

Why Ethiopia Needs Green Revolution and Industrial Decentralization (Part Two)

Tsegaye Tegenu, Stockholm University

In my previous posting I pointed out the need to rethink the development strategy in Ethiopia and put forward green revolution and industrial decentralization as alternative policy options, see http://aigaforum.com/articles/GreenRevo_Industrial_policy_Ethiopia.pdf). I based my argument by identifying two qualitatively different population pressure drivers which I defined in terms of the objectives, needs and capacity of the sector of a population that is increasing. The first pressure driver is an increase in the number of high dependency ratio households that have relatively high consumption requirements. I refer to this pressure as the multiplication of child-rich households and this driving force is on the increase particularly since the land reform in 1975/76. In rural Ethiopia the child-rich households constitute at least 56% of the rural households and they are growing by a constant average growth rate of 2,6% in the period 1994-2006 (Tsegaye 2008). Increasing on the number of child-rich households means an increasing need for cropping land to ensure household food security. The second pressure driver is an increase in the volume and growth rate of young labour force actively participating in rural labour market. This driving force has shown constant average growth rate of 4,69% in the year 1999-2005 (Tsegaye 2008). Other things equal, if the labour force is growing at 4,7% per year, then *just to stand still* it will have to increase other parameters (education, employments, health, energy, housing, etc) at about the same rate.

By looking at the nature, size, speed and need of the driving force unfolding in rural and urban areas of the country and reviewing the capacity of current government policy to counter the negative effects of the pressure drivers, I suggested green revolution and industrial decentralization as policy options to keep up with the race. Green revolution means introducing agriculture technology in rural areas: high-yielding varieties of grain, use of pesticides, and construction of irrigation physical structure facilities and management for harvesting two or three times per year and to avoid dependency on rain-fed agriculture. Industrial decentralization is defined as the spread manufacturing employment and enterprise management from major cities to rural towns through a phased transition.

In part two, I will continue to discuss the need for green revolution and industrial decentralization for another two more reasons: as means of raising the country's labour productivity and overcoming structural instability. Labour productivity is an important source of long-term growth and it measures of what farmers and workers get in return for their efforts (time and management skills). It is beyond the scope of a website standard article to discuss details of labour productivity (the full account focusing on agricultural labour will appear in another publication, Tsegaye and Bo forthcoming).

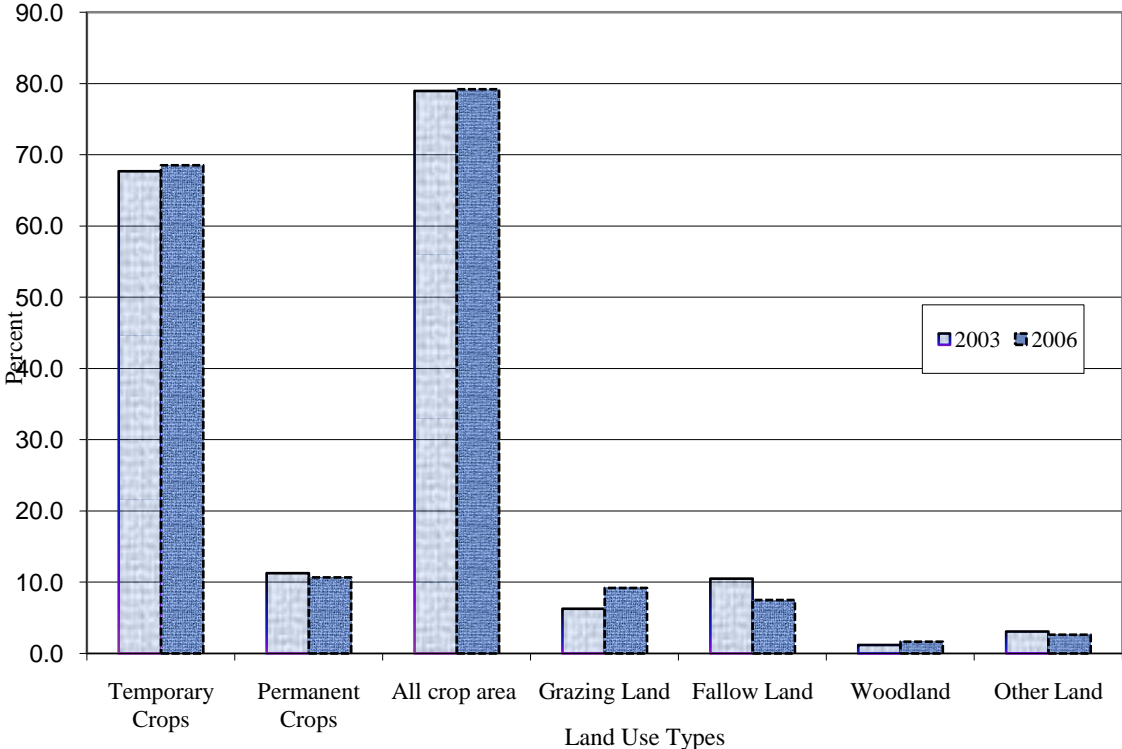
Before proceeding to my argument points I would like to say few words on the data used for analysis. To analyse past productivity change in agriculture at national level I used the Central Statistical Agency (CSA) agricultural sample survey data on area and production of crops for the period 1995-2008. The credibility of this data set has been seriously questioned by (Dercon and Hill, 2009). This is for the second time that the data of CSA is seriously questioned, the first being the 2007 census data. I have respect for the professionals in CSA

