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The Impact of Export-Driven Cash Crops On Smallholder Households

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Overview

Market-oriented agricultural production can be a mechanism to increase smallholder farmer welfare, rural market performance, and contribute to overall economic growth. Cash crop production can allow households to increase their income by producing output with higher returns to land and labor and using the income generated from sales to purchase goods for consumption. However, in the face of missing and underperforming markets, African smallholder households are often unable to produce efficiently or obtain staple foods reliably and cheaply.[1,2,3] Firms face similar constraints that limit the ability and incentive to invest in smallholder-based production systems.[4] Expanding commercial production therefore requires an understanding of the potential welfare impacts for smallholders and rural economies, as well as the economic and institutional constraints to such expansion.

This literature review summarizes the available literature on the impact of smallholder participation in cash crop and export markets on household welfare and rural markets. We include theoretical frameworks, case studies, empirical evidence, and historical analysis. Over 150 articles were examined and 112 have been included in this literature review. One third of the included resources appeared in peer-reviewed academic journals. Research yielded 42 relevant primary empirical studies, half of which have been peer-reviewed. The review focuses exclusively on evidence from Africa regarding top and emerging export crops.* Tobacco and horticulture were also included due to the volume of research relevant to smallholder welfare gains from the production of these crops. The most relevant and comprehensive resources cited most often throughout this review are the World Bank *All-Africa Review of Experiences with Commercial Agriculture: Lessons from Success and Failure* (Poulton et al, 2008) and the International Food Policy Research Institute 2020 Vision Initiative and Overseas Development Institute *Future of Small Farms* (IFPRI 2020 Vision Initiative & ODI, 2005).

Methodological Challenges

There are several challenges in evaluating the impacts of cash crop production on smallholders in Africa. The first set of challenges derives from the complexity of production structures among smallholders and the variety of ways in which welfare might be measured. Smallholders are typically both producers and consumers, and given that local food markets may not function efficiently, the impacts of commercialization on food availability for smallholders must be considered.[5,6,7] Second, welfare impacts should consider both farmers participating in cash cropping as well as non-participants who may nonetheless be affected, particularly through the labor market and impacts on local food

* Top exports include: sugar, cocoa, cotton, coffee, maize, banana, tea, cashew, sesame, and natural rubber. Emerging exports include: vanilla, jatropha, allanblackia, shea, and hemp.

markets. Third, welfare gains (or losses) may not accrue evenly within farm households or across farm households. Welfare impacts may also involve tradeoffs - higher income may come at the expense of food security or labor opportunities. Higher income may or may not translate into poverty reduction, improved nutrition, or health. Finally, many of the benefits of cash crop production – particularly at the regional level –unfold over time, and many shorter-term studies do not capture this impact.[8]

The second set of challenges derives from attempting to make comparisons across a wide variety of crops, cropping systems, production arrangements and study methodologies. Producing French beans is quite different from producing cocoa and participation in an outgrower contract farming scheme may have different implications from participating in a cooperative, or from open market production for export. In addition, there is typically a selection bias in studies of cash cropping, since farmers are rarely randomly allocated to participate in cash cropping. Those farmers that choose (or are chosen) to participate likely differ systematically from those that do not. Comparisons of participants to non-participants may therefore overstate impacts.

All of these challenges make comparisons across countries, crops and cropping schemes quite complex. Where possible in this review, we document the particular crop under consideration, the nature of the contract or growing arrangement and the particular way in which smallholder welfare is measured. Throughout the literature, coordination, organization and competitive advantage are emphasized as the basic prerequisites for the success of commercial agriculture in general, and for smallholder integration into commercial production systems.[9] The literature underscores that "one-size-fits-all" interventions have been responsible for inadequate outcomes in the past and that specific agendas designed in response to national and regional contexts are critical to successful outcomes.[10] We begin by looking at household-level impacts, then examine region-wide impacts, and finally look at the available evidence on the structure of production systems and context on welfare outcomes.

Household Impacts of Cash Crop Production

Production systems in rural areas are complex and producers are heterogeneous in their asset endowments and access to input and output markets. As a result, households will react differently to cash crop production opportunities and derive different welfare benefits from participation. Results from the review highlight the potential heterogeneity of impacts.[11,12,13] Poulton, Dorward, and Kydd (2005) argue that, in general, traditional export cash crops can make a significant contribution to poverty reduction when there is broad based participation by farmers in an area, labor-intensive production processes, and potential positive linkages to staple crop productivity in cash crop production.[14] Household-level spillover effects can result when production of a commercialized crop enables the farm household to acquire new resources that would not otherwise be accessible.[15,16] For example, in a recent evaluation of Pride Africa's DrumNet sunflower promotion intervention, Okello (2010) found that households participating in the service bundling program earned higher incomes, produced more food on their farms, were more food secure, and did not decrease medical and health spending during the recent rise in food prices.[17]

<u>Determinants of Smallholder Adoption</u>

The extent to which smallholders are able to forgo production for own consumption depends on their level of risk aversion, the availability of local markets to purchase food, and the probability that commercial production will yield sufficient profit to meet the household's consumption needs through purchased goods. Reardon et al (2009) argue that critical incentives for smallholders to engage in commercially oriented production include the relative net price of the product (the farmgate price minus transaction costs) as well as the relative cost and risk of the technologies required to meet quality and transactional requirements.[18]

In their study of cotton production in Zimbabwe, Govereh & Jayne (2003) observed that the most critical determinants of smallholder decision to produce cotton were farmer education levels, distance from the nearest buyer, and the early clearance of the tsetse fly.[19] Similarly, Reardon et al (2009) note that farmers must possess the capacity to

make the necessary investments for market access, sufficient assets (land and non-land) to meet quality and consistency requirements, the capital to access public infrastructure and the market, and access to inputs, credit and information.[20]

Ashraf, Giné and Karlan (2008) evaluate the factors associated with take-up of an NGO horticulture promotion program supporting the production of French beans and baby corn. They find that literacy, farm size and household size are all associated with participation; risk tolerance, previous cropping practices and household income show no association with participation. The study also finds that farmers with relatively high yields and that sell directly to the market prior to the inception of the program are less likely to join, suggesting that the program may have been more appealing to farmers with less commercial production experience. Overall, their results suggest an inverted U-pattern to participation: neither the wealthiest nor the poorest farmers are likely to join the program.

