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# African Re-Agrarianization? Accumulation or Pro-Poor Agricultural Growth?

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ABSTRACT

Recent signs of increasing agricultural production in a number of countries in sub-Saharan Africa are by some commentators connected to local level differentiation. This paper discusses such interpretations using household level longitudinal data from smallholder households in eight African countries for the period between 2002 and 2008. The use of a mixed methods social science approach complements traditional economic approaches through adding a spatial perspective. Pro-poor agricultural growth so far is concentrated to particular villages, where it is highly inclusive. The policy challenge remains to devise strategies that can enhance growth also in marginal areas.

Keywords: Africa, Zambia, pro-poor agricultural growth, rural differentiation, social science research

# 1. INTRODUCTION

Since the turn of the millennium renewed political interest in African agriculture has resulted in a number of national initiatives seeking to enhance the role of the smallholder sector as a driver of broad based poverty reduction and growth. The devotion of the World Development Report in 2008 to the topic of *Agriculture for Development* (World Bank, 2007) signaled a turnaround also in donor circles, with smallholder based growth being increasingly viewed as the foundation of long term poverty reduction and economic transformation in sub-Saharan Africa. A spate of Green Revolution style programs geared towards family farms have sought to democratize growth in the smallholder sector through sometimes vague, but politically appealing strategies of "pro-poor agricultural growth". The latter concept entered the mainstream development discourse in the early 2000s with operational variations tested in different national contexts since then (Dorward, Kydd, Morrison, & Urey, 2004; Minde, Jayne, Crawford, Ariga, & Govereh, 2008; Poulton & Dorward, 2008; Poulton, Kydd, & Dorward, 2006).

Resting on historical evidence from China and India and a large literature showing the strong linkages and poverty reducing effects of agricultural growth in general (Haggblade, 2007), practical strategies for pro-poor agricultural growth have tended to vary among countries. Two main criteria are identified as especially important, however: pro-poor agricultural growth should be inclusive, in the sense of involving the majority of smallholders while the concept presupposes their gradual commercial integration into national and sometimes global value and market chains. An agricultural-led path out of poverty does not occur through the growth of the agricultural sector alone, but requires the growth of "a broad class of smallholder entrepreneurs (Staatz & Dembélé, 2007, p. 3)". The strategies of pro-poor agricultural growth viz. the importance of staples versus non staple crops, the role of the state and at what level market integration should occur are less well defined at least in practice.

The policies for ensuring inclusivity in situations of scarce public resources have also varied with governments targeting regions or smallholder segments to fulfill the pro-poor criteria (Birner & Resnick, 2010; Smale & Jayne, 2010).

The macro-economic consequences of generally expansive economies in the post-millennial period appear to have been positive for African smallholders at least in some countries, with signs of production increases noted alongside the entry of new groups of smallholders in agricultural markets (Andersson, Djurfeldt, Holmquist, Jirström, & Nasrin, 2011; Andersson Djurfeldt & Djurfeldt, resubmitted, 2012; Haggblade & Hazell, 2010; Jirström, Andersson, & Djurfeldt, 2011). Increasing rural differentiation perceived as a local level result of neo-liberal policy and further integration of Africa into the relations of unequal exchange characteristic of global capitalism provide an alternative interpretation of such trends, however (Havnevik, Bryceson, Birgegård, Matondi, & Beyene, 2007; Kay, 2009). Building on a tradition of studies within the scholarly tradition of rural capitalism, such commentaries, as suggested by Oya (2007) suffer from the lack of longitudinal data upon which to draw robust conclusions over time, however.

While the latter is readily available in the mainstream economics literature, documenting for instance reductions in average land sizes (Jayne, Mather, & Mghenyi, 2006) as well as promising productivity increases (Haggblade & Hazell, 2010), the perspective is often sectorial rather than spatial: differentiation among smallholders in terms of income and land sizes are treated at the national rather than the local or regional level. Contextualizing growth (whether pro-poor or not) is necessary given highly localized production systems and patterns of commercialization, however. In turn such variation is connected to heterogeneity in terms of geographical and social relationships, differences in rural urban interaction and gender

dynamics (Andersson Djurfeldt, 2012; Andersson Djurfeldt & Djurfeldt, resubmitted, 2012; Wiggins, 2000).

The following article therefore seeks to add a local level social science based perspective to shed some further light on these patterns. A geographical understanding supplements economic perspectives on agrarian change and agricultural transformation (Binswanger-Mkhize, McCalla, & Patel, 2010). Using panel data from 2354 households in eight African countries, (Ethiopia, Ghana, Kenya, Malawi, Mozambique, Nigeria, Tanzania and Zambia) surveyed in 2002 and 2008, the paper analyses signs of commercialization against a backdrop of possible differentiation at the village level. The paper employs a mixed methods social science approach drawing on panel level data as well as qualitative interviews. Breaking the data at the village level makes it possible to situate and qualify patterns. A number of central questions are posed in relation to signs of agricultural growth seen in the data: Is agrarian growth concentrated to an elite stratum of households? Is a broad class of smallholder entrepreneurs emerging? Have these processes been inclusive? And finally what village and individual dynamics can be connected to such processes?

## 2. THEORETICAL PERSPECTIVES: BROAD BASED AGRICULTURAL GROWTH, COMMERCIALIZATION AND POLARIZATION

As suggested initially, the role of agriculture in African development has been at least temporarily reconsidered, following what are usually described as the “lost decades” of the 1980s and 1990s. In this sense, the discussion on whether African agriculture is capable of engendering growth has in practice closed in favor of the proponents of an agricultural led, smallholder based strategy (Diao, Hazell, & Thurlow, 2010; Jayne et al., 2006; Lipton, 2005).[12]

The explanations for this change of focus relate to theoretical as well as political considerations of the poverty reducing capacity of smallholder based agrarian growth. The rise of the concept of pro-poor agricultural growth and the political strategies that have followed in its wake, rest on historical evidence from Asia (Hazell, Poulton, Wiggins, & Dorward, 2010; Rosegrant & Hazell, 2000) that show how large sections of the rural population were lifted out of poverty as part of the Green Revolution. Broad based, poverty reduction through agricultural growth is tied to relatively egalitarian systems of land distribution (Ravallion & Datt, 2002), highly labor intense production techniques (Heltberg, 1998) and expenditure patterns focusing on local rural non tradable goods (Hazell, Haggblade, & Reardon, 2007; Hazell & Roell, 1983). Given the comparatively equal distribution of land *within* the African smallholder environment that constitutes the home to the majority of the African poor, improving incomes in this sector through raising productivity and increasing commercialization is perceived as the key to widespread poverty reduction.

Redressing institutional market failures that result in poor producer incentives and lacking consumer confidence are considered particularly vital in the pro-poor agenda (Dorward et al., 2004; Fafchamps & Minten, 2001; Jayne, Zulu, & Nijhoff, 2006). Participation in output markets are in this sense pivotal, while the ability of an emerging entrepreneurial class to create linkages also to local labor markets through increased demand for agricultural labor are crucial (Tiffen, 2003).

The view of the agricultural entrepreneur has, however shifted back and forth since the early 1940s. Lewis' (1954) perception of family farming as undercapitalized - the result of savings and investment being undermined by family obligations - shaped the modernist view of African family agriculture in the 1960s and 1970s. The key role of savings as a source of

investment and the inability to save in an environment characterized by diffuse but manifold family demands has been considered one of many ills affecting the African rural economy (Hydén, 1983). The lack of rural entrepreneurs and an institutional environment which penalizes rather than fosters entrepreneurship is perceived as a cause of low productivity in African smallholder agriculture.

The use of the concept of "entrepreneur" in this case is used to denote a class of enterprising smallholders and hence does not conform to Schumpeter's (1943 (1992)) view of entrepreneurs as individuals who dramatically transform production systems. Oya (2007) terms this the weak sense of entrepreneurship: "they may be considered rural entrepreneurs insofar as they negotiate spaces of accumulation and access to resources in ways that put them in a privileged position to increase the productivity and profitability of the various activities they perform (p, 460)."

