Get Rid of Small Farms: Reflection on 2008 World Development and 2011 Rural Poverty Reports

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Background

Should African countries such as Ethiopia farm their way out of poverty? According to the World Development and Rural Poverty Reports the answer is yes they should. On 6 December 2010, IFAD released Rural Poverty Report 2011 declaring the progress attained in reducing poverty as the result of agricultural development and the number of poor people still residing in rural areas waiting for action (IFAD 2010). This report is a continuation of recent years renewed interest in agriculture as a key driver of development and poverty reduction. The World Development Report (WDR) 2008, by the World Bank forwarded a message that agriculture is a vital development tool for achieving the Millennium Development Goal (WB 2008). The Rural Poverty Report 2011 was preceded by a special issue publication on the future of small farms (Wiggins, et al. 2010). In all the papers and reports, despite differences in the amount of weight given to the role, there is a consensus that small farms can drive agricultural growth in sub-Saharan African countries.

Even if the sudden rise in cereals prices on world markets kindled further interest in agriculture in general and small farms in particular, the argument for basing agricultural development on smaller farms emanated from two principal considerations: one a matter of concern to equity and poverty, and the other concerning efficiency. The Rural Poverty Report 2011 notes that “global poverty remains a massive and predominantly rural phenomenon – with 70 per cent of the developing world’s 1.4 billion extremely poor people living in rural areas”. In an earlier World Development Report (WDR) of 2008 it is stated that “three out of every four poor people in developing countries live in rural areas, and most of them depend directly or indirectly on agriculture for their livelihoods”. If the goals of reducing poverty and hunger to be achieved, “governments and donors need to shift their attention to developing agriculture in general and strengthening small farms in particular”. The efficiency argument for small-scale agriculture is based upon an investigation on the ‘inverse relationship’ between farm size and production per unit of land. The empirical findings show a common
tendency for larger farms to yield lower gross and net returns per ha of land per year than smaller farms (Lipton 2005).

Is it true that small farmers can drive agricultural growth and reduce poverty because of their sheer size and dominant involvement in rural economies and efficiency character attributed to them? The reports mentioned above assume that small farms can given the challenges that faced them are solved. These challenges include access to resources and markets, uncertainties and risks, governance and climate changes, among others.

In identifying the determinants of small farm productivity growth, the various reports focus on comprehensive enabling policy and institutional factors. I think this is not the right approach in studying the sources of productivity in smallholder agriculture. Instead the focus should be on the growth fundamentals of smallholder agriculture: the consumption requirements, saving and investment capacity and multiplication of small farms and how these factors affect the adoption of new technologies and factor ratios in rural areas.

My point of departure is that at a time when labor force growth is characterized by young age (56% of the labor force as in the case of Ethiopia) with fertility rate of 5. 5 children per woman and household types of higher consumption requirements (56,7% of the total agricultural households) small farms do not positively respond to policy instruments and investment options related to commercialization, trade, price incentives, and technological adaptation. There is low adoption of new technologies as a result of high household dependency ratio and low labor productivity as a result of high density ratio (household multiplication). The government, the private sector and the households do not have the required capacity to provide or meet the agricultural input demands at the required speed.

The missing link in the World Development and World Poverty research reports is the factors of household dependency ratio, density ratio and rural surplus labor. These factors are not static as they seem or assumed to be. The level, timing and distribution of these measurements (demographically explained in terms of tidal waves and disordered flows) affect capability and factor ratios in rural areas.

**Beyond Poverty: Understanding Small Farms as Consumption and Investment Units**

One of the strong cases for preferring small farms is the issue of equity, an ethical concept grounded in the principle of distributive justice. In operational terms, pursuing equity means
reducing income disparities that are systematically associated with the majority of social
disadvantage population living in rural areas. An equity framework systematically focuses
attention on socially disadvantaged groups of poor people in a given country.

However, acknowledging the right to income equality between social groups and
systematic poverty reduction requires understanding of the fundamental causes related the
multiplication of households in rural areas. In rural Ethiopia there are over 12 million
households and of this more than 55% are child-rich households (households with four children
and above). As a consumption unit the needs and demands of child-rich households include
the followings:

- **Food Security**: Children are entitled to the provision of sufficient calories, proteins
  and vitamins/minerals. These provisions should be stable from year to year,
  without excessive seasonal fluctuations.

