Transforming Agriculture to combat Food Insecurity, Under nutrition and Poverty in Ethiopia: Challenge and opportunities for the future

Sisay Asefa

Paper presented at Ethiopia Forum: 
Challenges and Prospects for Constitutional Democracy in Ethiopia
International Center, Michigan State University
East Lansing, Michigan, March 22-24, 2019

ABSTRACT: This paper addresses the challenge of reducing poverty, food insecurity, under nutrition and natural resource degradation, in Ethiopia. With a population of 110 million, Ethiopia, the second largest and most populated countries in Africa and can be regarded as a microcosm of Africa due to its vast and diverse agro-ecology and population. Physically, it ranges from 200 meters to over 4000 meters above sea level. It has about 18 agro-ecological, zones and diverse population of some 85 linguistic groups that are united in diversity through historic migration, trade and intermarriage among linguistic groups. The paper begins by addressing the relationship among food insecurity, poverty and natural resource degradation based on relevant literature. The basic challenges of food insecurity-poverty-natural resource degradation discussed including the challenges of developing and managing human and resource and population growth, and developing and reforming institutions of governance, and the challenge of adopting pro poor economic growth policies. The relevance of agricultural and employment based development strategy is emphasized, given the fact that 85 percent of the population is currently engaged in agriculture and rural economy. Finally, the need to adopt a land tenure system that provides security by legal ownership rights to farmers and communities for sustainable development is one of key policy implications of the paper.

1. Introduction: Agricultural, Natural Resource and Demographic background of Ethiopia

With a population of about 110 million and a physical size of 1.115 million hectares, Ethiopia is one of the largest and most populated countries in Africa. It is second most populated nation among 54 African States. Ethiopia's economy is primarily based on subsistence agriculture, which accounts for 50 percent of the gross domestic product (GDP) and employs about 85% of the labor force. Agriculture accounts for 90 percent of total foreign exchange earnings with coffee contributing about 60% of the total value of exports. Ethiopia's coffee exports, however, is only about 2 percent of the world coffee market.

Agriculture provides about 70% of the raw material for food processing, beverages and textile industries. Animal Hides and skins account for 20 percent of the total value agricultural exports followed by pulses, chat and animal products in that order of significance (MEDAC, 1999). Food Crop and livestock production is primarily based on smallholder farming, which comprises of some 10 million farmers who produce more than 90% of agricultural products, including 98% of coffee. About 95 percent of the cultivated land is under smallholder agriculture, and the rest under state or commercial farms. About 60% of the total land area is estimated to be potentially suitable for agricultural production, although only 10 percent is currently under cultivation. Much of the country's food crop production including 75% of the livestock production currently takes place in the highlands and 25 percent in the lowlands. In spite of its vast agricultural potential, Ethiopia has been trapped in the state of food insecurity and poverty. The country has been chronically dependent on food aid, and it is currently one of the largest recipients of food aid in Africa.

Ethiopia's population grew from 23 million in 1960 to 110 million in 2018, and it is expected to double in the next 25 years (CSA, 2001). Population growth is more severe especially in the highlands (above 1500 meters above sea level), which are home to 85-90% of farm households.