but the management has to take the issue seriously and do the “auditing” together with the researchers.

Based on CSA evidence, Dercon and Hill found out “Massive growth in output +100% since 1996/97, +12% per year in last 5 years +200% wheat, +150% maize, 60% teff, 80% sorghm • Huge area expansion +44% since 1996/97, +5% per year in last 5 years +85% wheat, +70% maize, 20%teff, 60% sorghum • Strong yield increase +40% since 1996/97; +6% per year in last 5 years +60% wheat,50% maize, +30% teff, 13% sorghum. Concerning the area expansion, they asked “where does this huge area expansion come from?”

Whatever the multiplying factors might be, there is a clear evidence for the expansion of grain crop areas in the country. Researchers in Ethiopian agriculture agree that production has increased in Ethiopia mainly as a result of crop area sown. As I have pointed out growth in the number of child-rich households with higher consumption requirements and young labor force seeking land for employment creation are the driving forces behind area expansion. Currently grain land is expanding at the expense of other categories of land and environmentally inhospitable areas. A study on the proportional mix of land in the regions of Tigray, Amhara and SNNP shows that new crop lands are expanded at the expense of fallow land, cash crop land (coffee), wood land and other land categories including gardens and barn lands (see Figure below).

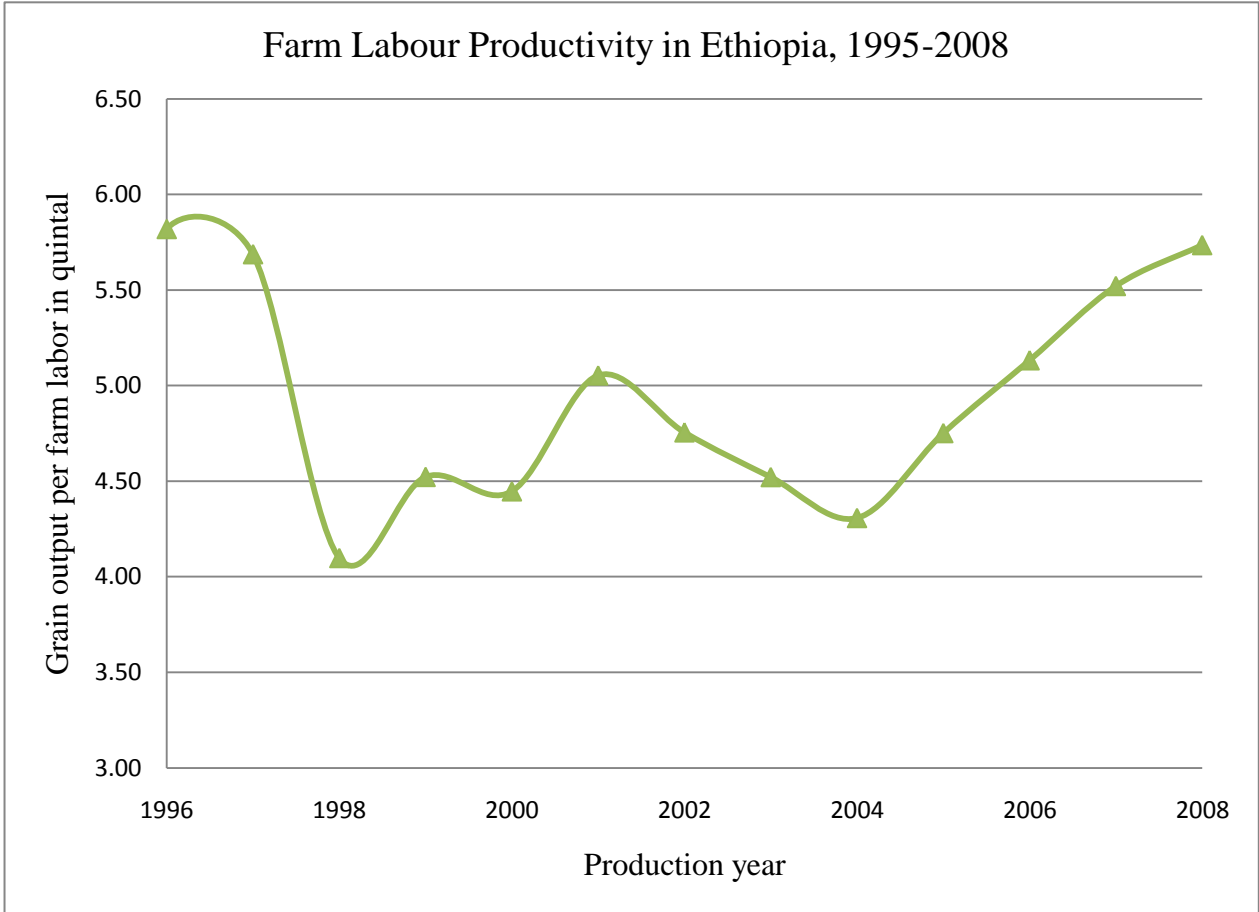
Proportional mix of land use change 2003 and 2006