Among the critics of the pro-poor agricultural growth strategy (Havnevik et al., 2007; Kay, 2009), the distinction between the elite and the entrepreneurial or rural capitalist class is not clear cut, however. Drawing its intellectual heritage from studies of rural capitalism and class formation (see e.g. Bernstein, 2004; Ponte, 2002; Raikes, 2000) the gradual integration of African smallholders into the global capitalist economy is seen to encourage rural differentiation. Accumulation among the rural capitalist class occurs through the usurping of weaker households' productive resources: either directly through acquiring land or livestock or indirectly through exploiting their labor. This notion of growing polarization has its historical roots in a Leninist view of smallholder dispossession as the starting point for the emergence of large-scale capitalist farming (Larsson, 2001).

Such polarization encourages what has been referred to as de-agrarianization or depeasantization: a trend towards differentiation within smallholder agriculture where poorer households are pushed out of agriculture into casual rural nonfarm pursuits or into the urban sector (Bryceson, 1999, 2002; Bryceson & Jamal, 1997). Tied to this process are also issues of cultural and social collapse, such that: "local social norms are breaking down and inter-household economic differentiation is generating winners and losers who undermine the egalitarian legacy of tribal communities (Havnevik et al., 2007)". The identification of such tendencies rests on comparing results from cross sectional studies, however. For this reason macro-level presumptions of accelerating processes of depeasantization may need to be reconsidered over time. The strong linkages between rural and urban areas (Andersson, 2011a, 2011b; Andersson Djurfeldt & Wambugu, 2011), recent trends of rural return migration (Potts, 2009), and increasing prices on staple crops may require a reinterpretation of signs of agrarian differentiation.

In political terms major differences between the pre- and post-millennial periods have at least ostensibly changed the situation for smallholders, with a turnaround in policy priorities towards the smallholder sector since following the Maputo Declaration in 2003. Operationalized through the political commitment to devote 10 percent of public spending to agriculture and rural development as well as a growing focus on food crops, this shift in some respects represents a more comprehensive approach to agrarian development. The emergence of homegrown agricultural strategies signals a change in regional and national priorities that contrast starkly with the gradual collapse of agricultural policy in the structural adjustment era. Growing state commitment to agriculture has also been successful in moving donor priorities towards agriculture (Holmén & Hydén, 2011).

At the national level, agrarian policies need to be put into historical context, however. While Kenyan policies with roots in the post-colonial era have contributed to longstanding smallholder based success in particular sectors such as horticulture and dairy farming (Minot & Ngigi, 2010; Ngigi, Ahmed, Ehui, & Assefa, 2010) policies in other countries have more recent origins. Whereas budget allocations to agriculture overreached the 10 % target only in Malawi among the countries covered in the study (2007 figures) all countries have focused on increasing access to inputs and improving marketing structures for smallholders, especially in food crops. Such policies have translated into different types of input subsidy schemes in the majority of the study countries since the year 2000 (Holmén, 2011). Zambia has had a targeted scheme in existence since the mid-1990s (Haantuba, Wamulume, & Bwalya, 2011) while Nigeria introduced fertilizer subsidies in 2000 (Akande, Andersson, Djurfeldt, & Ogundele, 2011), Tanzania in 2002 (Isinika & Ashimogo, 2009) and both Ghana and Uganda in 2008 (Dzanku & Sarpong, 2011). The most publicized scheme is without doubt Malawi's Agricultural Input Supply Program, however which was established in the face of donor resistance in the 2005/2006 growing season as a response to recurrent droughts and food shortages (Chinsinga, 2007).

Political trends should be placed in temporal as well as economic context: the period from 2000 onwards has seen rapid economic growth in all the countries, with Ethiopia and Mozambique in particular growing rapidly per capita in the period 2002 to 2007 (World Bank, 2009). In the case of Nigeria and Zambia, growth has been influenced also by rising prices on oil and copper. Given such caveats some signs of "re-agrarianization" may be found (Andersson Djurfeldt & Djurfeldt, resubmitted, 2012). While macro-level examples of agriculturally based successes and production increases (Haggblade & Hazell, 2010) can to some extent be found at the national level a distributional perspective on local level patterns of recent dynamism are relevant to discussions of pro-poor agricultural growth.

To analyze the distributional aspects of recent patterns of agrarian based growth, four main questions will be used to guide the analysis: Is agrarian growth concentrated to an elite stratum of households? Is a broad class of smallholder entrepreneurs emerging? Have these processes been inclusive? And finally what village and individual dynamics can be connected to such processes?

## 3. METHODOLOGICAL CONSIDERATIONS

To approach these questions household level panel data from eight African countries collected in 2002 and 2008, respectively will be used. The panel consists of 2354 households, which is a subset of the 3537 households interviewed in 2002 and the 3810 households interviewed in 2008. The attrition rate between the two rounds of data collection was 20.6 %, but biased towards Mozambique, Tanzania and to a lesser extent Zambia (see Djurfeldt, Aryeetey, & Isinika, 2011). In the case of Mozambique high attrition rates are related to non-traceability of households probably a result of high mobility in the aftermath of the civil war, while in Tanzania the death of the senior partner in the midst of data collection explains the high rate. In Zambia problems with survey organization in one particular village raised attrition rates.

Qualitative data collected by the author together with members from the various country teams will be used to supplement, evaluate and qualify the quantitative data. Qualitative interviews conducted at the household and individual level in four Kenyan villages (35 interviews in 2006), four villages in Malawi (fifteen interviews in 2008) and four villages in Ghana (32 interviews in 2011) are used. In addition village level data interviews with key informants and focus groups in eight villages in Zambia (2007) and four villages in Ghana (2008; 2011) have been undertaken. In total therefore around 100 qualitative interviews have been carried out in twenty villages.

The first round of quantitative data was collected in 2002 as part of a comparative project taking the Asian Green Revolution as its starting point (Djurfeldt, Holmén, Jirström, & Larsson, 2005). The focus was on potential for intensified production, technology use and marketing of staple crops (grains, roots and tubers), with the major grain crops (maize, sorghum, rice, teff and wheat) being studied in most detail. Qualitative village level data was collected to supplement the survey data. A second round of this project was carried out in late 2007 and early 2008, when the households were resurveyed. Again, the primary purpose of the survey was to analyze the drivers of smallholder staple crop production in the villages in question (Andersson et al., 2011).

Sampling followed a multi stage purposive design[3]. Original sampling aimed to shed light on the possibilities for intensified smallholder production in Africa as a whole with eight countries in the African maize and cassava belt being sampled: Ethiopia, Ghana, Kenya, Malawi, Mozambique, Nigeria, Tanzania and Zambia. Regions within countries were purposively sampled in areas that were deemed to be above the average in terms of agro-ecological conditions and market access, but excluding the most vibrant local rural economies, since these were considered outliers with respect to intensification potential in staple crops specifically. Sites within countries were sampled to provide variety in terms of agricultural and economic dynamism. A purposive sample of dynamic and less dynamic regions was taken in each country and a number of villages were purposively sampled in each region, depending on the size and agronomic variation found within the country. In total there are 84 villages in the panel[4]. Using average household cash income from 2008 as an indicator of dynamism suggests that the original selection criteria are still relevant: dynamic regions have higher average incomes than the national sample averages, whereas the less dynamic regions have average household incomes below the national average. A list of the regions included in the sample is found in table 1.

*TABLE 1 HERE*

In each village farm households were sampled randomly with the sample being representative at this level. While the use of panel data enables discussing changes within and among households over time the panel does not constitute a statistically representative sample, since it consists of a subset of the two cross sections taken in 2002 and 2008. Panel bias is a well-known phenomenon in panel level studies and tends to bias the results positively as attrition has disproportionately affected the poor (who may have left farming all together), while the ageing of the panel may improve the farming capacity of households during the middle of the life cycle.

