

# AGRICULTURAL AND RURAL DEVELOPMENT IN ETHIOPIA

## SUMMARY AND RECOMMENDATIONS

By

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**ABSTRACT:** The International Conference on a Development Strategy assembled a group of scholars and professionals with experience and expertise in the various dimensions of human development in the Horn of Africa. This is a summary by the participants of the Rural and Agricultural Development Panel. The participants of this plenary panel and their affiliation is as follows: Dr. Sisay Asefa, Professor, Department of Economics & Director, Center for African development Research, Dr. Efrem Bechere, Senior Research Associate, Plant and Soil Science Department, Texas Tech University (TTU), Dr. Badege Bishaw, Director of International Programs, College of Forestry, Oregon State University, Dr. Haile Selassie Belay, Chief Technical Advisor/FAO/UNDP (Retired), and Mr. Michael Wales, FAO Investment Centre, Food and Agriculture Organization, Rome Italy. The panel was chaired by Professor Sisay Asefa, who also compiled this draft report based on the reports provided by the individual panelists. Those interested in the detailed paper by each participant can directly contact the individual panelist. We are thankful to the panelists and participants of the plenary session. We also thank the organizers and co-sponsors of the successful international conference on the development strategy of the Horn of Africa: The University of Texas-Arlington Africa Program, and the Amoud Foundation, and the Horn of Africa Peace and Development Center. Information on the conference including the final agenda can be accessed at website: [http://www.uta.edu/africaprogram/upcoming\\_new.html](http://www.uta.edu/africaprogram/upcoming_new.html)

## SUMMARY AND RECOMMENDATIONS

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Even by African standard the Ethiopian agricultural system is quite young. Formal agricultural research started only about 50 years ago. Unlike many African countries, Ethiopia has not been colonized by any European power and subsequently did not benefit from the research infrastructures left behind when these powers left Africa. Whatever achievements made so far is solely accomplished through the national efforts. The national agricultural system has evolved through three different systems – a feudal system, a totalitarian socialist military junta, and now is going through an ethnic based federal form of government. All systems restructured the system to fit their specific ideologies. This has created a significant level of instability in the agricultural research system and created havoc and disenchantment in terms of the outcome expected from investment on agricultural research. During the socialist government, 1974-91, thousands of the intelligentsia fled the country and during the fall of that government, local people stormed the local research facilities and looted everything from microscopes to research seeds. These are some examples in recent memory. Despite these up and downs, the research systems has gradually evolved through the years and contributed its part to the betterment of agriculture and the national economy. The last decade has seen more focus on the agricultural research system and the outcomes has also been relatively more promising. Unfortunately, these outcomes have been neutralized and diluted by some controversial government policies which have created bottlenecks to the implementation of agricultural research outcomes. Some of these bottlenecks which require urgent attention are enumerated below.

### 1. Irrigation :

**The Problem** – Out of 11 million hectares presently farmed, only 190, 000 hectares are under irrigation. Ethiopia is the water tower of Africa. Rainfall is becoming more erratic and unreliable.

**Suggestion** – Promote low cost water harvest irrigation technologies such as construction of earth dams, river diversions, and hand pumps should be expanded and encouraged. On the research side, crop varieties and management practices for irrigated agriculture should be given due emphasis.

### 2. Fertilizers:

**The Problem** – Ethiopia totally depends on fertilizer imports. Even though farmers are fully aware of the use of fertilizers, the cost is becoming prohibitive. One hundred kilogram of DAP and Urea costs 318 birr and 380 birr, respectively. Fertilizer and others inputs totally cost the farmer about 1000 birr/hectare. A poor subsistent farmer can not simply afford this.

**Suggestion** – Until such a time that farmers can afford these inputs, the government should help with subsidies or reduce the current interest rate which is about 7.5 %. Mechanisms of promoting microcredit mechanisms such as experienced in the Gramen credit system of Bangladesh should be adopted

### 3. Improved Seeds:

**The Problem** – Only about 2% of the seeds used by farmers is improved seed. The rest are all local, low yielding, disease susceptible landraces. **Suggestion** – The increase and distribution of improved seeds at a price the farmers could afford should be given serious consideration.

