studies were done on the nature and degree of such informal land markets. Conditions of tenancy, mentioned as serious problems in the pre-1975 period, were not properly studied after the reform. However, problems of insecure and informal arrangements and high rents have continued up to today.

Tenure insecurity

Tenure insecurity is mentioned as a persistent problem in rural land tenure systems since the Imperial period. The most important cause mentioned is frequent land redistributions carried out to balance holdings among households within peasant associations. There are also some problems mentioned in relation to arbitrary and high-handed land administration practices by local officials—resulting in tenure insecurity. Eviction of peasants by governments had continued during the Derg regime in the name of establishment of production cooperatives, villagization, environmental conservation, and other projects. While state farms were one source of peasant eviction by then, there are hints that commercial farms are becoming sources of such problems after 1991. Though there were insufficient studies in this regard, impacts of tenure insecurity have been cited as discouraging peasants to invest in land improvement and land management.

Diminution and fragmentation of holdings

After the 1975 Land Reform and presently as well, frequent redistributions have been as the major cause of diminution and fragmentation of holdings. The egalitarian principle of granting all rural dwellers ‘equal’ access to land is said to result in ever diminution of holdings. Both equity considerations of allocating land of different quality to peasants, and peasants’ rational actions of having lands of different soils and different agro-ecologies are mentioned as causing fragmentation.

National level observation of holding patterns for decades does not show substantial differences in average size of holdings. This may be, due to increasing of land area under cultivation. Agricultural sample survey data for the period
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1979/80 showed that land area under major crops has increased on average by 2.66% per year (Samia and Wubshet, 1996). The general trend noted from the statistics was that larger holdings were disappearing while smaller holdings were becoming more prevalent. Impacts of this phenomenon are among other factors noted as challenging production of enough food for family and surplus, causing resource degradation, and leading to vulnerability.

Smaller holdings constrain adoption of improved technologies such as fertilizer and improved farm implements (Mulat et al., 1995; Frew and Shilema, 1998; Bedassa, 1998). Moreover, there are some arguments that land deficit (landless) peasants resort to poor lands for farming, a process that has aggravated degradation. The system with such very small holdings is also characterized as fragile and leading to more vulnerability and poverty (Dessalegn, 1997).

Fragmentation is also a serious problem constraining agriculture since decades. The problems of fragmentation included that it has incurred high costs in terms of traveling time, hindered taking advantage of some technologies, and made closer care of farms difficult. Some specific case studies after the Land Reform showed an increasing trend of fragmentation although the figures were not significantly high (on average 3–4 parcels per holding). However, the problem was stated as more serious (Fasil, 1980; Mengistu, 1994).

**Lack of allocative efficiency**

After 1975, restrictions on transfer, egalitarian land allocation practices and, to some extent, misallocation of land to collective and state farms were as sources of misutilization/underutilization of land. In the process of egalitarian land redistribution in which household size was the basis for land allocation, very poor individuals without the necessary resources to work on the land were given land. This, coupled with restrictions on land transfer, has made some plots underutilized or totally unused. Yigremew (2001) found that in two rural communities of West Gojjam, northwestern Ethiopia, among a sample of households who got land during the 1997 Land Redistribution, female-headed households received about 0.47 ha arable land on average while male-headed households got 0.41 ha. About 91.3% of female-headed households had no ox. As male labor and plow ox are among factors indispensable for production in the area, 87% of the female-headed households had to rent out their land. On average, 18% of female heads of households reported that their plots were either not cultivated at all or did not produce any yield; 47.8% complained that their plots were cultivated without fertilizer; 41.3% reported that renters mismanaged their plots. This situation, coupled with some restrictions on land market, has led to a common complaint by the local people that “land has been divorced from the good farmer”
Some also argue that state farms and agricultural production cooperatives were not efficient enough in using land and other resources. Given the level of investment on such production systems, their productivity was, in some cases, lower than the productivity of private peasant farms. Currently, transfer and large-scale farming are restricted and there are some indications of underutilization of land. There are, for instance, complaints that those commercial farms are not productive as expected and even some are not operational.

Problems in land administration

Though not explicitly stated in many studies, land administration problems have existed in all land tenure systems. Watterland (1970) pointed out that the general objective of land administration is the establishment of a system of adequate land utilization which includes provision of security on land possessions, land protection, development-oriented land use planning with knowledge of land resources, land classification system, and appropriate system of land distribution.

However, there were no established systems and practices for regulating allocation and utilization of land resources. Throughout decades, with few exceptions like the short-lived Ministry of Land Reform and Administration around the last days of the Imperial Regime, there were no government institutions mainly concerned with land administration. Land cases were handled by many organizations without proper delimitation of powers and duties. For instance, during the military government, the Ministry of Agriculture, Ministry of Interior, political cadres, mass organizations, and local administrative units were involved in land administration issues. Still at present, there is no specific government agency dealing with land administration issues. Technical issues of land administration are assigned to the administration and political structures. Land distributions are carried out by political cadres. Assignment and protection of land rights is also left to political personnel in the government hierarchy. As a result, land administration has been done arbitrarily and negatively affecting both the rights of citizens and the use of resources. This problem seems even more serious at present under regionalized and politicized framework where line ministries like Ministry of Agriculture are more marginalized in relation to land administration.

However, some of the generalizations in literature raise some doubts. For instance, landlessness could more likely result from population increase than from the land tenure system. A system of frequent land distribution should also be acknowledged for minimizing landlessness. Given the level of productivity, diminution of holdings could also be understood as a serious problem. However, it has to be qualified as it is not the same for different cropping patterns (double and single cropping, for example) and type of crops (root crops, add cash crops, for example). In addition, there is insufficient knowledge of causes and impacts of diminution of holdings. Redistribution seems exaggerated as causing diminution and
fragmentation as subdivision seems inevitable with or without redistribution as far as population increases. Micro-level studies showed that transfer mechanisms other than official land allocation are important in transferring land particularly within families (Yigremew, 2000a). In a case study in Gojjam, it was found that out of 42 young household heads, 33 (78.6%) had indicated that, at the time of establishing their households, they got land only from their families’ possessions willingly. Only 24 (57.1%) of the informants indicated that they received land from the peasant association until the end of the Derg period. Moreover, on average plots given by parents were 1.3 times than plots transferred to them through peasant association. In Ankober, North Shewa, 18.6% of the respondents indicated that they acquired all of their plots through inheritance (Yigremew, 2000b). This shows that land redistribution is not the only mechanism by which holdings are subdivided. So, population pressure might have been the underlying cause for diminution of holdings than is redistribution.

Although there were inadequate studies, it is difficult to accept those generalizations about the seriousness of land fragmentation in the country. First, in diverse agro-ecologies, no criteria were used as to what fragmentation really meant in a given context. Second, it seems that the cases mentioned are much less than international realities. For example, in some parts of Spain, the average number of plots in the 1970s was 14.52 with an average size of 0.34 ha per plot. Around 1984, China had about 200 million small and fragmented farms with a peasant household on the average contracting 0.56 ha of land fragmented into 9.7 plots of average size of 0.06 ha each (Dong, 1995). Third, the issue of risk aversion under which fragmentation should partly be explained and other advantages, say production of different crops for household subsistence, were not discussed in the Ethiopian context. Fourth, it is important to ask what the advantages of consolidation, say to an Ethiopian highland peasant, would be. It is also expected that the 1975 Land Reform might have, in some respect, contributed towards lessening the problem of fragmentation as it has limited access to only within territorial jurisdiction of a given peasant association. The experience and rationale of peasants also deserve attention. Therefore, more comprehensive theoretical arguments and empirical studies are needed in this respect.

Though studies state that the 1975 Land Reform has restricted land transfers, it was not known to what extent legal restrictions affected land transfer mechanisms like rentals, plot exchanges, sharecroppings and gifts of land. Empirical micro-level studies like Abebe (2000), Fafchamps (2000) Yigremew (2000a and 2000b), Yohannes (1994), Gavian and Amare (1996) and Bereket and Croppenstedt (1995) suggest that many of those land transfers were ‘informally’ existing; sharecropping being the commonest type. For example, in seven of their study sites, Bereket and Croppenstedt (1995) found that 46% of the respondents were involved in land transactions. In some of their study sites like Yetmen in Gojjam, they found that 42% of households were engaged in renting land. North Shewa, central Ethiopia, 37.6% of households with their own possessions were involved in land transactions.
Yohannes (1994). Yigremew (2000a) found that 74% of sampled young households in Gojjam, had sharecropped other peoples’ plots during the 2000/2001 crop season. Gavian and Amare’s (1996) study in Arsi shows that 65% of landholder sample households were engaged in land contracts in addition to their government allotted plots. They indicated that, in 1994, 24% of the fields in the study district were farmed under some sort of informal contract between farmers. These studies showed the prevalence of land transactions regardless of legal restrictions.

Although tenure security and its effects have not been studied systematically, it can be argued that the nature of the land administration system and restrictions on land transactions could lead to tenure insecurity. However, the impact of tenure insecurity on investment in land and in enhancing productivity is unknown. While the case and extent of insecurity is not well established, tenure security is not a sufficient condition for investing in land. It is also highly improbable that short-term productivity-enhancing investments like application of fertilizer are affected by tenure insecurity. Even, in many parts of Ethiopia, long-term investments like terracing are common since the 1975 Land Reform (Yigremew, 2000b).

The Current Land Debate and Some Queries

Due to continued problems (real or perceived) in the land tenure policies, there are mounting concerns by many people and national and international organizations. However, the current land debate focuses on ownership and on ‘private-state dichotomy. The first position advocates freehold system referring to peasants’ unrestricted property rights and, to some extent, to its importance in bringing about tenure security, incentives to investment that leads to better productivity and better resource management for sustainable use (the standard argument). The other major position is that which largely belongs to the ruling party and advocates public ownership of land. The central argument here is protection of poor peasants from landlessness by way of concentration of land in the hands of those who have capital to buy land. However, if closely examined based on experiences of many countries and the existing reality of the country, neither the narrow focus on ownership nor the narrow and exclusive private-state choice seems tenable (Yigremew, 2000c).

There is total absence of the peasants and pastoralists’ opinions and interests in the discussions on rural land tenure. While these sections of the society are the largest in number and the direct operators of the land, their views about the land tenure system of the country were not given attention. There is also lack of active involvement of the civil society, NGOs, donors and other international agencies. As such, rural land issues are mainly handled by politicians.
It is a narrow and uninformed approach to go into the private-public choice while it is important to have a wider perspective by considering the country's tradition, the government's administrative capability, absence of situations necessary for a land market, the existing land tenure issues and realities and other factors. Given the aforementioned issues, it will be more important to have a combination of different tenure arrangements wherever necessary than the given single choice or search for other tenure arrangements. For instance, Dessalegn (1994) and Hoben (2000) have suggested a devolved type of tenure in which communities will have the necessary power of land administration.

There is the need for protection of peasants and pastoralists. It is well known that land markets are regulated even in developed western market economies. It is also evident that free land markets in poor agricultural economies where there are no developed markets of other factors such as credit and no important alternative livelihoods outside agriculture, will exacerbate the already existing rural poverty. While Ethiopian peasants have no other important livelihoods outside agriculture, an important issue in the Ethiopian rural land debate has been whether peasants would sell their plots if unrestricted and individualized rights were allowed. The usual argument that Ethiopian peasants historically retain an affection and emotional tie to land, which remains the source of their social identity and the abode of their ancestors, and thus do not intend to sell it may not hold strong in a serious poverty situation, which the Ethiopian peasants are currently in. This has also been the case in many societies of other countries where an immediate consequence of the emergence of a land sales market based on formal titles was the development of a credit market based on collateral value of land (Kenya is a good example).

Even assuming that land markets in an individualized tenure arrangement will result in economic growth, we may ask whether the market mechanism may function properly. It is asserted that (Platteau, 1992) the market can work satisfactorily as an allocation mechanism only when it is embedded in a suitable socio-political order. A market order in which anonymous, general and abstract contractual relationships are predominant, professional standards and procedural norms are established, things are alienable, exchange transaction consists of temporary relationships between the objects exchanged and the civil society is independent of the polity. Even with all good government intentions and commitment, given resource and other constraints of a country like Ethiopia, the task of regulating free land markets, starting from a cadastral survey and provision of title deeds, will be thought of as one of the most difficult if not impossible tasks.

The potential danger of peasant evictions through land markets does not, however, necessarily justify state ownership. If we accept that the potential danger of landlessness and other problems associated with the free land market are not speculations, one way of preventing such consequences is regulating the land market. This means that the rights of individuals to own, buy, sell and accumulate private land property should be constrained in the pursuance of objectives of social
equity, economic growth and political stability. This does not, however, necessarily entail state ownership of land. Experiences in Africa, Asia and even in developed Europe show possibility to protect smallholders without necessarily having state ownership or even without a total ban on land sales.

Private property itself does not automatically bring about tenure security. One can observe that in debates on rural land in Ethiopia, the central issue is ownership and implied in that right is tenure security (in freehold) and peasant protection (in public ownership). However, the exercise of property rights is contingent on a political process that involves the ability of the owner to enforce the specified social relationships. For landowners, be individuals or the state, institutional and economic conditions necessary to exploit and administer the land must be present to fully exercise their rights on land. Therefore, the debate on ownership assumes that if people own the land, there are conditions that will guarantee their unrestricted rights on it. However, in the African context where property confiscation is not the exception, the policy of land ownership by itself will not be expected to guarantee exercise of such rights. Ethiopian peasants also have experience in this respect as peasant evictions and property confiscations are common.

Implied in the arguments forwarded by proponents of individualized land rights is the bias towards large-scale/modern farm production for food production and long-term growth. The country's need for food production (commercial farms tend to produce high-value cash products which are most likely not food items), absence of other non-farm means of livelihoods and employment opportunities, efficiency issues of large-scale farms and other related issues should be considered in such choice of agricultural organization.

Long-term growth requires social equity and political stability. Skewed land holdings resulting mainly from the workings of free land markets may, in the long-run, undermine such development prerequisites and lead to the collapse of the social and political order. In many of the political upheavals in developing countries, the slogan 'Land-to-the-tiller' was used to mobilize the majority of the peasants who were hard hit by unfair land tenure systems.

Though it was argued that state ownership of land constrains land transfers, literature indicates that, within the general framework of public ownership of land, China has made tremendous economic development (Prosterman, 1994; Lin 1998; Johnson, 1998; Dong, 1995). The incremental reforms in China's Rural Land Tenure Systems (Land Tenure Center, 1995) since 1960s with the reinstatement of the small private plots and liberalization of farm management decision-making have resulted in rapid agricultural development. These changes, combined with other favorable conditions (Lin, 1998), have resulted in an extraordinary increase in productivity, farmers' income, and the development of the economy. Within the period 1980–1990, the country’s gross agricultural output value increased by 86%.
rural total production rose by 163% and average per capita income of peasants grew by 64% from 1980 to 1985. These results were also achieved with smallholdings of average household farmland size 0.6 ha. Half of such development is attributed to the change in the land tenure and agricultural organization through the Household Responsibility System, which was an incentive to farmers (Johnson, 1998). This change is also noted for bringing about large impact on productivity (Lin, 1998).

All these considerations suggest that it is not easy to blindly accept those narrow private or public propositions as the best alternatives available. Hence, at least in the short-run, it will be important to explore some feasible and useful options beyond the ownership choice.

Conclusions

Given the degree of existing rural poverty in the country and scarcity of other factors of production and services (credit, marketing, training and research) to enhance production and productivity, it seems that any change in the land tenure system alone will not bring about significant changes in the country’s economy and people’s livelihoods. That is why, among other things, changes in the land tenure system since 1975 could not bring significant change in the development of the agricultural sector.

However, it is also important to appreciate the contribution of an improved land tenure system for increasing food production and sustainable resource utilization. As already noted, many of those generalizations found in the literature are not based on rigorous empirical studies relevant to the Ethiopian situation. Therefore, it has to be noted that any serious recommendation on Ethiopian land tenure system should be based on comprehensive empirical study. Nevertheless, based on the existing knowledge and experiences, the following problems were identified and possible changes suggested.

The private or state choice will not help much in ameliorating the country's land tenure problems. Although Ethiopia's experience shows that state ownership and control of land has been abused to serve the narrow political interests of ruling bodies and not the country and the people at large, private ownership of land does not seem feasible and potentially beneficial at least in the short run (free land markets are no more advocated to benefit poor countries). As ownership by itself is not a determining factor for having an effective tenure system and the serious resource and capacity implications of individualized land rights, changes could be initiated and introduced gradually within the existing framework of public ownership.
It is also important to note that land reform alone would not resolve landlessness. However, it is desirable to take corrective measures wherever there are skewed land distributions. Poor peasants are already marginalized in land transactions and they should be assisted to access land through other mechanisms in addition to land redistribution and in utilizing their small plots (e.g. access to credit). It is also to the advantage of the poor to regulate and make land transfers (such as rental arrangements) official.

If tenure security is to be enhanced and peasants’ rights to land respected, politicization of land should be minimized. These rights have to be institutionalized. It is imperative that detailed land laws be given and land administration be assigned to a technically competent institution. Decentralization of land administration is also important measure as it will enhance participation of communities, make the existing practices more official and assist the limited bureaucratic capacities. It is important to relax land rental period and ease other unnecessary interventions in land transfer mechanisms.

Diminution of landholdings seems exaggerated as international experience shows and it does not seem amenable to short-term tenure-related solutions. The correct direction, in this respect, seems to search for possibilities of sustainable intensification.

Land tenure institutions should be facilitated to evolve from the bottom than determined for the last time from the top. Moreover, it is essential to note that land tenure system is part of a country’s social, political and economic systems; and would be changed along with changes in such systems.

These changes are very important to start with. They are politically and administratively feasible. Political will is important, however, to introduce such changes as land has traditionally remained as one of the spoils of the victor; the resource to reward the allies and to punish potential opponents.

References


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LAND TENURE SECURITY AND PUBLIC PROGRAMS FOR INVESTMENT IN SOIL CONSERVATION IN NORTHERN ETHIOPIA

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Introduction

Developing countries have been grappling with how to reconcile their objectives to increase agricultural production, reduce poverty and use their natural resources sustainably. With land frontier shrinking due to population pressure, future growth in agriculture will have to come from yield increases rather than from area expansion (Eicher, 1994). Production will have to increase in such a way that future production capacity of natural resources is enhanced rather than diminished (Delgado and Anderson, 1993).

The major environmental problem in developing countries is land degradation in the form of soil erosion and nutrient depletion, both of which undermine land productivity. Land degradation is especially serious in Ethiopia, where agriculture accounts for about 50% of gross domestic product and employs over 80% of the population. Hurni (1985) indicated that Ethiopia is the most environmentally troubled country in the Sahel Belt.

Land degradation is severe in highlands (over 1500 meters altitude) which account for more than 43% of the country, 95% of the cultivated area, 75% of Ethiopia’s livestock and about 88% of the population. The Ethiopian Highland Reclamation study as quoted in Bojo and Cassels (1995) estimated that by the mid1980s, about 50% of the highlands (27 million ha) is badly eroded, while more than one-fourth is seriously eroded. Average Soil Loss in cultivated areas is estimated at 42 metric t ha\(^{-1}\) per year, far exceeding the soil formation rate of 3–7 m t ha\(^{-1}\) per year (Hurni, 1988). Stahl (1990) estimated that by year 2010, size of total land incapable of supporting cultivation would reach 10 million ha.

Despite the severity of the problem, public intervention in soil conservation in Ethiopia is a recent phenomenon. Policy makers largely neglected land conservation until the 1970s. After the early 1970s, national efforts to conserve land intensified. These interventions relied on mobilization of farm households and food-for-work (FFW) projects to conserve degraded lands through the construction of soil bunds, stone terraces and afforestation programs which were guided by little prior research. Perhaps as a result, peasants have occasionally dismantled conservation structures built on their farmlands (Shiferaw and Holden, 1999). Formulating appropriate public policies to
promote soil conservation requires understanding incentives and constraints farmers face in their decision to conserve land.

Land tenure insecurity due to frequent redistribution has been a problem in Ethiopia (Yeraswork, 2000). This distinguishes between factors affecting short-term investments in soil bunds and long-term investments in stone terraces. Further, it distinguishes between determinants of the decision to invest and the decision on how much to invest in conservation, given the decision to make some investment.

The role of property rights and social capital in providing incentives for the adoption of soil conservation in developing countries emerged only in the late 1980's. Before that, land tenure institutions had been explored in the context of developed countries with well defined property rights.

Optimal private soil depletion decreases as farmers planning scope increases from farm renter to family farm then to corporate farm McConnell (1983) as tenure security encourages soil conservation investment (Lee, 1980). Both McConnell and Lee assumed that land tenure status was known with certainty. In contrast, in many developing countries, especially where private ownership of land is not allowed and only usufruct rights are permitted, the expectation of future land tenure may change over time (Besley, 1995).

Interaction between land tenure expectations and willingness to invest in soil conservation has been investigated in relatively few cases. The Hallmark study by Feder et al. (1988) showed that land titling in Thailand to be associated with increased adoption of land improvements, including soil bunds and stump removal. Likewise, Besley (1995) found evidence that more secure land tenure in Ghana was linked to land improvements (although the ones examined did not include soil conservation investments). Place and Hazell (1993) found out that land rights in Ghana, Kenya and Rwanda play a role in the choice to improve land, if not in the type of land improvement selected. Shiferaw and Holden (1998) tried to measure expected land tenure security at the extreme level of lifetime tenure or not in Andit Tid, Ethiopia. However, time scope of the study was too rough to detect any influence on adoption behavior.

Despite the dynamic nature of conservation investments, most studies failed to distinguish between short-term and long-term investment types. However, Hayes et al. (1997) found that the probability of long-term investments in fences and wells in Bambia was enhanced by the presence of complete rather than preferential land tenure rights. Other studies employed either a single measure of land tenure status (Ervin and Ervin, 1982; Feder et al., 1988; Shiferaw and Holden, 1998) or a single measure of land improvement (Gavian and Fafchamps, 1996; Pender and Kerr, 1998; Shiferaw and Holden, 1998), making it impossible to link the degree of land tenure security with the durability of land improvement investment. Yet, major differences exist in the time scope and magnitude of net benefits associated with such practices as planting grassy
strips, building soil bunds and constructing stone terraces. Besley (1995) analyzed several types of land improvement in Ghana, but he interpreted the results in light of the extent of land rights rather than in light of their durability.

As soil erosion also has off-site costs, neighbors and others have a stake in it. Yet, the influence of other people’s opinions on farmer adoption of conservation practices has not been examined well except that Bultena and Hoiberg (1983) found timing of conservation tillage adoption to vary significantly with attitude of the local community towards farmers who fail to use conservation practices.

Another shortcoming in previous conservation studies was the assumption that factors affecting adoption of conservation practices are the same as factors determining the intensity of use of the conservation practices. Instead, studies like Feder et al. (1988), Place and Hazell (1993), Besley (1995), Gavian and Fafchamps (1996), Hayes et al. (1997), Shiferaw and Holden (1998) have focused on adoption alone using logit, probit or linear probability models.

In the case of costly soil conservation practices such as terracing, there is reason to expect that adoption and degree of adoption are based on different criteria. Adoption may be a threshold-based decision depending on awareness, planning horizon, and capacity to invest. Degree of adoption may depend on marginal profitability factors. However, the validity of this distinction between adoption factors and intensity of use factors is very questionable. This hypothesis cannot be tested by tobit analyses such as Pender and Kerr’s (1998) Model of Soil Conservation Investment in India that treat the decisions jointly. Rikoon et al. (1996) found differences between the factors associated with adoption and continued use of banded application of herbicides. However, they failed to link their models econometrically.

To date, no conservation adoption study, of which we are aware, has formally distinguished between adoption and intensity of use decisions as has been done in consumption studies by Yen (1993) and Lin and Milon (1993). The closest outcome to making this distinction was Place and Hazell’s (1993) observation that “multinomial logit analysis ... showed that land rights have less effect on choice of improvements than on the probability of undertaking an improvement.”

These research gaps raise the following questions. (1) How do institutional, public program and social capital factors influence soil conservation investments? (2) How do the determinants of investment vary between short-term and long-term soil conservation investments? (3) How do the determinants of investment vary between whether and how much farmers invest in land improvements?

This study examined factors that affect farmers’ decisions to invest in land conservation in Tigray Regional State, northern Ethiopia, focusing on land tenure and public programs. It attempted to provide answer to the question ‘how do institutional, public program and social capital factors influence soil conservation factors?’ by considering

Conceptual Model

To highlight the institutional and organizational factors affecting conservation investments, a model of soil conservation decisions in which both land tenure institutions and public image play roles was presented. Farmer utility was assumed to be increasing in accumulated wealth (Ω) and public image (I) as indicated in Equation (1).

$$\max_{E[T]} U(E[\Omega_T], I)$$

subject to

$$E[\Omega_T] = \sum_{r=1}^{T} \delta' \left( E[E[T_r] - wcI(K_h)CI_r] \right)$$

$$y_t = y(s_t, z_t)$$

$$s_t = s_0(1 - e(R, \sum_{r=1}^{t} CI_{r-1} - 1, \sum_{r=1}^{t} PC_{r-1}))$$

$$I_t = I(s_t)$$

This equation defines present value of accumulated wealth (ΩT) at the end of the farmers’ planning horizon (T) as accumulated annual crop revenues minus the unit cost (wcI) of conservation investments (CI,) as discounted by factor δ. It is assumed that the unit cost of conservation investments is decreasing in level of worker experience (wc(Kh) < 0). Price (p) variability is captured by distance from farm to the nearest road or market. Expected crop revenues are the product of crop price (p), yield (yt), land area (a,), and the binary expectation of whether land tenure will be retained in period t (E[T,l]). Yield in season t, in turn, is concavely increasing in current soil depth (y'(s_t) > 0) and depends also on other conditioning factors (z,) such as weather, pest attacks, and soil fertility.