- **Shelter**: Children need shelter for sleeping, eating, drinking, playing, resting and to
  be in a relationship with those who inhabit the house, the neighbour and the
  community. Shelter is the primary setting for physiological reproduction and
  procreation. Families should afford to meet these shelter needs for the well-being
  of children.

- **Health Care**: Children's health means considering issues involving diet, nutrition
  exercise and health in the early years. Children need a healthy diet, adequate
  clothing, and a clean and safe home. In the early years children's health is heavily
  affected by t preventable diseases such as diarrhoea, measles, malnutrition,
  respiratory disorders and more recently HIV/AIDS. Children therefore need access
to health care, immunization, nutrition, water and sanitation.

- **Education**: Education is one of the most basic needs of the child. Without
  education, children are far less likely to achieve their true potential. Child
  development specialists agree that the early years of a child’s life are the most
  important in terms of their future development. Damage done at this age has a
  lasting effect, while positive experiences give the child the tools they need to make
  the most of their future education.

- **Protection**: Children should be protected by their families and communities from
  violence. Violence can take many forms, such as physical punishment and
  trafficking for exploitation; or violence from emergencies.

The child rich households have higher consumption requirements and lower economic support
ratio. Given the stated needs and demands, child-rich households do not have the saving
capacity to use modern fertilizers, pesticides and tillage machinery for intensification purpose.
Instead, they seek to optimise the on-farm resources (manure and cover crops) through the
application household labor inputs and this is called here low-input intensification, the
principal coping means and livelihood strategy.

In low-input intensification agriculture, child-rich household can provide an average of
four adult-equivalent labor and needs an average of four hectar land to maintain the level of
output needed for reproduction (an average of 12.8 quintal per child-rich household per year). Considering the average land productivity, child-rich households at least need 0.92 hectare of land to produce the required food (calculated using 1984 value). The total land area reported for the private holdings of households in rural Ethiopia was estimated at about 15 million hectares in 2007.

The question is what happens to such proportional input output ratio as the number of the child-rich households increases over time. Increase/decrease in the number of child-rich households is affected by changes in the age group 30-45, birth rate per woman (reproductive behaviour of young adults), dissolution rate of large size households (out-movement of adult children and formation of new households) and decline in land-labor ratio. The multiplication of the child-rich households increases the consumption requirements and land demand of the households (see figure below).

Source: Tsegaye Tegenu and Bo Malmberg (2010).

The multiplication of the child-rich households creates deficit in consumption and land requirements. As the household number increases child-rich households either has to decrease consumption (two meals per day) or increase production input to maintain the level of
subsistence output. The physical inputs and the output have to grow in balance to guarantee food security.

Increasing land and labor inputs depends on saving capacity. This means increasing production is significantly affected by the rate of investment, which in turn is related to savings. Savings on the other hand depend on the level of income (own production) and consumption of the household. As pointed out variables of family size and dependency ratios are inversely related to household saving/consumption.

If one studies the sources of households’ agricultural loan in rural Ethiopia, one finds that most important sources are loans from friends/relatives, money lenders and/or local saving/funeral associations. Even better-off of households could not meet their basic necessities leave alone to save form their own production (income). If one look at the household expenditure, loan and own-production are used to cover basic necessities (to buy foods and cover fertility related expenditures such as health, education and weeding). Since an increase in production inputs (the size of agriculture land, number of oxen, quantity of fertilizer used, hired labor etc.) and consequently an increase in output depends on saving, subsistence households do not have the capacity to spur growth.

At the macro level poverty is related to economic growth. Faster population growth requires greater investment to maintain the level of capital per head. This implies that in a situation where there is a lower saving rate, which is the case during the period of smallholder household multiplication, a rapidly growing population is supported by a lower standard of consumption. Poverty can thus be manifested through deprivation of basic needs such as water supply, school age enrolment, health care, energy and housing conditions of the rural population.