### 4. Population Control

**The Problem** – One of the greatest development problem facing Ethiopia today is population explosion. Research achievements and other development outcomes are negated by the astounding increase in population number. At the current rate of growth (2.2 – 2.9%) by the year 2050 Ethiopia's population will be 169 million, the largest in Sub-Saharan Africa.

**Suggestion** – A strict national policy to reduce the current birth rate should be in place. Education and family planning should be expanded to the rural communities. All avenues, including contraceptives and other birth control methods should be pursued. Better employment and educational opportunities for poor especially the female population should be rapidly promoted.

## 5. Land Policy:

**The Problem** – Tenure security is vital for a successful agricultural development especially in Ethiopia where 85% of the population lives in the rural area. Tenure security will provide the right incentives to invest or make improvements in land and natural resources. In the central and northern highlands, land holdings have dwindled from 0.5 hectares/per farmer in the 1960s to only 0.11 hectares/farmer in 1999.

**Suggestion** – These fragmentation and abuse of land will continue until land is privatized and the average land holding of farmers increase. The population pressure on the land has resulted in loss of fertility, degradation and ecological imbalances with far reaching consequences. The government's and the private sector's responsibilities will be to create alternative sources of employments for farmers displaced from their lands in the rural areas..

## 6. Underdeveloped Rural Infrastructure:

**The Problem** – Road networks are limited and do not reach many villages in the rural areas. Farmers do not get fair prices for their produces. This discourages farmers from adopting new technologies to increase yield of their crops or livestock. It is also difficult to transport heavy items like seeds and fertilizers especially during the rainy season.

**Suggestion** – The government should consider investment in rural roads a serious priority. Railways will be a cheaper alternative and these will carry much heavier loads. There have been some promising progress in road building in recent years, which must be accelerated further.

For outcomes from agricultural research to bring about meaningful development in Ethiopia, these issues, among many others, need to be addressed by the current and future Ethiopian Governments. Research and developments issues do not function in vacuum. Realities on the ground should create enabling environments for research results to translate into success and lead the country to food self-sufficiency.

## AGRICULTURAL & RURAL DEVELOPMENT ISSUES IN THE HORN OF AFRICA

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### INTRODUCTION

The Horn of Africa was not only the origin of mankind, but also one of the few *origins of food production* in the world which has regrettably been better known, during the last three decades, as the land of famine, hunger, and poverty. Recent information derived from relevant sources has identified six major possible causes for the undesirable current situation:

- War, violence and conflict
- Government policy
- Land tenure system
- Capacity building
- Natural hazards
- Social values

The participants believe that the mentioned above are reversible; and therefore, having discussed the necessary measures to correct the bottlenecks, the Conference as indicated its recommendations below under each category.

## **WAR, VIOLENCE AND CONFLICT**

Having realized that the poorest region is spending billions of dollars on military expenditure and that in some instances the conflicts were fermented by their national or tribal leaders, as well as external elements. This was for their political ends at the expense of valuable human lives. The conference, therefore, appealed to all the leaders at every level to stop any conflict or violence including the spread of hatred using religious and ethnic differences.<sup>1</sup> Furthermore, the Conference emphasized their appeal to cease conflict and confrontation in order to:

1. Create an environment for durable peace and stability in the region.
2. Enable effective use of scarce resources, and
3. Consolidate their economic and social activities for the peoples' welfare making it a prosperous and powerful region.

## **GOVERNMENT POLICY**

Though the HOA has immense wealth of natural resources, dysfunctional administrative organizations and misguided execution of agriculture and rural development programs have hampered its full potential and support provided through external assistance. Hence, the conference recommended that corrective measures be made on the following issues mentioned under the two sub-headings:

### **1. Policy Regarding Maladministration Organizations**

- Organization with no clearly defined purpose (or goals and objectives)
- Lack of clearly defined functions
- Lack of delegation of responsibility commensurate with authority
- Lack of proper coordination within and between related rural agencies.