2. The Food Insecurity-Poverty, Low Agricultural Productivity, & Natural Resource Degradation Trap
The over-arching development problem of Ethiopia in particular, is the problem of poverty and food insecurity. Although the developing world has made some progress in this area over the last three decades, food security in Africa has stagnated or declined. For example during 1970-90 period, the number of food insecure people in developing countries fell from 940 to 786 million, or from 36% to 20% of the total population. However, the food insecure population in Africa rose from 130 to 170 million (ACC/SCN 1992). Food insecurity is directly related to poverty at the global, regional, national, and local levels. Globally, about 1 billion people are food insecure and chronically undernourished (FAO, 1996a). Food insecurity is a result of lack of income and access to food, which is driven by income poverty. Global food insecurity can be addressed through a more equitable distribution and access to food. For example, if available food is evenly distributed, it is estimated that each person in the world can be assured of 2700 calories per day, which is more than 220 minimum calorie requirements for an average person. The reality, however, Ethiopia is one of the Poorest and food insecure based on data on poverty and governance on Multiproverty indicators. There is a strong link between lack of economic growth, poverty, and food insecurity. This idea is revealed by the fact the most significant reduction in food insecurity and poverty has occurred in East Asia, where the number of food insecure fell from 52% to 32% of the total population or from 475 to 268 million over a period of about 30 years. On the other hand, the proportion of food insecure population more than doubled or rose from 11% to 26% in Africa. The projected share of food insecure population in the Region is estimated to be 39%, which will make Africa the only region in the developing world where food insecurity will increase by the year 2020. Many factors are contributing to trap Ethiopia, in the current state of food insecurity and poverty. These include production fluctuations, non-farm employment, low income, fragmentation of food markets, high rate of natural degradation, low level of farm technology, high level of illiteracy and inadequate quality of basic education, poor health and sanitation, high population growth, poor governance, and interstate and intra-state conflicts and wars. Ethiopia is caught up in vicious cycle of food insecurity-poor quality food- low agricultural productivity- land degradation cycle. The food insecurity-poverty-natural resource degradation can be overcome by focusing on three basic and related development policy challenges: 1. The Challenge of Developing and Managing Human Resources and Population Growth, 2. The Challenge of Developing and Reforming Institutions of Governance, 3. The Challenge of Adopting Poverty-focused and/or pr-poor Economic Growth Policies that Reduce the Costs and Risks of Private Investment on key sectors such as agriculture.

2.1 The Challenge of Developing and Managing Human and Natural Resources and Population Growth:

The most significant element in the process of economic development of any country involves appropriate investment in its population, since people are both the means and beneficiaries of economic development. The quality of population or “human capital” is the single most important factor that distinguishes economically successful nations from failed or poor states. Improving population quality requires massive investment in education, health care including adequate nutrition, shelter, and clean water guided by an effective and capable system of governance at all levels. The share of developing countries population growth is expected be 84% of the total global population growth by the year 2020. Over this period, the relative increase in population growth will be the greatest in Africa, where it is expected to double from 0.6 billion to 1.12 billion. For Ethiopia the current population of 110 million is expected double by 2030, Ethiopia must reverse the marginalization of its people, especially its female population, and strengthen their capabilities and capacity. The various regimes of Ethiopia neglected the critical human capital development needs of country by failing to invest in quality education, health, and nutrition and investing Military Expenditure that contributed to internal and regional wars.

2.2. The Challenge of Developing and Reforming Democratic Institutions of Federal and Local Governance:

The second challenge for reducing food insecurity and poverty in Ethiopia is that of improving institutions of governance aimed at developing capable and effective system of government at national, regional, and local levels. This challenge depends on leadership that is accountable and transparent at all levels. Ethiopia needs effective system of governance that allocates scarce resources both efficiently and
fairly across all the current regional states in Ethiopia. A capable and effective system of governance and leadership is possible only under constitutional democracy guided by the rule of law, independent judiciary, peaceful and open political competition, and an independent press. These pillars of democracy must be built into the national constitution, with checks and balances that include term limits for significant political offices including the President. Governance should be decentralized on former provincial and geographic taking into consideration the cultural and economic and physical settlement patterns of the population. The current constitution must be changed following a peaceful, open inclusive dialogue of all stake holders. A system of governance that is imposed from the top down as it has been the case under various regimes in Ethiopia cannot be sustained in the long run. Changing constitution should lead to restoration former provinces based on geography to replace current ethnic federal system that drives conflict and corruption including removal of residences due to the fact local elites believe they do not belong in that region a consequence of flawed ethnic federalism.

2.3 The Challenge of Adopting or pro-poor inclusive Sustainable growth policies

An agricultural led strategy manufacturing strategy is the best way of reducing food insecurity and generating greater employment both in farm and non-farm sectors. Investment on agriculture focused economic growth is especially crucial for Ethiopia, where 85% of the population currently makes its livelihood in rural and agricultural related activities. Moreover, investment in agriculture must be pursued not only to reduce food insecurity, but also to alleviate poverty through employment creation and income generation in farm and non-farm sectors including creating manufacturing and agro-industry through value chain of crops and livestock. It is also the best strategy for conserving natural resources or reversing land degradation and deforestation, since poverty forces poor people to overuse natural resources and forests in order to meet their basic survival needs. Land reform that secures land on farmers and rural and urban communities including pastoralists will go a long way in protection forest and land degradation and water depletion. Ethiopia can also benefit from urban farming based on small plots to feed growing urban areas.