The percentage increases in the child-rich households reflects the tax base and expenditure structure of the state. The larger the dependency ratio, the greater the responsibility the government has to provide basic services and investment in social infrastructure such as education and health care. The use of almost all the goods produced and value added generated to immediate consumption strains the capacity to save. The high dependency burden shifts the pattern of investment to a welfare type of investment (health, education, housing, etc.) from directly productive type of investment (plants, factories, etc.). Hence the level and composition of net investment resulting from the effects of increased dependency burden would tend to reduce growth in total output or per capita income.
Examining Small Farms Efficiency: Relationship between Sources of Production Increase

The efficiency argument for small-scale agriculture is based upon a theoretical and an empirical investigation which shows a common tendency for larger farms to yield lower gross and net returns per ha of land per year than smaller farms. The proponents of small farm agriculture use the law of diminishing returns. They believe that the owners of small farms, because of their characteristically greater diligence, industriousness, and thrift, produced goods at less cost than the large-scale farmer.

The efficiency argument can be examined empirically and theoretically. Empirically it is important to verify whether the agricultural statistics which points to higher amount of output per unit land on small farms in comparison with large ones is falls or not. Have they included in their calculation a monetary estimate of labor input by the household members (including child labor) and exchange labor (communal labor). If not such estimates can be substantially lowered for small farms.

Concerning the theory, the law of diminishing returns applies as well to the smallholder agriculture. As we have seen smallholder agriculture is multiplying as the rural labor force grows. During this period an increase in land size does not lead to an increase in total production given the limited quantity of household labor. In our study we found out that the combination of land and labor is optimal for child-rich households. In such type of households increase in land requires an addition of hired labor. But who affords to hire labor if household saving is very low.

In the case of the labor rich households, there is no need to increase the size of holding. What is needed is an increase in the household labor participation rate or creation of new holding for new entrants, for those who move out the household and form their independent household. Under such circumstances access to land becomes a critical factor in food production. But, in a situation where new clearing of land is not possible, the formation of new households or new entrants in the sector can only lead to partition of land (at the expense of other members) or new holding arrangements (renting and sharecropping). Parcilization of land leads to a decrease in the number of plots per holder and/or decrease in the average size of parcel. Since pacilization affects the average working day, as the farmers move from one parcel to another, there is possibility of decrease in output per worker.
In the literature on smallholder agriculture the incentive to apply technology by small farms is often associated with the abundance of family labor per hectare farmed. It is said that family workers are typically more motivated than hired workers and provide higher quality and self-supervising labor. They also tend to think in terms of whole jobs or livelihoods rather than hours worked, and are less driven by wage rates at the margin than hired workers. Small farms exploit labor using technologies that increase yields (hence land productivity) and they use labor-intensive methods rather than capital-intensive machines. As a result, their land and capital productivities are higher (Hazell et al. 2006).

If labor intensity is a source of productivity, then this view is true only for child rich households where labor input per hectar is greater than other types of households and this is done for the purpose of increasing consumption. Since these households do not have enough private savings they cannot invest in technology.

In rural areas the efficiency characteristic attributed to small farms is not separated from on-going fragmentation of land and saving capability of the households. In a situation of high population pressure (multiplication of rural households and growth in surplus labor) small farms are not efficient. The 2008 World Development and 2011 Rural Poverty Reports did not give due weight to the population pressure measured by combination of different factors: population size (volume), speed (rate of natural increase, transition multipliers, wave and momentum), time-duration where the speed change takes place and the context of a limited level of technological change.

For instance, Ethiopian population has now topped 80 million, the second largest population in Africa. By 2050 it is estimated it will have reached 171 million (UNFPA 2005). During the twentieth century, the growth of the Ethiopian population has quickened tremendously. It had grown more than five times since 1900, three times since 1955 and had doubled since the early 1970s. The country will continue to experience a fast growing population in the coming three decades.