### **2. Policy regarding Dysfunctional Program Execution**

- Management by objective is replaced by crisis management and politicizing public administration
- Frequent changes or turnover of staff, rules and regulations hampering the flow of resources to rural areas
- Religious, ethnic or tribal politics interfering with local interests as well as normal organizational and managerial practices
- Lack of incentive policies to encourage the retention of competent staff to work in rural areas
- Lack of effective measure to discipline corrupt officials
- Lack of freedom of choice – education not force should be used to persuade farmers to adopt modern practices
- Lack of absorptive capacity for knowledge and professional skills as well as:
  - Contempt of trained manpower
  - Reluctance to use their services

## **LAND TENURE SYSTEM & LAND TENURE POLICY**

As vast experience throughout the world has demonstrated that private ownership of land is prerequisite to agricultural development and; that the present systems in Eritrea and Ethiopia are the major causes of low production in agriculture; and that the conference realizing the reform will increase production of agriculture and encourage investment of capital; has recommend the two governments establish ownership of land as well as fix viable economic size of holdings for each type of farm practices.

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<sup>1</sup> For specific suggestions on the peace process leading to federation in phases, see Annex A.

## **CAPACITY BUILDING**

The development of agriculture is directly dependent on farmers' ability, knowledge and skills and the primary measure of increasing the capacity of farmers in the region is to equip them with technological know-how for the purpose of harnessing natural resources, the Conference recommended that the following socio-economic and technical services be made available:

- An integrated system of Agricultural Education, research and extension
- Basic education and health (including birth control)
- Farmers cooperatives
- Credit and marketing facilities
- Improved inputs including: Seeds, farm implements both for crop and animals, farm practices and fertilizers
- Pest and animal disease control; and that in order to ensure their application are technically sound, economically feasible and socially acceptable to the rural people of the Horn of Africa, the services should be staffed by professionals and trained technicians.

## **NATURAL HAZARDS & DISASTERS**

The Conference realizing that draughts were the major natural hazards causing repeatedly serious famine in all countries of the region recommended the establishments of grain storages at selected critical locations.

## **SOCIAL & CULTURAL VALUES**

The Conference fully aware of, that the observance of numerous religious holidays, in at least two countries; and that timing in agriculture being a critical factor, the Conference has recommended that the two governments and their relevant churches to persuade communities involved by various means and ways to gradually eliminate or minimize the observance of such holidays.

### ***Integrating Agroforestry into Rural Development for Food Security and Environmental Protection***

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## **Introduction**

Ethiopia is situated in the Horn of Africa, and has an area of 1,100,000 km<sup>2</sup> (472,000 square miles). It has a population of 75 million with annual rate of growth of 2.9 percent (World Resource, 2005). Ethiopia is the second most populous country in Sub-Saharan Africa after Nigeria and in land area it is the ninth largest. Ethiopia lies within the tropical latitudes; the climate is cool in the highlands and warm in the lowlands. It has very diverse agro-ecology ranging from highlands with 4,200 meters above sea level (Ras Degen), to the Dallol Depression -100 meter below sea level. These varied physiographic features and climate regions have endowed Ethiopia with diverse and extensive natural resources.

Ethiopia's key assets are its diverse natural (water, soils, forests and wildlife) and human resources. The country is home to over 6,500 species of plants (12 percent of which are endemic), 240 species of mammals, and 845 species of birds (EFAP, 1994). The vegetation (forest and woody vegetation) cover large tracts of land. The country has also vast water resources, with high potential for irrigation, hydroelectric generation, fishing, and other uses.

Agriculture is the dominant sector of the Ethiopian economy, with 85 percent for the population living in rural areas. Agriculture provides about 52 percent of the country's gross domestic product, 85 percent of its employment and 90 percent of its export

earnings. The direct contribution of forestry to the national economy has not been surveyed systematically; however, recent estimates indicate that forestry accounted for about 6.7 percent of the national GDP (MEDaC, 1999).