3. Achieving for by adopting Productive and appropriate and sustainable Technologies and improving the quality education and Institutions

As indicated earlier, Ethiopia is a large country with over 110 million people of which about 85 percent still engaged in rural and agricultural based economic activities. It has one of the lowest per capita income in the world and high incidence of absolute poverty- with 50 percent of the population below the poverty line. For example, Ethiopia’s per capita income was about $110 in 1997, and it’s Human Development Index (HDI), a composite index of income, life expectancy, and education ranks 171 out of 174 countries listed in the Human Development Report 2000, published by the UNDP. Ethiopia also faces a related problem of severe food insecurity that manifests itself in the lowest calorie intake in Africa at about 1845 calories per person per day including chronic child under nutrition. Food insecurity, is defined as the lack of food access by all peoples to enough food for active and healthy life. It is a result of lack of income to acquire food from domestic production and/or food imports. It is estimated that more than half of the population is food insecure of which the largest group are located in rural areas, with insufficient land to produce and purchase food (Testaye & Debbe, 1995).

A major development challenge for Ethiopia is to reduce absolute poverty and food insecurity at acceptable environmental and economic costs. In order to tackle this problem and devise appropriate policies and institutions to meet the challenge, it is necessary to understand the relationships among natural resource management, technology, agricultural productivity and food insecurity

Ethiopia faces a rapid population growth that contributes to the environmental problem, which manifests itself in land, water degradation and loss of biodiversity caused by low agricultural productivity and high dependence on fuel wood (Denel 2001). Soil degradation is the severest environmental problem (Paulos, 2001). Ethiopia loses about 400 tons/ha of topsoil every year (Shibru & Kifle, 1998) that aggravates poverty and food insecurity. To address this problem, it is necessary to identify and generate appropriate
and sustainable technologies that significantly reduce food insecurity and poverty. A policy research to develop the institutions that impact on agro-ecologically specific productive and sustainable technologies, aimed at reducing food insecurity and absolute poverty in Ethiopia. Insuring food availability by increasing food or supply, which can be addressed by public and private investments the “the prime movers of agricultural development (Eicher, 1988, 1995). These prime movers include public and private investments in: 1. new technology and agricultural research, 2. human capital and managerial skills produced by investments in schools, training, and on-the-job experience, 3. physical capital investments in rural infrastructure such as irrigation, dams and roads, 4. farmer support institutions such as marketing, credit, and extension services. But, a crucial pre- condition to implement the above prime movers is a favorable public policy and institutional environment and good governance guided by a political leadership committed to agriculture.

The adoption of an agriculture and rural-centered development strategy known as Agricultural Development-Led Industrialization (ADLI) is correct. But, the successful implementation of the strategy remains to be seen, since it faces major institutional impediments such as land policy and corruption at federal, regional and local levels.

4. The Relevance of Agricultural and Employment Based Economic for pro-poor Growth Strategy

An agricultural and employment based economic growth strategy as articulated by Mellor (1986) is the most appropriate strategy for the development of the Ethiopian economy, where 85 percent of the population is rural and agricultural based. Most of the agricultural potential is located in the Ethiopian highlands, which constitute 35-40 % of the landmass. The Ethiopian highlands are home to 88 percent of the population, comprising 90 percent of cultivated land, and 70% of the country’s livestock population. Thus, the battle to eradicate or to significantly reduce absolute poverty and food insecurity in Ethiopia will be won or lost on the highland ecosystems. This is not to suggest that the lowlands are to be ignored by public policy. But, in fact the success in reducing poverty in the lowland or marginal lands can be achieved faster by investing on high potential agricultural areas, due to the dynamic relationships between highland and lowland eco- systems as long as there is free internal trade and mobility of labor and capital. Moreover, lowland areas can specialize in economic activities such as eco-tourism that are suited to their regional comparative advantage and benefit from interregional trade. An agricultural and employment based strategy based on the generation and dissemination of technological and institutional changes and investments required to improve agricultural productivity and to increase farm and non-farm employment and incomes will be the primary source of sustainable and equitable growth for Ethiopia.