Poverty Reduction & Income

The studies that examine the impact of cash crop activities on rural poverty reduction underscore the fact that poverty reduction impacts are not guaranteed nor uniformly distributed. Contextual factors prove to be critical determinants of positive welfare gains from cash crop production. Using national household data from Ghana, Breisinger et al (2008) observe that the poverty rate (percentage of households living below the national poverty line) among cocoa growers has decreased from 60 percent in 1991 to 24 percent in 2007. However, since cocoa production is geographically concentrated, only 19 percent of rural households grow cocoa and any poverty reduction impacts are therefore not evenly distributed.[21] In a similar study, Deininger and Okidi (2003) used two national household surveys to measure changes in the poverty level of coffee growers in Uganda from 1992 to 2000. The authors found that higher coffee prices had significant poverty reduction effects, as indicated by household per capita expenditure, level of asset accumulation, education levels, and health (incidence of sickness). However, farmers appear to have a high price elasticity of supply, suggesting that decreases in price could have strong negative effects on poverty reduction.[22]

Income

The empirical literature provides mixed examples of net income gains from cash crop production. Only three studies explicitly test the hypothesis that commercially oriented production increases net household incomes. Benfica, Tschirley and Boughton (2006) conducted a study of contract tobacco farmers in the Zambezi valley of Mozambique using a stratified random sample of 159 households in 2004. Since the cash crop sectors in Mozambique are organized by monopsony concessions, farmers must participate in the contract scheme in order to grow tobacco. The authors examine both determinants of participation and effects of participation on household income. According to their results, factor endowments were a key determinant of participation and tobacco growers had much higher mean household and agricultural incomes, both total and per capita, than non-tobacco growers. Non-growers had more diversified incomes, with statistically significantly higher percentage of income from off-farm wage labor than tobacco growers.[23]

In Kenya, Minot & Ngigi (2004) use survey data from 1,482 rural households involved in crop production to compare the profitability of French bean farming to the most common production alternative, maize-bean intercropping. Three-quarters of the French bean growers in the study had less than three hectares of land and 86 percent planted less than one hectare of beans, and over 90 percent of French beans grown were sold commercially. Profitability was estimated using the gross margin, defined as the value of output minus the cost of variable purchased inputs such as seed, fertilizer, pesticides, and hired labor; the implicit cost of family labor and land are not deducted. The study found that when the right conditions are present, in terms of rainfall, markets, family labor, and household ability to bear risk, French bean production is much more profitable than maize-bean intercropping, leading to net income gains for French bean producing households. The authors underscore that their calculations were based on the average conditions of farmers currently producing French beans and the enabling conditions that make this a more profitable

activity are not present for all farmers. For example, rural farmers may be located far from traders and therefore would receive a lower price for French beans, decreasing the profitability of production. In addition, French beans are very water and labor intensive and require significant upfront investment. Farmers may not have access to these resources or the ability to accept the higher risk associated with vegetable production.[24]

Household characteristics also appear to influence the potential for gain from commercially oriented production. Benfica (2006) observed different explanatory variables determining profits earned from tobacco and cotton production. The size of landholdings was a statistically significant determinant of higher profit earnings for both crops, but only for growers in the fourth (largest) quartile of land area. Farmers in the fourth quartile – those with an average 12.71 hectares for tobacco or 6.45 hectares for cotton – earned higher profits than their land-poor counterparts. Gender of the household head was an additional significant factor in tobacco areas with female-headed households earning average profits significantly below their male counterparts. In cotton areas, the value of production and marketing assets was a significant determinant positively correlated with profits from cotton growing.[25]

Income gains from cash cropping may also vary by crop. In other work in the Zambezi valley of Mozambique, Benfica (2006) conducted an ex-post random survey of 300 smallholder farmers between 2003 and 2004. The sample was designed to be representative of Mozambique's cotton and tobacco growing areas to compare the income and poverty reduction effects of tobacco versus cotton farming, compared to non-growers of those crops in the same concession areas. Participating tobacco farmers had statistically significant incomes 1.8 times higher than non-participating farmers. Cotton farmers appeared to forgo other off-farm income opportunities in order to grow cotton and therefore did not differ from non-growers in total household income. Tobacco growers had more animal traction and agricultural production assets than non-growers, but there was no difference in the size of land holdings between the two groups. In cotton growing areas, on the other hand, households with more land and less education were more likely to seek a cotton contract. While inequality (Gini coefficient) was high in both areas – 0.54 in tobacco areas and 0.40 in cotton areas – there was a greater gap between growers and non-growers in cotton areas (.09) than in tobacco areas (.04).[26] Because this study is ex post, some of these differences may have been present before the start of cash cropping, rather than being a result of cash cropping.

In the only randomized controlled study in this review, Ashraf, Giné and Karlan (2008) evaluated the impact of Pride Africa's DrumNet export horticulture crop promotion service bundling program on farmer practices and household income. They found program participants were 19 percent more likely to grow export cash crops than non-participants and allocated a greater proportion of their land to cash crop production. Participants did not have higher expenditures on agricultural inputs, however. They found significant increases in household income only among farmers who were not formerly producing export crops, suggesting that similar interventions should focus on market access for new farmers and not on facilitating transactions for farmers already producing export crops. The study found that middle income farmers were most likely to participate and that offering a version of the program including credit increased participation but did not have an impact on household income, relative to the non-credit treatment group. In fact, the study did not find any significant differences between the credit and no-credit treatment groups, possibly due to the effect of the credit offer on the type of farmer who agreed to participate.[27]