Despite the efforts made to develop Ethiopian agriculture over the years, the problems of hunger, famine, and malnutrition and land degradation still linger and present the greatest threat to the survival of the nation. The traditional diversification of farmlands, which arguably has been the source of sustenance in rural Ethiopia since time immemorial, has largely been abandoned. Furthermore, deforestation, accelerated soil erosion, and land degradation are now serious problems in Ethiopia. As a result crop and livestock yields are generally very low and the recurrent drought has aggravated the situation. The land use system is associated with the decrease in the size of holdings both for arable and grazing lands. Thus, there is a continued trend toward the conversion of forested and marginal lands to agricultural lands, resulting in massive environmental degradation and a serious threat to sustainable agriculture and forestry.

## **Development Strategy for Agroforestry and Natural Resources**

Various international organizations including the World Bank, in *the Ethiopian Highland Reclamation Study* (Constable 1985); FAO, in *Preparatory Assistance to Research for Afforestation and Soil conservation* (Davidson 1988); ICRAF, in *Agroforestry Potentials and Research Needs for the Ethiopian Highlands* (Hoekstra, Torquebiau, and Bishaw 1990), all have emphasized in their recommendations the need for conservation-based integrated development as strategy to overcome the degradation of land resources and improve agriculture and forestry development in Ethiopia.

To overcome deforestation and land degradation in Ethiopia and to provide the rural people with food fuelwood and fodder for their livestock on a sustainable bases, three natural resource management strategies are proposed: (1) implementation of agroforestry in the rural areas where subsistence farming is practiced, (2) expansion of plantation forestry on currently uncultivated and sloping lands, and (3) conservation of the remaining natural forests to conserve species, biodiversity and the environment (Bishaw, 2001).

## **I. Potential of Agroforestry in Ethiopia**

There are many ways to reducing poverty, increasing food security and safeguarding the natural resource of Ethiopia. Agroforestry can be an important pathway to lead to prosperity through addition of trees to the farming systems. There is a huge potential for agroforestry development in Ethiopia – if properly practiced and managed, it can make a significant contributions to food security and environmental rehabilitation. The diversity in altitude, climate, soils and other physical features have created a variety of agro-ecological zones that give rise to a diverse forest flora and agricultural systems with opportunities for agroforestry in different setting.

### **Agroforestry and soil conservation**

Agroforestry has the potential to mitigate land degradation by controlling soil erosion (barrier approach), maintenance of soil organic matter through mulch and biomass transfers. The barrier approach to erosion control by checking runoff and keep valuable top soil in place. The contour hedges created by multipurpose trees provide soil erosion control through barrier approach mechanism.

### **Agroforestry and food security**

Agroforestry can contribute to food security through provision of edible products such as fruits and seeds. Trees can also improve soil fertility by fixing nitrogen from the air and recycling nutrients, there by helping to increase crop yields. Trees provide valuable supplemental fodder for animals to enhance livestock production. Trees provide household energy for cooking, heating and lighting.

### **Agroforestry and Income**

Agroforestry provides farmers with products, many of them high in value, which can be sold in rural and urban markets such as selling timber, poles, charcoal and honey. Many trees and shrubs have medicinal value that keeps the farm family healthy and

generate additional income. Trees that adapt well to the environment and drought tolerant tree species are insurance mechanism against crop failure.

### **Agroforestry, Biodiversity and Environment**

Many trees and shrubs planted through agroforestry can increase plant and ecosystem biodiversity; trees are also helpful in ameliorate global climate change by sequestering vast amount of carbon. The physical presence of trees on farm boundaries serve as living fences and protect home gardens from free grazing livestock.

In order to realize the full potential of agroforestry in Ethiopia it has to be supported by ongoing and completed research results from the Ethiopian Institute of Agricultural Research (EIAR), higher learning institutions and regional research institutes. Such existing data can provide a good background for future research and development activities including scaling up of successful experiences.

The International Center for Research in Agroforestry (ICRAF) which deals with agroforestry research, extension and information exchange should play a leading role in improved land husbandry and agroforestry in Ethiopia. This would help Ethiopia in its efforts to attain food and income security for millions of rural poor and help in rehabilitation of the environment.