The use of the household as a unit for data collection is in some respects problematic presuming that decision making and control of resources is made on household basis (Chant, 1997; Guyer, 1981; Udry, 1996). Nonetheless, for comparative reasons, it is necessary to use the same unit of measurement, while collecting data on intra household differentiation among nearly 4000 households was not feasible due to financial and time constraints and possibilities of respondent fatigue. For these reasons the household, as defined by residence, has been used as the data collection unit, with interviews carried out with the farm manager.

Data structure, availability and quality also provide restrictions on the types of analyses that can be carried out. Given the initial interest in intensification, the first survey questionnaire of 2002 prioritized reliability and focused on demographic characteristics, production volumes, agricultural techniques and crop patterns rather than prices and incomes. Data related to the institutional environment for technology adoption was also a crucial component of the first round. In the second round (2008) more detailed data on prices, marketing and incomes were added. One of the most important limitations in the dataset therefore is the lack of detailed cash income data for 2002: although household participation in various types of farm and

nonfarm activities is available, data on cash incomes raised from these activities were not collected until 2008. Moreover, production, price and marketing data is only available for the grain crops but not for tuberous staples. Analyzing commercialization therefore requires operationalization through indirect methods and the use of dummy variables.

Smallholder entrepreneurs are operationally defined as households that have increased their market participation in grains (entered the market or increased volume sold) or staple crops (entered the market) or non-staple crops (entered the market) or animal products (entered the market) between 2002 and 2008, through commercial diversification or agricultural specialization[5]. To control for cases of distress driven commercialization I add an additional criterion: the household should (a) either have been able to save cash income in both years, or (b) have gone from not being able to save any cash income in 2002 to being able to save in 2008.[6] The former category, defined as *old farm entrepreneurs* comprises 15 percent of the panel households, the latter, *new farm entrepreneurs*, 20 percent. The expectation is that the old farm entrepreneurs to some extent overlap with the village elite and that the distributional profile of the two different groups of farm entrepreneurs is different. In total 837 households were defined as farm entrepreneurs.

Those households who were able to save throughout *without* increasing commercial diversification or specialization in agriculture between 2002 and 2008, constituted 8 percent of the panel households (*old nonfarm entrepreneurs*), while those who started saving on this basis (*new nonfarm entrepreneurs*) made up 6 percent. In total therefore 26 percent of the panel households report that they have started saving since 2002, while 24 percent have saved throughout. By comparison 32 percent of the households state that they had never been able to save and 17 percent that they had discontinued saving since 2002[7]. The net savings rate by this simple criterion is hence positive, with an increase of savers of 9 percent.

Although I am aware of the potential role of the rural nonfarm economy both as a source of income differentiation as well as growth, the present paper for a number of reasons concerns farm entrepreneurs. The primary reason for this is that the focus of the paper is *agricultural growth processes*, with processes of transformation and pluriactivity having already been covered in another publication (see Andersson Djurfeldt & Djurfeldt, resubmitted, 2012). The link to the nonfarm sector among farm entrepreneurs is controlled for both in the descriptive treatment of the data as well as in the statistical models, however. To enable a comparison between farm based entrepreneurship and the broad group of smallholders, the dataset that is used is a sub-set of the panel, excluding the households who are defined as nonfarm entrepreneurs. This is necessary to avoid comparing farm entrepreneurs with a heterogeneous reference group combining nonfarm entrepreneurs (households who have saved throughout or increased saving) with households who have either never saved or discontinued saving. The subset comprises of 2025 households and hence consists of three groups: old farm entrepreneurs (18 percent), new farm entrepreneurs (23 percent) and the remaining group of farmers who have not been able to save in the period under study or have discontinued saving since 2002 (59 percent). The farm entrepreneurs (old and new) will be compared with the remaining group of farmers in a descriptive section. The farm entrepreneurs comprise 41 percent of the households in the subset of 2025 households.

Following this section, I will use a multinomial logistic regression model to consider the correlation between a number of household level characteristics and (a) the logged relative risk of farm based increases in savings ability from 2002 to 2008, (b) the logged relative risk of having saved in both 2002 and 2008 on the same basis and (c) the logged relative risk of having discontinued saving, compared with a reference category that consists of households who have never saved. The aim of this analysis is to distinguish new patterns of agrarian based saving from old ones, while considering also the distributional aspects of these patterns.

## 4. WHO ARE THE ENTREPRENEURIAL HOUSEHOLDS?

Land, labor and livestock are the productive resources that constitute the backbone of the agrarian smallholder environment. In turn the potential for enhancing land and labor productivity varies greatly within communities, with wide village level yield gaps in grains having been documented in the material both for 2002 and 2008 (Jirström et al., 2011; Larsson, 2005). In this sense, localized agrarian growth takes place on an unleveled playing field. To what extent access to productive resources and productivity raising technologies have been concentrated to the entrepreneurial households, hence constitutes the first point of comparison in the descriptive analysis. The statistical significance of differences of means has been tested both between the groups for 2002 and 2008 (through analysis of variance) as well as within the groups over time (through T-tests). All statistical differences are significant at the 0.1% level unless specified as otherwise.

In terms of land sizes, total land size was as may be expected higher among the entrepreneurs than the rest of the sample, 3.18 hectares compared with 2.20 hectares. Changes in cultivated land sizes between the two periods were also more pronounced among the entrepreneurs, who reported an increase of 1.48 times compared with 1.15 times for other farmers. Whether households have expanded on land that had been kept fallow before 2002 or whether they had acquired additional land during the period is not possible to determine from the data, however. On the average, 50 percent of the entrepreneur households reported an increase in their land sizes since 2002, compared with 37 percent for the remainder of the sample.

Although land size differences are quite large, the difference in use of productivity enhancing technology is even more pronounced among the two groups of households. The use of fertilizer seed technology appears to be the foundation of the entrepreneurial base: as many as 58 percent of the entrepreneurial households used inorganic fertilizer on grain crops already at

the year of household formation, compared with 46 percent for the rest of the sample. In the period between 2002 and 2008, the share of fertilizer users increased among the entrepreneurs, from 57 percent to 64 percent, while it dropped from 50 to 44 percent among the non-entrepreneurs (significant at the 1% level for 2002).[8] The difference between the two groups is statistically significant in both periods, but the rise in share of fertilizer users among the entrepreneurs over time is not significant although the drop in fertilizer users among the rest of the sample is.

A remarkable technology shift has occurred between 2002 and 2008 in terms of irrigation and here the differences between entrepreneurs and non-entrepreneurs are striking. In 2002 there was only a minor difference between the two household types with 21.0 percent of the entrepreneurs using irrigation compared with 21.5 percent for the other households. While the non-entrepreneurs' use of irrigation was unchanged in the period between 2002 and 2008, irrigation use among the entrepreneurs increased to 34 percent.

A striking difference can also be found in the number of livestock units owned. Whereas the ownership of livestock among the entrepreneurs in 2002 was 0.93 compared with 0.94 for the non-entrepreneurs, the entrepreneurs have increased their number of livestock units considerably since then to 1.60 livestock units, while the non-entrepreneurs have only marginally increased their livestock units to 1.00 in the same period.

Family labor resources were on average half a labor unit higher for the entrepreneurs than for the other households in 2002, with the average entrepreneur household containing 4.17 farm workers, compared with 3.73 for the rest of the sample (significant at the 1% level). These figures remained largely unchanged in 2008 (4.28 and 3.71 respectively in 2008). The entrepreneur households have a somewhat younger profile with households being on average 49.0 years, compared with 51.6 years for the non-entrepreneurs, while they are to a larger

extent also headed by men[9]. Eighteen percent of the entrepreneur households were headed by women compared with 26 percent for the rest of the sample. Since the entrepreneurial households are expected to be wealthier than the non-entrepreneurial households and women's relatively poorer access to agrarian resources is well-documented in the literature (FAO, 2011; Peterman, Quisumbing, & Behrman, 2010), these figures are not surprising.