**What should be done?**

There is on-going unofficial debate among researchers studying rural economic development in Africa. For the sake of simplicity we can divide the researchers into four groups depending on their ideological inclination. The first group considers land size as a critical source for small holder agriculture and prescribes land reform policy to increase production. As we have seen small farmers have no saving capacity to hire labor for the
cultivation of additional land and invest in technology to increase land productivity. Farmers’ application of more labor to land than was optimally necessary in order to raise output led to low agricultural labor productivity (on labour productivity see [http://aigaforum.com/articles/Green_Revolution_PartTwo.pdf](http://aigaforum.com/articles/Green_Revolution_PartTwo.pdf)). It is a pity that some researchers of Ethiopian agriculture try to narrow down the agrarian reform to the issue of land and land tenure system missing the significance of labor capacity, consumption requirements and saving and investment capacity of small farmer households.

The second group is interested in market factors and they advocate supply of modern inputs and commercialization of agriculture to increase the productive capacity of small holder agriculture. Given the low level of labor productivity the significance of improved technology is undoubted. But when is technological adaptation takes place? In a situation where households have little or no saving adaptation will not take place. Many high value crops require considerable up-front cash investment in seeds, fertilizers and pesticides. The argument of this study is that the decision whether or not to adopt to a new technology is based on the household saving capacity. This study showed that higher consumption requirements and dependency ratios are negatively associated with household self-sufficiency and savings (some attribute problems of technological adaptation to institutional environments).

Assuming that there is the infrastructure capacity to provide the improved technology, adoption can lead to food security for the 76% grain deficient households (see Map 1). Large scale provision of improved inputs is not tenable in the long run if and when the working age population continues to have unchanged reproductive behaviour. What is produced will be consumed by the increased number of population and the provision of higher inputs has to keep pace with the growth in small farms.

If the government continues with its policy of improved package policy, it has to launch a massive family program aimed at increasing private saving that can be invested in technology. In a recent study the World Bank by advised the Ethiopian government to accelerate the fertility transition in order to capture the demographic bonus or dividend (World Bank 2007). Since behavioural change takes time, the government has to provide farm credit to smallholders pending an increase in household saving. Already the rural budget expenditure of the government is overloaded by the rapid expansion of primary education in rural areas. Given the current household situation even if the government provides the input technology
freely households still need cash to hire labor and in some cases rent land to adopt the technology.

Map 1: Spatial Distribution of Food Deficit, Food Balance and Food Surplus Households


The third group advocates the commercialization of small scale farms. The question is which of the households have the ability to commercialize their production system? By definition commercialisation assumes a profit motive. Previous field study has shown that child rich households, which are the majority type of households in the rural areas, are primarily interested in food security and meeting basic needs. Cash crops are cultivated if there is an excess resource after meeting the required for grain self-sufficiency. Child rich households have little incentive to produce non-food cash crops or food cash crops for the market until enough land and resources have been devoted to grain for self-sufficiency.
Beyond this point one may expect that extra productive resources would be used increasingly for cash crop production if these crops provide higher returns for sale.

The other difficulties in trying to adapt to the commercialization system is the choice of crops for production. There are food crops (including, enset, sorghum, maize, barley and wheat) and cash crops (including, chat, coffee, teff, and horticulture). All types of households do not cultivate any kind of cereal (teff, sorghum or maize) as they prefer. The kind of cereal to be grown is also determined by the unit cost of production and values of the crops grown by households. Households compare the costs and values of the alternatives and select the one that matches their need and capacity. For example, in medium density areas where the unit cost of production is high, cash crop such as teff can be grown by labor-rich families and these are not the majority in rural areas. In most cases it is non-food cash crop such as Khat which is expanding due to its relative low cost of production and higher returns (harvesting three times per year). Commercialisation of smallholder agriculture means making them dependent on purchased inputs and services. Smallholders require financial schemes, extension, input markets, market information and linkages.

Can the state actively provide these services under the current conditions where the private sector is underdeveloped? Recent study on quantifying the effects of government expenditure on rural poverty shows that the modest benefit so far gained in the agricultural sector is achieved at higher public expenditure. My observation is that I see no prospect for lowering high government expenditure on agriculture. The government expenditure will remain high since small farm households are multiplying in rural areas. As I have pointed out in my previous posting the young rural labor force is growing by about 4.7% per year. Even if I do not take this growth rate as an absolute truth (following the definition of CSA I used 10 as the lower age limit) in calculating the rate of household formation in rural Ethiopia, the labor force growth rate indicates a general broad trend in the multiplication of subsistence households with higher food consumption requirements.