The strategy also has the potential to lead to a poverty-focused economic growth necessary to reduce food insecurity and environmental degradation. A poverty-focused growth involves two complementary elements according to Adelman (1986). First, it must promote the productive use of the poor people’s major which is labor by policies that harness market incentives, along with the institutions, infrastructure, and technology economic activities of the poor, Second, it must provide basic social services to the poor in the form of health care, family planning, disease prevention, basic education, and nutrition services.

The role of agriculture the development process has three dimensions (Mellor, 1986): 1. Agricultural growth under shrinking farmland with population growth requires an appropriate technology that involves land saving in the form of biological and chemical technologies. 2. Growth in domestic demand for food and farm output despite inelastic demand. The growth in food demand occurs through accelerated growth in rural employment, made possible by indirect effects of agricultural growth itself. 3. Increased demand for goods and services produced by the non-farm sector and facilitated by technology-based increase in agricultural income. These basic elements of the strategy are interactive, which require an open trading regime favorable to farm goods at the domestic, regional and international level. For example in 2001, farmers some parts of Ethiopia were producing bumper crops due to good weather. But, they are also faced a problem low prices for their products due to weak demand and an inadequate system of marketing and transportation. The problem of localized food insecurity can, in the long run, be addressed by developing export markets for farm commodities, by increasing rural incomes from farm and non-farm employment, and by promoting greater inter-regional trade and international trade that allows movement of food from surplus regions to food deficit regions of the country. The critical need
for moving agriculture forward is underlined by the need to increase food supply to feed a rapidly growing population, and to provide employment and income growth needed to reduce absolute poverty and food insecurity for a predominantly rural-based population. Since Ethiopia has a large pool of unskilled and youth labor, agricultural development aimed at improving agro-industry and manufacturing can relieve the growing unemployment problem. The supply of labor is a function of the labor market and the food market. Increasing employment provides the working poor with added income of which 60 to 80 percent is spent on food due to high-income elasticity of demand. If food supply does not increase, a rise in population will cause food prices to increase, reducing real income of workers, raising wages and reducing employment in other sectors of the economy (Mellor, 1986). Agricultural and food crop production also stimulates non-farm employment since increased farm incomes provide effective demand for non-farm rural enterprises. Moreover, agricultural development makes well known general contribution to the overall national economic development and poverty reduction by increasing the supply of food for domestic consumption, by releasing labor for industrial development and non-farm sectors, by enlarging the market for industrial (non-farm) output, by increasing the supply of savings, and by providing foreign exchange earnings (Johnston and Mellor 1961 and Adelman 1986), has identified strategies to attack the problem of absolute poverty that includes an export-oriented growth in labor-intensive manufacturing, and reliance on agricultural-led industrialization, which she believes is likely to result in equitable economic growth and poverty reduction. But, most African economies have failed to implement this strategy in the past for at least two reasons: First, there is insufficient or lack of investment in improved technologies in Africa, unlike Asia, which has invested in green revolution technologies. For example, although crops such as maize and wheat have benefited from green revolution technologies, technologies for food crops such as sorghum, teff and barley are either not on the shelf or have not been adopted. Thus, there is a need for successful generation and adoption of appropriate technologies for specific agro-ecological areas of Ethiopia. The second reason is the lack of an appropriate public policies and institutions. The problem here is that policies and institutions are short term, discontinuous, misguided and focused on transfers and consumption activities.

5. The Quest for Productive and Sustainable Agricultural Technologies and Innovations

The challenges of meeting food security based on appropriate technology and that of slowing or reversing natural resource degradation should be pursued together in Ethiopia. An appropriate technology is one based on induced technical change as articulated by Ruttan (1998). It involves the adoption of labor-intensive biological and chemical technologies that increase yield increasing and land saving. Productivity and sustainability problems are two sides of the same agenda, which are also linked to the absolute poverty and food insecurity problem. Currently about half of the Ethiopian population is below the poverty line and food insecure.