Income Stability

Minten, Randrianarison, and Swinnen (2009) used representative household survey data and informant interviews to examine the income and perceived benefits for smallholders producing vegetables under supermarket supply contracts in Madagascar. They found that income from contract crops represented on average 50 percent of household income and that smallholders participating in supply contracts perceived higher income stability than non-participating farmers. The authors measured farmer motivations for signing the contract and found stable income throughout the year to be a very important reason for contract participation for 66 percent of farmers and access to income during

the lean period was a very important reason for 72 percent. Interestingly, only 17 percent of farmers noted higher income as a very important reason, suggesting that net income gains did not exceed the value of the other benefits of participation for farmers.[28]

Consumption

Four empirical studies use household consumption as an indicator of welfare and test the impact of cash crop and contract supply on consumption levels. Delarue et al (2009) deconstruct and rework the 1994, 2001, 2006, and 2007 national household surveys from Mali to resolve the paradoxical findings of an inverse relationship between cotton production and household poverty in Mali, and in the Sikasso region in particular. Per capita food consumption increased with the amount of cotton produced, however, even the largest cotton producing households consumed only at the national average, but no more. Cotton producers consumed an average of 9 percent more food than non-cotton farming households, however this average masks a great disparity between large and small cotton farmers. The largest cotton producers' food consumption levels were 20 to 22 percent higher than that of the smallest cotton producers.[29]

In Rwanda, Loveridge, Nyarwaya and Shingiro (2003) used survey data from the 2001 coffee season to evaluate the association between coffee production and overall household consumption. They found a weak but positive relationship, likely due to the fact that Rwandan coffee fetched low prices on the world market. Many farmers decreased coffee production or stopped growing it altogether, possibly contributing to a weaker association between coffee production and household consumption than had been observed in the past.[30] In 2002, reforms in the coffee sector promoted organization and private sector investment in processing and marketing infrastructure so that Rwandan producers, previously uncompetitive in the global bulk coffee market, could benefit from the rise in specialty coffees. Murekezi and Loveridge (2009), compare the 2001 data with 2007 data to assess the impact of the policy reforms on total household and food consumption. Pre-reform coffee production techniques are still practiced by farmers without access to the new processing facilities, thus allowing the authors to compare the difference between traditional growers and modern growers after the reforms. The study is based on a small sample; the 2001 data represented only 10 percent of Rwandan coffee growers and respondents were scattered all over the country. In 2007, the authors were able to revisit a random sample of only 252 households. They found that modern producers spent 15 percent more on food (per adult equivalent) and 17 percent more on all goods compared to traditional producers. Compared to pre-reform data, the difference in food expenditure was not statistically significant for either group of producers. Overall household expenditure for all coffee producers increased 13 percent over pre-reform expenditures, suggesting that even traditional producers have benefitted from coffee sector reform.[31]

In their study of the determinants of household poverty in Tanzania, Sarris, Savastano and Christaensen (2006) find that consumption smoothing needs help explain low rates of input and agricultural capital usage despite significant payoff potential. The authors find that both credit and liquidity constraints contribute to low levels of intermediate input use, including purchased inputs such as fertilizer as well as the value of own produced inputs such as saved seed and compost. In addition, the household's perceived capacity for ex post consumption smoothing later in the year is a significant determinant of input adoption decisions at planting. To test the validity of this perception, the authors include a vulnerability index (developed by Sarris and Karfakis, 2006) as an additional dependent variable, which indicates the probability that a household's consumption will fall below poverty in the next period.[32] They find a negative and significant correlation between household vulnerability and input use, likely reflecting consumption smoothing and precautionary savings behavior that inhibit vulnerable households from investing in intermediate inputs. These findings highlight the need for increased access to credit and financial services as well as consumption safety nets so that households can allocate resources to increasing productivity.[33]

Health, Nutrition & Food Security

Cash crop production can contribute to health, nutrition and food security through several different avenues. Increased cash income may allow households to increase food and health spending. In addition, spillover effects of inputs and technology from cash crop production can lead to higher productivity of food crops, increasing food quantity available and excess output for sale. However, the links between cash crop production and household health and nutrition are complex, and few studies have been carried out with sufficient baseline data to test the theoretical relationship.[34]

Health

Increased household income and income stability can free up resources for households to allocate to health and medical needs. For example, Okello (2010) examines household expenditure on medical services as a proxy for welfare among sunflower farmers participating in an NGO market access intervention, Pride Africa's DrumNet program. More DrumNet participants reported maintaining pre-crisis levels of health spending even during the 2008 rise in food prices than non-DrumNet participants.[35]

Cash crop production can also have negative impacts on health, especially from exposure to pesticides. In their study of the health effects of compliance with international food safety standards (GlobalGAP†) in Kenya, Asfaw, Mithofer and Waibel (2009) used single visit and season-long surveys of randomly sampled households to measure the different cost of illness for GlobalGAP adopters versus non-adopters. The study found that farmers adopting GlobalGAP standards had a 70 percent lesser incidence of illness than non-adopting farmers and that the cost of illness for non-adopters was double that of adopting farmers. Nevertheless, only one third of sample households adopted the standards during the survey season, although the authors note this may not reflect the actual rate of adoption. The authors found that education was significantly negatively correlated with incidence of illness, suggesting that households with more education are more likely to have better crop management and input use practices and handle pesticides with more caution.[36]

Nutrition

Only two studies examined the relationship between cash crop production and household nutrition. Kennedy & Oniango (1990) suggest that households participating in a Kenyan tea outgrower scheme increased overall caloric intake, but that this did not translate into better (or worse) nutritional or health status of children.[37] Aigelsperger, Njuki and Hauser (2007) observed that increased income from certified organic production in Uganda allowed farmers to consume more meals per day than their non-organic counterparts. However, the authors also found that improved food security did not necessarily translate into improved nutrition, and suggest that there is an underexploited natural synergy whereby organic agricultural interventions could also work to promote nutritional security.[38]

Food Security

Cash crop production can increase food security by increasing food availability either through household production or by increasing the income available to purchase food.[39] Household food availability can increase when higher productivity produces more food or decreases the household's need to sell the household food output for cash. In theory, farmers might be better off is they could produce only cash crops and use the earned income to purchase food. However, rural farming households perceive this to be a risky livelihood strategy, as Lukanu et al (2004) found