### **II Expansion of Plantation Forestry**

Private forestland ownership is not common in Africa. Most of African forests belong to the state, although some countries have maintained traditional forest land tenure rights, and smallholder farm forestry is widespread. South Africa is the only country where private sector-dominated forest ownership exists in Africa. There are more than 70 percent plantations and 43 percent of natural forests in private hands, producing over 80 percent of total commercial round wood in 1996/97 (DWA, 1997). There are large areas of land suitable for tree planting for industrial purpose in Ethiopia. Expansion of plantation forests on privately owned or leased lands by private industry or individuals is an attractive business. The size of this operation ranges from small-scale woodlots to large-scale industrial and non-industrial plantations. The most common objectives of private forest owners include: profiting financially from sale of different forest products; supplying raw materials to wood processing industries; making the best use of land holdings that are not suitable for other purposes; providing habitat for wildlife, promoting recreation, and fostering ethics of stewardship for ecosystem and social services of forest resources. The participation of the private sector in forestry is shaped primarily by public policies, product markets, and biological and biophysical conditions that influence productivity of land and alternative land use options. Some of these forces are linked to local – and national level socio-economic systems.

Ethiopia heavily depends on forest products for various domestic, industrial and cultural purposes. Over 90 percent of the population is dependent on biomass fuel as its major source of energy for cooking, heating and even lighting. Wood fuel accounts for about 95 percent of the total biomass fuel (EFAP, 1994). Presently this is met primarily by overexploiting the natural forests and woodlands. The current domestic wood supply which is 14.4 million m<sup>3</sup> satisfies only 30 percent of the total national demand for forest products. There is a big gap between the demand and domestic supply for various forest products. In order to supplement the limited supply of wood products from domestic sources, the country is importing lumber, plywood, and panel products from abroad. The total annual import value of sawn wood and other processed wood products including pulp and paper was about \$35 million for 2001 (<http://www.efi.fi/databases/tradeflows/>).

There is a great potential for Ethiopia to export round wood and other processed wood products to neighboring countries. Ethiopia is situated in close proximity to Middle Eastern countries that do not have suitable biophysical features to easily grow trees. These countries import huge amounts of forest products from countries farther way.

Private forestry has a potential role to play in Ethiopia's economic development. It can substantially raise the supply of forest products for domestic consumption as well as for export markets. Expanding domestic supply saves the country foreign currency (\$35 million in 2001) that the country spends on the import of forest products; this suggests market availabilities for the private sector. There is also a huge potential market for forest products in the Middle Eastern countries, to which Ethiopia has a comparative advantage due to its close proximity to the region.

Other outputs of the private forestry sector might eventually provide recreational and ecosystem services as well. The expansion of the private sector is a shared responsibility between the government, the community, and individual investors. Forestry investment should be market focused, and upheld by supportive policy and regulatory framework based on the economic, social, and environmental objectives of the country.

For the private sector forestry to develop and flourish in Ethiopia, land and property tenure guarantees are required for investors in large-scale plantations. Different levels of government are also critical players in company-community partnership models because they provide an enabling policy framework, facilitate negotiations, and can support implementation. Concerned government institutions should also educate about the realizable opportunities from forestry investments and assist in providing indirect incentives, such as market information, extension, education and research. Private forestry and agriculture are complementary rural endeavors, and, therefore, both sectors must be treated equitably in order to achieve the desired integration of rural development and poverty alleviation and the enhancement of the economic, social, and environmental well-being of Ethiopia as a whole.