The goal of cutting poverty level by half or to about 25% below the global poverty line is achievable within the next decade if proper combination of productive and sustainable technologies and institutions are adopted. Indeed this is a realistic goal that should be pursued in Ethiopia during the next decade with proper policy and institutional environment. For example, Malaysia reduced the population below poverty from 50 percent in 1970 (which was about the same as the current level in Ethiopia) to about 10 % in 1990 (World Development Report, 1990). Agricultural productivity, measured in terms of average or marginal factor productivity of land, labor, and capital, depends on technology, quantity, and quality of the factors used. A key technological issue is the type of technology farmers can use under a growing population, diminishing farmland, and land or soil degradation. Is the technology profitable or sufficiently productive to meet food security needs, and can it be sustained with the resource base of the various agro-climatic zones of Ethiopia. In Ethiopia, there is evidence that farmers can adopt improved agro forestry and soil conservation practices only under more secure land tenure system ( Beyene, 1996) .Thus, the challenge is to adopt agro-ecologically focused and locally specific technological options in Ethiopia aimed at slowing or reversing resource degradation. Moreover, according Bekele and Holden (1998), “the challenge of breaking the poverty-environment trap and initiating sustainable intensification requires policy incentives and technologies that provide short-term benefits to the poor while conserving the natural resource base. Improved technologies and use of farm capital is the most promising path to
achieve the goals of greater productivity, food security, and sustainability in most agro-climate zones (Reardon, 1998)

6. Enabling Institutions and Governance, Leadership and Institutions for productive and sustainable technologies for Agricultural and rural transformation

Institutions in are rules of the game that shape human interaction including economic interaction (North 1990). Economic problems such as hunger, poverty, war, and unemployment are result of institutions that provide rationale people with incentives to behave in a destructive rather than constructive manner (Van Den Berg, 2001). Institutions and organizations are not always the same. Institutions are rules of the game while organizations and individuals are the players (Kasper, 1998). Markets are institutions that evolve and develop overtime as a form of ‘institutional capital’ of a country, and must be allowed to evolve with proper public policies. Johnston (1998) notes that in addition to farm level technologies changes that improve land and crop varieties, institutional or “socially determined factors” in the form of public investments in areas such as agricultural research, extension, infrastructure, and enabling macroeconomic policy environment are essential. For example, a clearly defined and secured land tenure system is a key institution that promotes incentives for farmers to adopt improved technologies and to protect natural resources. A sustainable technology involves farm-capital intensification that takes place in two stages. First, it involves labor-intensive application of manure and construction of traditional land improvements (planting grass strips, anti-erosion ditches, and earthen bunds). Second, it requires increased use of improved soil conservation practices based on modified animal traction equipment, land saving chemical and biological technologies such as fertilizer and improved seeds. Sustainability here means successful management of resources for agriculture aimed at satisfying the changing needs of communities, while enhancing the quality of the environment and conserving natural resources (CGIAR, 1988). But, whether farmers can move to the second stage in the long-run will depend on institutions and policies that promote agricultural profitability, and provide access to cash or credit to farmers to purchase or produce farm capital (Reardon, 1998) enabling land policy aimed at eradicating absolute poverty and food insecurity is crucial. Since farmland is an increasingly scarce input, land markets should be allowed to emerge in order to allow for sustainable, equitable and efficient use of land (Teklu, 2001). For land markets to emerge the availability of capital that allows farmers to use fertilizer, organic matter, and improved seed, in combination with increasing investments in soil conservation and small-scale irrigation technologies.