† GlobalGAP refers to regulations set forth by the European Union (EU) Retailers Produce Working Group for Good Agricultural Practices, formerly known as EurepGAP. GlobalGAP requirements prescribe maximum residue limits, sanitary and phytosanitary standards, and traceability requirements based on official EU standards.

among smallholders in Mozambique. Few farmers in the study were willing to exclusively cultivate non-food crops because food for sale could be scarce or unaffordable, especially between the months of November and February and in years of poor harvests.[40] This case illustrates how participation in a cash crop market can increase uncertainty if it replaces secure subsistence with insecurity due to unstable markets, unfavorable price trends, or unknown technology.[41] Thus, uncertainty about food prices in local markets sustains the incentive to continue food crop production, even when returns are higher from market-oriented production.[42]

Jayne (1994) demonstrates that the higher the cost of acquiring staple foods relative to the producer price of a cash crop, the lower the incentive for households to diversify their production. Thus, the high cost of food marketing in rural areas lowers net expected returns from alternative production opportunities and works in conjunction with risk-averse behaviors to decrease household incentives to produce cash crops.[43] Govereh, Jayne and Nyoro (1999) further suggest that as the costs and risks of acquiring food in the market decline, smallholders will be able to devote more resources to higher return activities.[44] Poulton et al (2008) argue that smallholder cash crop production is best promoted or enhanced by interventions that either improve the efficiency of staple food markets or the productivity of staple food production.[45] From the firm perspective, increasing household food security (through increased productivity of food crops or strengthening of local food markets) will increase the amount of resources that the household can devote to the production of cash crops.[46] For example, Govereh, Jayne and Nyoro (1999) provide examples of coffee cooperatives in central Kenya explicitly supporting members' use of resources and services for both coffee and food crops, based on the premise that food crop productivity would raise farmers' ability to sustainably and profitably produce coffee.[47] Bolwig and Odeke (2007) observed a decrease in household food production after the adoption of organic coffee production practices in Uganda. Since households were instead able to purchase food in the local market, no decline in food security was observed.[48]

In Madagascar, Minten, Randrianarison, and Swinnen (2009) found that smallholders producing vegetables under supermarket supply contracts had shorter lean periods. Contract farmers had an average lean period length of 1.7 months, compared to the estimated area average of 4.4 months. Participating farmers noted seasonality smoothing and a shortening of the lean period as specific reasons for contract participation.[49] In examining the impact of export pineapple and mango production on household food availability in southern Ghana, Afari-Sefa (2007) found that households producing export crops were better off, in terms of income and food availability, than those producing food crops. However, crop choice alone was not a sufficient condition for improving household food security. The author found that the largest landholders were the most likely to adopt export crops and therefore land size may also have been a significant determinant of household food security. In addition, household food security was positively related to age and residential status of household head, household size, credit access, extent of off-farm employment, and regional location.[50] Pineapple was much more widely adopted by smallholders than mangoes; foreign large-scale commercial farms tended to dominate in mango production due to their longer required investment period.[51]

Production Spillovers and Food Crop Productivity

Strasberg et al (1999) argue that crop commercialization can contribute to food crop productivity through three pathways. First, the cash income from commercial production can overcome credit constraints that previously prevented the household from purchasing fertilizer and other inputs that increase crop productivity. Second, participation in a resource-providing scheme provides access to inputs through the marketing firm that can be used in part on food crops.[52] For example, Minten, Randrianarison, and Swinnen (2009) found that access to inputs were a significant motivator for smallholders in Madagascar to participate in contract supply to supermarkets.[53] Third, cash income allows the household to invest in lumpy assets, such as tractors or draught animals that can increase productivity across crops.[54] Minten, Randrianarison & Swinnen (2009) also found that technical training by marketing firms increased food crop productivity (rice) for smallholders. Firms specifically taught participating farmers how to make and use compost, leading to increased productivity through improved technology adoption and better resource management resulting from increased access to inputs on credit.[55]

Govereh, Jayne and Nyoro (1999) use ex post household survey data and informant interviews to test the hypothesis that crop commercialization contributes to food crop productivity among cotton growers in Mozambique and Zimbabwe and among coffee and sugarcane growers in Kenya. The authors found that commercialization schemes increased access to improved seed, fertilizer, herbicides, and pesticides in Kenya and Mozambique. Higher levels of commercialization were associated with higher levels of fertilizer use Kenya, with a one percent increase in the commercialization index associated with a 0.14 kg increase in amount of fertilizer per unit of land. In Mozambique, famers engaged in high-input cotton production had higher levels of food productivity that those in low-input schemes, due to use of improved seeds in all areas, and higher usage of fertilizer and herbicides in one area. It is not clear whether increased application of fertilizer on food crops is the result of a higher total volume of fertilizer use, or whether it represents a reallocation of use from cotton to food crops. In Zimbabwe, cash cropping appeared to take labor and land resources away from food crop production. However, commercialized cotton smallholders in Zimbabwe were twice as capitalized, more likely to adopt animal tillage and more likely to be grain-sufficient than non-cotton growers, suggesting some positive production spillovers.[56]

Evidence for positive production spillovers is found by Govereh and Jayne (2003) in subsequent work on Zimbabwe. Using survey data from 480 rural households, they found evidence for both household and regional spillover effects of cotton production on food crop productivity. Cotton commercialization was positively correlated with higher grain productivity, but did not appear to affect gross grain output. The number of cotton traders in an area was also positively correlated with grain output, likely resulting from the fact that cotton retailers provide a range of services for farmers growing food crops, such as inputs used in maize production, for example.[57]

