Is Poverty a binding constraint on Agricultural Growth in Rural Malawi?

Draft Policy Brief

By

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1. Context and Background

Agriculture remains the most important sector in sub-Saharan Africa and is a dominant form of livelihood for a majority of the population that resides in the rural areas. In Malawi, agriculture accounts for 35 percent of GDP and generates more than 80 percent of foreign exchange. In addition, agriculture is the most important occupation for 71 percent of the rural population in which crop production accounts for 74 percent of all rural incomes. However, agriculture has failed to get Africa out of poverty, and most countries are experiencing low agricultural growth, rapid population growth, weak foreign exchange earnings and high transaction costs (World Bank, 2008).

In Malawi, for a long time, economic growth has been erratic (see figure 1) with huge swings and poverty has remained high. For instance, the annual growth rates in per capita gross domestic product averaged -2.1 percent in the 1980-84 period, -2.7 percent in 1990-94 period, 3.8 percent in 1995-99 and -0.2 percent in the 2000-05 period.

Figure 1 Annual Growth Rate in real GDP and Agricultural GDP, 1990 - 2010
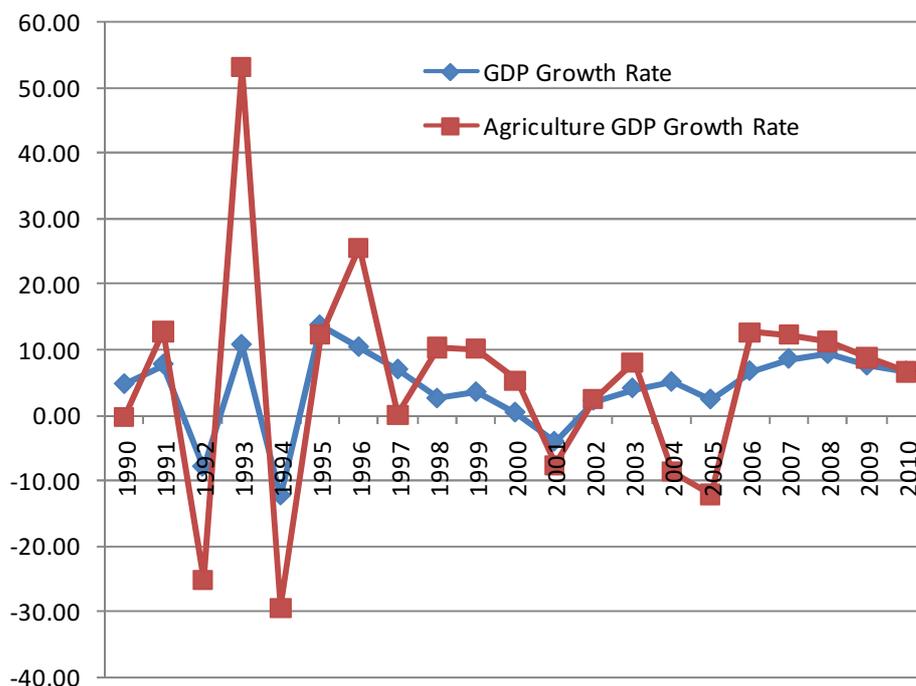
The performance of the agricultural sector and other sectors has been similar to the trends in gross domestic products with periods of high growth rates in the 1970s and experiencing negative growth rates in the 1980s. However, since 2005 the economy has consistently grown at more than 5 percent per annum. The agricultural sector has been growing at an average rate of 10.7 percent per annum, largely attributed to the input subsidy programme that has been implemented since the 2005/06 season and the good weather conditions that the country has experienced. During this period, model-based estimates of poverty show that the poverty headcount declined from 52 percent in 2004 to about 39 percent in 2009. Despite such decrease in poverty estimates, inequalities in living standards among households persist with Gini coefficient remaining at 0.39.

With such high levels of poverty and low growth rates the country has witnessed over time, the research set out to test the hypothesis that initial poverty or per capita consumption expenditure is constraining agricultural growth in Malawi using household level panel data between 2004/05 and 2008/09 agricultural season. The major policy development during this period was the implementation of a nation-wide agricultural subsidy programme since 2005/06 season, mainly targeting resource poor farmers in the rural areas. The programme aims an increasing food security and improving productivity by addressing smallholder farmers' affordability of inorganic fertilizers, improved seeds and chemicals that are critical in raising productivity in Malawi. Since this is a major policy change in the agricultural sector, the research also tested the hypothesis that subsidized farm inputs unlock the potential of resource poor farmers to contribute positively to agricultural growth.

2.   Methodology and Data

The main issue addressed by the research is whether poverty is a binding constraint on agricultural growth in rural Malawi. This was tested using panel data obtained in 2004/05 prior to the implementation of the subsidy programme and in 2008/09 during the implementation of the agricultural subsidy programme. The main hypothesis is that agricultural growth is dependent on level of initial conditions and time-varying policy variables including receipt of subsidized farm inputs. Since access to subsidized farm inputs involves targeting based on specific criteria that vary in application across communities, resulting in bias from non-randomisation of the subsidy allocation, a two-stage instrumental variable procedure was used in the research. In the first stage, selection into the subsidy programme or coupon receipt was treated as endogenous and conditional on a range of household socio-economic characteristics. A probit model of coupon receipt was estimated, from which the predicted probability of receiving subsidy in 2008/09 were obtained and these were used as one of the explanatory variables in the agricultural growth models in the second stage.