Soil depth increases linearly with initial soil depth (s'(s_0) > 0) and decreases concavely with erosion (s'(e) < 0). The erosion function, in turn, is assumed to be bounded to the interval [0, 1] and increasing in factors (R) that govern soil propensity to erode (e'(R) > 0) such as steepness and length of slope. Erosion is further assumed to be concavely decreasing in cumulative soil conservation investments, both private (e'(ΣCI_{r-1}) < 0) and public campaigns that build soil conservation structures on farmers’ land (e'(ΣPC_{r-1}) < 0). The cross partial derivatives of e() with respect to R and CI or PC are assumed
negative. Note that because the erosion function is bounded to the \([0,1]\) interval, the interaction effect of public and private conservation investment \((\partial^2 e / \partial CI \partial PC)\) is indeterminate in sign. There is potential substitutability between private and public soil conservation investments, but there is also potential complementarity if farmers learn from experience with public projects and opt to make private investments. Which effect dominates is an empirical question.

A populous setting where new lands of comparable quality are not available, so cropped land area (\(a_t\)) equals initial land endowment (\(a_0\)) times the expectation of retaining land tenure in season \(t\) (\(E[T,T]\)) was assumed. This expectation was assumed to be binary and non-switching such that the farmer either expects (\(E[T,T]=1\)) or does not expect (\(E[T,T]=0\)) to retain tenure in season \(t\); once tenure is expected to be lost (\(E[T,T]=0\)), it cannot be regained in a later period. Finally, public image in any period (\(I_t\)) depends on the degree of off-field soil erosion affecting other community residents, which is inversely connected to current soil depth (\(s_t\)) (hence, public image is increasing in field soil depth, \(I' (s_t) > 0\)). For simplicity, we ignore conservation maintenance activities.

Substituting the definitions in Equation (1) into the utility function yields the unconstrained, undiscounted Hamiltonian:

\[
H = U(E[\sum_t s_t' p_{yt} (s_0[1-e(R, \sum_t CI_t - 1, \sum_t PC_t - 1)], z_t) a_0 E[T,T] - w e CI], I[s_t])
\]

Differentiating Equation (2) with respect to choice variable \(CI_t\), we can identify factors expected to influence optimal rate of soil conservation investment under conditions of perfect factor markets:

\[
\frac{\partial H}{\partial CI_t} = \frac{\partial U}{\partial \Omega} \frac{\partial \Omega}{\partial y} \frac{\partial y}{\partial s} \frac{\partial s}{\partial e} \frac{\partial e}{\partial CI_t} (a_0 E[T,T]) + \frac{\partial U}{\partial I} \frac{\partial I}{\partial s} \frac{\partial s}{\partial CI} - \sum_{i=1}^I \delta' w_{CI} = 0
\]

These conditions specify that optimal soil conservation investment takes place where marginal utility of cumulative added yield equals marginal cumulative discounted cost of conservation investment required to achieve the added yield. In this model, apart from the familiar wealth argument, marginal utility also accrues through improved public image of the farmer who is not creating economic externalities in the form of gullies and muddied water that irritate neighbors. The signs of both marginal utility terms are positive; hence, farmers who care about their image in the community as well as garnering wealth will find it optimal to invest in soil conservation more than those farmers who care about wealth alone.

This optimality condition also highlights the importance of the subjective expectation of enjoying land tenure in time period \(t\) (\(E[T,T]\)). At this term appears multiplicatively in the wealth term, the expectation of land tenure dictates the length of the planning horizon, thereby largely determining whether soil conservation appears desirable at all and if so, the type of conservation practices chosen.
To illustrate a capital budgeting analysis of conservation investments in northern Ethiopia, Berhanu *et al.* (1999) suggest that high initial cost of stone terracing takes long to pay off in crop yield gains than do soil bunds. However, large cumulative discounted net revenue from stone terraces after five or more years made it more beneficial choice for long planning horizons (Figure 1).

**Figure 1. Hypothetical cumulative net returns from two alternative soil conservation practices**

**Hypotheses**

From the conceptual model discussed before, several hypotheses that merit empirical examination can be derived. These hypotheses can be divided between factors that affect adoption and those that affect degree of soil conservation investment. The two sets of explanatory factors differ primarily in length of planning horizon, based on the expected duration of land tenure.

**Adoption hypotheses**

Based on physics of soil erosion, physical factors could affect adoption patterns.

**HA**: Where productive soils are more prone to erode \((R)\) is large), farmers will be more likely to adopt soil conservation. This follows given \(e'(R)>0, e'(CI)<0, \text{ and } \delta e/\delta CI \delta R<0\).

However, land tenure status affects likely returns from conservation investments, generating hypotheses based on the type of conservation investment.

**HA**: Where land tenure is expected over long term \((E[T_r]=1 \text{ for } t>5 \text{ years})\), farmers will adopt durable soil conservation measures such as stone terraces. This follows from: a) temporal growth paths of cumulative net returns for stone terraces versus soil bunds (Figure 1) and b) need to maintain the inequality in Equation (3) which militates for making large investments in order to obtain more than compensating discounted returns.
HA3: Where land tenure is expected only for short term ($E[T]=1$ for $t\leq 5$ years), farmers will either adopt cheaper, less durable soil conservation measures such as soil bunds, or they will refrain from investing in soil conservation (for the reasons in the previous hypothesis).

Given that public and private investments in long-term structures can substitute for one another,

HA4: Where farmers have already benefited from soil conservation structures publicly constructed on their own land, they will be less likely to invest in private ones ($\partial CI/\partial PC < 0$). This direct substitution effect is expected to be dominant in the case of stone terraces, where public and private constructions are identical on public and private lands.

However, when public soil conservation campaigns have provided learning opportunities without building conservation structures on the farmers' own land, they may encourage adoption by reducing perceived cost of conservation investments.

HA5: Where public soil conservation activities (PC) take place in the same community but not on the households' own land, farmers will be more likely to adopt soil conservation. This result follows from a) the experience effect reducing real conservation investment costs ($wCI'(CI)<0$, and b) awareness of the effectiveness of conservation, leading to a more accurate assessment that $y'(s)e'(CI)>0$.

HA6: Where farmers feel community pressure to conserve soil ($U\{I[s]\}$), they will be more likely to adopt soil conservation measures. This follows from the second term in Equation (3), making the community pressure effect on derived demand for the CI input strong and amplifying willingness to pay for conservation. This is the hypothesized role of social capital in affecting adoption pattern of soil conservation investment.

In an impoverished rural setting where capital and labor markets are imperfect, farm level endowments of these factors affect capacity to invest (Clay et al., 1998; Pender and Kerr, 1998). Hence, endowments of labor and capital may affect the likelihood of farmers' adoption of conservation practices, implying:

HA6: Where capacity to invest per unit of land is great, farmers will be more likely to adopt conservation practices.
Degree (intensity) of adoption hypotheses

If factors affecting adoption differ from factors affecting degree of adoption, then we expect the degree of investment to depend more on marginal factors related to costs and returns from the degree of investment. Two hypotheses emerge from this.

HD₁: Land tenure status is relevant to the decision on whether to make soil conservation investments, but it is not relevant to how much investment should be made, given the decision to invest. This hypothesis emerges from the assumed relation between the investment-return time paths (Figure 1), such that the wealth-maximizing return depends entirely on the time horizon.

HD₂: Where expected return on investment per unit of land is great, farmers will invest more in soil conservation.

Empirical Methods and Data

These hypotheses were tested using data from a survey of villages, farms, and fields in the Tigray Region of Ethiopia during 1992–95. Agriculture in the Region is characterized by mixed subsistence farming, where oxen are the only source of draft power. Soil erosion and deforestation are very severe. Intense tropical rainstorms, steep slopes and inappropriate land use have resulted in heavy soil loss. Extensive soil conservation efforts have been made in the Region since 1991. These efforts take three approaches: (1) private investments in terraces and bunds by farmers assisted by the Agricultural Extension Service (2) public conservation investments by mandatory community labor and (3) public conservation investments by food-for-work (FFW) projects. FFW payment is used for conservation works, mostly for micro-dam construction, area closures and afforestation. In some cases, FFW is also used to construct stone terraces on hillsides.

Data

The survey covered 250 farm households in 30 villages of six districts in the Tigray Region (Berhanu, 1998). It focused on farmers’ adoption of soil conservation practices, including stone terraces, soil bunds, and vegetative plantings. A variety of background information was also collected in order to associate adoption with the major classes of explanatory variables in the literature.

For sampling purposes, the area was classified into four topographic zones: steep, moderately steep, hilly, and plain. Representative villages were purposively selected in each topographic class. Number of villages selected was proportional to land area covered by each class. A sampling frame of household heads in each village was then
prepared and a random sample of 250 households drawn. The number of households sampled from each village was proportional to the number of households in the village (Berhanu, 1998).

Data were collected at village, household and plot levels. Most village level data came from observation and interviews with village leaders. Data on household characteristics and agricultural activities were collected through interviews with household heads. Physical characteristics of farm fields were observed and measured during site visits. Field observations included area, slope, shape of slope, position of slope, soil texture, and lengths of any stone terraces and soil bunds that were present.

The explanatory variables included in the empirical models were selected following the literature on farm-level investment theory (Clay et al., 1998; Feder et al., 1992). Following this literature, the general model for farm investment can be modeled as a function of:

1. market access factors (as a proxy for return on investment factors)
2. physical incentives to invest
3. capacity to invest
4. land tenure security (as a proxy for riskiness of investment)
5. socio-institutional factors and
6. household demographic characteristics.

The roles of market access and physical incentives were captured in the conceptual model before, as were land tenure and other socio-institutional factors. For simplicity, the conceptual model omitted the relevant capacity constraint on investible funds. As an individual farmer’s behavioral model, it omitted the household demographic characteristics that become relevant conditioning factors in a cross sectional data set.

The dependent variables used in the study were classified as adoption (use or non-use) and intensity of use of soil conservation practices. Intensity of use was measured as the number of meters per hectare (m ha\(^{-1}\)) of terraces or bunds constructed. An average estimated length of 700 m ha\(^{-1}\) of stone terraces or soil bunds is required to conserve a hectare of land to reduce soil erosion effectively on typical slopes in the area.

**Econometric specification: Double-hurdle versus Tobit models**

The objective of undertaking this research was to understand the factors affecting the probability of adoption of soil conservation practices and the factors affecting the intensity of practices adopted. As such, it was necessary to go beyond the typical binary dependent variable methods applied to cross-sectional surveys on technology adoption (Feder et al., 1992).

The decisions on whether to adopt and how much to adopt can be made jointly or separately. When the decisions are joint, the Tobit model is appropriate for analyzing
the factors affecting the joint decision (Greene, 1993). This assumption has been a norm in previous research into the determinants of the intensity of soil conservation investments (Sureshwaran et al., 1996; Pender and Kerr, 1998). However, adoption and intensity of use decisions are not necessarily made jointly. The decision to adopt may precede the decision on the intensity of use, and the factors affecting each decision may be different, as assumed in the present case. In this case, it is more suitable to apply a “Double hurdle” model in which a probit regression on adoption (using all observations) is followed by a truncated regression on non-zero observations (Cragg, 1971).

The double hurdle model is designed to analyze instances of an event, which may or may not take place, and if it takes place, takes on continuous positive values.

In the case of farmer adoption of soil conservation practices (e.g., building terraces or bunds), a decision on adopting the practice is made first, and the decision on the intensity of use (how many meters per hectare of terracing or bunds) follows. Following Cragg (1971), the decision on adoption can be modeled as a probit regression:

\[
f(y = 1 | X_1, X_2) = C(X_1' \beta)
\]

where \(C(\cdot)\) is the normal cumulative distribution function, and \(X_1\) and \(X_2\) are vectors of independent variables, not necessarily distinct. The decision on the intensity of use can be modeled as a regression truncated at zero.

\[
f(y | X_1, X_2) = (2\pi)^{1/2} \sigma^{-1} \exp\{- (y - X_1'y)^2/2\sigma^2\} \frac{C(X_1' \beta)}{C(X_2' \gamma/\sigma)} \text{ for } y > 0
\]

Whether a tobit or a double hurdle model is more appropriate can be determined by separately running the tobit and the double hurdle models and then conducting a likelihood ratio test that compares the tobit with the sum of the log likelihood functions of the probit and truncated regression models (Greene, 1993).

**Regression specification**

Based on the general model of soil conservation investment presented before, the regression models were specified for investments in stone terraces and soil bunds to mitigate soil erosion. All regression equations used the explanatory variables (Table 1), which correspond to the six categories identified in the general model.
Table 1. Definition and measurement of explanatory variables used by regression equations specified for investments in stone terraces and soil bunds in Tigray Region, 1992–95

<table>
<thead>
<tr>
<th>Variable</th>
<th>Definition</th>
<th>Mean</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent variables</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Terraces</td>
<td>Stone terrace construction (m ha⁻¹)</td>
<td>71.200</td>
<td>198.200</td>
</tr>
<tr>
<td>Bunds</td>
<td>Soil bunds constructed (m ha⁻¹)</td>
<td>13.200</td>
<td>82.200</td>
</tr>
<tr>
<td><strong>1. Market access factors</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market distance</td>
<td>Distance from village to nearest market (walking hours)</td>
<td>1.620</td>
<td>0.770</td>
</tr>
<tr>
<td>Road distance</td>
<td>Distance from village to nearest all weather road (walking hours)</td>
<td>1.490</td>
<td>1.170</td>
</tr>
<tr>
<td><strong>2. Physical factors</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Firewood distance</td>
<td>Village roundtrip distance to fetch fuel wood (walking hrs)</td>
<td>6.300</td>
<td>3.300</td>
</tr>
<tr>
<td>Highland</td>
<td>Village lies above 2500 meters altitude (0/1)</td>
<td>0.100</td>
<td>-</td>
</tr>
<tr>
<td>Hilly village</td>
<td>Predominant topography of village (0/1)</td>
<td>0.655</td>
<td>-</td>
</tr>
<tr>
<td>Plots cultivated</td>
<td>Number of plots cultivated by household</td>
<td>3.520</td>
<td>1.980</td>
</tr>
<tr>
<td>Slope</td>
<td>Slope of plot (degrees)</td>
<td>6.440</td>
<td>6.680</td>
</tr>
<tr>
<td>Soil sandy¹</td>
<td>Predominant soil type of plot is sandy (0/1)</td>
<td>0.213</td>
<td>-</td>
</tr>
<tr>
<td>Soil silty</td>
<td>Predominant soil type of plot is silty (0/1)</td>
<td>0.019</td>
<td>-</td>
</tr>
<tr>
<td>Soil loamy</td>
<td>Predominant soil type of plot is loamy (0/1)</td>
<td>0.280</td>
<td>-</td>
</tr>
<tr>
<td>Slope convex²</td>
<td>Plot slope has convex shape (0/1)</td>
<td>0.041</td>
<td>-</td>
</tr>
<tr>
<td>Slope concave</td>
<td>Plot slope has concave shape (0/1)</td>
<td>0.066</td>
<td>-</td>
</tr>
<tr>
<td>Slope mixed</td>
<td>Plot slope has mixed shape (0/1)</td>
<td>0.086</td>
<td>-</td>
</tr>
<tr>
<td>Plot on upper slope³</td>
<td>Plot located on upper slope (0/1)</td>
<td>0.135</td>
<td>-</td>
</tr>
<tr>
<td>Plot on mid slope</td>
<td>Plot located on middle slope (0/1)</td>
<td>0.121</td>
<td>-</td>
</tr>
<tr>
<td>Plot on lower slope</td>
<td>Plot located on lower slope (0/1)</td>
<td>0.265</td>
<td>-</td>
</tr>
<tr>
<td>Plot area</td>
<td>Plot area (ha)</td>
<td>0.445</td>
<td>0.323</td>
</tr>
<tr>
<td>Plot distance</td>
<td>Distance of plot from home (walking hours)</td>
<td>0.476</td>
<td>0.477</td>
</tr>
<tr>
<td>Plot age</td>
<td>Duration that plot operated by owner</td>
<td>7.570</td>
<td>6.060</td>
</tr>
<tr>
<td><strong>3. Capacity factors</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workers</td>
<td>Number of working age (15–64) household members</td>
<td>2.950</td>
<td>1.320</td>
</tr>
<tr>
<td>Farm size</td>
<td>Area of cultivated land (ha.)</td>
<td>1.190</td>
<td>0.500</td>
</tr>
<tr>
<td><strong>4. Land tenure security factors</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Own plot now</td>
<td>Plot is owned (not rented or borrowed) (0/1)</td>
<td>0.808</td>
<td>-</td>
</tr>
</tbody>
</table>

1. Clay soil was the base of comparison for all soil texture dummies.
2. Rectilinear shape of plot was the base of comparison for all slope dummies
3. Plain or plateau was the base of comparison for all plot location dummies
Berhanu Gebere Medhin

<table>
<thead>
<tr>
<th>Variable</th>
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</tr>
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<tbody>
<tr>
<td><strong>Dependent variables</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Own in 5 years</td>
<td>Owner feels certain to cultivate the same fields after five years (0/1)</td>
<td>0.604</td>
<td>-</td>
</tr>
<tr>
<td>Own on bequest</td>
<td>Owner feels certain to leave plots to children (0/1)</td>
<td>0.422</td>
<td>-</td>
</tr>
<tr>
<td>Time since land redistributed</td>
<td>Years since last land distribution in village</td>
<td>6.560</td>
<td>2.410</td>
</tr>
<tr>
<td><strong>5. Socio-institutional factors</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Community pressure</td>
<td>Household head feels pressure from community to conserve soil (0/1)</td>
<td>0.594</td>
<td>-</td>
</tr>
<tr>
<td>Extension contact</td>
<td>Household had contact with extension conservation service (0/1)</td>
<td>0.574</td>
<td>-</td>
</tr>
<tr>
<td>FFW available</td>
<td>Food-for-work was available in village (0/1)</td>
<td>0.448</td>
<td>-</td>
</tr>
<tr>
<td>Public conservation</td>
<td>Household had conservation work done on its plots by public campaigns (0/1)</td>
<td>0.695</td>
<td>-</td>
</tr>
<tr>
<td><strong>6. Household demographic characteristics</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dependency ratio</td>
<td>Ratio of total household members to working age household members</td>
<td>1.800</td>
<td>0.547</td>
</tr>
<tr>
<td>Age of head</td>
<td>Age of household head (years)</td>
<td>46.500</td>
<td>14.400</td>
</tr>
<tr>
<td>Male head</td>
<td>Male head of household (0/1)</td>
<td>0.829</td>
<td>-</td>
</tr>
<tr>
<td>Literate head</td>
<td>Literate household head (0/1)</td>
<td>0.229</td>
<td>-</td>
</tr>
</tbody>
</table>

The market access factors affect profitability of investment in soil conservation practices. Ideally such factors would include crop prices, cost of labor and materials used for conservation and yield effect of soil conservation practices. However, information on the effect of soil conservation on yield was not available. Moreover, large number of infra-subsistence farmers meant that crop sale prices were unavailable. Instead, prices were proxied by distance from marketplace. Labor input is a major cost component in soil conservation investment in the study area. Distance from an all-weather road was used as a proxy for differences in the opportunity cost of labor. The expected effects of this on soil conservation investment were ambiguous as distance reduces crop income and off-farm work opportunities during the dry season.

Physical incentives to invest in soil conservation practices include village level ecological factors and physical characteristics of plots. It was expected that the greater the land degradation in a village, the more likely resident farmers would invest in soil conservation practices. Villages in hilly areas tend to suffer more from soil erosion, and thus should benefit more from soil conservation. Highland zones have higher rainfall than intermediate highland zones and so should experience greater soil erosion—giving more incentive for soil conservation practices to reduce runoff.

Field-level physical factors associated with soil erosion (and hence are likely benefits from soil conservation) include slope steepness, concave or convex (rather than...
rectilinear) slope and non-clay soils. Due to the expected low return of investment on very steep slopes, a squared degree-of-slope term was included to capture this effect. Large fields cultivated for long periods were also expected to favor soil conservation investment. In contrast, distance of plot from homestead and plot fragmentation were expected to detract from soil conservation investment due to increased transaction costs.

Factors expected to affect capacity to invest include cash income, wealth, land area and family labor. Of these, cash income and wealth data were unusable due to under-reporting. Usable data included land area measured as hectares of cultivated land and family labor measured as number of household members aged 15–64. The effect of land area is ambiguous. On one hand, as more land indicates more wealth and capacity, it was expected to encourage investment. On the other hand, more land was expected to reduce the need to conserve land. Own labor availability was anticipated to encourage investment either due to availability of labor to do the work or due to the need to feed more people.

Three different measures were used to capture the degree of land tenure security, an institutional risk factor in soil conservation investment. For short term, risk was measured in terms of whether or not the land was owned or leased. For medium term, tenure security was measured by whether farmers believed that they would cultivate the same plots five years from the time of the survey. Long-term tenure security was gauged by whether farmers believed they would bequeath the plot to their children. At village level, time elapsed since the last land distribution was used as a measure of stability of land tenure. Given evidence elsewhere that land improvements may be made to enhance tenure security (Otsuka, et al. 1997), the medium and long-term land tenure security variables were checked for endogeneity.

Several socio-institutional variables were expected to encourage farmers toward investing in soil conservation. These include community pressure, contact with the Agricultural Extension service, and availability of FFW projects. Due to the substitution effect, beneficiaries of public soil conservation campaign were expected to invest less in private soil conservation.

Household demographic variables include age, sex, dependency ratio and literacy of household head. Older, male and literate household heads with fewer dependents were expected to be more likely to invest due to experience and influence of extension posters about soil conservation.

The models were initially specified as household-level random effects models in order to accommodate correlation in management among fields within the same household (Deaton, 1997).
Regression Results

A likelihood ratio test rejected the tobit model in favor of the double hurdle model (Berhanu, 1998). The test confirmed that the adoption and intensity of use decisions were separate for this data set. Hence, the results reported here were for the double hurdle model only. Results for all variables were reported in both the probit and truncated regression models despite the fact that they confirm Hypothesis HD₁ (land tenure status is relevant only for the probit model).

The random effects models were found to yield insignificant coefficients of within-household and within-village correlation of disturbance terms, so household effects were dropped from the models. Likewise, the Hausman tests for endogeneity of the land tenure-related explanatory variables yielded no evidence of simultaneity. The probit models of stone terrace and soil bund adoption were tested for independence of these decisions against a bivariate probit alternative; the likelihood ratio test could not reject the hypothesis of independence.

Determinants of adoption

Regression results (Table 2) show that household investment both in stone terraces and soil bunds is influenced by many factors. Physical incentives to invest, household capacity to invest, land tenure security and socio-institutional factors were important in explaining household adoption of stone terraces, and market access was also important for adoption of soil bunds. Overall, the likelihood of adoption of stone terraces was modest; an average farmer had 18% predicted probability of adopting the practices. By contrast, the predicted probability of adopting soil bunds was far less, a little more than 1% during 1992–95. Interestingly, many of the determinants of adopting soil bunds had effects contrary to those on stone terraces.

The physical factors influencing soil conservation were the ones that relate most closely to Hypothesis HA₁ (Where productive soils are more prone to erosion, farmers will be more likely to adopt soil conservation.)