The capacity of farmers to choose alternative technologies is critically conditioned by public and private investments in rural infrastructure, input and output market improvements, land markets, credit policy and promotion of non-farm enterprises such as agro-industry. The challenge is to develop innovative, cost-effective private and public institutions that support agriculture under a favorable and macroeconomic and institutional environment (Reardon, 1998). Indeed, in absence of appropriate rural institutions, rural poverty alleviation will be just a dream, since technological packages and credit cannot reach the small farmer that is land less. (Itana, 1995)

7. Summary, Conclusion and Policy Implications

Over the period of more than four decades, Ethiopia has gone through two major revolutions. Both the 1974 and 1991 top down policies resulted from the inability and unwillingness by the governments of the time to undertake the necessary institutional reforms including land reform to transform the rural economy where the majority of the people make their livelihood, the per-capital income of Ethiopia during the period since the revolution of 1974 has not changed. It has fluctuated between $100 and $240 per year, and the proportion of the population in poverty has increased. When Ethiopia experienced first top down revolution in 1974, some 53 percent of East Asians and 58 percent of the population in all developing countries lived in absolute poverty. But, East Asia to reduce absolute poverty rate by at least half, and abolish the recurring food security famines over the next 25 years. The experience of East Asia suggests poverty reduction has primarily been driven by rapid agricultural based economic growth,
experiments have not transformed agriculture since at least 80% of insecurity in agriculture. Finally, the paper calls for measures that include privatizing land with regulation against excessive concentration, generative privatization of state and collective farms. For example, the Indian experience with land policy reforms aimed at increasing land access to the rural poor has some implications for Ethiopia. It involved a selective deregulation of land-lease (rental) markets, a reduction of land transaction costs by improving land ownership registration, promoting independent farmers land rights and associations at the local level, and strengthening civil society for checks and balances needed for successful reform. A study on the economics of sustainable management of land in the highlands of Ethiopia concludes as follows. “A change in the land tenure system to ensure security of land ownership is indispensable. This serves as a guarantee for farmers’ confidence to reap the benefits of long-term investments on land such as construction of soil conservation structures, manure use, and implementation of water harvesting techniques and irrigation using internal river network of flows. It is also imperative to come up with and implement a policy that ensures secured and reliable and regulated legal land transaction, as against de facto land market, for proper (and sustainable) utilization of land resources” (Senait Ragassa, 2003).

It is also important to have short-term safety-net programs that directly transfer income and social services to the poor in the short-run that include food subsidies, public works programs, and credit programs focused on the poor. The approach must be demand driven by local communities, and target women, youth and children. Other means of safety-net programs include public works programs for employment during off-season period when agricultural work is limited or unavailable.

Long-term benefits can be generated if such programs can be used to build rural human capital assets such as schools, primary health services, and physical infrastructure such as roads. But, for such programs to be useful they must be accompanied by on the job training linked to long-term employment and development.

In general, such policies that can bring about a win-win outcome of developing agriculture, alleviating poverty, and protecting the environment in Ethiopia includes generating non-farm sources of employment is crucial to increase the incomes of rural communities to as generate incomes that can be re-invested back on farm and non-farm enterprises. The evidence of value a secured land tenure is shown by the author the two districts in southern Ethiopia district that revealed farmers fear of losing farmland through sale or redistribution by local cadres. Farmers express strong desire to have land ownership title as reported by the majority (73 percent) of farmers in the two districts surveyed. Results from a survey of rural development professionals in the district also speak with a clear voice about the positive effect of privatizing land with regulation against excessive concentration is necessary to transform agriculture. Lessons can be drawn from Ghana who engaged the youth in training and education to become farmers and entrepreneurs including that empowered women farmers and entrepreneurs. (See SBS Interview of Akog Birara on April 26,2019). https://www.sbs.com.au/yourlanguage/amharic

Finally, the paper calls for massive effort or private and public partnership focused on transforming agriculture suggested in this paper will enable Ethiopia to break out of the current cycle of poverty-food insecurity- natural resource degradation. But, the experience of close to 50 years of top down experiments have not transformed agriculture since at least 80% of Ethiopians are in subsistence agriculture and food insecure and income poor today. This short paper shows policies required to
transform subsistence agriculture to modernize the Economy of Ethiopia for future and move Ethiopia to middle income nation by 2030.
9. Selected References *(Final copy editor can keep references appear in the text if necessary)*


North, Douglass (1990), Institutions, Institutional Change and Economic Performance, Cambridge University Press


Senait Regassa (2002). The Economics of Managing Land Resources towards Sustainability in the Highlands of Ethiopia, Margraf Verlag, Germany. 2002.