With respect to productive resources and productivity enhancing technology, a number of characteristics unite the entrepreneurs: they are households who drawing on a family tradition of using seed fertilizer technology on grains have increased their use of irrigation, while also increasing their livestock assets and total cultivated land size.

## 5. EXPLANATIONS FOR ENTREPRENEURIAL SUCCESS

The many risks associated with a livelihood affected not only by market fluctuations, but perhaps especially weather-related risks, have long been established as motives for diversifying both crop patterns and income sources (Ellis, 1998; Ellis, 2005; Haggblade, Hazell, & Reardon, 2007; Reardon, Berdegué, Barrett, & Stamoulis, 2007). In the context of production systems and consumption patterns that rely a great deal on self-provisioning, ensuring food security enables households to avoid the major risk of not being able to feed their families. By implication therefore the foundation of entrepreneurship may be food security attained either through the market or through self-provisioning, which in turn transforms seasonality into a potential source of profit rather than hunger.

### (a) Avoiding food security risks

As shown earlier (Andersson, 2002, 2011a, 2011b; Andersson Djurfeldt, 2012; Andersson Djurfeldt & Wambugu, 2011), the consumption burden of households may fall outside the co-resident household, and for this reason calculating grain availability per consumption unit[10] may be deceptive. Nonetheless, changes in amounts of grain per consumption unit may tell us

something about the relative improvements or deterioration of household food security over time.

Despite being hampered by a large number of missing cases (25 percent for 2002 and 13 percent for 2008), the data on grain production per consumption unit reveal an improvement in food availability for the entrepreneurs during the period between 2002 and 2008, not matched by the rest of the sample. For the latter group average grain production per consumption unit has actually fallen by 8 kg since 2002 to 208 kg (this drop was not statistically significant however). In contrast grain production per consumption unit has increased by roughly 40 percent among the entrepreneur households, starting at 256 kg and reaching 368 kg by 2008. (The difference between the two groups in 2002 was statistically significant at the 1% level). Grain availability per consumption unit was not only much higher for the entrepreneurs, but above all improved considerably over the period. In this sense, the risks of not being able to feed ones family have lessened noticeably among this group of households since 2002.

(b) Avoiding market related risks and turning seasonality into profit?

Such increases in grain production are translated into greater commercialization in grains. Indeed, it appears that the entrepreneurial households have *diversified into grains* between 2002 and 2008. In 2002 only 50 percent of the entrepreneurs participated in grain markets but 69 percent did so by 2008. Market participation for the remainder of the sample remained largely stagnant, increasing from 49 to 50 percent. Smaller changes have occurred with respect to non-grain staples (including cassava), where the group of entrepreneurs increased market participation from 45 to 50 percent (significant at the 1% level), whereas the rest of the sample decreased participation from 35 to 29 percent.

Although the entrepreneurial base appears to lie primarily in the grains sector, it has in part at least been diversified outside the staple crop sector, primarily in other food crops. The share of entrepreneurs engaged in sale of non-staple food crops in 2002, at 60 percent was considerably higher than for the rest of the sample among which 49 percent participated in non-staple food markets. Again, during the period between 2002 and 2008, market participation rates have increased among the entrepreneurs, but fallen among the non-entrepreneurs: 68 percent of the entrepreneurs sold non staple food crops in 2008 compared with 45 percent for the non-entrepreneurs. For the latter group, the drop from 49 to 45 percent was significant at the 5% level. With regards to cash crops the situation is somewhat different: here market participation among entrepreneurs, at 28 percent in 2008 was higher than for the rest of the sample but unchanged since 2002. Meanwhile, the non-entrepreneurs recorded a drop in market participation from 20 percent in 2002 to 16 percent in 2008.

As is to be expected entrepreneurs have much higher cash incomes, with an average annual household cash income of 783 USD compared with 353 USD for the non-entrepreneurs. More surprising is the composition of cash income among the groups, since it is largely similar. The exception is the share of income sourced from sale of non food cash crops and other food crops, which are higher among the entrepreneur households (see Table 2). The diversification tendencies in the direction of increased nonfarm activities noted by Havnevik et al. (2007) who argue that as much as 60-80 percent of cash income is sourced outside agriculture are not evident in the sample.  The share of nonfarm incomes adheres closely to figures of between 30-40 percent reported in other sources (Haggblade et al., 2007) however, with both groups having similar nonfarm profiles. The exception here is cash remittances from relatives and to some extent also work on other peoples' farms the income share from which was larger among non-entrepreneurs.

*TABLE 2 HERE*

Entrepreneurial strategies to the extent that they exist appear therefore to be connected to three key components: firstly *raising land productivity* over the long term through inputs such as fertilizer and more recently through irrigation, secondly, *attaining food security* (and here the causality is difficult to determine, but may be related to higher grain production as a result of increased use of fertilizer technology for grains especially) and lastly *diversification of income sources within* rather than outside agriculture.

The excerpt below presents an entrepreneur in Malawi who is in some respects emblematic of this group of farmers.

*Interview with a Malawian entrepreneur, July 2008*

*The respondent is a young man in his early thirties. Altogether he has 3.5 acres of farmland. He grows beans, sweet potatoes, Irish potatoes and maize. His most profitable crops are grown on dambo land – small plots of land located near the river, of which he has three plots. Irrigation canals will be constructed from year to year. Irish potatoes are the most important source of cash income for the household. He sells them to vendors who come from Lilongwe and sell to Shoprite. On occasion he hires an oxcart and takes his potatoes to Chimbiya market to sell potatoes himself. He does not have established links with a particular group of vendors. The price of potatoes has risen and is now ten times higher than for cassava. He started by planting a small plot for own consumption in 1998. In 2002 he increased the area under potatoes through converting earlier fallow and grazing land. He has also expanded his area under maize gradually, since he uses maize to pay for labor: usually he pays in kind, but sometimes they will prefer to be paid in cash and he sells maize to raise the cash for this. He budgets his maize in this way: it is used to pay for labor. Unlike potatoes which are perishable the maize can be kept and be used to pay for labor at any time of the year.*

*The earnings from selling potatoes are set aside for fertilizer use both for potatoes and maize. Whenever he plants potatoes he has budgets in mind: he needs seven bags of fertilizer. He has been using fertilizer ever since he started farming, but now mixes it with manure. He knew that soil fertility was low when he started farming and that it would need to be raised. Since 2004 he uses the Sasakawa method, applying the recommended amount of fertilizer using bottle tops. He heard from the radio about the method and then adopted it. At the same time, also inspired by the radio, he started growing hybrid maize. He mainly grows hybrid maize but mixes it with local varieties, although he is planning on phasing out the local varieties. He is able to feed his family and also provides maize to relatives who come during the lean period to collect maize. He only farms he does not do any business. In the past he used to sell second hand clothes, but now he spends most of his time in the fields where he farms together with his wife. He feels that farming is also a business. His situation has improved compared to two to three years earlier. His harvests are better these days with the new methods of cultivation. His household does not receive remittances – he is an independent person and does not need help from anyone. Five years from now he will have a good house, and he wants to buy a TV and a sofa set. The future looks very bright.*

As suggested by the respondent, food security had been achieved for the family, while diversification was occurring largely into non grain staples. Maize was grown mainly to provide for own consumption and raising income for hiring labor. Re-agrarianization had occurred through leaving the nonfarm sector to engage full time in agricultural production and commercialization. While the experiences of the respondent points to the positive consequences of increasing commercialization for the individual household, the question remains to what extent such patterns are occurring at the expense of weaker households.