In rural Ethiopia there are not sufficient conditions of drivers of commercialisation: there is lack of asset accumulation, growth in per capita production and urbanization. In the absence of production surplus (see Map 1) commercialization can lead to the practice and culture of theft in rural areas.

The fourth group recommends the promotion of non-farm economy through provision of credit (micro finance), business support services in training and technical assistance, and provision of infrastructure such as electricity and water. 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.

As our study on the rural employment structure shows, the non-farm economy is dominated by non-tradable services, i.e., goods produced by all and everywhere (Tsegaye and Bo 2010). In the case of small trading rural towns, for instance, every one produces and sales similar product (grain and livestock trading) at the same season while there are few who can buy the products at the time. Even if the service sector is less land intensive compared to agriculture, it cannot absorb 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 labor productivity. Instead of idealizing smallholder agriculture out of ethical concern, I suggest rethinking on how to get rid of small farms.

**Sequences and timing in getting rid of smallholder farming**

The conclusion of this study is that small farms cannot be the engine of agricultural growth in the face of a growing labor force that has unchanged high reproductive behaviour. If there are no more lands for expansion and problems of technological and market adoption, what is the purpose of keeping the labor force in the rural areas where employment generation and level of productivity is very low?

My empirical results show that small farm is a deficit and unproductive sector. There is no need to sustain it through reforms aimed at developing its tillage/cropping systems and efficiency in a way that can be suitable for the soil and climatic conditions. The small farm sector has to disappear or dissolve into an employment sector and this can happen mainly through industrialization of rural towns and green revolution undertaken in Asian countries.

My view differs from the above four groups even if I share the view of transforming the rural economic structure. I am not after a recipe to promote small holder agriculture nor non-farm economy, or their linkages. Instead, I prescribe policies aimed at getting rid of both sectors and replace them with something new and dynamic.

My difference lies mainly in my approach in conceptualizing small holder agriculture and non-farm economy and on focus of analysis. I think that small holder agriculture and non-
farm sectors came into being the way they did because of population pressure. What determines how they should be handled in the future is neither the level of poverty nor the diversification of livelihood activities. Change is affected by the quantity and quality of the population that is rapidly growing in the rural areas. As a result, I focused mainly on input, activity and output analysis and as to how these factors related to population growth, size, density, dependency ratios and surplus labor. I have a non-sector based approach and I am not primarily concerned on outcome evaluation: issues of poverty (who benefits) and sources of livelihood incomes.

In its overall development goals and analytical methods (model building and linking of the macro-micro aspects) my perspective on population pressure and economic development is not different from other theories such as human development theory. The added value of population pressure perspective is the driving force hypotheses. The driving forces indicate which elements belong to which dynamics of development. For instance, in a given demographic period when rural areas are dominated by multiplication of child-rich households priority should be given to food security. The factors of democratic governance, human resource development, change in property ownership rights, development of markets and employment creation are more important in the period of growth in rural surplus labor.

Unlike other development perspectives, my population pressure approach does not focus on a particular factor of development neither it excludes any. It identifies the proper combination, sequence and process in time and space. In getting rid of small farms the sequences are (in accordance to their importance): i) industrialization of small and medium towns for the creation of productive employment, ii) state-led green revolution for the purpose of food security, iii) rural land reform and consolidation for the purpose of migration and resource reallocation, iv) green revolution by smallholder farmers for the purpose of capital accumulation and creation of linkages, v) program of family planning (method to plan rather than prevent children) for the purpose of increasing household saving, and vi) commercialization of agriculture. The measures to stimulate the rural economy, namely a favourable rural investment climate, provision of public goods, infrastructural and institutional development are largely the same for all policy suggestions. To further understand the precise weight attached to each of these clusters of policy suggestions please see the following opinion postings at:

http://aigaforum.com/articles/GreenRevo_Industrial_policy_Ethiopia.pdf

Thinking out loud about long term impacts, I see a positive correlation between the disappearance of small farms and institutional stability in a sub Saharan African countries. The faster small farms disappears the less likely one reproduces institutional instability. I defer this hypothesis to a future task.

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