The conversion of marginal areas with lower sustainable yield potential for crop cultivation demands greater labour input to raise land productivity. Conversion to crop land means deforestation, overgrazing, limited fallow, farming on steep slopes, limited application of nutrients/organic matter, and lack of proper soil and water conservation measures— which constitute proximate causes of land degradation. To protect the land and increase its soil fertility (to regain land productivity) farmers are engaged in terracing, manure, inter-cropping

(planting two or more species within an individual parcel of land) and land conservation infrastructure (grass strips, anti-erosion ditches, hedgerows).

The extension of cultivation to poor lands decreases the return to labour. In the marginal lands to obtain the same level of output more labour input per unit of output is required than had previously been the case. This situation, according to classical economists such as David Ricardo, leads to eventual stagnation, as the marginal return to additional labour decreases. In addition to land degradation, cyclical drought, moisture stress and loss of local species have contributed to the law of diminishing returns in Ethiopian agricultural sector.



To see the changes in output subsequent to a proportional change in labor inputs, analysis is made on the growth level and growth rate of labor productivity. The growth level is the starting value of whatever is growing; while the growth rate is the change in the growth level from year to year. The above figure on farm labor productivity shows that the labour productivity growth levels fluctuate and do not show any increase. The labour productivity of 2008 has similar level to that of the middle of 1990s.

The growth rate of the labour productivity level, however, has shown a dramatic increase. According to CSA, (1995/96-2006/07) data, the constant average growth of labour productivity increased strongly from negative 8% in 1996-1999, to negative 0,1% in 2000-2004, and to positive 6,5% in 2005-2008. This, however, does not mean that an increase in economic productivity. For longer term growth it is necessary to keep both the growth rate and the growth level as high as possible. An economy with a low growth level will not grow very much in the long run even if the growth rate is high at times.

The increase in the average growth rate of 6.5% between 2005 and 2008, reaching 5,74 quintals per farm labour can be explained by the rise of land productivity (crop yields obtained from a given size and quality of land) rather than by technical progress (an improvement and move closer to existing best practices of green revolution). Land productivity reflects the level of labour and fertilizer inputs. Since only 45% of the rural households in Ethiopia use fertilizers (CSA 2006) well below the recommended rates, land productivity is mainly the result of labor intensity.

The question is now what farmers have got in return for their efforts? To answer this question assessment is conducted on household production, consumption needs and productivity performance for a given year. It is found out that child-rich and labour rich households (76% of the total households) have lower income available for non-food expenditure after selling grain production. Even if the majority of these household types have the potential to cover their higher food requirements according to CSA data, they are left with no money to cover other household non-food annual expenditures: health, education, cloth, government tax, fertilizer debt, etc.

Another result of the study is that active rural labour is not only over utilized for low income return, it is also under employed. Grain crop production is a seasonal activity in Ethiopia. Since the farming system is generally characterized by rain-fed crop production, the labour demand for agricultural activities has seasonal characteristics. The period from February-May is relatively low agricultural activity season while the peak period of agricultural activities (starting the beginning of June through the end of November) are depending on the availability of rain fall. The dry season (October-January) is the peak harvesting season in Ethiopia. Considering weekend and religious holidays, farmers have at least a total of 175 days that can be allocated for various agricultural activities in the wet and dry seasons. Due to the low level of technical changes and dependency on rain-fed agriculture, farmers use only 56% of the 175 days and the remaining days are used for off-farm and non-farm activities.