Degree of slope increased the use of both stone terraces (slope concave with marginal effect of 0.138 and soil bunds (with marginal effect of − 0.011 from slope convex), up to a maximum steepness. Plot location was found to influence both kinds of structures. Farmers preferred to use soil bunds on toe slopes, as indicated by the negative signs on middle and upper slope locations. In contrast, they tended more to build stone terraces on middle and lower slopes where they can curb erosion. Hilly topography of villages was an important determinant of the adoption of stone terraces but did not matter for the adoption of soil bunds (coefficient estimate 0.389). This suggests that Tigrayan farmers believe that stone terraces are more effective when soil erosion is more severe.
# Table 2. Probit regression results for adoption of stone terraces and soil bunds in Tigray Region, 1992–95

<table>
<thead>
<tr>
<th>Variable</th>
<th>Adoption of stone terraces</th>
<th>Adoption of soil bunds</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coefficient (Robust std. err.)</td>
<td>Marginal effect</td>
</tr>
<tr>
<td>1. Market access factors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market distance</td>
<td>0.0280 (0.160)</td>
<td>0.0076</td>
</tr>
<tr>
<td>Road distance</td>
<td>-0.1120 (0.106)</td>
<td>0.0300</td>
</tr>
<tr>
<td>2. Physical factors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Highland</td>
<td>-0.9870 (0.316)***</td>
<td>0.1720</td>
</tr>
<tr>
<td>Firewood distance</td>
<td>-0.0230 (0.039)</td>
<td>0.0060</td>
</tr>
<tr>
<td>Hilly village</td>
<td>0.7240 (0.246)***</td>
<td>0.1390</td>
</tr>
<tr>
<td>Plots cultivated</td>
<td>0.0060 (0.086)</td>
<td>0.0016</td>
</tr>
<tr>
<td>Plot age</td>
<td>0.0470 (0.025)*</td>
<td>0.0120</td>
</tr>
<tr>
<td>Soil sandy</td>
<td>-0.1860 (0.227)</td>
<td>0.0470</td>
</tr>
<tr>
<td>Soil loamy</td>
<td>0.4350 (.718)</td>
<td>0.1360</td>
</tr>
<tr>
<td>Slope</td>
<td>0.1180 (.952)**</td>
<td>0.0310</td>
</tr>
<tr>
<td>Slope squared</td>
<td>-0.0039 (.0017)**</td>
<td>0.0010</td>
</tr>
<tr>
<td>Slope convex</td>
<td>0.3060 (.727)</td>
<td>0.0900</td>
</tr>
<tr>
<td>Slope concave</td>
<td>0.4850 (.236)**</td>
<td>0.1380</td>
</tr>
<tr>
<td>Slope mixed</td>
<td>0.3050 (.242)</td>
<td>0.0890</td>
</tr>
<tr>
<td>Plot distance</td>
<td>-1.1010 (.291)***</td>
<td>0.2930</td>
</tr>
<tr>
<td>Plot area</td>
<td>0.6000 (.307)**</td>
<td>0.1590</td>
</tr>
<tr>
<td>Plot on upper slope</td>
<td>0.0150 (.112)</td>
<td>0.0040</td>
</tr>
<tr>
<td>Plot on middle slope</td>
<td>0.5390 (.264)**</td>
<td>0.1670</td>
</tr>
<tr>
<td>Plot on lower slope</td>
<td>0.4540 (.2580)*</td>
<td>0.1330</td>
</tr>
<tr>
<td>3. Capacity to invest factors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Availability of workers</td>
<td>0.5970 (.2180)***</td>
<td>0.2300</td>
</tr>
<tr>
<td>Large farm size</td>
<td>-0.2200 (.1400)</td>
<td>0.0360</td>
</tr>
<tr>
<td>4. Land tenure security factors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Own plot now</td>
<td>0.3750 (.2330)</td>
<td>0.0340</td>
</tr>
<tr>
<td>Own in 5 years</td>
<td>-0.4800 (.4910)</td>
<td>0.1860</td>
</tr>
<tr>
<td>Own on bequeath</td>
<td>0.4160 (.2110)**</td>
<td>0.2860</td>
</tr>
<tr>
<td>Time since land redistributed</td>
<td>0.1040 (.0520)**</td>
<td>0.0070</td>
</tr>
<tr>
<td>5. Socio-institutional factors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Community pressure</td>
<td>0.2840 (.2270)</td>
<td>0.0760</td>
</tr>
<tr>
<td>Extension contact</td>
<td>-0.1900 (.2350)</td>
<td>0.0490</td>
</tr>
<tr>
<td>FFW available</td>
<td>0.7440 (.3820)**</td>
<td>0.2480</td>
</tr>
<tr>
<td>Public conservation</td>
<td>-0.5450 (.1770)**</td>
<td>0.1450</td>
</tr>
<tr>
<td>6. Household demographic characteristics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dependency ratio</td>
<td>-0.1010 (19100)</td>
<td>0.0260</td>
</tr>
<tr>
<td>Age of head</td>
<td>-0.0038 (0.0104)</td>
<td>0.0010</td>
</tr>
<tr>
<td>Male head</td>
<td>0.4140 (0.3590)</td>
<td>0.0930</td>
</tr>
<tr>
<td>Literate head</td>
<td>0.0830 (0.2540)</td>
<td>0.0210</td>
</tr>
<tr>
<td>Constant</td>
<td>-2.0040 (0.9400)**</td>
<td>-1.4000 (.1041)</td>
</tr>
<tr>
<td>Regression diagnostics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chi-square</td>
<td>118.5200</td>
<td>101.2200</td>
</tr>
<tr>
<td>Prob. &gt; chi-square</td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
<tr>
<td>Pseudo R-square</td>
<td>0.2783</td>
<td>0.2762</td>
</tr>
<tr>
<td>Predicted probability at mean</td>
<td>0.1840</td>
<td>0.0150</td>
</tr>
<tr>
<td>Sample size (n)</td>
<td>638</td>
<td>638</td>
</tr>
</tbody>
</table>

* ** *** significant at 10, 5 and 1% levels respectively.
(coefficient estimate 0.724). Compared with the base case of clay soils, farmers preferred to construct soil bunds on sandy soil textures that are both more prone to erosion and easier to work with than clays. All these factors were consistent with the null hypothesis that physical propensity toward erosion enhances the likelihood of soil conservation adoption. On middle and low slope plots, stone terraces (coefficient estimate = 0.539 and 0.454, respectively) were adopted more than soil bunds (coefficient estimate = -0.713 and -0.490, respectively). Farmers were more likely to build both soil bunds and stone terraces on plots they cultivated for long time, suggesting the importance of stable tenure for soil conservation. Results appear mixed on the influence of slope shape in that concave shape within marginal effect of 0.138 which is significant at 5% level favors adoption of terraces while mixed shape with marginal effect of -0.011 which is significant at 1% level detracts from adopting of bunds (Table 2). The negative effect (-0.172) of rainy upper highland villages was against expectations. However, overall, the evidence strongly supported the importance of physical factors behind adoption of soil conservation measures.

The coefficient estimates for land tenure security in Table 2 provide the primary basis for testing Hypotheses HA2A and HA2B. Farmers with secure land tenure who 1) expect to bequeath their fields to their children and 2) live in villages with no recent land redistribution were more likely to build stone terraces as indicated by coefficient estimate of 0.416 and less likely to build soil bunds as indicated by coefficient estimate of -0.957. In contrast, field owners who currently operate a field for short period were more likely to adopt soil bunds (coefficient estimate = 0.862) than stone terraces (coefficient estimate = 0.375). Overall, the evidence strongly supported the hypotheses that tenure security favors long-term soil conservation investments like stone terraces, whereas tenure insecurity favors short-term investments, such as soil bunds.

Socio-institutional factors were the key to testing the three remaining adoption hypotheses. Hypothesis HA3, (farmers benefiting from publicly constructed conservation structures substitute for private investment), can be tested by examining the coefficient estimates on the ‘public conservation’ variable. Evidently, households who had benefited from public conservation campaigns were likely to adopt neither soil bunds (coefficient estimate = -0.426) nor stone terraces (coefficient estimate = -0.545).

The hypothesis “nearby public soil conservation activities that take place off farmers own plots may encourage private soil conservation investment (HA4)” can be tested with coefficient estimates on the ‘FFW available’ variable. The availability of FFW increased adoption of stone terraces (coefficient estimate = 0.744) but decreased adoption of soil bunds (coefficient estimate = -0.548). This was consistent with the fact that FFW projects emphasized the rehabilitation of hillsides, focusing in part on stone terraces, but not on soil bunds.

The effect of community influence (social capital) on adoption of soil conservation (HA5) was tested using the ‘Community pressure’ variable. This had no significant effect on adoption of either terraces (coefficient estimate = 0.284) or bunds (coefficient
estimate = -0.382). Although the signs of the coefficient estimates were consistent with our expectations, there was no significant statistical support for this hypothesis.

The capacity to invest and convenience of doing soil conservation were the basis for testing hypothesis HA6 and played roles that were consistent with the maintained hypothesis of wealth in the utility function. The presence of more working-age household members favored adoption of labor-demanding stone terraces (coefficient estimate = 0.597), as did ownership of large plot area (coefficient estimate = 0.600) that would yield greater rewards to the costs of construction. In contrast, households having many plots were more inclined to build soil bunds, which demand less labor. Distance of plots from the homestead detracted strongly from the propensity to build both stone terraces (coefficient estimate = 0.028), with each added hour of walking reducing the probability of building terraces by 29%, and soil bunds (coefficient estimate = -0.343). Village distance from markets had mild negative effects on adoption of both soil bunds (coefficient estimate = -0.075) and stone terraces (coefficient estimate = -0.112).

**Determinants of level of soil conservation investment**

The second stage of the double hurdle model measures extent of adoption among adopters of the soil conservation practices. The truncated regression of stone terraces showed that factors that influenced adoption and intensity of use of stone terraces were different (Table 3).
<table>
<thead>
<tr>
<th>Variable</th>
<th>Adoption of terraces [probit] (robust std. error)</th>
<th>Intensity of terraces [Truncated regression]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Actual values (asym. std. error)</td>
<td>Predicted values (asym. std. error)</td>
</tr>
<tr>
<td>1. Market access factors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market distance</td>
<td>0.0280 (0.1600)</td>
<td>216.800 (120.3000)**</td>
</tr>
<tr>
<td></td>
<td>137.250 (057.0700)**</td>
<td>187.130 (061.0100)**</td>
</tr>
<tr>
<td>Road distance</td>
<td>-0.1120 (0.1060)</td>
<td>162.570 (076.4200)**</td>
</tr>
<tr>
<td>2. Physical factors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Highland</td>
<td>-0.9870 (0.3160)**</td>
<td>659.470 (296.2000)**</td>
</tr>
<tr>
<td>Firewood distance</td>
<td>-0.0230 (0.0390)</td>
<td>61.740 (032.2900)**</td>
</tr>
<tr>
<td>Hilly village</td>
<td>0.7240 (0.2460)**</td>
<td>174.540 (245.6000)**</td>
</tr>
<tr>
<td>Plots cultivated</td>
<td>0.0060 (0.0860)</td>
<td>-68.130 (057.8100)**</td>
</tr>
<tr>
<td>Plot age</td>
<td>0.0470 (0.0250)*</td>
<td>23.140 (011.5900)**</td>
</tr>
<tr>
<td>Soil sandy</td>
<td>-0.1860 (0.2270)</td>
<td>207.040 (161.7000)**</td>
</tr>
<tr>
<td>Soil silty</td>
<td>0.4350 (0.7180)</td>
<td>1383.300 (387.4000)**</td>
</tr>
<tr>
<td>Soil loamy</td>
<td>-0.2760 (0.2050)</td>
<td>102.330 (214.8000)</td>
</tr>
<tr>
<td>Slope</td>
<td>0.1180 (0.0520)**</td>
<td>63.760 (044.2100)</td>
</tr>
<tr>
<td>Slope squared</td>
<td>-0.0039 (0.0017)**</td>
<td>-2.460 (001.8700)**</td>
</tr>
<tr>
<td>Slope convex</td>
<td>0.3060 (0.2720)</td>
<td>200.860 (227.8000)</td>
</tr>
<tr>
<td>Slope concave</td>
<td>0.4850 (0.2360)**</td>
<td>76.410 (218.6000)</td>
</tr>
<tr>
<td>Slope mixed</td>
<td>0.3050 (0.2420)</td>
<td>145.720 (183.5000)</td>
</tr>
<tr>
<td>Plot distance</td>
<td>-1.1010 (0.2910)**</td>
<td>-28.570 (243.4000)</td>
</tr>
<tr>
<td>Plot area</td>
<td>0.6000 (0.3070)**</td>
<td>-810.300 (261.8000)**</td>
</tr>
<tr>
<td>Plot on upper slope</td>
<td>0.0150 (0.1120)</td>
<td>248.920 (232.4000)</td>
</tr>
<tr>
<td>Plot on middle slope</td>
<td>0.5390 (0.2640)**</td>
<td>194.650 (239.8000)</td>
</tr>
<tr>
<td>Plot on lower slope</td>
<td>0.4540 (0.2580)*</td>
<td>61.710 (184.2000)</td>
</tr>
<tr>
<td>3. Capacity to invest factors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Availability of more workers</td>
<td>0.5970 (0.2180)**</td>
<td>32.280 (66.1800)</td>
</tr>
<tr>
<td>Large farm size</td>
<td>-0.2200 (0.1400)</td>
<td>8.150 (77.7100)</td>
</tr>
<tr>
<td>4. Land tenure security factors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Own plot now</td>
<td>0.3750 (0.2330)</td>
<td>-204.590 (199.4000)**</td>
</tr>
<tr>
<td>Own in 5 years</td>
<td>-0.4800 (0.4910)</td>
<td>163.870 (196.7000)</td>
</tr>
<tr>
<td>Own on bequeath</td>
<td>0.4160 (0.2110)**</td>
<td>-113.880 (165.8000)**</td>
</tr>
</tbody>
</table>

Table 3. Probit and truncated regression results for adoption and intensity of use of stone terraces in Tigray Region, 1992–95
### Adoption of terraces [probit]

<table>
<thead>
<tr>
<th>Variable</th>
<th>Adoption of terraces [probit] (robust std. error)</th>
<th>Intensity of terraces [Truncated regression]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time since land redistributed</td>
<td>0.1040 (0.0520)**</td>
<td>-43.7400 (031.0200)</td>
</tr>
<tr>
<td>5. Socio-institutional factors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Community pressure</td>
<td>0.2840 (0.2270)</td>
<td>-106.1600 (118.3000)</td>
</tr>
<tr>
<td>Extension contact</td>
<td>-0.1900 (0.2350)</td>
<td>-187.6900 (157.6000)</td>
</tr>
<tr>
<td>FFW available</td>
<td>0.7440 (0.3820)**</td>
<td>198.9800 (167.9000)</td>
</tr>
<tr>
<td>Public conservation</td>
<td>-0.5450 (0.1770)***</td>
<td>-101.7600 (197.5000)</td>
</tr>
<tr>
<td>6. Household demographic characteristics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dependency ratio</td>
<td>-0.1010 (191)</td>
<td>131.5800 (091.3000)</td>
</tr>
<tr>
<td>Age of head</td>
<td>-0.0038 (0.0104)</td>
<td>-1.6900 (005.7600)</td>
</tr>
<tr>
<td>Male head</td>
<td>0.4140 (0.3590)</td>
<td>-162.6400 (226.3000)</td>
</tr>
<tr>
<td>Literate head</td>
<td>0.0830 (0.2540)</td>
<td>-157.2700 (151.8000)</td>
</tr>
<tr>
<td>Constant</td>
<td>-2.0040 (0.9400)**</td>
<td>-</td>
</tr>
</tbody>
</table>

**Regression diagnostics:**

- Chi-square: 118.5200
- Prob. > chi-square: 0.0000
- Pseudo R-square: 0.2783
- Sample size (n): 638

* *, ** *, *** significant at 10%, 5% and 1% levels respectively
As expected under hypothesis HD₁, the land tenure status variables that were key to the decision on whether to invest in soil conservation (the probit model) (own plot now (coefficient estimate = 0.875), own on bequeath (coefficient estimate = 0.416) and time since last land redistribution (coefficient estimate = 0.104)) were insignificant in the decision on how much to invest (the truncated regression model). Likewise, the capacity to invest and socio-institutional factors (availability of more workers (coefficient estimate = 0.597), FFW available (coefficient estimate = 0.944) and community pressure (coefficient estimate = 0.284)) that were important in determining adoption had no influence on intensity of use. The one exception was plot area, which detracted from terrace density. Given that the dependent variable measures meters of stone terracing per hectare, large fields had few meters of terracing per hectare because of terrace indivisibility and diminishing marginal returns to construct terraces within a field. The truncated regression for soil bunds was insignificant and was not reported.

There was clear evidence that farmers invested more on stone terraces where expected returns were high (HD₂). In villages distant from markets and roads, terrace density was significantly high (coefficient estimate = 216.80 and 137.25 for distance from market and road, respectively. In such remote villages, off-farm employment opportunities were limited and lower wages prevail (Berhanu, 1998)—reducing cost of hired labor as well as opportunity cost of family labor. On the revenue side, stone terracing was significantly dense where slopes were steep and in highlands, where rainfall is higher and expected benefits from erosion abatement are high. Similarly, plots operated by current owner for longtime received more terracing (coefficient estimate = 0.375), presumably because erosion was severe and land tenure security was high. However, density of terraces was very insignificant (coefficient estimate = -204.59). Adoption of terraces was also significantly high with farmers who own on bequeath (coefficient estimate = 0.416); whereas, density of terraces was very insignificant (coefficient estimate = 113.88). Likewise, silt soils, which tend to be very fertile, received more terracing.

**Discussion**

Importance of physical determinants of soil erosion in influencing the adoption of soil conservation practices by Tigrayan farmers was inline with findings elsewhere (Ervin and Ervin, 1982; Pender and Kerr, 1998; Shiferaw and Holden, 1998; Sureshwaran et al., 1996). The specific results were consistent with the Region’s hilly and rugged terrain. The significant negative quadratic term indicates that farmers disinclined to invest in conservation practices when slopes become very steep.

The cost of conservation works is especially important. It includes cash costs and transaction costs of travel to plots distant from homestead or plots highly fragmented and small. Such plots were more likely to be developed with soil bunds than with stone
terraces. Similarly, Clay et al. (1998) found that distance of plots from homestead discouraged investment in stone terraces.

Where labor markets function poorly, availability of family labor encourages adoption of labor-demanding conservation technologies (Pender and Kerr, 1998). The labor market in Tigray was likely to be imperfect due to information asymmetry or transaction costs. Hence, in this case too, the availability of family labor encouraged adoption of stone terraces.

Neoclassical economic theory suggests that, other factors kept constant, reduced risk and long planning horizons should enhance expected returns and encourage investment. Land tenure security and stability embody both of these attributes. The results of this study confirmed that farmers who have long term land tenure security are more likely to invest in costly but durable stone terraces, while farmers who have only short term land tenure security are more likely to invest in cheaper, less durable soil bunds. The greater specificity of the tenure status variables used here allows more insights to be gleaned than in Shiferaw and Holden’s (1998) single variable for lifetime tenure security. Results of this work also revealed that tenure security encourages land improvements, notably the use of conservation practices, as did studies in the United States (Besley, 1995; Feder et al., 1988; Gavian and Fafchamps, 1996; Hayes et al., 1997; Lee, 1980; and Ervin, 1982).

The determinants of conservation adoption and its intensity of use were considered the same in most of the conservation literature. A notable exception is the work by Ervin and Ervin (1982), which modeled conservation effort separately from adoption. The present finding that the factors affecting adoption and intensity of use of stone terraces in Tigray were different agrees with Ervin’s (1982) finding. Intensity of use of stone terraces is affected by the opportunity cost of labor and the expected return from investment.

While development of off-farm employment opportunities may detract from intensified use of conservation practices due to competition for labor, market and infrastructure development were likely to encourage intensity by enhancing the return from conservation investments.

For farmers who have already decided to invest in conservation practices, expected net benefits and resource constraints are the key factors influencing degree of investment in conservation practices.
Conclusions

This research explored the determinants of the decisions on whether to invest and how much to invest, as well as how those decisions are affected by land tenure security. The results confirmed most of the hypotheses.

Investment in stone terraces was positively influenced by such factors as capacity to invest and land tenure security, which are associated with long-term investment perspectives. In contrast, investment in soil bunds was associated with short-term, low-budget investment perspectives. The factors affecting level of investment were different from factors affecting the decision on whether to invest. The opportunity costs of labor and foregone land productivity were strong determinants of level of investment, despite their making no significant contribution to the choice of whether to invest. This suggests that activities that use labor in the dry season when bunds and terraces are constructed and maintained (such as migration, local off-farm activity, and food-for-work programs) may compete with soil conservation.

Recent researches on soil conservation in Ethiopia (Shiferaw and Holden, 1999; Berhanu et al. 1999) have highlighted the need for public policy interventions to supplement private incentives to make soil conservation investments in erosion-prone mountain areas. The social benefits of soil conservation often justify public intervention, especially when private returns are marginal at typical discount rates.

However, the evidence presented here reveals that not all public interventions are helpful. Direct public involvement in constructing soil conservation structures on private lands appears to undermine incentives for private investment although public conservation campaigns need not be counterproductive. When done on public lands, public conservation activities may be exemplary, serving an educational role that reduces the learning cost of building soil conservation structures privately.

The right kind of policy interventions can strongly enhance private incentives to invest in soil conservation. Secure and stable rights to land tenure assure the long-term perspective that favors costly, durable investment in soil conservation such as construction of stone terraces. Land titling and legal enforcement of title are fundamental for the widespread adoption and sustained use of conservation practices. The drive in the Region towards land registration seems a step towards this goal.

Policy makers will find that the relevant tools for encouraging conservation investments depend on whether or not farmers are already convinced of the need to adopt soil conservation. Awareness of conservation practices, plus secure stable land tenure are important for adoption of long-term soil conservation.
References


Introduction

Agricultural Extension is broadly defined to include any non-formal education system clients of which are rural people and content of which is primarily agricultural (including crop and livestock production and marketing, fisheries, forestry and the like). Many types of organizations using a variety of strategies and a large array of methods and techniques over the past years use different approaches to extension. Practice has proved that certain approaches are more effective than others under particular circumstances.

The first extension program was started under the then Alemaya College of Agriculture, now Alemaya University of Agriculture, in 1954. The Program was organized under the College along with research and education. In 1963, the extension arm of the College was transferred to the Ministry of Agriculture leaving Debre Zeit research and education arms under the administration of the College. In view of the weaknesses of the conventional extension service and considering the need to develop agriculture, the Ministry of Agriculture initiated comprehensive package programs, namely Chilalo Agricultural Development Unit /CADU/ and Walaita Agricultural Development Unit /WADU/.

The comprehensive package concept was considered an important development policy to establish agricultural development in a small sharply defined region. However, it demanded, coordinated application of components such as transport, marketing and credit services and distribution of improved seeds.

Due to heterogeneity of agro-ecology and economic and social conditions as well as their high demand on finance and skilled human power, the replicability of such packages to other parts of the country was found practically difficult. Then, a Minimum Package Project (MPP) approach was initiated. The basic idea behind the MPP approach was to extend agricultural extension service by way of extension, inputs supply and credit in selected districts.

Following the MPPs, Peasant Agriculture Development Project (PADEP) was initiated. PADEP adopted the modified Training and Visit (T&V) extension system. Development agents (DAs) were assigned at service cooperatives level to
bring agricultural extension services closer to farmers. Service cooperatives were the basis for extension activities.

In 1993, after critical evaluations of past extension strategies employed in Ethiopia, a Participatory Demonstration and Training Extension System (PADETES) was adopted as a national agricultural extension system. Since 1994, the national agricultural extension program has implemented PADETES with the aim of achieving food self-sufficiency.

This paper tried to address issues related to enabling policy environments for implementing the new extension strategy, the economic development strategy, the national agricultural extension strategy, agricultural development challenges and future directions towards improving production and productivity of the agricultural sector.

**Recent Policies Conducive for Implementing the New Agricultural Extension System**

The Economic Policy of the country lays the foundation for economic recovery. It provides a fundamental and dramatic change in the role of the state in managing the economy from all-embracing and controlling role to facilitating and regulating role. It permits market forces to be the chief instrument of resource allocation and invites domestic and foreign private investment almost in all sectors.

Investment Code has been enacted. This Code provides an institutional framework for private investment in the country, offers wide ranging tax incentives, and removes other restrictions like capital ceiling that were set on private investment. Special emphasis has also been given to regional and local self-administration and devolution of power.

All the aforementioned and other policy measures are considered essential for smooth implementation of the new extension strategy being pursued in Ethiopia. This new extension strategy serves as one of the major instruments for attaining the objectives of the economic development strategy.

**Economic Development Strategy**

In essence, the current Economic Development Strategy of Ethiopia is planned to revolve around productivity improvement of smallholder agriculture and industrialization based on the utilization of domestic raw materials with labor-
intensive technology. This strategy, known as Agricultural-Development-Led Industrialization (ADLI), is framed into Ethiopian context. Thus, the economic development strategy visualizes export-led growth which feeds into an interdependent agricultural and industrial development.

The ADLI Strategy is focused primarily on agricultural development, which is to be attained through improvement of productivity in smallholdings and expansion of large-scale farms, particularly in lowlands.

The development of the smallholder is, therefore, envisaged to proceed in three stages.

Stage 1. Improving agricultural practices and utilization of better technologies
Stage 2. Developing agricultural infrastructure, such as small-scale irrigation
Stage 3. Increasing farm sizes, which takes place along with shifting of population from agricultural to non-agricultural activities.

Stages 1 and 2 are land augmenting in that more output would be obtained from the same unit of land. Output per farm family would increase depending on pace of productivity improvement and population pressure on land. Enduring the sustainability of agricultural development can only be realized with the realization of Stage 3, which is dependent on industrialization.

The agriculture sector strategy focuses on improvement of productivity of smallholder agriculture, whilst encouraging growth of both extensive mechanized farming and intensive commercial agriculture. Small-scale farmers are expected to shift towards production for market; thus reducing the current dominance of subsistence production.

Two ways in which the productivity of small-scale farmers in Ethiopia can be raised are:

1. using existing land, labor and capital resources in a better way through improved agricultural practices and
2. increasing resources, essentially of capital, to introduce improved technology, be it biological, chemical or mechanical.

The strategy to develop small-scale agriculture also includes building rural infrastructure. This will include soil and water conservation measures, afforestation, physical infrastructure for tackling erosion, regeneration of pasture, improvement of water to increase production and feeder-road construction. The strategy also envisages the expansion of irrigated agriculture along with water shade management and protection against health hazards.
National Agricultural Extension Strategy and Program

To complement the ADLI Strategy, the government of Ethiopia has launched the National Agricultural Extension Program since 1994/95-crop season aiming at contributing to the attainment of food self-sufficiency. This Program assists small-scale farmers to improve agricultural productivity through the dissemination of technology and information.

According to this Program, execution of the extension program is the sole responsibility of regional agricultural bureaus (RABs) while formulating agriculture-related policies, coordinating inter-regional development programs and projects and providing technical advice and training services to increase technical competence of extension staff members of RABs are the mandate of the Ministry of Agriculture. This Program acknowledges package-based development program and uses PADETES for attaining the desired objectives. Thus, through PADETES, the Program:

- acknowledges that demonstrations are grounds for testing the validity of technology packages being promoted as well as production centers for participating farmers
- ensures physical availability of technology packages where participating farmers will obtain production inputs with the necessary information and skills
- ensures availability of inputs on credit where participating farmers are required to pay down payment for the inputs provided to them and expected to pay the remaining later
- acknowledges participation of farmers since management of demonstrations is the responsibility of participating farmers themselves
- gives farmers full right to decide on their own development program and
- gives due consideration to linkages between research and extension.

Although encouraging results have been achieved using the extension program with PADETES as instrument for increasing production and productivity, there are formidable challenges facing the ongoing agricultural development program.