Using data from a random household survey in Kenya, Strasberg et al (1999) examine the impact of the degree of household commercialization on two outcome variables: fertilizer use and food crop productivity. They found the degree of agricultural commercialization, as measured by the household commercialization index (gross value of crop sales over gross value of all crop production), to be positively and significantly correlated with both fertilizer nutrient application per food crop acre and gross food crop productivity per food crop acre. However, the effect of particular cash crops on these variables was found to be markedly different depending on the region, regardless of the household level effects of commercialization. French beans and sugarcane were negatively correlated with both fertilizer use and food crop productivity, and tea was also negatively correlated with productivity. Only coffee was positively correlated with both outcomes. District-crop interactions revealed even more variation, such as the negative impact of coffee in Meru and positive impact of sugarcane in Bungoma. All the crops demonstrated positive relationships in some districts while not in others, with the exception of tea, which was positively correlated with fertilizer use in all districts. These findings underscore that the effects of any particular cash crop are difficult to generalize.[58]

Asset Accumulation & Risk Reduction

Constructing pathways to asset accumulation is a critical component to achieving rising prosperity over time. Higher incomes from cash crop activities may allow households to invest in improved farm practices and non-farm assets. A combination of these investments allows the household to reduce risk and increase income generation over time.[59] Delarue et al (2009) found that cotton growing households in Mali had greater fixed asset holdings, such as agricultural equipment, bicycles, motorbikes and radios, than other rural farmers. For example, in 2006, 92 percent of cotton farmers owned a bicycle, compared to only 55 percent of other farmers.[60]

Among cotton farmers in Zimbabwe, Govereh, Jayne and Nyoro (1999) found general asset levels to be a weak predictor of household commercialization, as measured by the household commercialization index. However, ownership of specialized assets, such as knapsack sprayers, had a strong and significant impact on commercialization.[61] This underscores the fact that the impacts of cash crop production may reflect existing differences among farmers prior to the adoption of the crop. Similarly, Minot and Ngigi (2004) found that in Kenya,

French bean producers were much more likely to own some type of irrigation equipment (50 percent) than other farmers (10 percent).[62] Since this study is based on ex post survey data, results may reflect differences among farmers prior to the adoption of French beans.

Intrahousehold Resource Distribution & Gender Equity

Women may be at a relative disadvantage in access to cash crop production opportunities and may have more limited influence on how income from cash cropping is allocated. This may mitigate the potential benefits of cash crop production on overall household welfare, especially for children. Jayne, Mather and Mghenyi (2005) argue that when gender is a key determinant in an economic activity, as is often true with cash crops, the loss or absence of an adult male can prevent access to the activity.[63] In dual-headed households, Stockbridge (2007) argues that men tend to control the revenues from cash crop production and have different spending priorities from those of women. The author further argues that as a result, household involvement with cash crops often appears to benefit men more than women and children.[64] Household bargaining models suggest that resource allocation decisions are made according to the relative bargaining power of the members of the household.[65] There is some empirical evidence to support this, including the work of Sorensen and von Bulow (1990), Dolan (2005), and Carney (1993), finding that disputes over women's labor allocation lead to poor productivity in the case of tea and French bean production in Kenya and irrigated rice production in The Gambia.

Impacts of Smallholder Cash Crop Sectors on Regional Economies

Regional spillover effects occur when a commercialization scheme attracts new investments to a region, providing benefits to all farmers in that region regardless of participation in the commercial crop or scheme.[66] The literature suggests that regional spillover effects can occur through rural economic growth, increased market efficiency, and strengthened rural non-farm sectors and related off-farm employment opportunities.

Economic Growth

Agricultural growth has been shown to spur overall economic growth in diverse settings across continents.[67] In rural areas, such growth contributes directly to poverty reduction through increased productivity and incomes for the rural poor.[68] Cash crop production can contribute to agricultural growth by creating new employment and investment opportunities and multiplier effects, even for non-farming households and unrelated markets.[69] For example, Minot & Ngigi (2004) suggest that there are significant indirect benefits associated with horticultural exports in Kenya. The multiplier effects of injecting the value of the sector ($46 million in 2004) into the economy generate benefits for other households and sectors that produce goods purchased by export producers. Since 96 percent of fruit and vegetable production is consumed domestically in Kenya, even small improvements in yield, post-harvest methods, and marketing efficiency in the domestic supply chain could generate large benefits in the economy.[70]

Only one study, Benfica (2006), directly examines the effect of cash crop production on regional economic growth. The author simulates the magnitude of secondary effects that would result from cash crop sector shocks on regional economies in the Zambezi valley of Mozambique, using the household survey data detailed above. Shocks incorporated into the model included sector expansion; an export price increase in tobacco, cotton or maize; productivity increases; increased import prices of inputs; and a government tax on cash crops. Model results suggest that these shocks would have a sizable effect on income growth rates and poverty reduction for grower and non-grower households, but that these effects would be larger in tobacco areas than cotton areas.[71]

Market Efficiency

Agricultural growth can also contribute to increased market efficiency. For example, it can decrease the cost of food for both urban and rural households through increased production and infrastructure to support the transport and

marketing of agricultural output and food products. [72] However, this review found no studies directly testing the hypothesis that the presence of cash crop industries leads to other investments along the supply chain.

Govereh, Jayne and Nyoro (1999) hypothesize that input-intensive crops can increase the demand for inputs and thereby create an incentive for private supply. Private investment would increase the availability and accessibility (by reducing per unit costs) of key inputs that can be used on a wide range of crops. The authors examine the importance of distance to market on commercialization to test this hypothesis. They found that in both Kenya and Zimbabwe, distance to market was a significant determinant of the degree of commercialization, as measured by the household commercialization index. The authors did not find much evidence for private investment in transportation infrastructure beyond pressure for government investment in Zimbabwe.[73]

Rural Non-Farm Sectors

Evidence suggests that smallholder-based cash crop production can strengthen rural non-farm economies and that non-farming households can benefit through employment opportunities.[74] Multiplier effects of agricultural growth strengthen local markets for other goods and services provided by the non-farm rural poor.[75] Mellor (1999) demonstrates that in the long run, the agricultural stimulus to non-farm employment drives poverty reduction in rural areas. He notes that this is a long-term effect with significant lag due to the lag in wage rate adjustment and expenditure patterns for increased farm income; only about half of the long run effect of increased agricultural output on rural poor incomes is likely to occur within three years of the initial gain in farm yields.[76] This underscores the argument by Pingali, Khwaja and Meijer (2005) that investment in public goods is essential to reorienting the rural economy toward alternative long-term employment opportunities that support the changing agricultural system. Specifically, the authors argue for the need to invest in education and rural infrastructure, including transport, communication and market infrastructure.[77]