Non-farm sector include petty trade, handicraft, transporting, mining, selling of wood, local brewery, etc. Households participate in non-farm sectors either as self-employed or as wage labourer. Off-farm self-employment involves ownership of a firm that produces goods and services. It requires capital, managerial skill and access to market. As we have seen the majority of rural households have low productivity and shortages of liquidity to invest on equipment purchase.

Some researchers and donors suggest promotion of non-farm rural economy through provision of credit (micro finance), business support services in training and technical assistance. As I have pointed out in my previous posting the non-farm sector is dominated by non-tradable services, i.e., goods produced by all and everywhere. Even if the service sector is less land intensive compared to agriculture, it cannot absorb the growing surplus labor if it is non-tradable. In the case of rural Ethiopia, its growth depends on government budget rather than on sale of services (labor productivity and specialization). What is need is a shift to new occupations involving higher levels of skills and better technology which raises labour productivity.

The conclusion is that labour productivity in rural Ethiopia has remained on the same level for decades despite growth in grain output. CSA data shows that grain output grew at a

constant average growth rate (CAGR) of 7% between 1995-2008, while crop area and farm labour inputs grew by 3,85% and 5,4% respectively. This means that increase in inputs is the main sources of growth in rural Ethiopia. There are no studies which prove that technological progress and institutional innovations as sources of agricultural growth in Ethiopia.

Currently the Ethiopian government has allocated millions of hector land for investment See <http://www.moard.gov.et/eng/publication/invest/ethiopian%20investment.pdf>). While the government is allocating more lands for investment, demographic factors are pushing the growth of the labor force. Both in the urban and rural areas more than half million people are added to the labor force each year. It seems that the government is trying is to put more input to get more output. As the analysis on labour productivity shows input increases cannot be sustained in the long run and they have only short term effects. What is needed is a policy for increasing the growth level and growth rate of labour productivity. Green revolution (high-yield varieties of grains and irrigation) leads to more output using the same input level. Industrial decentralization (i.e., migration-led urbanization and mechanization) increases output while it decreases land and labour inputs. It is time to change the government policy from growth in the resource base to growth in productivity.

In addition to technological changes and improvements, institutional innovations (including governance) are contributing factors to growth, even if it is difficult to isolate their effects from non-institutional factors. Since I have dealt with institutional issues in my previous work, I do not have time now to examine institutional changes in terms of factor productivity. For an overall understanding see my book (Tsegaye 2006), which is written purposely for those who are interested in choosing institutional changes that are efficient in resource allocation and conducive for economic growth particularly at local and regional levels. I recommend readers to read it and to give me their feedback. In connection with this I would like to note that institutional innovations usually take time.

Finally, I would like to briefly discuss my last argument point as to why Ethiopia needs green revolution and industrial decentralization. Observers agree that Ethiopia is making progress in infrastructure development. The electrification program is absolutely essential to jump-start industrialization and Gibe III must be completed by all cost. Without abundant power and large scale central generation systems it is not possible to start industrial decentralization.

Industrial decentralization provides an incentive to competitive production. Growth cannot be sustained for long without structural competitiveness. Sustainable growth is the outcome of concentration of economic activities in urban centres (following the model of economic geography), development of human capital (following endogenous growth theory) and innovative entrepreneurship (neo-Schumpeterian economic theory). Industrial decentralization is about the skill development of the young labour force and the process of economic driven urbanization. It introduces a systematic competitiveness in the economy as privately and/or collectively owned local and national manufacturing firms compete for production and export. China is a good example in this particular case. Systematic competitiveness has the advantage to create structural stability since it provides sustainable economic development that has a capacity to manage social change without resorting to violent conflicts.

If green revolution and industrial decentralization help Ethiopia to overcome structural instability what are we waiting for? The World Bank, FAO and other research institutes are telling us to “develop agriculture” (see World Development Report 2008) because we have

not yet finished our homework: we have applied less fertilizer while it should be more, lacks land reform, etc. Why the Ethiopian young adult labour force is condemned to stay in the valleys, mountain hills and slopes doing terracing, grass strips, anti-erosion ditches, and hedgerows, etc. My studies on process of urbanization and rural livelihoods show that the Ethiopian youth have chosen migration to urban centres and education as livelihood strategies. Their valuation for smallholder agriculture has declined because of the low level of labour productivity discussed above. It is high time now we accept this reality and rethink our development strategy.

The author can be reached at tsegaye.tegenu@epmc.se

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