Agricultural Development Challenges

Environmental constraints

Human and livestock population pressure, coupled with inappropriate land use system, has been responsible for overgrazing of farmlands and irrational use of
Agricultural Extension Strategy in Ethiopia

forest resources—thereby resulting in environmental degradation. This is reflected in the serious soil erosion that has taken place in many parts of the country, particularly in the highlands.

Technological constraints

Ethiopia's agriculture is mainly traditional and subsistence. Most smallholder farmers use very backward agricultural technologies. The technological constraints emanate from dependence on traditional farm tools and farming practices, low application of improved inputs like improved seeds and fertilizers, use of poor animal breeds and the like.

Institutional constraints

Attempts to create rural institutions to facilitate effective participation of farmers in the process of agricultural development have been inadequate. Institutional supports to promote agricultural development in terms of providing modern inputs and research and extension services have been inadequate. Besides, in agriculture sector, some people may have productive assets such as land and labor, but may lack sufficient means of production such as oxen and money to undertake their economic activities which would have been fulfilled through credit facilities to be availed by appropriate institutions. Market outlets for farmers’ produces are another problem.

Dependence on rain-fed agriculture

Although Ethiopia is considered as a country of water tower, agricultural activities are being conducted using mainly rainwater. Most often, the rainfall is inadequate in amount and erratic in distribution for the growth of plants.

Directions for increasing Agricultural Production

Extensification

One way of increasing agricultural production in Ethiopia is through ‘expansion’, which involves bringing additional land suitable for agricultural production under crop production. Studies indicate that additional land can be brought under cultivation with the introduction of conducive strategies and appropriate technologies like Vertisol management and irrigation.
There is enough land to achieve the desired expansion target. A strategy to encourage farmers to cultivate more land needs to be worked out. However, care must be taken not to expand into fragile environments without the introduction of appropriate soil and other natural resources conservation measures.

One of the difficult issues that may arise in the long run in using the expansion option is the conflict it may cause between crop and livestock farming. Putting more land under crops will result in less pastureland for domestic animals. The solution for this problem lies in genetic improvement of livestock where emphasis should be placed on shifting from talking of large livestock numbers to enhancing productivity.

**Intensification**

Intensification seems the most feasible and more acceptable option for raising sustainable agricultural production through the application of improved agricultural production technologies and appropriate crop and animal management practices as Ethiopia’s potential to increase crop yield through intensification is large. Short- to medium-term agricultural development strategy needs to focus on environment conscious intensification program both in traditionally surplus producing and drought prone and seriously degraded areas.

**Yield projection**

Not applying or sub-optimally applying crop husbandry practices such as timely planting, weeding, keeping plant population appropriate and properly applying chemical fertilizers has seriously constrained the effectiveness of inputs such as seeds and chemical fertilizers. It is, thus, assumed that the complementarity between the use of modern inputs and management practices will be an integral part of the strategy for increasing agricultural productivity.

**Promoting marketing system**

Development of an efficient and equitable agricultural marketing system is a critical component of the effort for improving food security, reducing cost of food to consumers, and promoting farmer’s incentives to use productivity-enhancing inputs in Ethiopia. Exporting food grains through the involvement of both public and private sectors can also be a promising feature towards market development in the country. The government should invest on supportive infrastructure such as transportation and storage systems and encourage involvement of the private sector. It should also focus on market research program that would help to
understand the performance of rural markets and to identify constraints impending agricultural development.

Efforts should, thus, be made to make markets accessible to smallholder farmers through improvement of marketing extension services and road conditions to motivate farmers to produce more for markets. Designing appropriate strategy to stabilize prices of surplus food crops and building buffer stock of food grain in which both the private and public sectors will be involved should be given top priority.

**Implementing resource-based integrated agricultural development program**

The Integrated Agricultural Development Program (IADP) is envisaged to maximize efficiency and effectiveness in utilizing available resources.

The entry point for IADP is an individual holding. Maximum effort will be vested on the individuals' holdings to satisfy their basic needs (food, feed, and construction materials) while sustaining the potential of their holdings through various measures of natural resources conservation.

**Maintaining strong research-extension-farmer linkages**

The overall objective of research-extension-farmer linkages is to enhance the rate of adoption of agricultural technologies by the farming communities and thereby improve their livelihood. This could be achieved by employing efficient linkage strategies at various levels that will bring together all stakeholders in the entire process of technology generation, development, transfer, utilization and feedback.

**Developing and introducing agricultural technology**

Yield increases obtained through the extension program need to be sustained. Furthermore, there should be a need to extend from food crops to high economic value crops which are important in the long-term for produce diversification and increased foreign exchange earnings. This will require two distinct responses from the agricultural research system. First, focus on ‘maintenance’ research in support of sustaining high yields already obtained for the main food crops; and second, broad and deep research on other crops and livestock activities.
Promoting of participation in the formulation and adoption of extension packages

A participatory approach considers the needs of the different groups of farmers. Extension focuses on farmers’ needs rather than on farmers being ‘targets’ of extension. Participatory approach is, therefore, considered essential if extension is to be client-oriented. Extension program should be based on farmers’ knowledge that farmers should be involved in the planning and implementation of the program. Simply making information readily available is not enough to ensure that it is used effectively. Producers themselves must be able to analyze constraints, seek solution, and make choices.

Moving from rain-fed agriculture to irrigated agriculture

Irrigation will be promoted where water resource available to allow development at reasonable cost. This may include areas where rainfall is more reliable and where the focus would be on creating conditions for year-round agricultural activities, and for diversifying into value-added enterprises. Due to the urgent need to decrease the country’s reliance on rain-fed agriculture to the extent feasible, cost-effective irrigation will also need to be pursued in areas with less reliable rainfall.

Ensuring availability of inputs and credit

Sustainable agricultural development, among other things, requires the availability of production inputs as well as finance for the purchase of these inputs. It is, therefore, essential to make sure the availability of the required production inputs and credit for beneficiaries.

Conclusions

The success of an agricultural extension program tends to be directly related to the extent to which its approach or strategy fits the program goals it was established for. Any particular agricultural extension approach is likely to be sustainable over time if the benefits to its clients tend to be great. Thus, in order to bring about sustainable agricultural development in Ethiopia, it is important to take immediate actions against the formidable challenges facing the extension program.
INTRODUCTION

In Ethiopia, nomadic pastoralists constitute about 5 million people or roughly 12% of the total population of the country (Fekadu, 1990). The majority of these, as is the case in the rest of the Horn of Africa, live in dry lowlands of the country (below 1,500 meters and arid climatic zones with average annual precipitation of between 400 and 700 mm). The area these people occupy covers slightly less than 50% (500 000 km$^2$) of the country's land size and encircles central highlands of Ethiopia and border areas of neighboring countries (UNDP/RRC, 1984). Nomadic pastoralists share peripheral lowlands with shifting cultivators while sedentary farmers are pervasive in central highland plateaus. UNDP/RRC (1984) divides pastoral areas in Ethiopia into five geographical regions as Northeastern Pastoral Region, Southeastern Pastoral Region, Southern Pastoral Region, Southwestern Pastoral Region and Western Pastoral Region.

The Northeastern Pastoral Region is located at the northern half of the Rift Valley. It lies between the eastern and northern escarpments of the central highlands to the West and South of the Rift Valley. The Region covers a total area of 75 000 km$^2$ most part of which is in altitudinal range of 380 to 700 m. The highest mean annual rainfall is below 700 mm and bimodal in pattern. Temperatures are high, the hottest months of the year being June, July, and August. Lowland plains of the Awash River Basin are found in this pastoral region, and are inhabited by the pastoral and agro-pastoral groups of Afar, Issa, Karrayu, Ittu, Arsi Oromo, and Argoba.

The Southeastern Pastoral Region has a total area of 293 000 km$^2$, which makes it the largest of the five pastoral regions. It encompasses Ogaden area (about 300 masl) near Ethiopia-Somali border. Its upper limits reach 1500 meters in the eastern and southern sides of highlands of Harrerge and Bale and the Jijiga Plains stand at an even higher altitude of 1500 m. The mean annual rainfall ranges from close to 700 mm around the upper limits to below 100 mm in the Southeast. With a particularly bimodal rainfall pattern, the pastoral region is characterized by high temperatures all year round, especially in the low areas. This pastoral region is almost entirely inhabited by Somali ethnicity.
The Southern Pastoral Region, commonly referred to as ‘Borana’ or the ‘southern rangeland’, has land area of 95,000 km². Most part of the falls within altitudinal range of 1000 to 1500 masl and experiences a very distinctly bimodal rainfall pattern. Mean annual rainfall ranges from about 200 mm in the South and East to about 700 mm in the Northwest. The two rainy seasons are from March to April and from October to November. Other months constitute dry periods of the year. All year round, temperatures are high, with mean minimum monthly temperatures of 10°c and mean maximum monthly temperatures of 25°c. The two pastoral groups in the Region are the Borana and Guji.

The Southwestern Pastoral Region is divided into two agro-ecological regions as the Lower Omo Drainage Basin and the Gambella Plain. Land area of the Region is 63,000 km², with an altitude range of about 300 masl at the lowest end of the Omo River and around Lake Rudolf to about 1500 masl in Hamar and Mursi ranges. The mean annual rainfall is low—ranging from about 700 mm in the North to below 200 mm in the South. Annual temperatures are high, with mean minimum monthly temperature of 15–20°c in low areas and mean maximum temperature of 25–35°c in high areas. The Region is inhabited by Arbore, Hamar, Bena, Dassanetch, Bume, Mursi, Bodi, Tsemai, and Nuer agro-pastoral ethnic groups.

The Western Pastoral Region encompasses present day Benishangul Gumuz Administrative Region which borders with the Sudan, and lowland areas of Amhara and Tigrai regions. It stands at altitude of 900–1300 m with mean range temperatures of 30–40°c. The Region has a unimodal rainfall pattern with southern parts receiving more rainfall than northern parts. Mean annual rainfall of the southern part of the region, especially that of Metekel and Asossa areas is between 1000 and 1400 mm and occurs in July, August, and September.

The lands inhabited by nomadic groups are further characterized by the expansive and undulating plains, which are watered often by big and perennial rivers. The Blue Nile, Tekeze, Omo and Wabieshebelle rivers and the Baro Akobo and the Ganale-Juba-Dawa systems splendidly meander through the expansive pastoral lands of Ethiopia before they cross the country’s frontiers in almost all directions (Yacob, 1995). Thus, pastoral areas largely lend themselves to large-scale agricultural development and are thus attractive to agricultural investment.

In the past, there was no comprehensive and integrated policy ensuring sustainable livelihood for people in pastoral areas in Ethiopia. In late 1950s, the Ministry of Agriculture initiated rangeland development projects aimed at harnessing pastoral resources. Such moves were, however, driven mainly to get access to resources allegedly held by the pastoralists. Even when pastoral development, as opposed to livestock development, was thought to be worthy of being seriously considered, the attempts were propelled by the need to procure products for regional and world
markets, to satisfy consumption requirements of urban dwellers and to facilitate the integration and assimilation of the pastoralists into sedentary agriculture.

Over the last several decades, particularly in the second half of the 20th century, therefore, pastoralism as a social and economic system has suffered a rapid decline in its prevalence. The major causes of this decline were the need to put more land under crops, the contending demands placed on scarce resources, the advent of large-scale commercial and state farms and the growing economic importance of national parks designed to promote tourist industry. Dwindling carrying capacity of the environment in lowlands and highlands increased competition for access to grazing land and water among pastoralists. Frequent drought and enhanced armed conflict between neighboring nations, particularly in the East, have provided the conditions for a more pronounced confrontational relationship among pastoralist groups themselves and between pastoralists and non-pastoralists.

More specifically, with progressive security decline in highlands, peasants and agro-pastoralists from highlands often claim to land in low altitudes to make up for the losses they face. The State is also increasing claims on pastoral land for various development purposes. All these circumstances provide conditions for tense and sometimes openly hostile relationships. Dietz (1996:35) complains about this condition surrounding pastoralism as "The tragedy of pastoralism in many parts of the world today is that the survival niches nature supplied to pastoralists have also been discovered by cultivators, gold diggers and fishermen and have become opportunity niches or, even worse, have been privatized as speculation zones...or as forbidden game reserves."

**Contribution of the Pastoral Sub-Sector to Ethiopia's Economy**

UNDP/RRC (1984) divides the total surface area of the country into highlands (39%) and lowlands (61%) with an elevation of 1500 m taken as a rough dividing point. The lowland area amounts to 769 000 km². Ethiopia's Ministry of Agriculture (1993) estimated the rangelands to be only 44% of the land area of the country with the highlands constituting the remaining 56%. This estimate puts the size of the pastoral land in the country at 500 000 km². Although the rangelands account for a significant portion of the land area of the country, they are thinly populated with only 12% of the country's population.

Fekadu (1990) estimated the number of Ethiopia's livestock population at about 27 million cattle, 24 million sheep, 18 million goats, 7 million equines, and 1 million camels. This figure represents large size of livestock wealth that puts the country first in Africa and among the top ten in the World. The nomadic pastoral sub-sector
contributes about 40% of the cattle, 75% of the goats, 25% of the sheep, 2% of the equines, and 100% of the camels (ibid). Livestock concentration is on the whole lower in the lowlands than in the highlands. Nonetheless, the rangelands still contain more livestock in relation to the size of their population. Hence, the pastoral sub-sector represents a per capita of five Tropical Livestock Units (TLU) while animal population in the highlands accounts for a per capita of only about one TLU (IBRD, 1970)—implying that the nomadic sub-sector can play a significant role in the national economy owing to its huge potential for surplus production. In fact, pastoral production has many economic linkages with various sub-sectors in many ways not readily noticed or statistically accounted for. For example, trade activities involving livestock and livestock products generate considerable additional employment and income opportunities both in formal and informal business sectors. Besides food, clothes and other products, the non-pastoral sector contributes to the complex networks which combine multiple aspects of the national economy; that is livestock, cash, grain, and manufactured goods. Employment creation and supply of raw materials to different sub-sectors certainly reflect the importance of pastoralism at various levels of the economy.

In the 1980s, the livestock sector constituted 33% of the gross value of agricultural production and 15% of the gross domestic product (Coppock, 994). Understandably, the pastoral sub-sector provides rural and urban inhabitants of the lowlands with milk, meat, employment and investment opportunities. Moreover, cattle and sheep from the lowlands comprised over 90% of the legal exports of live animals. During the same period, revenue from live animal export ranked second to coffee though taking only 12% share of the overall gross annual export. Nevertheless, this does not include the 450 000 lowland livestock estimated to had been traded on international black markets, and not often reflected in the official statistics (ibid). The large volume of the illegal lowland livestock trade is attributed to black market prices, which were 150% higher than the regulated domestic livestock prices during the 1980s. Of the draft animals in the highlands, 20% were from the lowlands, which means that the pastoral sub-sector was an important provider of livestock in the nation (ibid).

**Evolution of Pastoral Development Policies**

Impacts of modernization policies which serve as a platform for legitimization and acceptance of regimes on the one hand, and for provoking expectations for better life by people on the other, are closely associated with the evolution of pastoral policies and development interventions. However, formulation of policies pertaining to pastoral groups in Ethiopia had been based on flawed assumptions...
Pastoral Development and policy orientations in Ethiopia: Appraisal of Policies and Experiences

and generalizations about the primitive nature of pastoralism and pastoral land use and tenure arrangements. Since feudal times, the state was firmly rooted in the central highlands and largely controlled by highlanders, who dominated the bureaucracy, and who neither understand the nature of pastoral production nor appreciated pastoral culture. Historically, the defining characteristic of the relationship between pastoralists and the Ethiopian polity has been extractive and authoritarian (Markakis, 1993). Thus, the interests of successive Ethiopian states in pastoralism had always been to extract economic surplus for the national economy. As a justification for their extractive policies, they attributed all sorts of drawbacks presumed to be inherent in pastoral mode of subsistence. Pastoralists were stereotyped as irrational and destructive users of land and that this was seen as the main cause for the problem of overpopulation and overgrazing in the lowlands of the country. As pastoralists were often blamed for bringing these phenomena upon themselves, this had been used to justify the governments’ draconian policy measures that had in turn made the situation worse for the pastoralists.

Such government intervention led to policies for destocking of pastoral herds as witnessed in Rangeland Development Projects initiated by the Ministry of Agriculture, and transformation of pastoral land use through alienation of pastures for non-pastoral purposes, a process superintended by the Awash Valley Authority and its successor institutions. More importantly, a series of legal provisions that could have explicitly regulated the status of pastoral lands were issued over time. These provisions and the justifications for their enactment have subjected pastoral areas to encroachment by relocated people from over-populated areas and appropriation by governments without consent and with little or no compensation although herders had well defined territories and land management systems.

The immediate consequence of such moves, notwithstanding real intentions, has been severe on pastoralists in general and those in the Awash Valley in particular. The urban bias of policy directions and attendant striving in their implementation characterized by unilateral measures emphasizing the promotion of parochial interests have entailed negative consequences for pastoralists over the years. The concrete manifestations of misfortunes that have befallen nomadic pastoralists and agro-pastoralists in Ethiopia include massive displacements, removal of large tracts of prime land from gazing regimes to make way for ever-expanding irrigated agricultural schemes, parks, game reserves, plantations, large closures for conservation projects and hosting new resettlement programs. Such policy measures and the subsequent pastoral predicament were roughly discussed herein.
The development of large-scale commercial farms

Before 1974, the Imperial Ethiopian Government embarked upon a long-term effort to modernize the agricultural sector in several directions. Prominent examples of these efforts include:

- the construction of dams on the Awash Valley for generating power and creating conditions for irrigated agriculture
- the development of national parks in several regions of the country for wildlife conservation and as a means of attracting foreign tourists
- the development of large-scale commercial farms and plantations in the Upper, Middle, and Lower Awash Valleys: Erer in Harererge; Bilate in Sidamo; government-owned agricultural enterprises in Awassa: Arbaminch, in Gamu Gofa, and Boter on the border of the then provinces of Shewa and Kaffa
- creation of the Chilalo Agricultural Development Unit (CADU) in Arsi and the Wolamo Agricultural Development Unit (WADU) focusing on the development and modernization of peasant agriculture.

Nearly all these developments in large-scale commercial agriculture took place in the areas of Awash River Basin primarily inhabited and worked by nomadic pastoralists and transhumant groups—leaving their blue prints on pastoral development.

The area put under commercial agriculture in the Awash Valleys between 1970 and 1971 reached 48,900 ha; their expansion was further strengthened by the Military government (Post-1974) and grew to 113,000 ha until 1980 (Table 1).

<table>
<thead>
<tr>
<th>Area</th>
<th>Developed during 1970-71 (ha)</th>
<th>Projected cultivation before 1980 (ha)</th>
<th>Estimated irrigable area (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Valley</td>
<td>17,500</td>
<td>31,000</td>
<td>50,000</td>
</tr>
<tr>
<td>Middle Valley</td>
<td>3,000</td>
<td>32,000</td>
<td>80,000</td>
</tr>
<tr>
<td>Lower Valley</td>
<td>28,400</td>
<td>50,000</td>
<td>70,000</td>
</tr>
<tr>
<td>Total</td>
<td>48,900</td>
<td>113,000</td>
<td>200,000</td>
</tr>
</tbody>
</table>

*Source: Bondestam, 1974.*

Major beneficiaries in the Awash Valley were the then Ethiopian Sugar Corporation (ESC), the Ministry of State Farms Development (MoSFD) and the Relief and Rehabilitation Commission (RRC). Their benefits were purely at the expense of the pastoralists in the Valleys.

2 The classification of the Awash River Basin as Upper, Middle, and Lower valleys was made by the former Awash Valley Authority (AVA) in order to oversee the various agro-industrial projects that operated in the area.
During the Derg period, the Relief and Rehabilitation Commission (RRC) undertook settlement programs in many areas including the Awash Basin. By 1982, the Commission had 13,729 ha of land farmed in the Awash Basin. In the same period, it had resettled 6,321 heads of displaced pastoral families for farm activities, with a total settler population of 22,070 (Zekru et al., 1990). Settlement programs were being undertaken at Amibara, Gewane, Dubti, and Asayita—all in the Awash Basin, where the MoSFD was also operating state farms. These farming and settlement measures had critically affected pastoral development.

Following the change of government in 1991 and the subsequent structural adjustment adopted thereafter, the Horticulture Development Corporation (HDC), Ethiopian Sugar Corporation (ESC) and Awash Agricultural Development Corporation (AADC) were dissolved. The estates and enterprises were then reorganized to function as autonomous bodies, still under state ownership, yet weakening the fate of pastoralism in the area.

Rangeland development projects

A wide rangeland and livestock development policy with diverse orientations and objectives targeting the country’s lowland regions has been carried forward by the Ethiopian states from 1958 onwards. Developments with greater and concerted emphasis on lowland livestock systems were launched particularly after 1965. The major objective of this thrust was to enhance and consolidate the processes of integrating the production systems of the highlands and lowlands. In addition, commercializing the livestock sector was an important policy strategy. Thus, a series of livestock development projects were undertaken after 1965.

A forerunner in this regard was the First Livestock Development Project (1958–1963) which had a narrow emphasis on dairy development in the highlands. The subsequent one; that is the Second Livestock Development Project (SLDP) (1973–1981) emphasized the laying down of effective marketing and other infrastructure with the view to enhance livestock sales and processing (Coppock, 1994).

Subsequently, the then Ethiopian Livestock and Meat Board LMB initiated and funded a series of consultancy research works on the pastoral areas with a vast livestock supply potential for the newly installed infrastructure. The research conducted was inter-disciplinary, covering many relevant fields such as population, vegetation, water resource, pastoral anthropology, and animal husbandry. Based on the findings, a proposal was drawn up to launch the Third Livestock Development Project (TLDP) which took off and acted as the dominant force in the development of the livestock sector since 1975. As such, the TLDP has extended its facilities and services to benefit up to one million pastoralists who occupy 27% of the lowlands in the North, South and East of the country (ibid). The benefits included roads, markets, water points, veterinary services and the facilitation of inter-
regional trade. The primary project goal was to stimulate livestock commercialization in three regions singled out for intervention, totaling 203,000 km² (ibid). Three components of the Project were restructuring and modernizing the traditional system characterized by low-output, increasing efficiency through stratification of the livestock industry and developing a controlled system of range utilization by balancing livestock numbers with available resources.

The target regions were selected based on proximity to the highland and export markets, potential of superior livestock breeds and easy access to meat packing plants (ibid). Not considered by the TLDP were the lowlands to the West and Southwest which have rich grazing potential. Distance from infrastructure and prevalence of trypanosomiasis meant that these regions did not meet the selection requirements set by the Project. As described by Coppock (1994), the TLDP had a separate sub-project for each of the three target regions, namely the Jijiga Rangeland Development Unit (JIRDU), the Northeast Rangeland Development Unit (NERDU), and the Southern Rangeland Development Unit (SORDU).

It has now become clear that the projects faced unintended performance consequences and failures. The water development projects, for example, entailed negative impacts on the environment. Notable among the failed projects in this regard is the Southern Rangeland Development Unit (SORDU) in Borana, which tried to introduce water into dry places and caused disruption to traditional pastoral land use patterns. Although meant to be primarily a multi-faceted project, SORDU is remembered in retrospect for its emphasis on uncritical water development (Helland, 2000). The maldistribution of water points caused people to settle permanently at certain locations in large numbers. Gradually, the new situation led to the removal of the traditionally clear distinction between dry-season and wet-season pasture in Borana. As a result, the movement of herds is now greatly restricted with herdsmen grazing their livestock all year round near their permanent settlements. However, with the traditional patterns of movement and resource use significantly altered, seasonal resting of pasture ceased to be an important resource management tool and resulted in resource depletion in the area, impact of which ranges from changes in vegetation composition and bush encroachment to disappearance of woody vegetation (ibid).

Before the intervention by SORDU, the pastoralists in Borana depended on the traditional system of split herd management in which case livestock alternately moved between wet and dry season pasture. Thus, small herds were kept at semi-permanent settlements located close to where water was available for much of the year. However, large stocks were made to stay for the duration of the dry-season at distant cattle camps established at sites of deep water wells (ibid). The split herd management made seasonal resting of the crucial dry-season pasture possible—enabling grass regeneration while animals stay at the semi-permanent settlements during the rainy period.
Side by side with the uncritical water development schemes came the imposition of a ban by the local administration on range burning. The Borana most commonly practiced grass burning at the interval of three or four years to control bush encroachment and facilitate pasture growth. With the prohibition of burning, unpalatable grasses rapidly expanded. The situation helped only to speed up the loss of the once clear distinction between dry and wet season pasture, further aggravating resource degradation that had already been caused by the uneven distribution of water facilities (ibid).

The failure of all these pastoral development schemes can largely be attributed to the disregard of local interests and experiences and the exclusion of local communities in decision-making. The Borana, for example, were known for their traditions of water management, control and distribution techniques. To this effect, they had well-structured local institutions which played a vital role in establishing and enforcing access rights to the distribution and utilization of this critical resource. Therefore, by overlooking technical considerations of range management and local arrangements for appropriate distribution of water resources, the development schemes ultimately caused environmental damage, with undermining effect on traditional networks of mutual assistance and socially constructed means of averting risks.

On the basis of the justification that pastoralists have many livestock that overgraze and ultimately degrade the land, the centerpiece in all these rangeland development projects, in one way or another, has been the promotion of the sale of livestock and hence the commercialization of livestock husbandry. It was this supposed ‘pastoral irrationality’, a philosophy which underpins the rangeland projects in the country, that led to policies for destocking of pastoral herds. Reliance, on the one hand, on methods of indirect compulsion in which destocking was viewed as an end in itself, and on purely technological solutions, on the other hand, only invited failure. The motive behind rangeland developments and their policy drive was extracting as much surplus, in the form of livestock and livestock produce, as possible from the pastoral sector to be able to satisfy the growing demand for local, regional and international markets.