Non-farm employment can contribute to household income diversification, even for farming households. Davis (2004) found that employment in the rural non-farm economy was responsible for between 40 and 60 percent of incomes and jobs in almost every one of the 55 studies of rural economies surveyed.[78] Dorward et al (2004) use micro-economic models of the rural economy in Zimbabwe to demonstrate that households with diversified income sources – and especially those with one or more members engaged in wage employment – tend to be less poor and less vulnerable.[79] However, the scale of local production can be a key constraint to the development of off-farm labor opportunities. Farmers must first produce sufficient quantities to create a market incentive for firms to invest in processing facilities in order for secondary employment opportunities to arise. Small production quantities or numbers of producers constrain both productivity and the potential for spillover effects from cash crop production. In Namibia, for example, cotton appears to be a promising cash crop, but the country currently does not produce sufficient quantities to support investment in processing infrastructure and as a result there are no ginning facilities.[80]

Maertens and Swinnen (2009) examine the income effects of contract farming versus off-farm employment in the fresh fruit and vegetable sector of Senegal. They found that participation as either a contract farmer or agro-industrial employee had highly significant, positive impacts on poverty and welfare.[81] However, the authors found that the rural household income gains were greater for contract farmers than for agro-industrial workers.[82]

Market Access and Institutional Factors

The structure of the supply chain, the nature of the smallholder-market relationship and the institutional context for production affect the extent of smallholder participation and potential for welfare gains. Poulton, Dorward and Kydd (2005) argue that the successful development and operation of intermediate and coordinating institutions requires four components: the potential for substantial and reliable responses to investment in more intensive production; a reasonable density of economic activity; communications infrastructure; and sufficient margins in the supply chain to provide acceptable returns to all actors.[83] The empirical literature indicates that there are major differences in the

performance of different types of cash cropping arrangements involving smallholders and private firms, such as intensity of input use, crop productivity and smallholder incomes.

Barriers to Entry

Agricultural production in Africa faces numerous constraints, well documented throughout the literature, that often create barriers to entry or limit competitiveness for commodity production in the global open market. Poor resource endowment and liquidity constraints can hinder producers' ability to cope with the imperfections of rural markets and expose poorer households to greater risk in the case of price collapse or the breakdown of local marketing institutions, for example as observed among pineapple and mango growers in Ghana. Poorer households may also be at greater risk of inadequate technological knowledge to meet quality and health standards.[84] Pressures to meet the new requirements of a more exacting food system create new transaction costs for small farmers in dealing with different rules, regulations and players. As the case of Ghanaian pineapple illustrates, increased emphasis on specialization, quality, size and delivery standards has increased the costs of exchange and may inhibit smallholder entry into competitive markets.[85]

Market access also varies across smallholders. Murekezi and Loveridge (2009) demonstrate that the type of marketing outlet available to coffee farming households in Rwanda is a significant determinant of the impact of coffee sales on household income and food consumption. Farmers located near a washing station can sell whole coffee cherries for a premium price while farmers located far from processing facilities are forced to sell parchment coffee for the minimum government mandated price. Parchment coffee farmers are generally located in areas that lack one or more conditions for the construction of washing stations, such as adequate water sources or lack of sufficient production quantity to make such an investment profitable. Furthermore, parchment coffee farmers are additionally disadvantaged because more labor is required to process the coffee before it can be sold. Geographic disadvantage also may result in lack of access to contract arrangements, credit, or extension services.[86]

Sector Coordination

Overcoming barriers to entry requires coordination between governments, the private sector, and producers to ensure the provision of services and infrastructure, take advantage of economies of scale wherever possible, and decrease transaction costs. More specifically, interlocked transactions across credit, input, and output markets are critical given the constraints and ubiquitous failures in African markets. Govereh, Jayne and Nyoro (1999) argue that export-oriented cash crop markets offer greater potential for such interlocking because they tend to have more concentrated marketing channels.[87] Dorward and Kydd (2005) similarly argue that achieving successful coordination requires explicit external support for hierarchies that can provide or support coordinated exchange opportunities for pro-poor agricultural growth in conjunction with institutions, technologies, and prices that create incentives for private investment.[88]

Horizontal Coordination

Coordination among farmers through producer organizations can significantly decrease the transaction costs for both the farmers and the firms purchasing their output by bundling transactions and providing mechanisms for peer monitoring to combat strategic default and opportunism.[89] Producer organizations can manage the frequency of interactions between firms and producers and facilitate more cost effective service delivery.[90] They can also reduce the level of uncertainty by securing long-term contracts. Finally, producer organizations can facilitate the acquisition of lumpy capital investments that can increase productivity and meet more stringent quality and consistency requirements.[91] Although better prices for farmers are often mentioned, Pingali, Khwaja and Meijer (2005) suggest that the more important function of producer organizations is to facilitate secure market outlets and access to inputs, technical assistance, and credit.[92]

Using data from a 2006 IFPRI national household survey, Bernard, Gabre-Madhin and Taffesse (2007) examined the impact of farmer cooperatives on household commercialization. Specifically, they examined the decision to sell on the market, the extent of market participation, and the prices obtained in the market, comparing districts with farmer cooperatives to districts without them. The authors found that cooperative membership had no impact on the share of members' production sold in the market, despite the 7 percent higher price received on average.[93] In a companion paper examining determinants of cooperative performance, Bernard and Taffesse (2008) use a different subset of the same IFPRI data to examine the characteristics of cooperatives and their effect on members' commercialization. The authors demonstrate that offering additional social services, such as HIV prevention programs or literacy training, does lead to increased participation in farmer cooperatives, however, they increase management costs without contributing to improved market performance.[94] These findings suggest that cooperative membership alone may not be sufficient to promote smallholder productivity and income gains through commercialization.