## 6. ARE THESE PROCESSES OF PRO-POOR AGRICULTURAL GROWTH?

Cross country figures hide important diversity both within and between countries: Malawi and Zambia stand out with 29 and 41 percent of the country samples being new farm entrepreneurs (households who had started to save on agrarian basis since 2002). Nigeria and Ghana contain a large share of the old farm entrepreneurs, with 41 and 22 percent of the country samples being households who had saved throughout on agrarian basis. Wide disparities are also reproduced at the village level, especially for the new farm entrepreneurs who are heavily concentrated to a small number of villages: fourteen villages contain nearly half (49.6 percent) of all the new entrepreneurs whereas the old entrepreneurs are somewhat more evenly spread among the villages. This points to spatially and temporally separate processes, one of old farm based wealth emanating from the period before 2002 and one of more recent growth in the period after 2002.

The descriptive analysis, suggests that farm based entrepreneurship (whether new or old) rests on three processes working in tandem: raising land productivity through the use of seed-fertilizer technology, avoiding risks of food insecurity through raising grain production and diversifying commercially or specializing within, rather than outside, agriculture. To consider the generalizable nature as well as the distributional aspects of these processes I will use a multinomial logistic regression model to model (a) the logged relative risk of having saved throughout the period (saved throughout) (b) the logged relative risk of having started to save between 2002 and 2008 (started saving) and (c) the logged relative risk of having discontinued saving (stopped saving) during the period compared to a reference category consisting of households who did not save in either period (never saved). The focus is on patterns of growth found within the first two categories and mobility out of saving (stopped saving) therefore is discussed primarily to shed light on the distributional aspects of growth.

Modeling has three major aims: firstly, to analyze patterns of savings and their links to the processes identified above, viz. intensification, food security improvements and commercialization in agriculture. Secondly the purpose is to consider differences between old and new patterns of saving. Independent variables for intensification and commercialization - capturing both the situation in the year 2002 as well as changes occurring during the period 2002 to 2008 - are used. Nonfarm diversification and accumulation tendencies are considered next and finally the distributional profile of savers in terms of food security, gender and poverty are analyzed. The results of the model are presented in Table 3.

*TABLE 3 HERE*

(a) Saved throughout, commercialization and accumulation

The results both confirm and refute the findings presented in the descriptive analysis. Firstly, the control variable for age of head of household suggests a negative association[11] between the year of household establishment and having saved throughout relative to the reference category. This confirms the descriptive tendencies of entrepreneurs being younger than the non-entrepreneurs. Contrary to the expectations from the theoretical literature, rising age does not translate into increased ability to save.

Two sets of variables are used to describe intensification at the farm level: use of inorganic fertilizer on grains and irrigation. The expected association between fertilizer use on grains and having saved throughout the period is partially reflected in the model with starting to use fertilizer since 2002 increasing the relative risk for having saved throughout 1.97 times compared to the reference category (significant at the 1% level). Earlier fertilizer use on grains is not related to saving, however, suggesting more recent fertilizer adoption among these households.  Irrigation, both having irrigated already in 2002 and having begun

irrigation since then, is connected to having saved throughout the period. The relative risk of having saved throughout the period is 220 percent higher for households who irrigated their farms in 2002, while it is 160 percent higher for households who had started irrigating between 2002 and 2008 (significant at the 1% level). For the old savers hence intensification processes appear to be connected to recent patterns of fertilizer use on grains and with increased use of irrigation, although drawing on earlier patterns of irrigation.

In terms of commercialization, the coefficients point to a continuation of earlier patterns of market participation as the basis for saving. The exception here is participation in markets for animal products, where such market participation in 2002 did not increase the relative risk for having saved throughout. Grain market participation constitutes an exception in the other direction: having sold grains in 2002 increased the relative risk for having saved by 230 percent compared with the reference category. More recent processes of commercialization are connected to a number of markets, with two standing out especially: entering the market for non staple food crops raised the relative risk for having saved more than three times, while entry into the market for non food cash crops nearly tripled the relative risk of having saved throughout. Increased sale of grains and non-grain staples raised the relative risk by 266 and 247 percent respectively, but the latter was significant only at the 1% level. Households who saved throughout therefore appear to be diversifying into non staple food crops and non food cash crops, building on earlier patterns of commercialization especially in grains. For the period 2002 to 2008, entry into the markets for animal products also increased the relative risk of having saved throughout (significant at the 1% level). As suggested by the descriptive analysis, diversification appears to be occurring within rather than outside agriculture, with having diversified out of the farm sector since 2002 being negatively associated with having saved throughout the period (significant at the 1% level). For a household that had diversified

into the nonfarm sector since 2002, the relative risk for having saved throughout was 51 percent lower when compared with the reference category (significant at the 1% level).

The food security indicator[12] (whether medicine or food was the most costly expenditure item for the household) is negatively associated with having saved throughout (significant at the 1% level), which is not surprising. Old patterns of saving therefore appear to be connected to longstanding footholds in the agrarian economy which is also confirmed by the strong association between elite status (defined as belonging to the ten percent largest cultivators in the village in 2002) and having saved throughout. In fact this is the strongest single influence on having saved throughout with households belonging to this category having nearly four and a half times higher relative risk of having saved throughout when compared with the reference category. More encouraging from a distributional perspective is that the indicators of accumulation – having increased number of livestock units and land size over the period are not significant, suggesting that savings have not translated into increasing assets. Likewise female headed households do not have significantly lower relative risks of having saved throughout.

(b) Started to save since 2002, commercialization and accumulation

More recent patterns of saving divert from the processes outlined above in a number of ways. In part this appears to be related to different production systems to which new sources of commercialization have been added during the period. Whereas households that had saved throughout participated in a range of markets already in 2002, for households that have started to save earlier market participation is connected to two markets only: non grain staples and non food cash crops. Having sold these products in 2002 is strongly associated with having started to save when compared with the reference category. The relative risk of having started

to save roughly doubled in the case of non food cash crops and was 198 percent higher for households who had sold non grain staples in 2002.

Entry into a number of agricultural markets since 2002 is connected with having started to save. The growing role of non staple food crops is strongly relevant also for new patterns of saving, while having entered the market for animal products has the single strongest association with starting to save. The relative risk of having started to save for these households is 2.69 times higher than for households in the reference category. The role of market dynamics for animal products as a source of improved incomes is a reminder of the importance of viewing smallholder farms as integrated livestock and crop production units. Increased commercialization in cash crops between 2002 and 2008 more than doubled the relative risk of starting to save, while grain played a smaller role with increased sale of grains raising the relative risk by 167 percent (both significant at the 1% level).

A minor contrast with the households that saved throughout emerges in the distributional profiles of the households who had started to save: being a household whose expenditure on food or medicine was the largest item of expenditure was not negatively associated with having started to save. This suggests that newer patterns of saving may be more broad based, in the sense that they do not exclude the poor. The model does show a tendency towards accumulation in livestock units but such findings may be related especially to restocking measures in Zambia following outbreaks of rinderpest in the early 2000s and therefore need not be signs of accumulation as such. While elite status is again positively connected to having started to save, the association is weaker than for the households who had saved throughout and the level of statistical significance is also lower.

(c) Nonfarm diversification and accumulation

As suggested above, one of the leitmotifs of Leninist and neo-Leninist interpretations of smallholder production relations is the notion that growth in the family farming sector polarizes productive resources. More recently literature on the rural nonfarm economy has suggested that more broad based diversification out of the farm sector may occur locally when agricultural productivity rises (Hazell et al., 2007). The results from the model do not provide evidence for the latter processes, however: farm entrepreneurs are diversifying within rather than outside agriculture, with increased ability to save not being connected to diversifying into nonfarm income sources. Having saved throughout is negatively associated with nonfarm diversification, supporting earlier work on mobility between farm and nonfarm activities that points to a return from the nonfarm sector into the farm sector between 2002 and 2008 (Andersson Djurfeldt & Djurfeldt, resubmitted, 2012).