### **III. Natural Forests Protection and Conservation**

According to different literatures, high forests, either coniferous or broad-leaved vegetation, covered 35 – 40 percent of Ethiopia's land area before human settlement. Over the last 3,000 years there has been progressive deforestation, which has accelerated tremendously during the last century. Rapid population growth, extensive forest clearing for agriculture, over grazing, movement of political centers and exploitation of forest for fuel wood without replanting reduced the forest area of the country to 16 percent in the 1950s and 3.1 percent by 1982 (UNEP, 1983). Further estimates of the distribution of forests and woodlands indicate 2.8 percent of the land is under forest and woodland cover (Kuru, 1990; MOA, 1991). The remaining natural forests are located primarily in the southern and southwestern Ethiopia. These High forest areas have been identified and designated into 57 National Forest Priority Areas (NFPA). However, the proper protection and management of these National Forests are questionable due to lack of clear and efficient forest policy in the country. At present, accessible high forest areas are exposed to various development project pressures, including coffee and tea cash crops, human resettlement, grazing, and logging operations (MOA 1991).

The forests of the country have been sources of different forest products for local consumption and industrial purposes. Forests provide different goods and services, which include fuel wood, construction wood, gums and incense, foods, fodder, recreation etc. Effort should be made to conserve, protect, and manage the remaining natural forests to benefit the current as well as the future generations. Since the best way to maintain species is to maintain their habitats, protected areas are an essential means to sustaining biodiversity. Protected areas also help stabilize the local climate, protect watersheds, and prevent erosion, and constitute the most widespread mechanism for conserving Ethiopia's remaining natural forests.

Protected areas will contribute to the conservation of Ethiopia's remaining natural forests if they are able to meet the legitimate development aspirations of the people who live in and around the forests. Participatory forest management which promotes the involvement of the local communities in the identification of the complete range of relationships between the people and the forests that they use or manage is critical. It is important to create a policy and legal framework to allow the participation of local communities in co-management of the resources and provide a mechanism to put this into practice. There is a strong relationship between environment and poverty and food security. Existing government policies and international agreements provide some basis for more active linkage between poverty reduction and the environment. There is an urgent need to incorporate environmental strategies, targets and indicators for better monitoring and evaluation of the outcomes of activities. Inclusion of environmental programs into the macroeconomic policies is not only important for the sustainable management of natural resources, but it also helps for sustainable growth of the national economy and the improvement of the livelihood of the rural households. To ensure the success of food security efforts and poverty reduction programs, still the conservation of the remaining forest resources is very critical. The sustainable management of these resources and rehabilitation of degraded areas through soil and water conservation, closing of sloppy areas from agriculture is essential. Protection and conservation of the remaining natural forests play greater role in the environmental protection, soil and water conservation, biodiversity conservation, maintenance and improvement of micro-climate.

Adequate agroforestry and natural resource education, research and extension service are needed to meet the demand for and challenges of managing natural resources on a sustainable base. Strengthening the countries education and research institutions to train qualified agroforestry and natural resource professionals with appropriate knowledge of forestry and agriculture in Ethiopia is required. Finally, establishing a responsible and transparent independent natural resource organization to sustainably manage, protect and administer the natural resources of Ethiopia is needed.

## **A DEVELOPMENT STRATEGY FOR AGRICULTURE IN THE HORN OF AFRICA**

### **Summary of Proposed Actions**

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Food security requires peace and stability. Governments will therefore need to ensure swift and effective forms of mediation at local and national levels to prevent conflict and to restrict the flow of arms. Governments must continue with institutional reforms. However, opening the door to the private sector and civil society does not mean they will develop automatically. Governments will have to pave the way by reducing and simplifying their trade regulations and establishing strong legal systems as part of enhancing the enabling environment for development.

Within the agricultural sector, the most important critical elements include:

- Increasing productivity by improving the effectiveness and efficiency of research and extension, making agents more relevant, demand driven, and accountable to farmers
- Enhancing the role of the private sector
- Improving incentives by making markets more efficient and competitive
- Improving the risk environment to promote investment
- Infrastructure development – especially rural roads , communication and irrigation
- Developing rural financial systems
- Moving from large-scale food aid to cash, investing in information and supply chains for high value exports, and developing rural towns
- Expanding safety net mechanisms to help vulnerable people
- Improving land security that will provide incentives for farmers to increase productivity and reduce natural resource degradation such as soil erosion, and deforestation.