Owing to recurring droughts and socio-political pressures, per capita livestock holdings have fallen dramatically over the years, with dwindling income for pastoral households. As an alternative source of diet, grain has gained increased importance, forcing households to turn to markets for a regular supply. Hence, with an ongoing market penetration, the need for agricultural products continues to grow. Later, less and less pastoral households could manage to subsist on an entirely pastoral diet, which used to be the case in earlier periods. Grain requirements have, to some extent, been satisfied by locally produced crops, with a large proportion of household consumption needs being met from markets.
Such economic links, which often operate independently, could have resulted from multiple factors involving the relationship of herders with their neighbors and the State. More important to the livelihood of herding communities than the market relationships, however, are the exchange rates between pastoral and agricultural products. Changes in prices and market fluctuations have had serious consequences on livestock producers to a degree and manner comparable with adverse climatic conditions. Of course, exchange rates are affected by the products involved, seasons, distance from market and standards of transport and other infrastructure. The exchange rates decline even further in crises such as droughts, which take a heavy toll on livestock. Conversely, grain will become too expensive at such times, compelling the herders to significantly ‘decapitalize’ their livestock holdings. Thus, greater involvement with the market poses pastoral households the risks of market fluctuations caused by factors outside the realm of local situation. Therefore, risks of decline in livestock prices are high under extraordinary circumstances marked by adversities.

An increased commercialization of livestock production is also a result of other factors which have to do with national policies. In order to meet extra demands of the state for different taxes, households will be forced to increase the volume of their commercial livestock off-take. In addition, herders are driven to sell more animals by the need to maintain the level of income in the case of unfavorable grain-livestock terms of trade, a situation not necessarily evident in all market interactions involving pastoralists (Dietz, 1993; Dietz et al., 1999). Because of their inadequate access to regulated market, pastoralists are also subject to exploitation by livestock traders and middlemen. Retail traders and salesmen go down to local communities where they manage to buy livestock at cheap prices relative to what is offered at the open market (Dietz and Mohamed Salih, 1997). They also end up as victims of profit appropriation by marketers who accumulate the surplus for themselves.

Although this is the reality in which herding groups generally find themselves with regard to livestock commercialization, a persistent assumption exists on the part of governments and livestock development projects that the herdsmen have an irrational obsession with the possession of large herds regarding their livestock as reserve capital that they hardly destock under normal circumstance. Commercial off-take is contemplated in the event of high growths in herd size when livestock management becomes difficult in terms of labor or range capacity (Dietz and Mohamed Salih, 1997; Helland, 2000). Not being market-oriented, as they are misconceived, any off-take they make does not come as a response to price signals or in line with market mechanisms (Dietz and Mohamed Salih, 1997).

Over the last thirty years, livestock development and rangeland management projects in pastoral areas of Ethiopia had low productivity and commercial off-take attributed to natural and social constraints. As a solution to these problems, they
promoted the adoption of largely technical approaches, that is the introduction of modern production systems to raise livestock productivity and the establishment of market channels to enhance the commercial off-take of herds. At the heart of the policies of the development projects was, therefore, the promotion of destocking through integration of the pastoralists into domestic and international markets. The prime objective of livestock commercialization was to obtain cheaper supplies of livestock for private and government meat processing factories and abattoirs. That was why the rangeland development projects were located on strategic sites or access routes near the country’s major sea outlets and important meat packing facilities. Another purpose of the destocking campaign was to meet the growing needs of the politically vocal urban population for cheap meat and livestock products (Dietz and Mohamed Salih, 1997). The establishment of big abattoirs in connection with the rangeland development projects also came as a related development in the process of satisfying urban meat requirements.

The effort to increase commercial livestock off-take was also undertaken in a manner that little considered pastoral interests in profits from the sales. Emphasis was not given to making the market attractive and profitable to herd owners as it was on the campaign to destock for satisfying consumer requirements in general. Thus, a sustainable process of pastoral integration with the market will become possible through the sale of livestock and livestock products, if at least three important conditions can be met. First, it is very important to create a system of price regulation whereby average ‘caloric terms of trade’ between grain and livestock will be positive or not disadvantageous for the herd owners. Second, the creation of optimum accessible market conditions is important to encourage pastoralists to sell their animals at will. Coupled with this, steps should be taken to ensure a regular grain supply, which is an essential commodity the pastoralists need from the market.

Implementation of the TLDP was also hampered by internal and external political dynamics like social upheaval and intensification of insurgent activities that accompanied the 1974 Revolution. In addition, the 1977 Ethio-Somali war affected the activities of the TLDP as it had many sites in the conflict zone. In addition to organizational, financial and administrative bottlenecks exhibited in the course of its operations, the failure of TLDP to be more people-centered rather than simply donor-driven became outstanding (Coppock, 1994). The TLDP continued to operate until 1994 with much of the core administrative activities financed by the Ethiopian government. Additional funds had also to be made available from the Fourth Livestock Development Project (FLDP) which came into operation in 1988. The activities of FLDP were highly diverse with heavy emphasis given to forage development, livestock epidemiology, and livestock marketing in mixed farming systems of the highlands (ibid).

Ethiopia has been pursuing a livestock development goal in its development policies and programs on pastoral areas. In order to implement these plans and
programs; various bodies like the Livestock and Meat Board (LMB) were established as part of the Ministry of Agriculture and different multilateral organizations have poured considerable funding into the country’s livestock and rangeland development projects. A principal agency in this respect has been the then International Livestock Center for Africa (ILCA), now International Livestock Research Institute (ILRI).

However, this agency and others largely focused on the development of modern livestock production systems rather than on pastoral development. The large-scale schemes already referred to as FLDP, SLDP, TLDP and FLDP the first, second, and third livestock development projects and others based on rangeland development in Somali, Afar, and Borana pastoral areas were all meant to provide livestock development services like veterinary services, water development, rangeland management, genetic upgrading, supplementary feeding and fattening schemes. Their major purpose was to obtain animal supplies from pastoral areas to satisfy consumer needs in urban centers, or to pass them on as feeder stock to domestic fattening schemes and export markets. Of course, these development initiatives had brought improvements in the overall livestock sector. However, because of their greater emphasis on increasing livestock production and commercial off-take, they failed to address the needs and interests of local livestock keepers. Lessons gained from these failures led to a change in outlook on pastoral development interventions. Thus, a shift took place from the manipulation of factors of production to the development of a human capital and indigenous capacity to innovate on traditional livestock production.

To this end, the current ideology on pastoral development holds that great importance should be attached to fostering popular participation and strengthening local institutions to revive the organizational capacity of the indigenous people. The present approach focuses on revitalizing the capacity of herding populations to feed themselves and become self-reliant. This notable change in outlook distinguishes the pastoralist development paradigm from the classical livestock development paradigm (Mohamed Salih, 1991b; Dietz and Mohamed Salih, 1997)

In the light of the problems and shortcomings experienced with the rangeland and other livestock development programs, the current regime has laid emphasis on pastoral extension system.

Pastoral Extension System

Under previous governments, several pastoral development programs were implemented. Those programs had limitations and, therefore, failed to bring the desired results. The present government has enacted policy measures, which directly or indirectly have a bearing on the life of the pastoral groups in the country. These policy measures include the establishment of pastoral regional
states like Somali and Afar as part of the federal administrative restructuring of the country in 1992, the Proclamation (1992) which entitles the regional states to utilize revenues they generate for development projects within their jurisdictions and the 1995 constitutional provision that guarantees the herding populations the rights to free land for grazing and cultivation and not to be displaced from their land.

In addition, the 1995 Proclamation which stipulates the powers of the Federal Government’s executive organs bestows, among its duties and responsibilities, on the Ministry of Agriculture the provision of extension services to pastoral communities. In line with this, a draft working paper prepared by the Pastoral Extension Team in the Ministry (1999) states that the objective of the extension service is to enable pastoral and agro-pastoral communities to build and exploit their capacity to solve their problems on their own. As a strategy, the Extension Program assists these groups in developing their awareness about their environment, and in mobilizing their human and material resources for collective development through self-initiated projects. The paper also indicates that the government will provide financial, technical, and human power support to pastoral extension programs.

The Planned Extension Program, however, fails to adequately address the problems of the pastoralists as claimed. There is also a long-standing and stereotypical assumption which continues to linger to date about pastoralism as a way of life and mode of adaptation. The prevailing attitude is that natural resources are not properly managed or, in fact, are wasted as a result of pastoral tendencies to maximize livestock population on communally held grazing lands. It is generally thought that the resulting pressures on natural resources will eventually cause environmental destruction with serious consequences, if the process is left unchecked.

Two of the policy objectives of the Pastoral Extension Policy that illustrate the assumptions of the authorities on the intended program are to:

1. work out strategies whereby pastoral production can be redirected towards the development of domestic industries and supply raw materials to save and produce foreign exchange earnings, and the integration of the pastoralists into the national market and
2. encourage the introduction of small-scale pastoral settlement programs with federal and regional support to facilitate the provision of social and economic services to the herding population (translated from the draft working paper for the Pastoral Extension System, 1999).

The intent of the Policy is exploiting the naturally endowed pastoral areas to satisfy the consumption needs of urban dwellers as well as the national export requirements. The tendency to gradually integrate the pastoralists into the
mainstream society by implementing settlement programs to facilitate service provisions can also be noted. The actual purpose, as has always been the case with national policy makers, is to introduce pastoralists to a sedentary life. Thus, migratory pastoralism, an inferior and ecologically destructive mode of adaptation, will gradually be abandoned. In fact, the economic policy drive (Ethiopia’s current Five Year Plan) of the incumbent government, which is also stated in the preamble of the Pastoral Extension Program, is to implement Agricultural Development-Led Industrialization. Therefore, as this development ideology is promoted and executed, it is anticipated that pastoralism will become increasingly subordinated to the agricultural mode of production and way of life.

Assessment of Legal Status of and Policies on Pastoral Land Tenure

Legal status of pastoral areas

Throughout the history of Ethiopia, pastoral land has always been under direct State control. Traditionally, all “unsettled” or permanently uncultivated land in Ethiopia had been conceived as “no human’s land”, and hence was considered state land (EDRE, 1995). Such land was referred to as zellan or nomadic land. The Ministry of Interior (MOI) of the Imperial Ethiopian Government recognized two categories of nomads: the nomadic pastoralists and the nomadic hunter-cultivators (Yacob, 1995).

As Ethiopian land tenure systems are strictly related to tax-based state revenue, a special taxation law was proclaimed in 1950 for the zellan land. According to that law, tax assessment was based on the type and number of animals owned or possessed by pastoralist households. Accordingly, Eth.$0.50 was levied on a camel; Eth.$0.25 on a head of cattle, horse or mule; Eth.$0.10 on a donkey; and Eth.$0.05 on a goat or a sheep (ibid). However, the State was often unsuccessful both in assessing and collecting taxes on livestock, mainly due to difficulty of determining the livestock population at any given point of time. Livestock census was made exceedingly difficult by the constant movement of herders across national boundaries.

Zellan means nomad and the term is commonly used to refer to pastoral herders and hunters, gatherers as well as shifting cultivators. Etymologically and in everyday social discourse, however, the use of the term is highly associated with nomadic pastoralists. It also embodies pejorative connotations and prejudices against traditional livestock producers who inhabit the national frontiers. Therefore, in comparison with sedentary people, zellans are presumed to be ‘unsophisticated’, ‘unskilled’ and ‘backward’ who simply follow ‘tails of their stock’.
In the Borana area, for example, the Ethiopian Somali pastoralists often crossed boundaries to southern Somalia during tax assessment seasons. They would then come back to graze their stocks in Ethiopian territory after the tax assessment officials had left. The tax assessors often over-assessed the Borana pastoralists in order to compensate for what was lost by the evasiveness of the Somali pastoralists. From this, two kinds of inter-group tensions resulted. One was between the pastoralists who used the land without paying taxes, and those who were unfairly over-assessed because they were found in the area while tax assessment was made. The other tension was between the State and the pastoralists who were always made to pay taxes with little or no benefits coming to them in return.

As a way out, the Imperial Government introduced a poll tax in the final years of its period in most pastoral areas to replace the previous tax system based on herd size. These difficulties confirmed the views of the authorities that pastoralists presented problems of effective governance. However, it was not clear how poll taxes would help solve problems related to tax evasion. As an alternative, the authorities adopted a land distribution policy for individuals and groups with entrepreneurial attitude. Pastoral land was further allocated for national parks as in the Awash and Omo valleys. Such actions were taken usually with little or no alternative arrangements for the sustenance of the displaced under the pretext that all land not held in the name of any person, natural or juridical, belonged to the State. These notions have been promulgated in the constitutions and legal documents issued by successive Ethiopian governments. The provisions of these legislations in relation to pastoral areas and the ideology embedded in them were reviewed and presented under the following sub-sections.

Land reform legislations during the Imperial Period

A series of land-tenure-related legislations had been introduced and enforced over time. Particularly after the restoration of the Monarchy in 1941 under Emperor Haile Selassie I, many land proclamations were issued. The major ones, which have had significant bearing on the Ethiopian nomadic pastoralists, were Proclamation No. 1 of July 1994; Proclamation No. 70 of November 1, 1994; Legal Notice 117 of June 28, 1951; The 1955 Constitution and Land Policy and the Ethiopian Civil Code of 1960.

Proclamation No. 1 of July: Granting a gasha\(^4\) of land (including pastoral land) to each patriot who fought during the war against Italy, to nationals who spent the period of Italian occupation in exile and to survivors of persons who fell in battlefields. Thus, new classes of landowners emerged in the immediate post-war period. One of the consequences of this distribution was that pastoralists whose land had been taken away were turned into agricultural workers on lands now owned by the new land owners. In addition, large proportion of pastoral land was

\(^4\) Gasha is a measurement of land approximately equivalent to hectares.
turned into mechanized commercial farms—evicting and forcing thousands of pastoralists to crowd in areas not yet allocated.

Proclamation No. 70 of November 1, 1944: This clearly defined the status of a landowner and thereby rationalized the land tax system. Article 3 of this Proclamation defined a 'landowner' as 'a person whose title to ownership of land is recognized by law'. Titles were officially registered and entered into the tax roll. Thus, pastoral land continued to be owned by the State, and pastoralists, by this definition, were not landowners.

Legal Notice 117 of June 28, 1951: This Notice provided for land tax amendment and reclassification of holdings by fertility of soil and topographic conditions.

The 1955 Constitution and Land Policy: Article 130 Sub-article (d) of the Revised Constitution of 1955 stipulated “All property not held and possessed in the name of any person, natural or juridical, including all land in escheat, and all abandoned properties, whether real or personal, as well as all products of the subsoil, all forests and all grazing lands, water resources, lakes and territorial waters, are State domain.”

Both in letter and spirit, the provision made it clear that the State was henceforth the custodian of all natural resources including rangelands. As the Government didn’t recognize pastoral land as belonging to the pastoralists, no land tax, apart from cattle tax, was imposed and collected. This deprived pastoralists of ownership rights over their traditionally held grazing land and enabled the Government to allocate land freely to concessionaires. The pastoralists would have had chosen to pay tax in exchange for land by means of which they would have had tenure security. In fact, the prevailing view among pastoralists was that the land historically belonged to them, and that they are the rightful owners and, therefore, it should be under their control. The pastoralists even believed that the State should not even levy taxes. The rights and obligations related to the ownership and its use were in-built in the traditional rules and practices of the pastoral production system. Therefore, the contradiction between the State’s claim to ownership and that of the pastoralists’ described the perennial tension between the state and the pastoralist. This makes for a complex political relationship between the center and the periphery.

It was under these invincible provisions of the State against the weak position of the pastoralists that valley development agencies like the Awash Valley Authority (AVA) were created in the late 1950s. Following these developments, a considerable proportion of land traditionally belonging to the pastoralists in the Valley was appropriated and granted to concessionaires based on the rationale that grazing land belonged to the Government as provided in the Constitution. Even foreign companies like Handels-Vereniging Amsterdam (H.V.A) and Mitchell Cotts Ethiopia leased land on concessionary terms to produce sugarcane and
cotton, respectively. Individual entrepreneurs were also given concessionary rights for engaging in large-scale mechanized agriculture. Thus, although agro-industrial complexes in the Awash Valley helped stimulate the development of the area, they also resulted in internal displacement of pastoral groups such as Karrayu, Ittu and Afar. Therefore, the local people of these areas did not share from the fruits of the development schemes in any substantial measure.

Similarly, when the development of commercial agriculture based on the commercial production of sesame was launched in Setit Humera area in the 1960s, the Beni-Amir pastoralists were displaced, as were the Karrayu, Ittu and Afar in the Awash Valley. The Beni Amir did not benefit much from such development because laborers to work on the sesame estates were brought from outside the area. This was partly because of the belief that the Beni Amir did not have any experience in agriculture, and partly to solve the problem of urban unemployment elsewhere in the country.

The Ethiopian Civil Code of 1960: In respect to land tenure, Article 1168 of the 1960 Civil Code of the Empire of Ethiopia stipulated “The possessor who has paid for 15 consecutive years the taxes relating to the ownership of an immovable property shall become an owner of such property.”

According to this provision, pastoralists could not qualify for land ownership for they did not pay land taxes. All they paid was animal tax. This produced the unintended consequence of permanently alienating pastoralists from their land. The Civil Code further provided (Article 1194) “Immovable assets in Ethiopia which are vacant and without a master shall be the property of the State.” The catch in this article, concerning pastoral land, was that pastoral land could be presumed to be vacant when the herdsmen were seasonally away from their usual residence.

Accordingly, a new Ministry of Land Reform and Administration was created in 1966, and was empowered to administer, dispose of and distribute state lands to users with capacity to invest in modern agriculture. Most of the land available for such lavish distribution was found in areas inhabited by pastoralists but regarded as ‘vacant’ and ‘unused’.

Land tenure issues during the Military Rule
The political upheavals that brought the Military Government to power in 1974 subsequently led to the adoption of many fundamental measures connected with land use and tenure. The most important and far-reaching one was the Agrarian Reform Proclamation of March 1975 which made all rural lands and natural resources thereof ‘public property’ under the custodianship of the State. Accordingly, rural land was nationalized and redistributed to the farming community and landlordism was abolished forever. As well as reaffirming state ownership of all pastoral lands, the Proclamation limited the status of pastoralists only to usufructuary rights. This radical Land Reform Proclamation recognized the
rights of pastoral nomads to the lands they customarily use for grazing and other purposes related to agriculture through 'possessory title'. Article 24 of Chapter 5 stated "As of the effective date of this Proclamation, nomadic people shall have possessory rights over the lands they customarily use for grazing or other purposes related to agriculture..."

'Possessory title' refers to rights to land by way of possession, but ultimate ownership is held by the State. This title failed to bring about a fundamental change in the position of the pastoral nomads in relation to the land occupied and claimed by them as their inalienable property. In effect, it helped to perpetuate the long-standing insecure status of the pastoral nomads concerning land tenure. The implicit content of the Proclamation was that the pastoral nomads could exercise their possession title over land as long as the government did not want it for other purposes, be it agricultural or another. Hence, the provision of the 'possessory title' contained in this Proclamation did not completely remove the element of tenure insecurity that prevailed in the previous Imperial legal provisions. Of course, the Proclamation brought some measure of relief to pastoralists when it abolished all kinds of tax to traditional chiefs and made the pastoralists pay in cash only to the State per head of cattle possessed.

It also provided for the setting up of peasant associations in agricultural communities and pastoral associations in nomadic societies along with the entrustment of land and resource management to these bodies. Practically, however, these so-called grass-root institutions had accomplished little to their respective pastoral communities and rather served as smoke screens behind which further expropriation of land took place. They were simply used, as described by Yacob (1995), as conduits of state control of natural resources.

The ambiguity of rights to land tenure still made the pastoral nomads insecure and vulnerable as the alienation of their communal grazing land, particularly in the Awash Valley, for mechanized state farms continued unabated. As the Revolution gained momentum, state encroachment in pastoral areas increased. The process intensified as more and more emphasis was laid on the attainment of food self-sufficiency and agricultural-development-based industrialization. Moreover, the military regime also compounded the problem starting in the late 1970s by taking over parts of the Awash Basin for military purpose. It converted a vast tract of once Afar grazing land at the Arba locality into military training grounds for heavy weaponry. The area still continued to serve a similar purpose. The State made no practical alternative material, infrastructural and psychological support for pastoralists. Hence, the process of displacement of population groups in pastoral areas has been further accelerated—resulting in accelerated impoverishment of the inhabitants.

The Constitution promulgated upon the establishment of the People's Democratic Republic of Ethiopia (PDRE) in 1988 also reinforced the earlier State provision
that all natural resources including land, mineral, water resources and forests belonged to the State (Article 13). Article 10 sub-articles 2 and 3 state:

that the State will facilitate development through creating balance between natural resources and human settlement (Article 10 (2))

that the State shall encourage the resettlement of dispersed peoples as a strategy of dealing with the problem of rural backwardness and promoting the general economic and social welfare of such people (Article 10 (3)).

As clearly suggested in Article 10 (2), the Government of the time maintained the position that scattered settlement patterns are not favorable for socio-economic development. Hence, resettlement program was pursued as a major development alternative in rural areas. Lands targeted for resettlement schemes were located in sparsely populated territories inhabited mainly by pastoralists and shifting cultivators. In view of the increasing land pressures created by population growths in the highlands, the position of the State might have had justification for its position. The problem lied more with the conduct of the operation than with the rationale behind it. As it turned out, the scheme was implemented with little prior preparation, if any, and still worse without seeking the consent of both the host and resettled population groups. Thus, draconian methods were adopted to implement the program by forcefully dislocating large populations from one part of the country and resettling them in a different territory.

Land policy in the post-Derg Period
Following the collapse of the military government, the issues of land tenure and land reform were among the major items in the political agenda of the Transitional Government of Ethiopia (TGE). For most part of the transitional period, the Government kept deferring the issue until the election of a constituent assembly and the endorsement of a constitution after which a popularly elected government was established. In the meantime, there was a great deal of uncertainty as to the recognition of the customary tribal and clan land rights of pastoral and agro-pastoral groups in the country.


1. That all land remains the property of the people of Ethiopia and the.
2. Areas with special problems require special attention and treatment

The first provision reaffirmed the custodianship of the State over natural resources. The second one, though suggests that neglected populations should be given special considerations in development policies, alludes to pastoral and agro-
pastoral communities, too. The fact that references are made to the interests of marginal groups to this extent renders the Policy sympathy toward previously neglected populations.

However, this Policy also made a provision whereby private individuals and companies would have access to land on concession to develop commercial farms. It adds that the concessions would be made in a way that would not affect the land use rights of the local people. Yet, how this provision would work out when it comes to implementation remains to be assessed.

The 1995 Constitution and the pastoral land question: The 1995 Constitution of the Federal Democratic Republic of Ethiopia proclaims the following in Article 40 sub-articles 3 and 5.

The rights to ownership of rural and urban land, as well as of all natural resources, are exclusively vested in the State and in the peoples of Ethiopia. Land is a common property of the nations, nationalities and peoples of Ethiopia and shall not be subject to sale or to other means of transfer (Article 40 Sub-article 3).

Ethiopian pastoralists have a right to free land for grazing and cultivation as well as a right not to be displaced from their own lands (Article 40 Sub-article 5).

Article 40 Sub-article 3 does not provide anything different from the ‘possessory title’ granted to pastoral and agro-pastoral groups in the Land Proclamation of the Derg issued in March 1975. It does not recognize that customary land rights of the pastoral groups are deeply ingrained as centuries old traditions and that they have taken firm roots in the history and psychology of the inhabitants (Ayalew, 1995). Therefore, denying the indigenous people the customary tribal and clan land ownership rights and vesting them in the hands of the State does little in reducing the sense of insecurity that they continue to feel. However, Article 40 Sub-article 5 represents an important development as far as pastoral land issue is concerned. For the first time, it makes a specific reference to pastoralists and provides an apparent constitutional guarantee against displacement from their land in favor of other interest groups. Unlike previous legislations, constitutional or otherwise, this document confers upon herding populations the right to free land use (although not still able to dispose off their land), besides ruling out the act of dislocating pastoral households.

Article 40 Sub-article 6 further promulgates “Without prejudice to the rights of nations, nationalities, and peoples to own land, the Government may grant use of land to private investors on the basis of payment arrangements established by law.”
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The application of this provision would require further specific regulations aimed at identifying and demarking such lands. Only then will the inhabitants of marginal areas be spared from the threats of continuing land alienation, as Article 40 Sub-article 5 of the Constitution unequivocally guarantees.

Pastoral land tenure policies and policy outcomes

From the foregoing discussions in this paper on the legal provisions enacted by the three regimes, one may say that economic and strategic considerations have attracted the attention of policy makers with regard to pastoral areas. What is reflected in all the policies is the view that pastoralists are inefficient land users and they roam over a disproportionately large area with their animals—thereby degrading rangelands by overstocking them. It is apparent that the thrusts of these policies were towards an efficient utilization of pastoral lands. The policies underscored that an effective rangeland use was possible when the vast 'unused' resources came under the protection of the central government. According to Desta (1973), the intention of the Imperial Government when it made pastoral lands 'state land' was to acquire large areas for its settlement projects. Resettlement schemes were necessitated by increasing population pressures and continuing decline in agricultural productivity in congested and over-farmed highlands. Another factor was the desire to promote government-sponsored large-scale commercial farms and thereby attain food self-sufficiency and develop the country's export potential. It can, therefore, be understood that what really underlie the various policy drives that targeted pastoral lands was the promotion of wide socio-economic interests.