The relationship between agricultural growth and initial income poverty levels is assessed in the second stage consistent with the existing literature where it is argued that poverty may be a binding constraint on growth (Duclos and O'Connell, 2009). Ravallion and Datt (2002) and Deininger and Okidi (2003) note that initial conditions matter for both growth and poverty reduction. By using different levels of initial poverty status, the research tested whether the coefficients of the lower income groups have lower growth rates compared to the upper income group if poverty is indeed constraining agricultural growth. Other variables in the model include the interaction terms between initial income groups or poverty status and access to subsidized inputs in order to assess the impact of the subsidy programme in resolving some of the binding constraints faced by households in the agricultural sector.

The study used panel data for two agricultural seasons, 2004/05 and 2008/09 from which a usable matched panel of 1,227 households was obtained. The first panel sampled enumeration areas in which households had equal probability of being selected for the survey from a household listing exercise. The second panel randomly selected the districts and followed up households in enumeration areas sampled in the first panel.

3.   Results and Discussion

a) Household Characteristics

Table 1 shows the socio-economic characteristics of the smallholder households used in the research. Agricultural growth among households averaged about 1.6 percent per annum but with a very high standard deviation. The average per capita consumption expenditure in 2004/05 was US$85 per annum while the average value of crops harvested was MK8, 823. About 66 percent of rural households were predicted to have

received subsidized fertilizers while 40 percent purchased unsubsidized commercial fertilizers in 2008/09, with about 27 percent of households receiving subsidized fertilizers and also purchasing commercial fertilizers. Access to subsidized fertilizers is evenly distributed across different per capita consumption expenditure quintiles; about 14 percent in each expenditure quintile received subsidized fertilizers.

Table 1 Household characteristics

Variables[*]	Mean	SD
Annualized real agricultural growth	0.0160	0.251
Poor in 2005 (0/1)	0.4817	0.500
Ultra poor in 2005 (0/1)	0.1760	0.381
Marginal poor in 2005 (0/1)	0.3056	0.461
Received subsidy in 2008 & ultra-poor in 2005 (0/1)	0.1108	0.314
Received subsidy in 2008 & marginal poor in 2005 (0/1)	0.1940	0.396
Received subsidy in 2008 & poor in 2005 (0/1)	0.3048	0.461
Received subsidy (predicted) in 2008 (0/1)	0.6634	0.473
Purchased commercial fertilizer in 2008 (0/1)	0.4042	0.491
Commercialisation index in 2005	0.1713	0.254
Household head years of schooling in 2005	4.6015	4.010
Received extension advice in 2008 (0/1)	0.2037	0.403
Number of observations	1227	

Notes: [*] (0/1) indicates dichotomous variable equal to 1 for the included category, otherwise equal to 0 for the base category.

With respect to asset endowment, household durable assets were valued at an average of US$8 in the 2004/05 agricultural season. The average land holding size per household in 2004/05 was 0.6 hectare. The extent of commercialisation of agriculture in Malawi is low with only 17 percent of household output being sold, which indicates that the agricultural sector in rural Malawi remains subsistent. About 40 percent of the households have a commercialisation index of zero, implying that their agricultural activities in 2004/05 were for subsistence needs. The sample is dominated by male-headed households, with only 29 percent of households being female-headed. On average, the household heads attended 4.6 years of education indicating that they do not have even the primary school certificate of education. Only 20 percent of the households in the panel received extension advice in 2008/09 growing season of which 10 percent were in the poor category.