## **Rural Poverty and Food Insecurity in Ethiopia The Quest for Sustainable Rural Institutions and Technologies**

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**INTRODUCTION:** This paper addresses the issue of rural poverty and food insecurity in Ethiopia, with the aim of exploring some policy options for their eradication. Specifically, it discusses the role of agriculture in alleviating poverty and food insecurity. The paper also explores the general problem of ‘Environment-Food Security- Rural Poverty cycle’, with emphasis on the need to develop productive and sustainable institutions and technologies aimed at eradicating absolute poverty, food insecurity and natural resource degradation (soil erosion and deforestation). Based on data from the First Round Ethiopian Household Survey conducted in 1994, using an analytical model (known as Social Accounting Matrix or SAM) to show the nature of linkages within the agricultural/rural economy. Based on household data from peasant associations (PAs), the analysis also provides production trends and determinants or constraints of food crop production for selected provinces or zones. The paper shows the weak linkages among the sub-sectors of the rural economy, and concludes by drawing some policy implications from the literature reviewed and the results of the analytical case model. An important policy implication of the paper is the critical need to develop market and non-market institutions to increase agricultural productivity and to overcome crop production constraints and the weak linkages in the rural economy, in order to eradicate absolute poverty and food insecurity.

### *Concluding remarks and policy Implications*

A decade after its first report on poverty in 1990, the World Bank published a second comprehensive report on poverty<sup>2</sup>. The first report characterized poverty as a condition of low income and consumption resulting from low returns to labor and other assets of the poor. The second or the 2000/2001 report extended poverty to be a result of low investment in education, health, nutrition, including deficiency in the other areas of human development such as powerlessness, lack of voice, vulnerability, and fear that poor people around the world express themselves in their own words<sup>3</sup>.

The second report also recommends three policy actions to combat poverty in general, by: 1. *Promoting opportunity*: enhancing economic opportunity for poor people by promoting poverty-focused economic growth and by increasing the productivity of their assets (land and labor-through education and health), and increasing the returns to these assets through a combined market and non-market actions. 2. *Facilitating empowerment*: making public institutions more accountable and responsive to the poor, strengthening their participation in the decision making process that affect their lives, and removing or dismantling social barriers that result from gender, ethnicity, race, religion, and social distinction and discrimination. 3. *Enhancing security*: Reducing poor people’s vulnerability to ill health, crop failure, policy induced dislocations, natural disasters, and violence. The advances in each of the above three areas are complementary. Each is important in its own right, and helps to enhance the others. While the report does not envision a simple blue print, it underscores the crucial notion that, “priorities must be made at the national level, but action and implementation must take place with local leadership and ownership reflecting local or community realities” and needs. (World Development Report 2000/01, p. VI)

The focus of this paper is more limited than one addressed by the recent report by the World Bank. The emphasis here is on the problem of rural poverty in general, and on the relevance of an agricultural based employment strategy in alleviating poverty and food insecurity in particular.

The paper explored the general problem of ‘Environment-Food Security- Rural Poverty cycle’, with emphasis on the need for productive and sustainable market and non-market institutions aimed at eradicating absolute poverty, food insecurity and natural

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<sup>2</sup> See *World Development Report 2002/2001: “Attacking Poverty”* published by the Oxford University Press for the World Bank, 2001, New York, N.Y. For the 1990 report see *World Development Report 100 on “Poverty”* by the same publisher.

<sup>3</sup> See *Voices of the Poor: Can Anyone Hear Us?* By Deepa Narayan and others, published by the Oxford University Press for the World Bank, 2000, New York, N.Y.

resource degradation (soil erosion and deforestation). Based on data from the First round Ethiopian Household Survey conducted in 1994 and an analytical model (known as SAM), it has shown the weak nature of linkages within the agricultural/rural economy. Based on community level data of a sample of provinces, the analysis has revealed production trends, including some production determinants or constraints for selected crops by provinces.