Since the 1960s, pastoral lands have been used for expansion of agricultural projects, conservation, settlement schemes and military training grounds. The consequence was eviction of the pastoralists from their land. The overall consequence of the contraction in terms of available rangelands and accessible water points for State policy had always been grave as far as the relations between the central governments and pastoral peoples are concerned—leading to the 'center-periphery' dichotomy and concomitant conflict of interests during both the imperial and the military regimes.

Regardless of the consequences, Ethiopian states have insisted on their stand that pastoral land be regarded as primarily state land; thus, in effect abrogating all customary pastoral land rights. As indicated in different State policies and legal provisions, the premise held was that the land occupied by herding populations is not permanently settled and legally possessed. Salzman and Galaty (1990:19) put this as "... It is thus not surprising that governments often feel pastureland to represent a national resource much more than the privately developed agrarian regions..." As part of this premise, the State also maintains that it has the right to utilize such land in the best interest of the large segment of the population. This explains why drastic changes in the legal status of pastoral land were needed in the
areas where governments have shown a particular agricultural development interest.

The schemes like the ones mentioned may be justifiable and well motivated. Or else, the State may have to reconcile contending demands from various population groups. Matters that need to be addressed may thus refer to the promotion of entrepreneurial interests, the pursuit of national food self-sufficiency, improving the country’s export potential, and resettling of people from congested areas because of increased population/land ratio. Therefore, the heart of the controversy does not lie in the intention behind state-sponsored utilization of pastoral land for other purposes, when such is deemed necessary. Rather, what has become contentious is that, as experience shows, such measures are taken without involving the pastoralists in the process or, at least without giving sufficient attention to their circumstances. To the contrary, present practice indicates a notable failure to acknowledge the long-standing rights that herding people possess over their ancestral land by virtue of inhabiting it for many generations. Being the only source of sustenance they have had all these times, the denial of access to critical environmental resources will, in effect, mean a gross reduction in the survival chances of pastoral households. Hence, it has to be a concern for the State, as it already is for the victims, that one part of the population should not be at receiving end of the consequences brought about by measures adopted in the interest of other population groups.

If, however, resource entitlements and ownership rights of the pastoralists are ignored, conflicts of interest are sure to arise as they have occurred many times. Besides entitlement and ownership rights, denying local communities access to a survival niche on which their existence as a people depends also raises a fundamental question of human rights. The demand for resource security and entitlement becomes a justifiable human right concern in view of the fact that the main source of subsistence for the pastoralists is the land appropriated by the State (Dietz, 1996; Dietz and Mohamed Salih, 1997).

On the other side of the issue, an official argument commonly held by State authorities pertains to the propriety of developing rangelands for the attainment of wide national goals in irrigation agriculture, wild life conservation, game ranching and tourism. In such a situation, a real dilemma of reconciling two widely differing forms of land use arises. Handling the dilemma may call for working out acceptable and adequate compensation arrangements, which duly consider the circumstances of the losers.

Pastoral groups have been the subjects of pressure not only from State administrations but also from land-seeking peasants in neighboring territories. Competition over farmland unfolds in cases where pastoral areas contain agricultural potential, and farming groups, due to growing population pressures in their region, become desperate for cultivable land. Resulting incursions into
agriculturally suitable grazing lands continue to make a firm hold, with herding inhabitants being pushed out further into the margins as the State mediates land rights and land access in favor of crop-based agriculture. Thus, in the midst of consistent pro-farmer or anti-pastoralist bias, herding groups will finally lose in the competition. A major, if not the sole, determinant in the process is the general tendency in the mindset of state policy makers to associate agriculture with development and pastoralism with primitivism.

It is clear that contending demands emerge from the State and different population groups in connection with scarce land resources. It does not mean, in such a situation, that governments must desist from introducing remedial measures with pastoral land as part of suggested possibilities. Instead, it will need to be exercised with the utmost care so as to equitably meet the needs of the various stakeholders involved.

Of course, a reversal of the land alienation that has already taken place is belated and politically impractical. Regardless of that, the present thinking and practice that pastoralists have no legal rights over the resources they survive on remains to be an issue for debate and policy initiatives. Therefore, ensuring for herding communities a secure access to their environmental resources with the right to control or manage authority presents itself as a highly rational option. At the center of the debate is that populations in marginal areas directly depend on a stable access to the natural resources therein. As a result, the question of resource tenure should necessarily come on top of the development agenda in the national pastoral policy initiatives. The treatment of resource tenure issues in policy agenda may constitute a first step in the process of ‘demarginalizing’ nomadic populations. A policy drive that addresses this major pastoral interest on the principles of equity with other communities might be regarded as a pastoralist-friendly one. Such a policy should be geared towards laying down legal and institutional frameworks vital for establishing secure pastoral resource tenure.

To ensure a stable resource tenure would primarily require the creation of a system whereby the present arbitrary and unlawful seizure of land can be controlled and prevented. A mechanism also needs to be worked out to introduce alternative land use strategies that will facilitate and guarantee the continuance of pastoral practices. This can be accomplished through the legal and physical demarcation of land use zones. Thus, the separation of pastoral grazing areas from other lands allocated for non-pastoral purposes can be managed. By so doing, the vulnerability of pastoralists to a growing external demand for land will also be minimized. However, there may still be cases in which the State will have to move into the territorial domain designated for the traditional livestock sector. When such action is necessitated by wider public interests, an appropriate system of compensation needs to be put in place and duly implemented for the land lost.
Attempts Made So Far to Mitigate the Problems of Pastoralists

There have been various attempts on the part of governments to mitigate the losses and displacements of the nomadic groups. These compensatory measures have been adopted in two main forms: 1) settlement schemes, 2) provision of irrigated pasture.

Settlement schemes

Settling displaced pastoral households was started in 1959 by the then Imperial Ethiopian Government Awash Valley Authority. In its period of activity, the Authority undertook maize and cotton farming on thousands of hectares of land allocated for this purpose. To this end, the Authority had the land cleared and farmed by hired labor. While the maize produce was distributed to the settled pastoralists for consumption, the proceeds from the sale of the cotton yield used to be paid out in cash per household head (Zekru et al., 1990). Meanwhile, a specialized agency called the Public Settlement Authority was made to take over the responsibilities of settling displaced pastoralists from the Awash Valley Authority. The new body carried out settlement programs from 1977 to until it was replaced by the then Relief and Rehabilitation Commission (RRC) in 1979. These settlement schemes were the Dubtie Settlement Scheme covering an area of 1000 ha; the Asayita Settlement Scheme covering an area of 80 ha; the Amibara Settlement Scheme covering an area of 1460 ha; and the Gewane Settlement Scheme covering an area of 426 ha (ibid).

Catering to the needs of the displaced population, however, was not the sole motive of these settlement schemes. Especially under the RRC, the state had, as an additional aim, to introduce the local inhabitants to irrigated agriculture and thereby to settle the semi-nomadic pastoralists. Besides, the nature of the operations clearly suggested that the ideological and political motives of the schemes overshadowed their economic significance. Hence, the programs proved to be ineffective and unpopular with little advantage, if at all, for the intended beneficiaries. Moreover, government annual budgets for all the aforementioned schemes have been discontinued since mid 1989 before the schemes proved their worth.

The settlement schemes illustrate the attempt by the authorities to respond in some measure to the difficulties of the pastoral groups affected by developments in the Basin. Nevertheless, it has been witnessed, in the course of time, that these schemes or 'relief camps in perpetuity', as Gamaledin (1987) calls them, did not bring about the intended results for the following reasons.
There was not consistent settlement policy since the introduction of irrigated agriculture in the Basin; the limited and ad hoc efforts made in this regard were meant only to pacify the disgruntled nomadic population and ensure that the agricultural projects underway are not frustrated. The situation was the same during the era of the Derg. Settlement ventures were undertaken more to alleviate short-term problems of the affected herdsmen than to remedy the situation in a lasting manner.

There is incompatibility between a predominantly nomadic way of life and a sedentary agricultural mode of existence. Accustomed to a mobile livestock-based form of adaptation, displaced herdsmen found it strange to take up farming and stock husbandry as carried out at the settlement schemes. A sudden shift was quite a challenge for the settlers as the new circumstance demanded learning different techniques and experiences as well as a great deal of physically laborious activity. The resulting incompatibility between the two modes of adaptations and the non-participation of the would-be beneficiaries in the designing and implementation of the scheme seem to have contributed to the failure. Alula and Fekadu (1988); Zekru et al., (1990); and Ali (1992) are, however, of the opinion that better results would have been achieved if these state-sponsored settlement schemes were adapted to the traditional pastoral practices. To these writers, it was ambitious to have involved the settlers in large-scale mechanized farms.

Whether the compensation made was genuine or not was questionable as the pastoralists were resettled on the same land that had been taken away from them but was later said to have been given to them.

There was failure to appreciate the age-old and easily unbreakable attachment of the pastoralists to the land. By occupying and inhabiting the territory for generations, the indigenous pastoral groups strongly feel that they are legitimate owners of the land. Consequently, they believe that no external body, government or otherwise, is entitled to dispossess them of the land. The consequential spirit of resentment and rejection has led to the reluctance and lack of co-operation manifested on the part of the pastoralists towards the schemes.

The unsuccessful attempts to settle, resettle and compensate the pastoralists made the local population suspicious of the motives on the part of the governments—leading them to believe that every move of the State was intended to take away more land from them rather than to benefit them.
The provision of irrigated pasture

In conjunction with the settlement schemes, irrigated pasture development was undertaken as a second compensatory measure to address the problems of the nomadic groups. These irrigated pasture development projects, most of which were meant for the Afar nomadic pastoralists, were the following.

*Alledeghi Irrigated Pasture Project:* Alledeghi is located in the Middle Awash Valley on an estimated 170,000 ha land. This is a wide area of wet-season pasture East of the Awash River. In a bid to utilize the pasture during the dry-season, a loan was secured from the World Bank in line with the study conducted there by the Awash Valley Authority (AVA) in 1971 (Ali, 1992). Thus, ten boreholes were constructed over the plain from which the Afar benefited until conflicts with the Issa interrupted their use of the holes (Zekru et al., 1990).

*Ingelele Irrigated Pasture Project:* Also located in the Middle Awash Valley, this Project was intended to benefit the Afar displaced because of the Amibara Irrigated Agricultural Scheme. It was designed to provide irrigated pasture for 120,000 heads of livestock on 3000 ha of land to which effect the military government issued a permit in 1984 (ibid). Entrusted with the responsibility of undertaking the Project was the Ministry of Agriculture. Work was started, but not so far accomplished for various reasons.

*Galifagi Irrigated Pasture Project:* This Project was launched in 1983 at Dubti. The Project covered 5258 ha land and was intended to benefit 31,000 heads of livestock (ibid). While the Ministry of Agriculture was responsible for this Project, the original plan was to irrigate the land by means of gravity for growing pasture. Although construction work had begun, the scheme did not go far enough, and failed to serve the intended purpose.

The tracts of land given to the displaced pastoralists in the form of compensation in the name of all these projects proved far below what they had lost to the irrigation schemes. As a result, it failed to satisfy their needs and alleviate their problems. Moreover, the projects increased the concentration of livestock on the blocks of irrigated pasture—leading to overstocking and further environmental degradation.

**Conclusions**

Planned development interventions in the pastoral areas of the country started in the late 1950s when the Awash Valley Authority was established to explore the agricultural potential of the lowlands. Following this, as part of the Second Five Year Development Plan (1963–68) that envisioned the expansion of commercial
agriculture in the Awash Valley area, the Imperial Government embarked on making land grants to concessionaires. Engagement in irrigated agricultural schemes was progressively expanded by individuals, transnational corporations and other concessionaire syndicates that took little notice of the needs and problems of pastoralists. Pastoral land was further allocated for national parks designed to promote the tourist industry as in the Awash and Omo valleys and other areas as well with little or no alternative arrangements for the sustenance of the displaced.

In the post-1974 period, state encroachment in pastoral areas increased. Large-scale private commercial farms operated along capitalist lines were nationalized and turned into state-operated enterprises. Additional pastoral land was taken over in the pursuit of the goals of food self-sufficiency and agriculture-based industrialization. Hence, the process of displacement of pastoralists had been further accelerated—resulting in the accelerated impoverishment of the inhabitants. In the early periods of the Revolution, pastoral traditional social organizations were supplanted by local level pastoral associations whose aims were to induce pastoralists to co-operate in realizing the highly resented ideology-driven government projects like resettlement, cooperativization and villagization; collection of taxes; and controlling of land and resources by posing as appendages of the formal administrative setup.

Interventions in the form of a series of rangeland management and livestock development projects initiated thirty years ago were also mainly driven by such imperatives as facilitating favorable conditions for the industrial sector, increasing revenue from export trade and satisfying the demands of urban consumers. Doornbos (1993:118) states the following about such exploitative relationships between the center and the periphery.

Above all, interventions in the pastoral economy and society have been increasingly dictated by powerful urban-based groups, whose interests are in potential conflict with those of the majority of pastoralists themselves. As urban growth and class formation proceeded, pastoralism came to be regarded not as a mode of existence with its own needs and demands, but either as an unpredictable nuisance or even a threat, or (at best) as a resource to be tapped and exploited in the 'national' interest.

The pastoral groups in the country in general and those of the Awash River Basin in particular view the successive Ethiopian governments as indifferent to their cases and situations. Consequently, they have gradually developed negative and hostile attitudes towards state authorities and intervention programs undertaken in the region. Although they are given promises and assurances to the effect that whatever damage or loss caused will be redressed, such promises are nevertheless looked at with utmost caution and mistrust and the such land tenure arrangements had been marked by conflicts of interest in the ownership and use of the communal
Successive Ethiopian governments from the time of Emperor Menelik have pursued the policies of bringing pastoral grazing lands under state domain and issued legislations to that effect with the justification that all land not held in the name of any person, natural or juridical, belong to the State. Due to this, the governments failed to give legal recognition to the traditional land rights of the indigenous pastoral nomads to the communal land which they considered to be their inalienable natural possession.

The needs and circumstances of the nomadic pastoralists were not adequately addressed by previous policy statements and strategies. The documents, largely reflected the wrong assumptions and generalized misconceptions of the authorities about traditional pastoralism. In fact, the legacy of cultural prejudice towards this mode of adaptation lingers on to this day although some sensitivity is being shown now toward pastoral groups by government policy makers. The Economic Policy and Constitution of the present government have made provisions to deal with the economic marginalization of previously neglected population groups, prominent among whom are herding communities. In the light of this, one would hope that the problem of ‘special areas’ might be given due attention within the framework of the current ‘Rural-Centered Development Policy’

References


AGRICULTURAL INFORMATION AND POLICY FORMULATION IN ETHIOPIA

Samia Zekaria Gutu, Central Statistics Authority

Introduction

Agriculture provides the livelihood for about 85% of the Ethiopian population. It is the main income-generating sector for the majority of the rural population and main source of food. The issue of food security has continual national importance in Ethiopia. To achieve social and political stability, the government has to be able to attain food security by issuing an appropriate agricultural policy. Reliable agricultural data is important for this policy process.

Policy makers and analysts require such agricultural statistics and information to plan and formulate policy, to monitor and evaluate performance of programs and projects and to make informed decisions on a maze of issues that impact on rural households and rural economy in general and the country’s economy in general. Agricultural statistics are also required by investors, traders, researchers and the public at large to assess opportunities, risks and prospects in the sectors. Donors require agricultural information to assess requirements for assistance or participation in development initiatives. Such information is also required for academic purposes and public debate.

Countries involved in preparing and implementing Poverty Reduction Strategies (PRS) need to make better use of existing data and to identify where new investments are needed. Donors, governments and all participants in the process focus on the need to set appropriate targets, monitor performance and feed this information back to the policy making process. A review of poverty reduction strategy papers by Evans (2001) concluded that the level of spatial analysis of poverty in most PRSPs and IPRSPs was very limited; and one factor contributing for this was lack of reliable data.

Data requirement of agricultural development for planners and policy makers ranges from agricultural resource bases which include human resources (rural population), land, water, forest, wildlife, livestock, poultry, beehives and fisheries to agricultural services, production and marketing which include peasants’ smallholdings, agro-pastorals and commercial farming systems. Thus, collection of reliable, comprehensive and timely agricultural statistics in establishing economic performance indicators that could facilitate monitoring and evaluation of policy measures is very important.
Currently, large amount of agricultural information is available in the country in many data producing and utilizing organizations to satisfy their specific needs. However, there is often lack of coordination among different agricultural statistics producers. This creates duplication of efforts, wastage of resources and confusion among data users. Agricultural data and information are indispensable strategic resources that need to be developed and harnessed in a systematic manner for development.

The objectives of the paper were to:
- review past and current growth of agricultural statistics in Ethiopia
- assess methodologies, types of data collected and quality and constraints of existing official agricultural statistics
- review initiatives that were put in place to improve agricultural information system
- characterize challenges facing data producing agencies
- appraise challenges encountered in producing agricultural data for rural poverty reduction strategy and
- recommend future directions in the improvement of agricultural information system.

Historical Background of Agricultural Statistics and its Growth in Ethiopia

Since the compilation of statistical data on agriculture has been initiated in Ethiopia, three distinctly identified historical periods are characterized as follows:
- a) Before 1974—“Ad-hoc survey”
- b) From 1974 to 1979 “Annual Agricultural Sample Surveys”

Status of crop and livestock statistics before 1974

The growth and development of agricultural statistics could be discussed with the progress of statistical institutions that are responsible to collect, process and disseminate relevant data. Before 1974, statistical services in general and agricultural statistics in particular were in a weak position. During this period, the state of crop and livestock statistics was generally unsatisfactory and inadequate with respect to coverage, timeliness and reliability of data.

The author did not find records or documents that show when agricultural surveys were actually started in Ethiopia. However, agricultural statistics was initiated after the establishment of the Department of Economics and Statistics in 1954 in the
Ministry of Agriculture (Rau, 1972). He indicated that with technical assistance obtained from FAO, serious attempts were made to develop and improve agricultural statistics in the country. The only information he got available on area, production and yield-rates of crops at the time of his review was that built by the then Central Statistical Office (CSO). After reviewing the status of agricultural statistics, Rau concluded that the work done by the Department for 15 years starting from 1954 to 1968 had not significantly improved agricultural statistics, but helped to evolve a suitable scientific methodology for crop sampling surveys. It also provided some valuable information on methodological, operational and cost aspects for planning regularly nation-wide crop estimation procedures.

Crop statistics and the Ministry of Agriculture (MOA)
In the early years of the period between 1954 and 1968, emphasis was given to training of related office and field personnel. Conducting researches was the major task of the Department of Economics and Statistics of the. In 1965 and 1966, two pilot sample surveys were conducted in two provinces. Following the pilot surveys, crop estimation survey was conducted in 1969 in three provinces to obtain estimates for each of the three provinces separately. The surveys covered major crops such as tef, wheat, sorghum and maize. This activity was discontinued after 1969 owing to shortage of trained human power and funds.

Moreover, before 1974, many organizations were actively involved in producing data on crops. Some of the institutions were the Ministry of Agriculture (MOA), which was prominent among such specialized agencies, Ethiopian Grain Corporation, Ethiopian Grain Board, National Coffee Board, Ethiopian Tobacco Monopoly, Awash Valley Authority and Central Statistical Office (now Central Statistical Authority (CSA)). These institutions were collecting data on agricultural statistics on ad-hoc basis. Among the statistical data collected were details on production, exports, imports, prices, area planted, yield, fertilizer, climate, land tenure and farm credit. These data throw light on specialized aspects of agriculture in particular localities. Information on yield and other aspects of crop production was also available from studies carried-out by the then Institute of Agricultural Research (IAR) and other bodies (CSO, 1974).

Extension and Project Implementation Department (EPID) of the MOA was one of the institutions that were involved in collecting agricultural statistics at farm level. Starting from around 1970s, EPID had carried out surveys on major crops in areas under its jurisdiction. In 1970 and 1971, it had conducted two crop sample surveys in almost all the then provinces of the country except Arussi and Eritrea on two most important crops of each area.

Before the establishment of EPID, the FAO Fertilizer Program conducted crop sample survey for the major crops in nine provinces basically to set information on the responses of fertilizer on different crops on demonstration plots. Yield
estimates from this study helped EPID to focus its extension program towards those crops and fertilizer inputs.

Crop statistics and Central Statistical Office (CSO)
CSO was established in June 1960. During the first three years of its existence, it had very slow progress. At the beginning of 1965, the cumulative effects of accomplishments of Statistical Service began to grow rapidly (CSO, 1967).

The first and the second rounds of multi-purpose National Sample Survey (NSS) were conducted from 1963 to 1969. The first round covered 12 provinces out of 14 in Ethiopia. The first round of NSS emphasized on obtaining structural data from the provinces, covering about three provinces a year. It took four years to be completed. This was the first attempt ever by the CSO to conduct a survey of any sort. It is not difficult to see the shortcomings of the survey in terms of organization, technical planning and execution. However, it had produced useful data and, more importantly, it had provided, for the first time, field experience that helped a great deal in the second round. The second round NSS covered 13 provinces and it was undertaken simultaneously in all provinces for a year. In this round, objective measurements of fields were done better based on experience gained from the first round. Moreover, concepts and definitions were clearly spelt in instruction manuals that improved quality of the survey results. After the second round NSS, CSO placed its emphasis on obtaining annual information for the whole country on rural as well as urban economy (e.g. agricultural production, consumption and price) surveys. The second round NSS reports were produced and printed in several volumes.

Towards the end of 1972, Agricultural Statistics Sector Review Committee (ASSRC) was formed to assess the status of agricultural statistics of that time and to recommend specific programs for further development of statistics in the country. The Committee’s report indicated that from the standpoint of providing a comprehensive data that shows what was taking place in the crop sub-sector at national level, the data were seriously deficient. In this respect, the information was unreliable, restricted in coverage, collected only sporadically and published late, if indeed published at all. Specially, data regarding the output of major crops nationally or regionally were very inadequate (CSO, 1974).

Livestock statistics before 1974
Livestock and Meat Board (LMB), CSO and MOA were mainly responsible for generating livestock statistics. Data collected by the LMB include number of livestock, grazing conditions, stock migration, market, husbandry practices, livestock diseases and slaughtering and agricultural characteristics of livestock producing areas. Similarly, CSO had produced provincial estimates on number of cattle, sheep, goats and other animals based on the first and second rounds of NSS. The data on livestock numbers were regularly published in the Statistical Abstract of the CSO. However, the results on livestock numbers published in the Abstract
and figures quoted from LMB were different. It was ASSRC’s expert’s opinion that such surveys as the NSS, which attempted to collect a wide range of data on demographic, economic and social conditions, appeared unsuited to producing reliable information on the livestock sub-sector in Ethiopian conditions.

As in the case of crop statistics, it was found that livestock data that were compiled by different institutions were very deficient in providing accurate picture of the conditions in the sub-sector. Apart from these gaps in livestock data, difference of data from different sources made them more unreliable (CSO, 1974).

**Status of Annual Agricultural Sample Surveys during 1974–1979**

To satisfy the country’s need for agricultural statistics, efforts were made by concerned agencies with regard to crop and livestock data to narrow data gaps in that period. MOA conducted six nation-wide agricultural sample surveys including Small-Scale Agricultural Sample Survey of 1976. Before 1980, agricultural surveys and related data collection activities were the responsibility of the MOA. Specially, when the MOA started conventional type of annual agricultural sample survey starting from 1974 to 1979 with the assistance of FAO/UNDP, the preparations of a broad survey plan, schedules, instruction manuals and other survey documents were undertaken by the MOA. Regional and field supervisors of the MOA and temporary enumerators undertook the fieldwork during each survey. CSO co-operated very closely with the MOA by supplying supervisors, vehicles and equipment. MOA staff members processed the collected data manually.

In each survey year of 1974–1979, there were gradual developments in methods of data collection, sample design, sample size and topic coverage.

Generally, the socioeconomic and demographic data available in Ethiopia before 1980 were seriously deficient and unupdated. Most of the statistical surveys undertaken were ad-hoc and subject to various shortcomings. There was no national statistical program to ensure a continuous flow of data needed in development planning and in monitoring and evaluation of implemented development program.
Considering the limited resources available in a developing country like Ethiopia, the establishment of a National Integrated Household Survey Program (NIHSP) was very important. NIHSP enables a national statistical office to run many annual national socioeconomic and demographic surveys using available infrastructure, field staff (enumerators, supervisors, drivers and others), logistic support and data processing facilities. This helps in the effective and efficient use of the available resources. Thus, to narrow the gap in the demand for socioeconomic and demographic data and to make efficient use of the limited resources, NIHSP was initiated in 1980 by CSO with the assistance of FAO/UNDP and UNICEF. Furthermore, since the country’s economy is based mainly on agriculture, the development and improvement of food and agricultural statistics was also taken considered to establish the Rural Integrated Household Survey Program (RIHSP) in 1980 as a component of NIHSP (Hasen, 2000).

After careful consideration of the need for optimal utilization of available resources in the production of agricultural statistics, it was found necessary to entrust CSO to conduct agricultural surveys. Thus, CSO made several efforts in producing agricultural statistics through Integrated System of Food and Agricultural Statistics Program (ISFASP) and carried out 13 annual agricultural sample surveys between the years 1980 and 1992.

Unfortunately, the annual agricultural sample survey was interrupted for two years (1992 and 1993) when the CSA was fully engaged in preparing for the 1994 Population and Housing Census.

Existing Situations of Agricultural Statistics

Scope and coverage of surveys

Under the umbrella of NIHSP, CSA plans and executes many national socioeconomic and demographic surveys. The surveys include those on:

- main season annual agriculture (crop production forecast, area and crop production, land utilization, livestock, and agricultural practices)
- 'belg' season annual agriculture
- labor force
- distributive trade and services
- informal sector
- retail prices, producers' price of agricultural products
- household income, consumption and expenditure
- welfare/poverty monitoring
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- national family and fertility
- demography and health
- sample vital registration system: health and nutrition
- disability, large and medium scale manufacturing and electricity industries and
- mining and quarrying industries, construction and cottage/handicrafts industries.