In terms of polarization a number of variables are significant in the model: the negative association between poor households and having saved throughout comes out, while having stopped saving is also negatively associated with being a poor household. This pattern is replicated also in the position of the village elite: belonging to the village elite increased both the relative risk of saving throughout and having increased savings in the period 2002 to 2008, but also the risk of having stopped saving, relative to the reference category of households who had never saved. This may reflect the spatial concentration of both old and new patterns of saving: in villages that have experienced economic decline between 2002 and 2008 (elite) households that were formerly able to save have discontinued saving. The negative association between being a poor household and having discontinued saving supports this interpretation: poor households were less likely to have saved in 2002 and hence are less likely also to have stopped saving since then.  Accumulation through increased land under cultivation is positively associated with saving while increases in livestock units are only

related to new patterns of saving. Female headed households are not excluded from having saved throughout nor having started to save.

The results on household level characteristics associated with saving behavior therefore are inconclusive: using a modeling strategy only gets us halfway in dealing with the question posed initially in this paper: is growth occurring at the expense of weaker households or can such patterns be described as pro-poor at the village level?

## 7. IS ENTREPRENEURIAL GROWTH OCCURRING AT THE EXPENSE OF WEAKER HOUSEHOLDS?

I will return to this question through discussing village level dynamics of inclusivity and exclusivity, which point to patterns of spatial as well as individual marginalization. Those households who were defined as farm entrepreneurs (old and new) are strongly concentrated in a minority of villages: nineteen villages contained nearly half the entrepreneurs in the sample, whereas five villages contained no entrepreneurs at all. This is an effect of the new entrepreneurs especially being found in a small number of villages, as outlined above. Moreover, in sixteen villages, half or more of the panel population belonged to the farm entrepreneur category. In these villages, hence superficially at least, both old and new growth appears to be broad based.

Since my interest is in analyzing the distributional aspects of agricultural growth for the village population as a whole the nonfarm entrepreneurs will now be returned to the sample. Once again savings[13] are used to discuss the inclusivity of these patterns, dividing the panel population by village between (a) households who were able to save in 2008 (covering all four types of entrepreneurs as defined above) and (b) those households who were not able to save – that is they had been able to save in neither year or had discontinued saving since 2002.

TABLE 4 HERE

Table 4 presents the ten villages with the highest share of smallholder entrepreneurs and the sources of improved savings among the village populations. At an overarching level, it is interesting to note that the villages are evenly spread among dynamic and less dynamic regions, suggesting that local level variations in commercial opportunities may be large within both types of regions.

Although savings ability on average had improved in all these villages, the net improvement in saving ability varied widely from 30 percent to as much as 73 percent[14]. Such variation is suggested also by the difference in share of households who had saved in the two cross sections 2002 and 2008. Two villages in Zambia (Nega Nega and Munsakamba), one in Malawi (Bzyobzyo) and two in Kenya (Gatagati and Gatondo) stand out positively whether measured through changes among the panel or in the cross sections: here the ability to save has increased dramatically since 2002. In the two Zambian villages growth appear to have been largely inclusive: only 2 percent of the panel households reported that they had stopped saving since 2002, while as many as 86 and 78 percent of the panel households were able to save in these villages in 2008. One Kenyan village, Gatagati, stands out also in this respect with mobility out of savings being small. Among these villages growth appears to be largely farm based rather than connected to the nonfarm sector, regardless of whether new or old patterns of saving are considered. In this sense, localized, broad based agricultural growth appears to have occurred, albeit in the case of Gatagati also based on earlier patterns of growth.

The presence of contract farming schemes as providers of markets, seeds, fertilizer, credit and extension services in these villages provides some explanations for agricultural commercialization as well as broad based saving patterns. The Kenyan villages are especially interesting in this regard: village level data suggest that the majority of the village populations

in 2008 were involved in contract farming, with a strong bias towards women farmers. These findings are confirmed by qualitative interviews in 2006. In Gatagati in particular the strong connection both directly to the vibrant market in Karatina and different types of contract schemes especially in horticultural goods, alongside land fragmentation had led farmers to shift away from staple crops into intensive, but lucrative, vegetable production. Women had organized themselves into farmer groups to meet the growing demand for snow peas. Marketing of dairy products through the Kenya Co-operative creameries provided additional sources of income. Such patterns are local level outcomes of Kenya's smallholder based successes in the horticultural sector and dairy products tied to historical patterns of technology development and institutional support dating back to the efforts of the first independent government (see Minot & Ngigi, 2010).

Whereas, the Kenyan villages provide examples of long term patterns of agrarian based growth, signs of increased saving in Zambia and Malawi may be deceptive: drought in Southern (and Eastern Africa) in 2002 may have suppressed production and commercialization to suggest positive tendencies between 2002 and 2008 when in fact such increases may simply reflect a return to normal levels. Nonetheless, in the case of Bzyobzyo at least the qualitative interviews carried out in 2008 suggest a different pattern, with commercialization historically tied primarily to tobacco, being more recently complemented with soybeans for which there was strong and rising demand. Although the Agricultural Input Supply Program had made fertilizer more affordable both for maize and tobacco, soybeans require no fertilizer and therefore represented an attractive alternative to these crops. Similarly, growth in Munsakamba appears to be connected to new opportunities in vegetables and gardening adding to traditional patterns of commercialization in maize.

The rest of the villages reflect more mobility in terms of savings and here the two villages in Ghana, stand out with high mobility both in and out of savings. Qualitative interviews carried out in 2011 suggest that the explanation for such mobility may be tied to institutional specificities related to customary land tenure systems, which have circumscribed land rights among migrant populations for the past century. Such findings concur with literature that has questioned the equity of Ghanaian customary land tenure systems on a variety of grounds related to gender, age and ethnicity (Amanor, 2010; Amanor & Ubink, 2008; Boni, 2008; Grischow, 2008). In the Eastern Region, sharecropping arrangements between migrant ethnic groups and the clan heads of the villages (often absentee landowners) mean that half of the produce is paid as rent to the owner. This enhances the susceptibility to boom and bust cycles in agriculture as a large share of income is devoted to rent.

## 8. CONCLUSION: ARE WE SEEING THE EMERGENCE OF AN ENTREPRENEURIAL CLASS?

Let us now return to the question initially posed at the beginning of this article – are we seeing the emergence of an entrepreneurial class, or indeed a manifestation of pro-poor agricultural growth?

On the basis both of the descriptive statistics as well as the statistical model, processes of pro-poor agricultural growth appear to be occurring among the panel households. While the models provide mixed evidence for the inclusivity of these processes, the spatial concentration and variation of these dynamics suggest the need for situating such changes in the village context.

By this account, patterns are shaped as much by geographical as class-based selectivity, with the integration of whole villages into dynamic economic processes. In this sense early signs of broad based agrarian growth are concentrated to particular villages. Here commercialization – whether based on historical patterns or new market opportunities and rising input use appear

to be encouraging inclusivity. By contrast other villages, characterized by institutional inequity in land markets hamper the potential inclusivity of such processes.

Important qualifications exist however with respect to the sustainability of broad based processes of growth. Whereas it may be tempting to assume that new patterns of savings have emerged, the capacity of such patterns to change the economic geography of agrarian growth over time remains to be seen. Moreover, many of the policy measures taken in the first decade of the new millennium may not yet have found local level expressions and need to be evaluated at a later stage.

Formulating pro-poor agricultural policies that are genuinely inclusive as well as commercially driven requires spatial creativity. In turn this suggests identifying geographically generalizable components for dealing with smallholder insecurity (food security improvements and technology transfers) while dealing with the geographical specificities of local production systems, ecology and culture that characterize marginal areas. Importantly processes of declining incomes and rising poverty may be occurring that are similarly spatially concentrated, although they have not been the subject of this article. Study of localized processes - whether of growth or decline - holds the possibility of shedding further light on the spatial and distributional aspects of smallholder based agrarian development.

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NOTES

[1] Economist critics of strategies of agricultural led growth have pointed to the manifold problems facing African agriculture and the inability of smallholder based systems plagued by low productivity and market failures to keep up with growing populations (see Ashley & Maxwell, 2001; Ellis, 1998).