Ellis and Freeman (2004) found little cultivation of cotton, coffee, sunflower and castor in Tanzanian villages where these were previously significant cash crops. Villagers attributed this decline to the dissolution or disintegration of cooperatives and parastatals that formerly supported these crops.[95] Successful introduction of high-value crops into smallholder farming systems in East and North Africa, on the other hand, resulted from the simultaneous promotion of producer organizations, public sector support in research, development, training, investment and export promotion, and partnerships between producers and private-sector actors.[96] Minten, Randrianarison and Swinnen (2009) argue that individual contracts lead to high transaction costs in the case of vegetable contract farmers in Madagascar. The authors suggest that if farmers were able to organize into cooperatives, they could internalize verification systems and provide economies of scale, potentially attracting more firms to invest in the country.[97] However, limited organizational and governance capacity, lack of financial capital, and challenges in the market environment constrain the impact of producer organizations.[98]

Coordination between companies is also necessary so that they do not undermine each other's investments. Side-selling is a particular concern, whereby farmers accept pre-harvest inputs on credit from one firm and then strategically default on the loan by selling their output to another firm. The firm incentives to provide services and resources to smallholders are thereby stronger where the output market is more concentrated, since coordination is easier the fewer actors involved.[99]

Vertical Coordination

A fragmented market of many small players and extremely low levels of pre-harvest investment often characterize smallholder-dominated regions without supply chain coordination.[100] Vertical coordination can minimize transaction costs and create economies of scale while also facilitating access to input, output and credit markets for smallholders. Coordination can take the form of supply chain governance or a more formal contract farming arrangement.

Supermarkets now account for a large percentage of national and international food retail sales and are often multinational firms with highly centralized procurement and distribution systems.[101] The World Bank (2005) suggests that supermarket value chains may improve the efficiency of domestic markets and reduce food prices. Increasing quality standards and specialization (i.e. non-traditional crops, organic, specialty coffee, etc.) within the market may provide smallholders with access to new, higher value markets.[102] While some authors argue that increased safety and sanitary controls may exclude smallholders from participating in global supply chains, Minten, Randrianarison, and Swinnen (2009) demonstrate that even very poor farmers in a country with low competitiveness (Madagascar) and facing a monopsonistic marketing company can benefit from integration into a global value chain through contract farming.[103] However, as Asfaw, Mithofer and Waibel (2009) found with GlobalGAP adoption in Kenya, meeting standards may require education and support.[104]

Contract farming is a formal institutional arrangement intended to address failures in input, credit and output markets

and the lack of effective service provision networks (public or private). EPAR literature reviews *Smallholder Contract Farming in Sub-Saharan Africa and South Asia* and *Gender & Contract Farming in Sub-Saharan Africa* (Briefs numbers 60 and 67) provide more detailed analyses of the benefits and drawbacks to contract farming arrangements. In brief, the empirical evidence demonstrates that the economic and social benefits of contract farming for smallholder farmers are mixed and that the best outcomes result when farmers have more bargaining power to negotiate the terms of the contract.

Role of the State and NGO Sector

In the wake of structural adjustment policies, state direct involvement in Africa's commodity sectors is limited. The World Bank argues that state involvement in cash crop production is still necessary through regulation and investments in public goods in order to overcome market failures.[105] For example, in most tea and sugar sectors, high post-harvest perishability favors centralization to facilitate economies of scale.[106] In their analysis of Africa's experience with commercial agriculture, Poulton et al (2008) provide evidence for differing roles of the state and governance requirements depending on the structure of the sector. In monopolistic sectors, state provision of services for producers is unnecessary because firms have an incentive to provide these goods. However, in highly competitive markets, there are few incentives for buyers to provide pre-harvest services such as inputs and extension. In such cases, the state must play an active role, ideally in coordination with the private sector, to ensure that these services are provided. The Tanzanian and Ugandan cotton sectors provide salient examples of how the failure to provide these services can undermine the productivity of the sector.[107]

The NGO sector has also played a role in facilitating smallholder access to cash crop markets. For example, Pride Africa's DrumNet service provided a bundle of services to help farmers adopt market export crops. While the project succeeded in convincing farmers to make specific investments and crop choices, it did not secure the resources to cover substantial infrastructure and maintenance improvements. One year after Ashraf, Giné and Karlan's (2008) impact assessment ended, DrumNet collapsed as farmers defaulted on their loans and were forced to sell to middlemen when the exporter refused to continue buying their produce because farm conditions failed to meet new European export requirements.[108] In its second incarnation, DrumNet works exclusively with sunflower growers in Kenya and facilitates cashless micro-loans through Equity Bank and contract arrangements between suppliers and Bidco Oil Refineries, Ltd. In addition to credit and stable contracts, farmers receive training in farming techniques and business strategies as well as access to inputs (especially high yielding seed varieties).[109]

Macroeconomic and Policy Enabling Environment Factors

Macroeconomic stability and global openness to trade are essential to elicit long-term investments in productive capacity.[110] Without access to export markets through favorable exchange rates and international trade environments, domestic production can be stifled, even in countries that would otherwise be competitive in the world market. For example, in the world market for sugar, support for high-cost domestic production in major developed countries (USA, EU, Japan) has kept world market prices extremely low. As a result, Swaziland, Zimbabwe, Zambia, Malawi, and South Africa have limited their sugar production capacity to meet domestic needs – even though they rank among the lowest cost sugar producers in the world.[111]

Traditionally, Africa's comparative advantage has come mostly from favorable agro-ecological conditions and abundant labor supply. These advantages have been significant enough to outweigh the higher costs of agricultural production on the continent.[112] However, Poulton et al (2008) note that cases of successful export agriculture in Africa have occurred where the value of the commodity is US$500 or more. Only such high value products allow the African supply system to recoup its inherently high costs, especially transportation costs.[113] Poulton et al (2008) also argue that interventions to promote pro-poor rural development work best when the promoted crop has aspects of production that are very labor intensive or difficult to substitute with mechanization.[114] For example, in most places

cotton is a smallholder-dominated crop because the harvesting process (hand picking) is labor intensive.[115] In addition, Poulton, Dorward and Kydd (2005) argue that smallholders still have a competitive advantage where the inequality in farm structure is low and there is a low importance of credence attributes in the supply chain. Credence attributes refer to characteristics of a good or service that cannot easily be determined even after consumption, such as organic production or animal welfare practices, and can only be monitored by observation of production practices or analysis of the product.[116] *Appendix 1* illustrates a framework for conceptualizing the competitive advantage of different farm types.