Moreover, the Authority has carried-out the 1984 and the 1994 national Population and Housing Censuses and disseminated the results to users.

The Annual Agricultural Sample Survey is designed to cover selected households in sedentary rural areas of all regional states in the country. Agricultural households in urban and agro-pastoral areas are not included in the annual surveys. Thus, there is data gap especially on livestock in Somalie and Afar regional states, where most of the households are agro-pastorals. Moreover, the medium-and large-scale commercial farms that are now emerging are not included. However, efforts are being made to cover this sector in subsequent years and compiling the list of these establishments is underway. Agro-pastorals and urban and commercial farms were covered in the first Ethiopian Agricultural Sample Census conducted in 2001/2002.

The primary sampling unit used for the Agricultural Sample Survey (AgSS) was defined as an enumeration area (EA) for the 1994 Population and Housing Census. Starting from 1998, sample size of the AgSS has reached 1450 EAs selected from all regional states of the country. From each selected EA, a representative sample of 40 agricultural households was selected to represent the agricultural population of the sample EA.

Sample design

A two-stage stratified sample design was used to select sample EAs and agricultural households. The primary sampling units (PSUs) were enumeration areas (EAs). Agricultural households were secondary sampling units.

Questionnaires were administered to all holders within the sample households. Number of sample EAs was determined for each reporting level based on precision of major estimates and cost consideration. Within each stratum, EAs were selected using probability proportional to size: systematic sampling size being total number of agricultural households in the EA as obtained from the 1994 Population and Housing Census. From each sample EA, 40 agricultural households were systematically selected for the survey from a list of households prepared at the beginning of the fieldwork of the survey (CSA, 2000).
Method of data collection

In the Annual Agricultural Sample Survey, data on area and production were recorded on questionnaires using subjective and objective methods of data collection. Information on farm management practices (application of farm inputs) and data on livestock population and poultry was collected subjectively by interviewing holders in each sampled household.

The objective measurement procedures were carried out for crop production forecast and main season agricultural surveys. Hence, area measurements were carried out for 25 agricultural households sampled from each sample EA. This requires that all separate fields by land area utilization be physically measured using compasses and measuring tapes. In addition, for all fields under temporary crops of each holder of the last 15 sampled households, each was classified by type of crop, and for selected major crops, a field was randomly selected for each crop for crop cutting to be performed. Crop cutting procedures consisted of demarcation of a 16 m² plot randomly located in the selected field for which the crop in the field was to be harvested (CSA, 2000). In order to accomplish the data collection operation, all enumerators were supplied with the necessary survey equipment like compass, protractor, ruler, measuring tapes, balance scale, poles, ropes and sample bags at the end of the training.

Types of agricultural statistics

CSA has six survey programs that produce various types of agricultural statistics (Table 1).

<table>
<thead>
<tr>
<th>Program and Content of Survey</th>
<th>Areas covered</th>
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<tbody>
<tr>
<td>Main Season Annual Agricultural Sample Survey</td>
<td>21 Major grain food crops</td>
</tr>
<tr>
<td>Area and Crop Production Forecast</td>
<td>Area under crop, fallow, grazing, others</td>
</tr>
<tr>
<td>Land Utilization</td>
<td>Major grain crops</td>
</tr>
<tr>
<td>Area and Crop Production</td>
<td>Livestock population poultry and beehives</td>
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<tr>
<td>Livestock</td>
<td>Quantity and type of agricultural inputs</td>
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<tr>
<td>Agricultural Practices</td>
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<tr>
<td>Belg Season Annual Agricultural Survey</td>
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<tr>
<td>Area and Production</td>
<td>Major grain crops</td>
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<tr>
<td>Agricultural Practices</td>
<td>Types of agricultural inputs</td>
</tr>
<tr>
<td>Monthly Retail Price Survey (urban and rural areas)</td>
<td>Agricultural and non-Agricultural products</td>
</tr>
<tr>
<td>Monthly Producers’ Price Survey (rural areas)</td>
<td>Agricultural products</td>
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<tr>
<td>Enset Survey (special one-shot survey)</td>
<td>Enset and its products</td>
</tr>
<tr>
<td>National Benchmark Fertilizer survey (special survey)</td>
<td>Utilization of fertilizer</td>
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</table>

Production and area under 21 major food crops (cereals, pulses and oil seeds), which are the staple food of the population, are collected annually for main and belg seasons. Data on livestock population, poultry and beehives are collected
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annually. The types of data collected in agricultural practices include type and quantity of agricultural inputs used by peasant holdings.

Quality of agricultural statistics

One development in agricultural statistics is towards a broader definition of quality including aspects such as accuracy, timeliness, comparability and availability (Jomier and Vogel, 2001). Furthermore, Eurostat’s definition of statistical data quality consists seven dimensions: relevance, accuracy, timeliness and punctuality, accessibility and clarity, comparability, coherence, and completeness (Grunewal et al., 2001).

Accuracy was defined in terms of sampling errors, total survey errors or coefficient of variations. The main measure of timeliness is the period from the reference point to data dissemination. Timeliness is the component of quality that has gained importance by the transition from producer-oriented to user-oriented quality.

The current CSA data fulfill the accuracy and timeliness dimensions of quality. All CSA statistical reports meet necessary measurements of accuracy. Survey results for the major crops are within reasonable measures of error. Concerning timeliness, in recent years, CSA produces its reports within three to four months after completion of data collection. However, reports of crop production forecast are disseminated in a relatively short period after data collection. In other words, Annual Crop Production Forecast Survey is usually conducted from September 11 to October 11 of each year and data obtained are disseminated to policy makers and other data users around the end of November of each crop year.

Other dimensions of statistical quality are comparability and availability. CSA produces undisturbed time-series agricultural statistics with good comparability over time and space. However, in a country where agricultural census has not been undertaken, CSA’s data is not expected to be comparable with related information produced by other agencies.

Constraints of CSA

The constraints of CSA are expressed in terms of survey coverage in geographic area and types of agricultural statistics collected. Many data users consider lack of methodology in capturing rare items, and lack of resources to provide data at lower administrative levels as other constraints of CSA. In a general-purpose annual agricultural sample survey, CSA could not provide data on rare items or data on specific items such as livestock products. These types of data could be obtained through special surveys with specific methodology. Lack of skilled human power and finance hinder CSA from conducting such special surveys.
Strengths of the current system within CSA

The strength of CSA is expressed in terms of having permanent field staff at a grass roots level. In each sample site, there is an enumerator stationed in the peasant association. In addition, one supervisor is assigned to four or five enumerators to supervise the fieldwork. CSA utilizes these enumerators and available logistics support for different types of surveys through NIHSP. This enabled CSA to use its available resources effectively and efficiently. Provision of in-service training to the field staff before the fieldwork of each survey enabled CSA to use standard concepts and definitions. Hence, combination of the aforementioned points and the following ones contributed much to the strength of the current system. These are:

- utilizing accepted methodology of probability sample survey that can provide data with a measurable degree of reliability
- providing accurate and timely crop production (especially yield forecast) data before harvest to governmental and non-governmental agencies for planning in order to enable them to take necessary measures
- making effort to set up a medium-term statistical program with relevant government agencies and
- finalizing preparatory activities for the first Ethiopian Agricultural Sample Enumeration (EASE) done in 2001/2002 and launching the sample census.

Weaknesses of the current system

The following points are the weaknesses of CSA’s current system.

- Failure to coordinate and harmonize agricultural information produced from different sources in the country.
- Inability to provide agricultural statistics at a lower administrative level mainly due to unavailability of adequate data from census or administrative records.
- Unavailability of methodology as to how to produce data at a lower administrative level with available resources.
- High turnover of skilled human power due to insufficient payment set by the government.
Initiatives to Improve the Agricultural Information System and Challenges Facing Data Producing Agencies

Presently, when Ethiopia is making effort towards liberalizing and decentralizing the state of economic management, the need for disaggregated, reliable and timely data becomes more important than ever before. Gauging the impact of policy changes by means of quantitative indicators over time is possible only with the availability of reliable data that reflects the activities of the sector under consideration. Moreover, effective rural poverty reduction will require sustainable investment in rural and agricultural data systems.

Initiatives to improve Agricultural Statistics System

Formulation of a comprehensive national program that assesses the existing database, identifies data gaps and rationalizes data needs with available resources is a timely initiative. After analyzing the interest in improving the agricultural statistics systems of main institutions such as MEDaC, CSA, MOA and other relevant decision makers, Medium-term National Statistical Program (MTNSP) National Agricultural Information System (NAIS) were put in place.

Medium-term National Statistical Program
The Medium-term National Program (MTNSP) was formulated by a taskforce of experts set up by the former Ministry of Economic Development and Cooperation in collaboration with CSA. This Program encompasses a range of data items covering official statistics, data generated by government offices at all levels, local authorities, non-government organizations and the private business sector. Before the establishment of this Program, assessment of the data needs and existing data gap was thoroughly analyzed and what new data should be collected was identified (MEDaC, 2001). Furthermore, the focal institutions that would be responsible to conduct surveys or compile socioeconomic and demographic data were incorporated in the Program. Finally, statistical priority for five years (2000–2004) was established after analyzing institutional capacity of the producing agencies especially that of CSA (MEDaC, 2001).

The major objectives of the Program were:
• fulfilling the statistical data requirements for planning, policy formulation, monitoring and evaluation, socio-economic policy analysis and research activities and
setting up systems to ensure a sustainable flow of statistics in Ethiopia and thereby, wherever possible, bridge over the existing statistics gap during the medium-term.

In addition, workable Statistics Act with detailed regulations and procedures is required to reorganize information generation system. Instituting legal regulatory system would help to avoid duplication of efforts and to ensure efficient utilization of resources and improve quality. In the draft document of the proposed National Medium-term Statistical Program, a revised Statistics Act which is expected to articulate CSA’s mandate was incorporated (MEDaC, 2001).

**National Agricultural Information System (NAIS)**

The initiative of establishing NAIS within MOA has been pursued since 1997 and three workshops were organized. During the first workshop, existing situation of agricultural information was assessed, types of agricultural data and users and producers of such data were identified, and the need for a new agricultural information system was thoroughly discussed (MOA, 1999). The second workshop was organized to discuss with stakeholders the feasibility of implementing NAIS in the MOA. The objective of the system was to design a mechanism by which comprehensive and timely agricultural information could be generated. The third workshop was organized to review and discuss the development of the National Charter and Legislation for NAIS (MOA, 2001).

The National Charter document defines the type of information that can be collected and disseminated and includes a detailed structural organization of NAIS. The Draft Final Legislation document gives NAIS the mandate to collect and disseminate agricultural information from and to district, ‘kebele’, zone, region and federal government levels. Among the objectives of these regulations were to:

- facilitate the integration and harmonization of agricultural data collection, processing and dissemination activities and
- develop appropriate mechanisms for the formulation of common policies, standards and action plans to bring about a unified agricultural data and information system under the Service (MOA, 2001).

**Challenges facing data producing agencies**

In many African countries, sectoral agencies have been empowered by law to collect, compile and disseminate statistical information with or without reference to National Statistical Offices; thus creating confusion or sending conflicting signals to data producers (Kieta, 2001). Agricultural censuses, surveys and other statistical inquiries are often undertaken in isolation and there is a general lack of understanding and co-ordination between data producing statistical agencies and offices undertaking economic analysis, planning and decision-making or data users.
Agricultural Information and Policy Formulation in Ethiopia

Challenges facing data producing agencies in Ethiopia are lack of coordination and lack of appropriate institutional arrangements.

Lack of Coordination
The envisaged MTNSP and NAIS of the MOA have objectives similar in many aspects. MTNSP is responsible for all socio-economic (including agriculture) and demographic data while NAIS is responsible for agricultural and related data. Both MTNSP and NAIS indicated in their respective documents that they would establish standards and coordinate the data collection, processing and dissemination for data of their interests. Furthermore, both documents stated the need to minimize duplication of efforts and waste of scarce resources. However, it does not seem that there was any coordination between the institutions that were involved in the preparation of MTNSP and NAIS. Both initiatives prepared regulatory documents to empower them and implement their programs once approved by the government.

Coordination of activities is essential among the various producers of food and agricultural statistics, other sectoral statistical systems and within the overall national statistics system. Coordination is also essential between producers and users of statistics to ensure relevance and sustainability of rural and agricultural data systems.

Lack of appropriate institutional arrangements
Like in many African countries, the National Food and Agricultural Statistics System (NFASS) in Ethiopia typically suffers from lack of a clear identity and ownership. While national statistics offices (NSOs) are generally mandated with the responsibility for all official statistics, responsibility for agricultural statistics is, in many instances, delegated to the MOA which is often technically ill-equipped to assume this responsibility (Kieta, 2001). Thus, appropriate, functional and institutional arrangements need to be established with well-defined linkages and a clear delineation of responsibilities among CSA, MOA, and other data producing agencies in order to implement MTNSP and NAIS. The technical capacity to manage the system and to ensure integrity and quality of statistics produced must be ensured through the institutional arrangements.

Challenges in Producing Agricultural Data

Historically, agricultural data have been collected to meet development needs related to land use and agricultural production. Data needs also refer to the welfare of the population dependent on agriculture (e.g. income, health and nutrition) as well as food security of the rural population as a whole. Even though this information has proved useful, today’s data need to go beyond what is available in most countries. The broad issues of data quality and availability are widely
considered by data users (Kieta, 2001). In this respect, overall results of existing agricultural data are far below the expectations of data users. The available agricultural data are often incomplete in terms of the types of commodities covered, the range of variables or data sets covered, geographical coverage and unavailability at low administrative levels. Even when data are available, their accessibility is, in some cases, difficult and their reliability is often questionable. When it comes to data relating to depletion of land resources and their environmental effects, the situation is worse.

Technical constraints

Much of the agricultural production of Ethiopia comes from farmers using various agricultural practices. This complex environment, coupled with lack of documented and factual information on the farming practices used, creates a challenge for data collection. Due to large number of illiterate people in rural areas, farmers are unable to report the size of their holdings in standard units. In this exercise, CSA has documented more than 100 different types of local units that were reported by farmers in response to questions relating to size of their holdings during the last two decades. Similarly, there are about 200 different types of local units reported by farmers in quantifying their crop production. Mostly, names of local units in different districts are similar but are different in measurement units. As a result, crop production estimates are based on the objective measurement of crop areas and yields, but these exercises are extremely costly and often generate only limited information. Due to complexities of the procedures involved in the objective measurements, CSA is limited to production estimates of only 21 major food crops in its Annual Agricultural Sample Surveys. Therefore, specific concerns such as yield measurement of root crops and numbering of pastoralist livestock need to be urgently addressed.

However, CSA has launched its first Agricultural Sample Enumeration starting from early September 2001 using objective measurements to produce estimates for various crops such as root crops, vegetables, fruits and cash crops in addition to the major temporary food crops. Conventionally, such operations, as huge as agricultural censuses, are usually conducted using subjective methods of data collection.

Challenges relating to reporting levels

Planners and other data users in countries where planning and administrative functions have been devolved to low administrative units, to district level, for example, require highly disaggregated data. However, it is important to point out that sample surveys are not well suited for collection of highly disaggregated data (Kiregyera, 1999). Certainly, official statistical offices could not meet all needs.
District level reporting is applicable in a country like Ethiopia, when the country carries out Agricultural Census which is conducted may be only once in ten years. Reporting levels of Annual Agricultural Sample Survey (AgSS) cannot go beyond zonal level; a limitation which is not weakness of CSA. The question is how should the need for disaggregated data be met.

To satisfy data users’ needs, CSA and MOA or regional agricultural development bureaus (RADB) should be enhanced to provide data at low administrative levels. Usually, zonal estimates obtained from AgSS of CSA and totals of district estimates compiled from RADB do not agree. In such cases, district estimates will have to be adjusted so that they add up to the zonal estimates obtained from AgSS. As a result, duplication of effort and provision of agricultural statistics from different sources could be minimized.

To meet needs for disaggregated data, many countries apply the technique by (Kiregyera, 1999) given as:

\[ t_{ci} = Tx \left( \frac{t_i}{\sum t_i} \right) \]

assuming that the number of districts in a region be 4 and letting \( T \) = estimates for the region from the agricultural sample survey, and \( t_i \) = estimates for district \( i \) from \( (i=1,2,3,4) \) from the reporting service to find disaggregated data adjusted for district \( i \) such that \( \sum t_{ci} = T \). In this case, it is \( t_{ci} \) and not \( t_i \) that should be published as official district statistics.

Conclusions and Recommendations

Conclusions

Unlike those of many other African countries, the Ethiopian Government is highly committed to support the national statistical system of the country. In Ethiopia, statistical programs are not dependent on external resources. Huge operations such as Population and Housing Census and Agricultural Sample Census are financed by government allotted budget. Of course, these operations were supplemented by international agencies such as UNFPA, USAID and EU.

Lack of coordination among major agricultural data producing agencies is the major problem in improving NAIS. Coordination is best achieved through the establishment of a high-level steering group linked to PRSP monitoring and evaluation. The capacity building of these data producing agencies should receive high concern. Since data producing is highly technical and demands qualified and
dedicated personnel, the government should devise mechanism to retain senior staff of the data producing agencies. The mechanisms would include offering special salary scales and considering some kind of fringe benefits to staffs involved in data producing.

Documentation and dissemination of agricultural data require establishment of a one-stop center where all data users could easily access the data. This can be achieved by establishing the envisaged NAIS within the MOA. However, there should be appropriate institutional arrangement and coordination among the major data producing agencies. It should be emphasized that the donors’ activities in developing the capacity of the national statistical system should be in line with agreed national priorities.

Recommendations

*Produce dependable conversion factors:* The two major agricultural data producing agencies (CSA and RADB/MOA) should jointly conduct a survey that would enable them to produce dependable conversion factors for local units and come up with equivalent standard units. In this manner, subjective methods of data collection could be applicable to fill in the data gap easily.

*Utilize generated data:* Due to challenges in the agricultural population, it is increasingly becoming a challenge to fully enumerate all farms and farming activities using the traditional household-based data collection procedures (Jorner and Voge. 2001). Hence, in a country where administrative data is well documented, the availability of such data could help to fill-in data gap where it is appropriate. It is also argued that as the use of administrative sources is increased, the costs and response burden in producing farm data would reduce. Moreover, “to get the complete picture of agricultural and rural activities, new technologies should be adopted by using both existing non-statistical but reliable data sources and by implementing other survey techniques ...” (Marie Louis and Jonrup, 2001).

According to Prochier (2001), Administrative data system and statistics systems are different in their purposes and must be operated separately although both refer to information on the farming industry. They may look similar, for their difference does not lie in the variables they provide like acreage of crops and number of animals, but in the purpose of action which produces them.

Further, it could be an efficient and flexible way to use the existing data in order to meet new agricultural statistical demands. New administrative sources such as Integrated Administrative and Control System, Administrative System for Agricultural Aid, and all potential information about the agricultural sector within the whole register system, are recognized as offering new possibility for agricultural statistics (Marie Louis and Jonrup, 2001). However, Marie Louis and
Jonrup pointed out that administrative data should not be used directly as they are, because, in order to meet the statistical needs, they must be processed by what is called register statistical methodological work.

In the Ethiopian context, data generated by routine works of Development Agents (DAs) can be utilized to fill-in the data gap if planned well. By limiting the DAs' activities of data collection both in scope and coverage, MOA/RADB could provide important data that are usable by all data users including farmers.

Compilation of a well documented and reliable administrative data need to be adopted by DAs in implementing the envisaged NAIS in each district. Development Agents should be trained to keep a well-documented administrative data for important farm indicators. Availability of such data could minimize duplication of efforts and waste of scarce resources of the country.

Develop Data Management Systems: For better utilization of data, the data produced from different sources (scientific, statistical or administrative) should be channeled to NAIS Data Bank. Presentation of information could be improved by the use of analytical games, mapping and diagrams (bar and flow diagrams and time trends) rather than by presenting farm level data only in tabular forms.

Agricultural statistics should be widely disseminated by publishing them in pamphlets or brochures using local languages. Introducing computers in each region and networking them is important to strengthen the database management of agricultural information of the country. Developing a network system between major users of the data is necessary. Efforts should be made to develop user-friendly software which could be utilized by the system to make all agricultural statistics accessible to all; and capacity necessary for taking optimal advantage of emerging information and communication technologies should be built. A technical assistance that aims at harmonizing and producing one official statistical figure from one source should be designed.

Improve Agricultural Statistics System: The agricultural Statistics System should be improved. The following direction is believed to help improve the system.
New direction
- Develop medium-term statistical program
- Identify data gaps
- Determine type of data

Main features
- User-driven integrated effort
- Partnership among data producers and users
- Developed statistical proprieties

Expected input
- Focal institution identification
- Collaborative effort of stakeholders especially of CSA and MOA/RADB
- Government commitment

Expected output
- Adequate data, i.e. (qualitative and quantitative)
- Sustainable statistical system
- Development of database→ access to NAIS Data Bank

References


PRODUCTION INCENTIVES IN ETHIOPIAN AGRICULTURAL EXPORTS: IMPACT OF TRADE AND MACROECONOMIC POLICIES

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Introduction

Agricultural development policies may miss important linkages with economy-wide policies (trade and macroeconomic policies) and the agricultural sector. Several studies, however, suggest that macroeconomic policies and trade are more important determinants of agricultural performance and rural incomes than are policies specific to the agricultural sector. These issues are especially important to be discussed for Ethiopia where, 85% of the population is engage in the agricultural sector.

Agriculture accounts for about 50% of the total GDP, generates more than 90% of the export earning and supplies about 70% of the raw materials for the country's large and medium-size industries.

Ethiopia’s economic performance has been unsatisfactory in the last three decades. Due to poor performance of the agricultural sector, per capita GDP grew at a rate that has been inadequate to ensure economic development. There has been no discernable trend in agriculture; it grew at an average rate of only 1.7% per year during the period 1974 – 1999, which is very low as compared to its growth rate in the 1950’s and 1960’s.

The importance of agriculture in Ethiopia’s international trade is proportionally greater than implied by its overall contribution to the countries GDP. The agricultural production trends are reflected in the country’s international trade, which is characterized by an increasing deficit of exportable agricultural produces. Although, some improvements have been registered in export since the reform period, the growth in the export trade has been unable to catch up with the growth in imports. Export earnings cannot cover even half of the import bills. Thus, Ethiopia’s trade balance has steadily deteriorated as imports increased at an alarming rate and exports showed little improvement. Since a more rapid pace of investment and development would require increasing imports, the existing trade deficit will become critical before long unless a rapid growth of exports is insured.

As world prices of primary goods are declining, there is an increasing need to increase export volumes to offset low export prices. This could not be the case for
Ethiopia, however. As mentioned before, the country’s exports have been stagnated over the last three decades. “A major set back to Ethiopia’s export growth is the reduced profitability and competitiveness of exportables in absolute terms and relative to import substitutes and non-tradables” (World Bank. 1987b). The decline in incentives of producing exportables, predominantly agricultural products, against import substitutes and non-tradables has retarded export growth of the country. The important question again is what causes such decline of incentives to produce exportables relative to import substitutes and home goods. This question is central to the current study. A conclusive answer to this question is yet to come though trade and macroeconomic policies may matter.

Sector-specific policies, war, environmental degradation, drought, technology and external shocks such as prices instability of world primary commodities have been mentioned as the underlying causes for the poor performance of the agricultural sector. Besides, “The bulk of the decline in agricultural growth rate was due to a combination of factors such as weather and government agricultural policies” (Mesfin, 1994). However, this study had a base hypothesis that trade and macroeconomic policies, even if specifically directed to other sectors of the economy, can exert an important influence on agricultural incentives and performance in general and on agricultural exports in particular. The study was aimed at finding out whether trade and macroeconomic policies have significantly affected incentives to produce agricultural exports relative to home goods.

Macroeconomic Policies in Ethiopia

Agricultural policies

The agricultural policies of the period 1974–1990 reflected the then socialist mode of production and relations of production. The agricultural policies of this period were characterized by: (i) favourable situations created for producer co-operatives and state farms over private farms in the distribution of improved technologies and inputs (ii) administratively fixed prices that were low enough to depress farm income and to limit farmers’ purchasing power (iii) agricultural surplus extraction policies enforced through compulsory deliveries of grain quotas and (iv) regulation of other rural income-generating activities including the abolition of rural markets for land and labor (MEDaC, 1999; Mesfin, 1994).

The post-1991 agricultural policy of country targets at increasing productivity through utilization of domestic raw materials by adopting labor-intensive technologies. To attain this objective, the agricultural extension program based on demonstrating and training of farmers on proven technologies in line with the
philosophy of bottom-up development approach has been implemented (MEDaC, 1999)

Trade and exchange rate policies

Trade policy in the Derg regime (1974–1990) was characterized by administratively managed domestic prices and high level of taxes and duties on imports and exports. Regarding the exchange rate policy, the Ethiopian Birr was pegged to the US Dollar at a fixed rate of Birr 2.07 per USD throughout the period. After 1991, adjustments have been made throughout the economy among which were liberalization of domestic trade, suspension of taxes and duties levied on exports except duties on coffee, reduction of import taxes and duties, and step by step, policies which reduce the level and dispersion of effective rates of protection, average nominal tariff rates and the number of import duty exemptions. In line with exchange rate management, the national currency was devalued by 58% in USD terms from Birr 2.07 per USD to Birr 5.0 per USD. Then, after the biweekly exchange retail auction in 1993, the weekly retail auction and the weekly wholesale auction markets were introduced in 1996 and 1998, respectively (MEDaC, 1999)

Monetary and fiscal policies

The monetary policy of the country both before the reform and after the reform is characterized by a continuous growth in money supply. It grew at average annual rates of 12.9% during 1974–1991, at 12.2% during 1991–1999 and 12.5% over the whole period (Table 1). Percentage of GDP was 28.8% during 1974–1990, 41.1% during 1992–1999 and 34.9% over the whole period (Table 2). The major factor behind this growth in money supply was the unprecedented expansion in domestic credit, which grew at an annual average rate of 17.6% in 1974–1990, 13.0% in 1991–1999 and 15.3% over the whole period (Table 1). Domestic credit as percentage of GDP was 30.6% in the period 1974–1990, 43.8% in 1991–1999 and 37.2% in the period 1974–1999 (Table 2).