Some policy implications can be drawn from the analysis of this paper. First, for the officially adopted ADLI policies to succeed in meeting the goal of eradicating poverty in Ethiopia, private and public investments must be made on *institutions* and *technologies* that increase crop production and improve the weak linkages within the rural economy. This will involve developing or strengthening marketing and credit institutions that provide market access and opportunities for the poor in the farm and non-farm sectors. Public and private investments must be channeled to overcome the weak linkages that exist in the rural economy particularly in agricultural crop production and non-farm sub-sectors. Public and private investments on sustainable agricultural technologies that focus on the existing potentials of each region and provinces should be made to exploit the regional *comparative advantage* and productivity gains. Public and private investments must be encouraged in agriculture and related enterprises in these regions. In other words, regions and provinces with agricultural potential should be fully supported (or not to be undermined) if the desired goal of an agricultural based economic growth or the ADLI strategy is to become a reality in eradicating poverty and food insecurity. In the other regions and provinces, with no comparative advantage in agriculture and crop production, appropriate non-farm enterprises should be developed to increase incomes and employment in these regions. Regional states or provinces should then be linked by free trade of commodities, and free mobility of labor and capital. Institutions and policies should be developed to facilitate this important process, and those that retard it should be removed. For example, this paper has confirmed the fact that Arsi is among the provinces with comparative advantage in agriculture in general and food crop production in particular. Other provinces such as Wello may, for instance, have comparative advantage in non-farm enterprises that can be developed. Economic policies should encourage such (natural) patterns of comparative cost advantage and link such provinces through free interregional trade, and mobility of labor and capital, especially by encouraging private investment based on regional cost (comparative) advantage<sup>4</sup>. This has been the historical process of economic growth followed by nations that succeeded in using markets and agriculture as a vehicle of alleviating poverty and achieving economic development. For example, in the United States, most food crops such as wheat and maize are produced in Nebraska, Kansas and Iowa. Other states such as Michigan and Florida generally specialize in non-farm enterprises (Michigan in Automobiles and Florida in Tourism, for example). The federal states are then linked through free interstate trade of commodities and free mobility of labor and capital resources. Such regional specialization based on cost-advantages, and investment in agriculture has fueled the historic growth of the U.S. economy. This process has allowed the United States to achieve a successful economic development or *structural transformation* over time. Today, although only about 2 percent of the U.S. population is in the agricultural sector, the sector produces enough for the entire population as well as for exports and food aid to the rest of the world. The paper has also argued that appropriate technologies that enhance the productivity of rural poor people's assets (such as labor and land) through improved seeds, fertilizer, and improved farm implements are also consistent with reducing resource degradation in general, or soil erosion and deforestation in particular. In other words, technologies and institutions that enhance agricultural productivity can simultaneously reduce natural resource degradation problems.

In conclusion, the challenge for eradicating absolute poverty and alleviating hunger in Ethiopia is best achieved by pursuing an economic growth strategy that transforms the currently low productivity and huge agricultural sector, where 85 percent of the population makes it's livelihood. This challenge can be met by developing private and public institutions that promote the four *prime movers* of agricultural development identified earlier in this paper: 1. Appropriate technologies- produced by public and private investments in agricultural research; 2. human capital investments and vocational skills of poor people by investment in private and public schools, training programs, on-the-job experience and health; 3. investment in infrastructure such as dams, irrigation facilities, telecommunications and roads; and 4. investments in farmer support institutions such as marketing, credit, fertilizer, and seed distribution systems. Each of the above *movers* is important and complementary. But, the analysis of this paper underscores the critical need to develop agro-ecologically or locally specific technologies to raise crop productivity, and to invest in infrastructure and in agricultural support institutions such as marketing and credit in order to overcome problems of productivity and weak linkages within the rural economy. The paper also implies that success in transforming agriculture along these lines can reduce natural resource degradation, and thereby enable Ethiopia to break out of the absolute poverty-environmental degradation-food insecurity trap.

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<sup>4</sup> This is not to undermine the need for public policy to address regions and communities that may experience extreme economic dislocation or deficiency due to external shocks such as natural disasters or war. These are legitimate areas for policies to deal with at all levels of government. But, it is crucial to point out that such public transfer activities cannot substitute for or address the long term problem and challenge of promoting productive investment activities aimed at economic growth and poverty eradication.