Box 1: Changes in Agricultural Output by Income Groups, 2005 - 2009

The figure below shows the nature of growth in different income groups - per capita expenditure quintiles (PCQ1 – PCQ5). The left panel shows that a majority of households in different income groups experienced a decrease in agricultural output, with smaller proportions in the fourth and fifth quintiles. The richest and poorest groups had higher proportions of households experiencing negative growth. The highest proportions of households that did not experience any growth are in the fourth and fifth quintiles while the lowest proportion is in the first quintile.
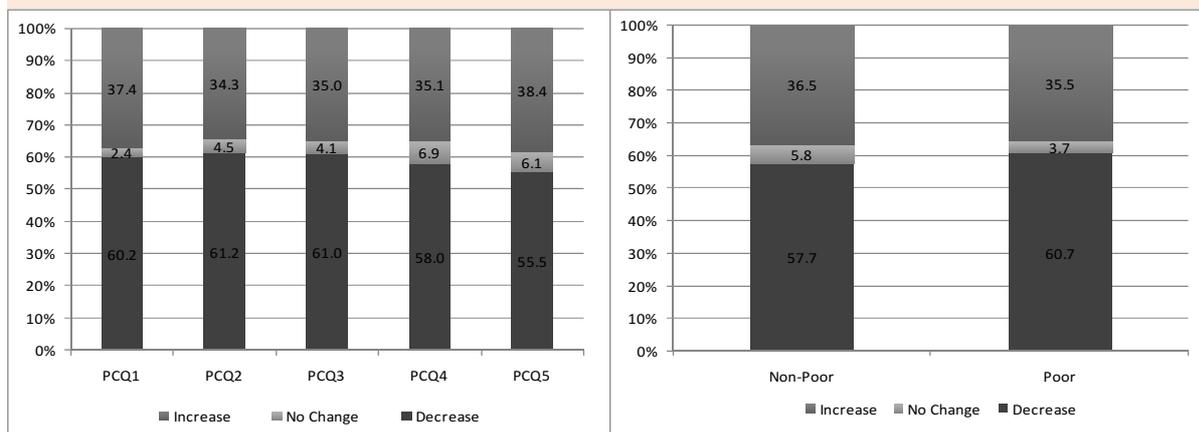
About 61 percent of the poor compared to 58 percent of the non-poor experienced a decrease in agricultural output (right panel). The non-poor who experienced no growth were 5.8 percent compared to 3.7 percent among the poor. The proportions of household that witnessed increases in agricultural growth are, however, not significantly different among the non-poor and poor households. Overall, there is no particular group that has outperformed in terms of agricultural growth.

b) Agricultural Growth and Initial Poverty Status

The research investigated the role of poverty on agricultural growth by using two ways of capturing initial poverty status of households. First, the role of poverty traps was captured through quintiles of initial per capita incomes, with the first quintile representing the poorest 20 percent and the fifth quintile representing the richest 20 percent. Secondly, smallholder farmers were categorized into poor, marginally poor and not poor based on the NSO (2005) categorization to represent the initial poverty status. However, the result showed that the latter categorisation is too broad for analysis of the growth-poverty relationship.

The results from the analysis of the initial poverty status as represented by income quintiles revealed that agricultural growth is constrained by poverty in Malawi. More specifically, the research revealed that:

- Households with low initial output grew much faster than those with higher agricultural output. This is consistent with the neoclassical β-convergence which

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postulates a negative relationship between agricultural growth and initial agricultural output.

- Agricultural growth was lower among households in lower quintiles compared to households in the fifth quintile (richest households) suggesting that low incomes or poverty constrain agricultural growth.
- The agricultural input subsidy programme plays an important role in agricultural growth in Malawi with beneficiary households experiencing 5.6 percent more growth compared to non-beneficiary households. The subsidy programme addresses affordability of inputs and enhances agricultural growth particularly for households in higher income groups suggesting that the growth potential of the poorest of the poor is not affected by access to subsidized fertilizers.
- Smallholder farmers that invest in productivity enhancing technologies experienced 6.5 percent higher growth rates relative to those who did not invest in fertilizers. In addition, those farmers that received subsidized fertilizers and also invested in commercial fertilizers in 2008/09 farming season experienced about 10 percent higher agricultural growth than those that did not.
- The farm input subsidy has differential effect on the growth of agricultural output for different-sized farms, with production increasing more for farmers with relatively large parcels of land. This also reflects the fact that one of the criteria for targeting the farm input subsidy is that the 'household must have land'.
- Farmers that received agricultural extension advice experienced about 4.3 percent higher agricultural growth relative to non-recipients suggesting that providing farmers with extension services complements initiatives to increase agricultural growth in Malawi.

4.   Policy implications and recommendations

The research provides evidence that access to subsidized farm inputs under the agricultural input subsidy programme has been the main driving factor of agricultural growth since 2005/06. Similarly, investment in fertilizers through commercial purchase provided further impetus for agricultural growth. However, access to subsidy by the poorest 20 percent does not lead to higher agricultural growth rates amongst the poorest households. Furthermore, households in lower income quintiles tend to have lower agricultural growth rates compared to the richest 20 percent of households; hence poverty is constraining agricultural growth. The lack of access to extension services by smallholder farmers is also one of the constraints to agricultural growth in Malawi.

The policy implications of the study are two-fold. First, agricultural subsidies may not be the best instrument for unlocking the growth potential of the poorest but rather the subsidy enhances agricultural output among households in the middle income group. This has implications on the targeting of the agricultural input subsidy programme which emphasis on resource poor households. Targeting the subsidy at the poorest of the poor,

may not be effective in expanding the productive capacity of poorest farmers. It is recommended that alternative policies to input subsidies are needed for the poorest of the poor in order to break the vicious circle of poverty. This is a group that may require social protection instruments such as direct cash transfers rather than productivity-enhancing interventions.

Secondly, the demand-driven extension service system that government introduced seems to reach very few farmers. There is therefore need to revitalize the extension system so as to reach as many farmers as possible. This is particularly important in the context of the subsidy programme in which access to extension services and other complementary services can enhance the efficiency of input use.

References

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