Table 1. Growth rates of some macroeconomic variables in Ethiopia, 1974–1999

<table>
<thead>
<tr>
<th>Period</th>
<th>GDP</th>
<th>perGDP</th>
<th>AGDP</th>
<th>MS</th>
<th>DC</th>
<th>GE</th>
<th>GR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1974–1990</td>
<td>2.1</td>
<td>-0.5</td>
<td>1.7</td>
<td>12.9</td>
<td>17.6</td>
<td>11.0</td>
<td>13.4</td>
</tr>
<tr>
<td>1991–1999</td>
<td>4.6</td>
<td>1.7</td>
<td>1.8</td>
<td>12.2</td>
<td>13.0</td>
<td>16.1</td>
<td>16.5</td>
</tr>
<tr>
<td>1974–1999</td>
<td>3.3</td>
<td>0.6</td>
<td>1.7</td>
<td>12.5</td>
<td>15.3</td>
<td>13.5</td>
<td>14.9</td>
</tr>
</tbody>
</table>

Where. GDP= gross domestic product. PerGDP= GDP per capita. AGDP= agricultural GDP. MS= broad money supply. DC= domestic credit. GE= government expenditure and GR=government revenue.

Although government revenue recorded respectful average annual growth rates of 13.4% during 1974–1990, and 16.5% during 1991–1999, the ever-increasing government expenditure has made the overall deficit level widen from time to time
Looking back to the first half of the 1950's, government budget was in surplus. Even during 1965–74, when the government began to undertake significant investment on infrastructure and creation of modern institutions, the practice of ‘fiscal conservatism’ kept fiscal deficit at a very low level (MEDaC, 1999). It was after 1974 that government deficit began to increase. During 1974–1990, government deficit as a percentage of GDP was on average -19.5% and it was -17.1% and -18.2% during 1991–1999 and 1974–1999, respectively. Given these developments, their impact on incentives of producing agricultural exports is yet to come in the empirical section.

<table>
<thead>
<tr>
<th>Period</th>
<th>MS</th>
<th>DC</th>
<th>GR</th>
<th>GE</th>
<th>GD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991–1999</td>
<td>41.1</td>
<td>43.8</td>
<td>8.4</td>
<td>25.5</td>
<td>-17.1</td>
</tr>
<tr>
<td>1974–1999</td>
<td>34.9</td>
<td>37.2</td>
<td>7.9</td>
<td>26.1</td>
<td>-18.2</td>
</tr>
</tbody>
</table>

**Table 2. Some macroeconomic variables in Ethiopia as percentage of GDP, 1974–1999**

GD = government deficit and others as defined in Table 1.

### Trade and Macroeconomic Linkage on Production Incentives of Agricultural Exports

#### Theoretical discussion

Agricultural market interventions such as agricultural trade restrictions, price controls and storage scheme, road construction, irrigation and other agricultural sector-specific activities affect agricultural production. However, other policies directed at trade and macro-economic management of the economy are very important to agriculture. These policies may have far-reaching effect although they are not directly targeted at the sector.

Perhaps the best way of analyzing the effect of trade and macroeconomic policies on the structure of incentives in a predominantly tradable sector such as agriculture (Although agriculture produces some non-traded food crops most agricultural products are exportable and import competing products (tradables)) is to evaluate the effect of such policies on the real exchange rate (RER). It is indeed through RER that trade and macro-economic managements of the economy affect production incentives of the agricultural sector, specifically of exportable commodities.

RER is defined as the ratio of the prices of tradables to the prices of non-tradables. Hence, movements in the real exchange rate show the resource allocation between the tradable and non-tradable sectors. Specifically, since most agricultural products are tradables, the main result of RER movements will be changes in resource
flows, essentially of saving and labor, to and from agriculture and the other sector (i.e. the non-tradable non-agricultural sector and the protected tradable goods sector in industry).

Chronic trade deficit has remained to be the dominant feature of the external trade merchandise of developing countries. The reason for this is the increased demand for importable industrial products and the disappointing export performance of developing countries that could not cover even half of their import bills. Among others, most developing countries have been employing the Import Substitution-Led Industrialization Strategy to solve this problem. This Strategy is assumed to encourage domestic production of import-substituting goods. Under this scheme, domestic manufacturing industries have received high level of protection through tariffs and other quantitative import restrictions. The protection, however, helps industry at the expense of agriculture.

Imposition of high tariffs on imports can affect the incentives to produce exportables in the agricultural sector in many ways. First, import tariffs are export taxes. Since exportables must be priced to compete on world markets, exporters cannot raise prices to recoup the high costs of industrial protection. Therefore, the sector that is especially hard hit is the exportables sector in general and the agricultural exports sector, in particular. Second, a policy that protects industry raises the costs of imported agricultural inputs such as fertilizer, machinery, chemical and other materials used by farmers. The third and most pervasive one is the effect of industrial protection through RER. An increase in import tariff increases domestic price of importables. This, in turn, reduces demand for importables and the improvement generated in the trade account requires a low RER if external equilibrium is to be restored. Hence, the RER that maintains a balance in the external account at a given rate of protection to industry is below the equilibrium RER. This signals that the terms of trade have worsened against the traded goods sector (i.e. the agricultural and non-protected non-agricultural traded goods sector) and that resources are being diverted to the non-traded goods sector, which in turn means that the production of agricultural exports is discouraged.

Export promotion policies such as tax rebates, drawbacks and export credit subsidies on inputs are also used to improve the external trade balance. However, Valdes (1989) argued that in most developing countries, agricultural exports have not received such export subsidies. Furthermore, input subsidies on exportables are usually small compared with import protection on industrial products.

To improve their international competitiveness, many developing countries have launched economic reform programs which involved trade liberalization in the form of reduction in import tariffs and export taxes starting from the mid 1980's. However, although trade liberalization efforts help in reducing the anti-export bias of previous policies, trade liberalization by itself does not guarantee an increase in RER. The reason is that accompanying macroeconomic policies can offset the
increase in the RER resulting from low import restrictions and reduction of export taxes. To illustrate this, consider an economy with continuous budget deficit. Lachaal and Womack (1998) argued that whether the deficit is financed by borrowing or expansion of money supply, expansionary government spending causes an increase in the demand for non-tradable goods, which raises their prices and causes the RER to decline. This reduction in the RER will work against the entire tradable component (exportables and import competing) of agriculture.

Also consider an economy with expansionary monetary policy, i.e. with domestic credit growing at a rate more than the rate of growth of money demand. The excess supply of domestic credit will be translated to an excess demand for home goods and tradables at a fixed exchange rate regime. Since prices of tradable goods are anchored by world prices and prices of home goods grow at the same rate of domestic inflation, the cumulative effect will be a decline in the RER. Hence, production of the traded component of agriculture (exportables and import competing) will be discouraged.

**Analytical framework**

To analyze the effect of trade and macroeconomic policies on the structure of incentives in a predominantly tradable sector such as agriculture, economists often evaluate the effect of such policies on the RER (Lachaal and Womack, 1998). Hence, the traded/non-traded goods model, based on the concept of the RER, is used to investigate these effects. The model developed by Sjaastad (1980) as cited and used by Tshibaka (1986) and others to determine the incidence parameter was extended to include the impact of macroeconomic policies. In this model, trade and macroeconomic policies are viewed not in terms of their effect on nominal prices but in terms of their impact on relative prices. Trade policy directly affects the domestic price of exportables relative to importables, which in turn affects the domestic price of exportables relative home goods. Macroeconomic policies have direct impact on the price of exportables relative to home goods. The domestic price ratios among exportables, importables and home goods are indicators of relative incentives to producers and, at the same time, of relative costs to consumers (Bautista, 1987).

The model assumes a simple open economy producing three types of goods: exportables, importables and home (non-traded) goods and takes given the relative prices of traded goods in the world market. Moreover, excess demand for importables, and excess supply for exportables and home goods are assumed to depend only on relative prices \( p_m/p_h, p_x/p_h \) and real income. If foreign trade is in balance, the equilibrium properties of the model can be analyzed in terms of equilibrium in the home goods market. For equilibrium in the home goods market to be attained, the demand and supply of home goods \( (D_h, S_h) \) should be equal, i.e. \( D_h = S_h \). Where the home goods demand and supply are expressed as:
Production Incentives in Ethiopian Agricultural Exports: Impact of Trade and Macroeconomic Policies

\[ D_h = D_h \left( \frac{P_m}{P_h}, \frac{P_x}{P_h}, y \right) \] .............................................(1)

\[ S_h = S_h \left( \frac{P_m}{P_h}, \frac{P_x}{P_h}, Z, t \right) \] .............................................(2)

and

\[ P_h = \text{domestic price of home goods} \]
\[ P_m = \text{domestic price of importables} \]
\[ P_x = \text{domestic price of exportables} \]
\[ y = \text{real income} \]
\[ Z = \text{vector of productive resources} \]
\[ t = \text{technology} \]

\[ y, Z \text{ and } t \text{ can be held constant for examining the comparative static properties of} \]
\[ \text{the model where the primary interest was the movement of relative prices.} \]

Differentiating equations (1) and (2) yields:

\[ D_h = \alpha_m (\hat{P}_m - \hat{P}_h) + \alpha_x (\hat{P}_x - \hat{P}_h) \]
\[ S_h = \beta_m (\hat{P}_m - \hat{P}_h) + \beta_x (\hat{P}_x - \hat{P}_h) \]

Equating \( D_h = S_h \), gives:

\[ \gamma_m (\hat{P}_m - \hat{P}_h) + \gamma_x (\hat{P}_x - \hat{P}_h) = 0 \] .....................................(5)

where, \( \gamma_m = \alpha_m \beta_m \) and \( \gamma_x = \alpha_x \beta_x \)

By adding and subtracting \( \omega \hat{P}_x \) equation (3) can be expressed as:

\[ (\hat{P}_x - \hat{P}_h) = \omega (\hat{P}_x - \hat{P}_m) \] .............................................(4)

where \( \omega \), which is equal to \( \gamma_m / (\gamma_m + \gamma_x) \) (with \( 0 < \omega < 1 \)), is the incidence parameter that determines the induced change in the domestic price of exportables relative to home goods brought about by the change in the domestic price of exportables relative to importables from trade and exchange rate policy measures.

Equation (4) can also be rewritten as:

\[ dL(P_x/P_h) = \omega dL(P_x/P_m) \] .............................................(5)

Where, \( dL \) stands for the derivative of the natural logarithm of the variables in brackets.

Assuming a constant \( \omega \) and integrating (5) gives:

\[ L(P_x/P_h) = c + \omega L(P_x/P_m) \] .............................................(6)

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In Equation (6), the domestic prices of tradables are determined by their foreign prices, the nominal exchange rate and trade policies such as import duties and export taxes or subsidies. Thus, for any given change in $P_x$ and $P_m$ due, for example, to changes in trade and exchange rate policies, the incidence parameter ($\omega$) determines the induced change in the domestic prices of exportables relative to home goods.

Equation (6) is the basic model to evaluate consequence of trade and exchange rate policies on domestic price of exportables relative to that of home goods. However, macroeconomic policies, through the adjustment of domestic prices ($P_h$), also exert important influence on the RER and, hence, on the profitability of producing tradable goods (Lachaal and Womack, 1998). The agricultural sector that tends to be highly tradable may be adversely affected by these policies. Hence, excess supply of domestic credit measured as the growth rate of domestic credit minus the one-period lag of growth rate of real GDP ($u$) and government deficit as a ratio of one-period lag in high powered money ($g$) was included to capture the role of monetary policy and fiscal policy on the relative prices. Thus, equation (6) can be rewritten as:

$$L(P_x/P_h) = c + \omega L(P_x/P_m) + \alpha_1 Lu + \alpha_2 Lg.$$

Furthermore, Equation (6) was derived based on the assumption that real income and productivity capacity (measured by given stock of capital, labor and technology) are constant and foreign trade is in balance. However, historical data invalidate these assumptions and call for the inclusion of these variables in the regression equation. Hence real income ($y$) as measured by real GDP and balance of trade

\[ P_{x}= \text{world price of exportable crop in foreign currency} \]
\[ P_{m}= \text{world price of importable crop in foreign currency} \]
\[ E_o= \text{nominal exchange rate expressed as a number of units of domestic currency per one unit of foreign currency} \]
\[ t_x= \text{Export tax rate} \]
\[ t_m= \text{Import tax rate} \]
\[ d_x= \text{domestic parallel market distortion for exportables} \]
\[ d_m= \text{domestic parallel market distortion for importables} \]

This formulation is adopted from Tshibaka (1986) with some modifications.

1 These variables were used by Edwards (1989) to measure the impacts of monetary and fiscal policies on the real exchange rate.
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of trade (BT) as measured by total export receipt minus total import payment as a ratio of total export receipt were included to Equation (7). Real income was expected to exert a negative impact on \( P_x/P_h \) as an increase in income boosts demand for home goods more than tradable agricultural prices. Deterioration in the trade balance should also exert a negative impact on \( (P_x/P_h) \) because the deficit in the trade balance requires a higher RER if equilibrium in the external sector is to be restored. Finally, trend (T) is included in the model as a proxy for change in productive capacity of the economy. Incorporating all these facts, the model can be reformulated as:

\[
L(P_x/P_h)_t = c + \alpha_1 L(P_x/P_m)_t + \alpha_2 L_u_t + \alpha_3 L_g_t + \alpha_4 L(BT)_t + \alpha_5 T + \varepsilon_t, \quad \ldots (8)
\]

Where (-) and (+) signs indicate the expected signs for the corresponding coefficients and \( \varepsilon_t \) is a random error term which captures the impacts of omitted variables.

Analysis and results

In order to estimate Equation (8), test for stationarity of the variables was done. This was required since regression analysis using non-stationary variables ends with spurious result. Results of unit root test for the variables using the augmented Dickey-Fuller statistic show that except the \( L_u \) variable which was found to be \( I(0) \), all other variables were found to be \( I(1) \) (Table 3).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Test on levels</th>
<th>Test on first differences</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>( L(P_x/P_h) )</td>
<td>-1.777</td>
<td>-1.409</td>
<td>-1.375</td>
</tr>
<tr>
<td>( L(P_x/P_m) )</td>
<td>-0.843</td>
<td>-0.833</td>
<td>-0.801</td>
</tr>
<tr>
<td>( L_u )</td>
<td>-2.851**</td>
<td>-1.697</td>
<td>-1.040</td>
</tr>
<tr>
<td>( L_g )</td>
<td>-0.925</td>
<td>-0.036</td>
<td>-0.090</td>
</tr>
<tr>
<td>( L_y )</td>
<td>2.442</td>
<td>2.174</td>
<td>3.225</td>
</tr>
<tr>
<td>( L(BT) )</td>
<td>-0.998</td>
<td>-0.827</td>
<td>-0.745</td>
</tr>
<tr>
<td>( (ECM)_h )</td>
<td>-3.026**</td>
<td>-2.998**</td>
<td>-3.225**</td>
</tr>
</tbody>
</table>

* and ** Significant at 5% and 1% levels, respectively

The result of the unit root test calls for finding out whether the variables are cointegrated and continuing estimation using an alternative procedure to the classical regression technique of OLS on levels. This is done using the Engle Granger two-step procedure. In the first step, the static model was estimated and the results reported (Table 4).
Table 4. Result of static modeling of $P_x/P_h$ using OLS

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. error</th>
<th>t-value test</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>38.5820000</td>
<td>3.7984000</td>
<td>10.1570000</td>
<td>0.0000000</td>
</tr>
<tr>
<td>$L(P_x/P_m)$</td>
<td>0.8614200</td>
<td>0.3709900</td>
<td>2.3220000</td>
<td>0.0309000</td>
</tr>
<tr>
<td>LGDP</td>
<td>-4.0356000</td>
<td>0.3989300</td>
<td>-10.1160000</td>
<td>0.0000000</td>
</tr>
<tr>
<td>LBOTP</td>
<td>0.0083264</td>
<td>0.1373200</td>
<td>0.0610000</td>
<td>-1.0220000</td>
</tr>
<tr>
<td>U</td>
<td>-0.6750800</td>
<td>0.6608100</td>
<td>0.9523000</td>
<td>0.3192000</td>
</tr>
<tr>
<td>Lgl</td>
<td>-0.7206200</td>
<td>0.2930600</td>
<td>-2.4590000</td>
<td>0.0232000</td>
</tr>
</tbody>
</table>

The error term from this regression was then tested for stationarity and it was found to be stationary, $I(0)$ (Table 3). This implies that the variables are co-integrated. The first lag of this error term along with the first differences of the variables was then used to estimate the short-run dynamics. The results obtained using the general-to-specific estimation procedure are reported in Equation (9) as follows.

$$DL(P_x/P_h) = -0.03 + 0.75DL(P_x/P_h)_t + 0.64DL(P_x/P_m)_t - 0.81DL(P_x/P_m)_t + 0.58DL(P_x/P_m)_t^2$$
$$\quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad 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The diagnostic test results reported under the equation showed no problem of error autocorrelation, autoregressive conditional heteroscedasticity, non-normality and specification. The large $R^2$ value ($R^2=0.72$), the significant $F$-statistic and the small standard error for the overall model also showed that the model fits is good.

The error correction term (ECM) was an important component of this short-run model. It was found to be statistically significant at 1% level with expected sign (negative) and magnitude (between 0 and 1). It shows that about 36% of the short-run shock in the previous year was adjusted to its long-run path in the current year.

The estimated value for the incidence parameter ($\omega$) was in support of a bulk of literature in that it is positive and between 0 and 1. It was significant at 5% (even marginally at 1% level). The 1st and 2nd lags of $P_x/P_m$ were also found to be significant with unexpected sign at the 1st lag. The explanation for the 2nd part of $P_x/P_m$ was however, not obvious. The estimated coefficient for $\omega$ was 0.64—implying that a 10% increase in the domestic price of importables relative to exportables will result in a 6.4% decline in the domestic price of exportables relative to home goods in the short-run. This estimated result was consistent with the results of Oyejide (1986) for Nigeria, Garcia (1981) for Colombia and Lachaal and Womack (1998) for Canada.

The other important variables were those used to measure the impact of macroeconomic policies. The ratio of fiscal deficit to high-powered money was
significant at 5% level with expected negative sign. Its coefficient estimate showed that a 10% increase in the ratio of government deficit to high powered money calls for a 2.5% decline in the domestic prices of exportables relative to home goods in the short-run. Excess supply of domestic credit at 2nd lag was also significant at 5% level with expected negative sign. The estimated coefficient for this variable indicated that a 10% increase in excess supply of domestic credit in the current period will decrease the domestic price of exportables relative to the domestic price of home goods by about 4.3% after two years in the short-run.

Balance of trade was found to significantly affect the domestic price of exportables relative to that of home goods at 10% level with expected negative sign. Its estimated coefficient showed that a 10% improvement in the trade balance brings about 0.9% decline in the domestic price of exportables relative to the domestic price of home goods. The first lag of the dependent variable was also found to significantly enhance its temporaneous value at 1% level. Finally, real income (y) and trend (T) variables were eliminated from the model as their estimated coefficients were found to be statistically insignificant. This may be because these variables do not affect the domestic price of exportables and that of home goods differently.

Conclusions and Recommendations

The main objective of this study was to find out whether trade and macroeconomic policies have significantly affected production incentives in Ethiopian agricultural exports during 1974–1999 using the error correction model. The results suggest that trade and macroeconomic policies have substantially reduced the relative incentive to produce agricultural export goods relative to home goods. The estimated coefficient for the incidence parameter (ω) was 0.64—implying that a 10% increase in the domestic prices of importables relative to the domestic price of exportables due to, for example, an increase in tariffs and duties on imports leads to a decline in the domestic prices of exportables relative to the domestic price of home goods by about 6.4% in the short-run. This implies that more than half of the tariffs and duties levied on imports lie as tax on exports. This discourages production of agricultural exportables. A decline in prices of exportables relative to home goods shows that resources are being diverted to production of non-tradables and away from production of agricultural export goods, signalling production disincentives in the agricultural exports sector relative to in the home goods sector. An increase in the ratio of government deficit to high powered money and excess supply of domestic credit by 10% also led to respective declines of 2.5% and 4.3% in the domestic price of exportables relative to home goods in the short-run. These findings evidence the contention that macroeconomic policy managements are far more important determinants of the incentives to produce agricultural exports in the country.
From these results, the following policy recommendations were drawn.

• As a trade policy of taxing imports is found to negatively affect the incentive to produce agricultural exports through its impact on relative prices, a subsidy for exports is required to offset this disincentive and to increase production and competitiveness of the agricultural exports sector. For instance, according to the results obtained in this study, for every 10% increase in the domestic prices of importable relative to exportables due to an increase in import taxes, a 6.4% increase in the domestic prices of exportables relative to home goods by an increase in export subsidies is required to offset the distortion introduced by taxing imports.

• As macroeconomic imbalances are also found to negatively affect relative incentives of producing agricultural exports to home goods, policy makers should concentrate on policies that restore macroeconomic balance by reducing government deficit and excess supply of domestic credit toward more price stability that will encourage production of agricultural exports.

References


Appendix

Appendix 1. Data sources and definition of variable whose stationarity was tested for estimating Equation 8

The data set used in this study spans about 25 years (1974–1999). Sources of the data were IMF database and different issues of the Quarterly Bulletin and Annual reports of the National Bank of Ethiopia. The definitions of the variables used are given below.

**Prices of home goods \( (P_h) \):** The consumer price index (CPI) of the country as measured by the CPI of Addis Ababa was used to measure this variable. The data was obtained from IMF database, which used 1995 as a base year.

**Domestic price of exportables \( (P_e) \):** Computed as \( P_e(1-\tau_e) \) where:

\[ P_e = \text{foreign price of exportables or export unit value index, 1995}=100, \text{ obtained from IMF database, and } \tau_e = \text{ average tax rate on exports computed as: collected taxes on exports/total value of exports.} \]

**Domestic price of importables \( (P_m) \):** Computed as \( P_m(1+\tau_m) \), where:

\[ P_m = \text{foreign price of importables or import unit value index, 1995}=100, \text{ obtained from IMF database, and } \tau_m = \text{ average tax rate on imports computed as: collected taxes on imports/total value of imports.} \]

**Real income \( (y) \):** Measured by real gross domestic product (GDP) at 1980/81 constant factor cost.

**Balance of trade \( (BT) \):** Computed as total export receipts less total import payments as a ratio of total export receipts.

**Macroeconomic policies:** Following Edwards (1989), the rate of growth of domestic credit minus the lagged rate of growth of real GDP, i.e., \( u_r = \{d\log(\text{domestic credit}), d\log (\text{GDP}_{t-1}) \} \), was used to measure the role of monetary policy and the ratio of fiscal deficit to high powered money \( (g) \) was used to measure the role of fiscal policy on relative prices.
CLOSING REMARK

His Excellency Ato Gebre Medhin Belay
Vice Minister of The Ministry of Agriculture

Mr. Chairman,
Conference Participants,
Ladies and Gentlemen,

It gives me great pleasure to make a closing remark at this ceremony of the 6th Annual Conference of Agricultural Economics Society of Ethiopia, which took place for two days under the theme Agricultural Policy in Ethiopia’s Economic Development: Scope, Issues and Prospects.

I would like to express my appreciation to the Agricultural Economics Society of Ethiopia for selecting this timely theme for the Conference, as it is a key issue of discussion and concern at national level.

It is obvious that agricultural problems of Ethiopia are complex and deep-rooted. As such, the sector requires wide and comprehensive solutions in strategies and approaches. For this to happen, Agriculture and Rural-Centered Development Policy has already been put in place.

In this regard, I hope that this Conference of the Agricultural Economics Society would contribute to the efforts of implementing the Policy as your deliberations were in line with these expectations.

Mr. Chairman,
Conference Participants,

Much depends on what is happening in agriculture, especially in smallholder agriculture, which has to be the resolute foundation for growth if the living standard of the majority of the Ethiopian people is to show meaningful and visible improvement and if the country is to successfully tackle the growing problem of food insecurity. This largely depends on increasing the productivity of smallholder agriculture through technological change as well as promoting marketable production which is intended to come as a result of transformation of the subsistence farming systems into capitalist farming system.

This does not mean neglecting industrial development, which is a key to the diversification and long-term structural transformation of the economy. In fact, agricultural development will be hindered if one fails to strengthen linkage between agriculture and industry through the development of trade (both domestic and foreign).
In general, developing agriculture, industry, infrastructure, and human development, among other factors, constitute the central and immediate development challenge for Ethiopia. They are the bases of economic development and have to be addressed now within a long-term development perspective. They are of immediate concern in the Ethiopian situation to reduce poverty and food insecurity.

Mr. Chairman,
Conference participants,
I understand that timely and very important issues were discussed on your deliberations. In response to the benefits members of the Agricultural Economics Society of Ethiopia get from it, they are expected to contribute to the development a lot making themselves important source of valuable options, which help to foster the development of agriculture in the country.

Finally, thanking all who organized this conference, I officially declare that the conference is closed.

Thank you for your attention.