[2] Collier (2008) in contrast has argued for concentrating resources in large-scale units with higher productivity, as a necessity to counteract rapidly growing global food demands in the face of poor infrastructure and low technology use.

[3] A detailed account of sampling strategies and project methodology as well as attrition analysis between the two rounds can be found in Djurfeldt, Aryeetey, Isinika (2011).

[4] In the case of Nigeria a very large number of villages was originally sampled with few respondents in each village, therefore the data from Nigeria is treated on regional basis in the discussion. In total this gives sixty villages and two regions.

[5] This is based on combining a set of dummy variables, such that households who have entered more agricultural markets than they have exited, or entered the market/increased their degree of commercialization in grain crops are added to households who have specialized in agriculture – that is they report no nonfarm income sources in either in 2002 or 2008, or have withdrawn from the nonfarm sector since 2002.

[6] The data on saving derive from one question on whether the household is normally able to save some money. Hence saving in livestock for instance is excluded from this category, although increases in livestock units have been added to consider accumulation in the models. Decreases in consumption related to increases in savings are captured in the models indirectly through distress indicators related to expenditure patterns on health and food.

[7] Rounding errors mean that the figures do not add up to 100 percent.

[8] The figures suffer from a relatively large number of missing cases (3.5 % for the 2002 data and as much as 23.5% for the 2008 data), and therefore need to be interpreted with caution.

[9] The average age of household head in the respective cross sections was 48 years for both 2002 and 2008, hinting at the panel bias with respect to age, but showing that the village population has not aged since 2002.

[10] A consumption unit takes into consideration the age composition of the household, converting the number of household members into equivalent number of adults. Adult household members (between the ages of 16-60) are given a value of one, whereas children

(15 and below) are given a value of 0.50 and older household members (61 and above) are given a value of 0.75, when converting the household into a number of consumption units.

[11]Negative coefficients point to a lower risk for a particular variable relative to the reference category, whereas positive coefficients point to a higher risk.

[12] Using grain per consumption unit as an indicator of food security produces a statistically significant result, but the coefficient is zero or close to zero and has not been included in the model since it increases the number of missing cases without adding explanatory value to the model.

[13] The dataset does not permit using other measures of wealth or income changes, since income data is not available for 2002 and changes in production data for grains is a poor measure of growth in the context of mixed farming systems where grains in some village contexts only constitute a minor crop. Changes in household assets likewise are difficult to use as the contextual nature of assets makes it difficult to standardize the meaning of asset availability across countries, regions and villages.

[14] Since the number of cases is very small it is not possible to test differences among the villages statistically and the figures in the table are therefore used as a starting point for a qualitative discussion of village level differences rather than for a quantitative analysis of such differences.

APPENDIX A.1

Descriptive statistics

*Table 1: Regions covered in the sample, by country*

| | Dynamic | Less dynamic |
|---|---|---|
| Ethiopia | Yetmen | Bako |
| Ghana | Eastern | Upper Eastern |
| Kenya | Nyeri | Kakamega |
| Malawi | Shire Highlands | Ntchisi |
| | Bwanje Valley | Thiwi/Lifidzi |
| Mozambique | Center | North |
| | | South |
| Nigeria | Kaduna State | Osun State |
| Tanzania | Iringa | Morogoro |
| Zambia | Mazabuka | Mkushi |

*Table 2: Income composition by source for entrepreneurs and non-entrepreneurs, 2008*

| | staple sales | sale of non staple food crops | sale of non food cash crops | sale of animals/animal produce | leasing out of equipment | work on other people's farms | Nonfarm salaried employment | micro business | large scale business | rent, interest | pensions | remittances |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Non entrepreneurs(N=1137) | 0.29 | 0.16 | 0.09 | 0.11 | 0,00 | 0.08 | 0.06 | 0.09 | 0,00 | 0,00 | 0.01 | 0.08 |
| Entrepreneurs (801) | 0.28 | 0.23 | 0.14 | 0.13 | 0.01 | 0.03 | 0.05 | 0.08 | 0,00 | 0,00 | 0,00 | 0.02 |
| Total (N=1938) | 0.29 | 0.19 | 0.11 | 0.12 | 0.01 | 0.06 | 0.06 | 0.09 | 0,00 | 0,00 | 0,00 | 0.05 |

*The data covers households who stated that they had a cash income in 2008.*

*Table 3: Multinomial logistic regression model of saving 2002-2008*

| | Saved throughout | | | | Started saving | | | | Stopped saving | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | B | S.E. | Sig. | Exp(B) | B | S.E. | Sig. | Exp(B) | B | S.E. | Sig. | Exp(B) |
| Constant | -1,522 | 0,392 | *** | | -1,517 | 0,356 | *** | | -0,224 | 0,341 | | |
| **Controls** | | | | | | | | | | | | |
| Year since household establishment (ln) | -0,549 | 0,098 | *** | 0,578 | -0,273 | 0,089 | ** | 0,761 | -0,268 | 0,090 | ** | 0,765 |
| Descendent household | -0,314 | 0,479 | | 0,731 | -0,101 | 0,442 | | 0,904 | 0,000 | 0,453 | | 1,000 |
| **Intensification** | | | | | | | | | | | | |
| Fertilizer used on grains in 2002 | 0,260 | 0,182 | | 1,297 | 0,353 | 0,164 | ** | 1,424 | 0,198 | 0,160 | | 1,219 |
| Started using fertilizer on grains between 2002 and 2008 | 0,680 | 0,281 | ** | 1,974 | 0,702 | 0,258 | ** | 2,019 | 0,224 | 0,278 | | 1,251 |
| Farm irrigated in 2002 | 0,789 | 0,211 | *** | 2,202 | 0,148 | 0,203 | | 1,160 | 0,627 | 0,184 | ** | 1,872 |
| Started irrigating farm between 2002 and 2008 | 0,470 | 0,209 | ** | 1,600 | 0,064 | 0,197 | | 1,066 | 0,063 | 0,213 | | 1,066 |
| **Commercialization** | | | | | | | | | | | | |
| Sold animal products in 2002 | 0,292 | 0,180 | | 1,339 | 0,183 | 0,168 | | 1,201 | 0,033 | 0,159 | | 1,033 |
| Sold non staple food crops in 2002 | 0,486 | 0,219 | ** | 1,626 | -0,054 | 0,193 | | 0,948 | 0,105 | 0,187 | | 1,111 |
| Sold grains in 2002 | 0,832 | 0,193 | *** | 2,298 | 0,095 | 0,170 | | 1,099 | 0,174 | 0,165 | | 1,190 |
| Sold non grain staple crops in 2002 | 0,607 | 0,206 | ** | 1,835 | 0,683 | 0,188 | *** | 1,981 | 0,526 | 0,184 | ** | 1,692 |
| Sold non food cash crops in 2002 | 0,532 | 0,196 | ** | 1,703 | 0,737 | 0,178 | *** | 2,091 | 0,314 | 0,182 | | 1,369 |
| Increased sale of grains or market entry for grains between 2002 and 2008 | 0,980 | 0,173 | *** | 2,663 | 0,510 | 0,161 | ** | 1,666 | -0,260 | 0,175 | | 0,771 |
| Entered the market for animal products between 2002 and 2008 | 0,508 | 0,230 | ** | 1,662 | 0,988 | 0,197 | *** | 2,686 | -0,397 | 0,251 | | 0,673 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Entered the market for non-grain staples between 2002 and 2008 | 0,904 | 0,285 | ** | 2,469 | 0,744 | 0,244 | ** | 2,104 | 0,507 | 0,257 | ** | 1,660 |
| Entered the market for non staple food crops between 2002 and 2008 | 1,213 | 0,244 | *** | 3,365 | 0,882 | 0,210 | *** | 2,416 | 0,232 | 0,237 | | 1,262 |
| Entered the market for non food cash crops between 2002 and 2008 | 1,085 | 0,283 | *** | 2,958 | 0,730 | 0,276 | ** | 2,074 | 0,124 | 0,322 | | 1,132 |
| **Nonfarm diversification** | | | | | | | | | | | | |
| Cash income earned outside farm sector in 2008 but not in 2002 | -0,717 | 0,210 | ** | 0,488 | -0,311 | 0,181 | | 0,732 | -0,485 | 0,199 | ** | 0,616 |
| **Accumulation** | | | | | | | | | | | | |
| Increased number of livestock units between 2002 and 2008 | 0,283 | 0,163 | | 1,327 | 0,439 | 0,146 | ** | 1,552 | 0,120 | 0,149 | | 1,127 |
| Increased total farm size between 2002 and 2008 | 0,086 | 0,162 | | 1,090 | 0,193 | 0,146 | | 1,213 | -0,337 | 0,153 | ** | 0,714 |
| **Poverty indicator** | | | | | | | | | | | | |
| Food or medicine most costly household expenditure in 2002 | -0,522 | 0,167 | ** | 0,594 | 0,037 | 0,152 | | 1,037 | -0,379 | 0,151 | ** | 0,685 |
| **Distribution** | | | | | | | | | | | | |
| Female headed household | -0,352 | 0,205 | | 0,704 | -0,076 | 0,173 | | 0,927 | 0,128 | 0,166 | | 1,137 |
| Elite household | 1,469 | 0,361 | *** | 4,346 | 0,945 | 0,377 | ** | 2,572 | 1,316 | 0,340 | *** | 3,730 |
| Valid cases | 1600 | | | | | | | | | | | |
| Missing cases | 425 | | | | | | | | | | | |
| Nagelkerke R Square | 0,295 | | | | | | | | | | | |

*Table 4: Share of households by saving status in the ten villages with highest shares of farm entrepreneur households.*

| | | | Saved in 2008 | | | | | Did not save in 2008 | | | Change | Cross sections | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Country | Type of region (2002) | Village | New farm entrepreneurs | Old farm entrepreneurs | New nonfarm entrepreneurs | Old nonfarm entrepreneurs | Total savers 2008 | Never been able to save | Have stopped saving | Total, did not save 2008 | Net change in saving 2002-2008 | Share who saved in cross section 2002 | Share who saved in cross section 2008 | Net change in share of savers in cross sections |
| Kenya | Dynamic | Gatagati (N=27) | 0,41 | 0,41 | 0 | 0,04 | 0,86 | 0,11 | 0,04 | 0,15 | 0,71 | 0,48 | 0,85 | 0,37 |
| Zambia | Dynamic | Nega Nega (N=46) | 0,65 | 0,02 | 0,15 | 0,04 | 0,86 | 0,11 | 0,02 | 0,13 | 0,73 | 0,09 | 0,87 | 0,78 |
| Malawi | Less dynamic | Bzyobzyo (N=38) | 0,45 | 0,24 | 0,05 | 0,08 | 0,82 | 0,08 | 0,11 | 0,19 | 0,63 | 0,42 | 0,82 | 0,40 |
| Zambia | Less dynamic | Munsakamba (N=54) | 0,7 | 0,04 | 0,04 | 0 | 0,78 | 0,2 | 0,02 | 0,22 | 0,56 | 0,02 | 0,78 | 0,76 |
| Ghana | Dynamic | Apaa (N=35) | 0,14 | 0,43 | 0,06 | 0,06 | 0,69 | 0,11 | 0,17 | 0,28 | 0,41 | 0,91 | 0,71 | -0,20 |
| Nigeria | Less dynamic | Osun (N=122) | 0,23 | 0,33 | 0,04 | 0,2 | 0,8 | 0,08 | 0,1 | 0,18 | 0,62 | 0,65 | 0,82 | 0,17 |
| Kenya | Dynamic | Gatondo (N=25) | 0,44 | 0,12 | 0,04 | 0,08 | 0,68 | 0,16 | 0,16 | 0,32 | 0,36 | 0,36 | 0,68 | 0,32 |
| Ghana | Dynamic | Gyidi (N=53) | 0,21 | 0,32 | 0 | 0,11 | 0,64 | 0,23 | 0,11 | 0,34 | 0,3 | 0,56 | 0,66 | 0,10 |
| Tanzania | Less dynamic | Mbingu (N=21) | 0,33 | 0,19 | 0,05 | 0,05 | 0,62 | 0,24 | 0,14 | 0,38 | 0,24 | 0,38 | 0,62 | 0,24 |
| Zambia | Less dynamic | Nkumbi (N=48) | 0,21 | 0,27 | 0,06 | 0,17 | 0,71 | 0,13 | 0,15 | 0,28 | 0,43 | 0,59 | 0,73 | 0,14 |

# APPENDIX

Table A.1

**Descriptive Statistics**

| | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| Households who have been able to save throughout, dummy | 2025 | 0,000 | 1,000 | 0,180 | 0,384 |
| Households who have started to save since 2002, dummy | 2025 | 0,000 | 1,000 | 0,233 | 0,423 |
| Households who have stopped saving since 2002, dummy | 2025 | 0,000 | 1,000 | 0,199 | 0,399 |
| Households who have never been able to save, dummy | 2025 | 0,000 | 1,000 | 0,371 | 0,483 |
| Year since household establishment (ln) | 1941 | 0,000 | 4,490 | 2,779 | 0,831 |
| Descendent household | 2025 | 0,000 | 1,000 | 0,031 | 0,174 |
| Fertilizer used on grains in 2002 | 1946 | 0,000 | 1,000 | 0,527 | 0,499 |
| Started using fertilizer on grains between 2002 and 2008 | 1773 | 0,000 | 1,000 | 0,100 | 0,300 |
| Farm irrigated in 2002 | 2025 | 0,000 | 1,000 | 0,205 | 0,404 |
| Started irrigating farm between 2002 and 2008 | 2025 | 0,000 | 1,000 | 0,173 | 0,379 |
| Sold animal products in 2002 | 2015 | 0,000 | 1,000 | 0,360 | 0,480 |
| Sold non staple food crops in 2002 | 2021 | 0,000 | 1,000 | 0,435 | 0,496 |
| Sold grains in 2002 | 2025 | 0,000 | 1,000 | 0,490 | 0,500 |
| Sold non grain staple crops in 2002 | 2021 | 0,000 | 1,000 | 0,392 | 0,488 |
| Sold non food cash crops in 2002 | 2023 | 0,000 | 1,000 | 0,238 | 0,426 |
| Increased sale of grains or market entry for grains between 2002 and 2008 | 1776 | 0,000 | 1,000 | 0,371 | 0,483 |

| | | | | | |
|---|---|---|---|---|---|
| Entered the market for animal products between 2002 and 2008 | 2025 | 0,000 | 1,000 | 0,169 | 0,375 |
| Entered the market for non-grain staples between 2002 and 2008 | 2025 | 0,000 | 1,000 | 0,168 | 0,374 |
| Entered the market for non staple food crops between 2002 and 2008 | 2025 | 0,000 | 1,000 | 0,180 | 0,384 |
| Entered the market for non food cash crops between 2002 and 2008 | 2025 | 0,000 | 1,000 | 0,074 | 0,261 |
| Cash income earned outside farm sector in 2008 but not in 2002 | 2025 | 0,000 | 1,000 | 0,190 | 0,392 |
| Increased number of livestock units between 2002 and 2008 | 2025 | 0,000 | 1,000 | 0,425 | 0,494 |
| Increased total farm size between 2002 and 2008 | 1928 | 0,000 | 1,000 | 0,424 | 0,494 |
| Food or medicine most costly household expenditure in 2002 | 2017 | 0,000 | 1,000 | 0,495 | 0,500 |
| Female headed household | 2015 | 0,000 | 1,000 | 0,231 | 0,421 |
| Elite household | 1998 | 0,000 | 1,000 | 0,062 | 0,240 |