Policy stability is particularly critical in the case of tree crops, such as cashews, because smallholders must make a long-term investment decision to plant new trees. For example, Poulton et al (2008) note that smallholders will only plant cashew trees when they are confident in the medium- to long-term future of their local cashew sector.[117] Furthermore, in the cashew sector of Mozambique, McMillan, Rodrik and Welch (2002) found that smallholders will only make investments once they see signals of commitment from other actors in the sector.[118] In Tanzania, the state has demonstrated such commitment through its investment in research, extension, and facilitation of input supply. Mozambique, on the other hand, has not experienced similar public support and private investors have entered and exited the cashew market amid significant policy uncertainty, especially regarding export taxes.[119]

Success Story: Horticulture in Kenya

The case of horticulture in Kenya is widely noted as a success story for economic growth through export agriculture and for smallholder welfare gains from commercially oriented production. Minot & Ngigi (2004) attribute this success to the efficiency and flexibility of the marketing system. A combination of factors has shaped the vertical coordination of the supply chain and contributed to maximizing both the growth of the sector and returns to producers. First, due to the potential demand in urban and foreign markets, the volume of horticultural production is highly dependent on developing strong market links between producers and consumers. Second, since the perishability of horticultural products contributes to high price volatility, there is greater potential gain from the exchange of marketing information. Thirdly, the labor, inputs, and skill requirements of horticultural production create a greater need for reliable access to credit, inputs and technical assistance than do staple crops.

Horticulture growth in Kenya has been driven by the private sector, with minimal government involvement limited mainly to regulatory functions. There is a state board responsible for gathering and disseminating information about the sector and the government is involved in the provision of extension services, research and development to support the sector. The non-governmental organization, Fresh Produce Exporter Association of Kenya (FPEAK), supports the sector through market research, representation of producer interests to the government, liaising with research and regulatory organizations, and supporting smallholder outgrower schemes, as well as creating and implementing the Code of Practice for horticultural producers.[120]

Conclusion

This review examined a substantial body of resources regarding smallholder cash crop production in rural Africa. The literature provides a number of examples where participation in cash cropping increased smallholder income, food security and health, as well as example of positive regional spillover effects from cash crop production. But in a number of studies results were also more mixed, particularly where institutional support for cash crop production was weak. Given the heterogeneity of crops and production structures across the continent, it is challenging to draw strong policy conclusions from the available evidence. One key finding from this review is that the empirical data available to evaluation the impact of cash crop production on smallholder welfare remains relatively weak.

The literature also emphasizes that the potential for smallholders to benefit from cash crop production depends on household, crop, production system, economic and policy environment factors. Given the complexity of farming

systems, the potential for failures in product and factor markets, differing competitive advantage and general heterogeneity of context, the exact nature of the system for the best smallholder outcomes must be endogenously designed and tailored to local contexts.[121,122]

Literature Review Methodology This review was conducted according to EPPI Centre guidelines for systematic reviews. A systematic review is one that uses explicit and transparent methods; follows a standard set of stages; is accountable, replicable and updateable; and ensures that reports are relevant and useful.[123]

Data bases and search engines used include: University of Washington Library, EconLit, University of Minnesota's AgEcon Search, Google, and Google Scholar as well as the FAO, IFPRI, and Michigan State University Agricultural Economics Department Websites. Searches used combinations of the following terms: smallholder; welfare; income; livelihood; pro-poor; export crop; cash crop; value chain participation; value chain integration; supply chain participation; supply chain integration; crop productivity; coffee; cashew; cocoa; cotton; value chain development; pro-poor growth; income distribution; vertical integration; market access; access to inputs; off-farm employment; non-farm income; export-driven growth; export-led growth; commercial agriculture; spillover effects; welfare effects.

Based on search results, criteria for inclusion in and exclusion from the literature review were iteratively formulated. Resources analyzing or empirically testing the following outcomes of interest were included: smallholder and/or rural poor welfare; spillover effects of agricultural production systems; cash crop production systems involving smallholders; smallholder participation in commodity value chains. Additional inclusion criteria incorporated: empirical studies with outcome variables related to smallholder welfare; empirical studies with dependent variables related to cash crop cultivation and/or export-oriented production; empirical or case studies with study populations representative of at least some smallholders and/or the rural poor; analytical or theoretical resources offering a framework for conceptualizing outcomes of interest; analytical or theoretical resources offering policy recommendations relevant to outcomes of interest; case studies involving smallholder cash crop and/or export-oriented production; analytical or theoretical resources concerning the current market situation relevant to aspects of constraints to or opportunities for smallholder production/value chain participation. The following exclusion criteria were applied to eliminate search results irrelevant to the scope of the research question: analytical or theoretical resources with a macro-economic focus only; studies or resources that do not address smallholders or the rural poor; a study population that is not representative of any smallholders or rural poor; policy analyses from before and during the era of structural adjustment policies; resources not pertaining to or including Africa; outcome variables not related to smallholder welfare or rural market performance; dependent variables not related to cash crop or export-oriented production; focuses on food crops only; focuses on export crops other than top and emerging crops (with the exception of tobacco and horticulture which were included); resources authored by a corporate source.

The weight of evidence was assessed for all empirical studies using EPPI Centre guidelines (Gough, 2007). Each study was given an overall assignment of strong, medium, or weak based on the coherence and integrity of the evidence and the relevance of focus to the research question. The text notes weight of evidence assessments where relevant.

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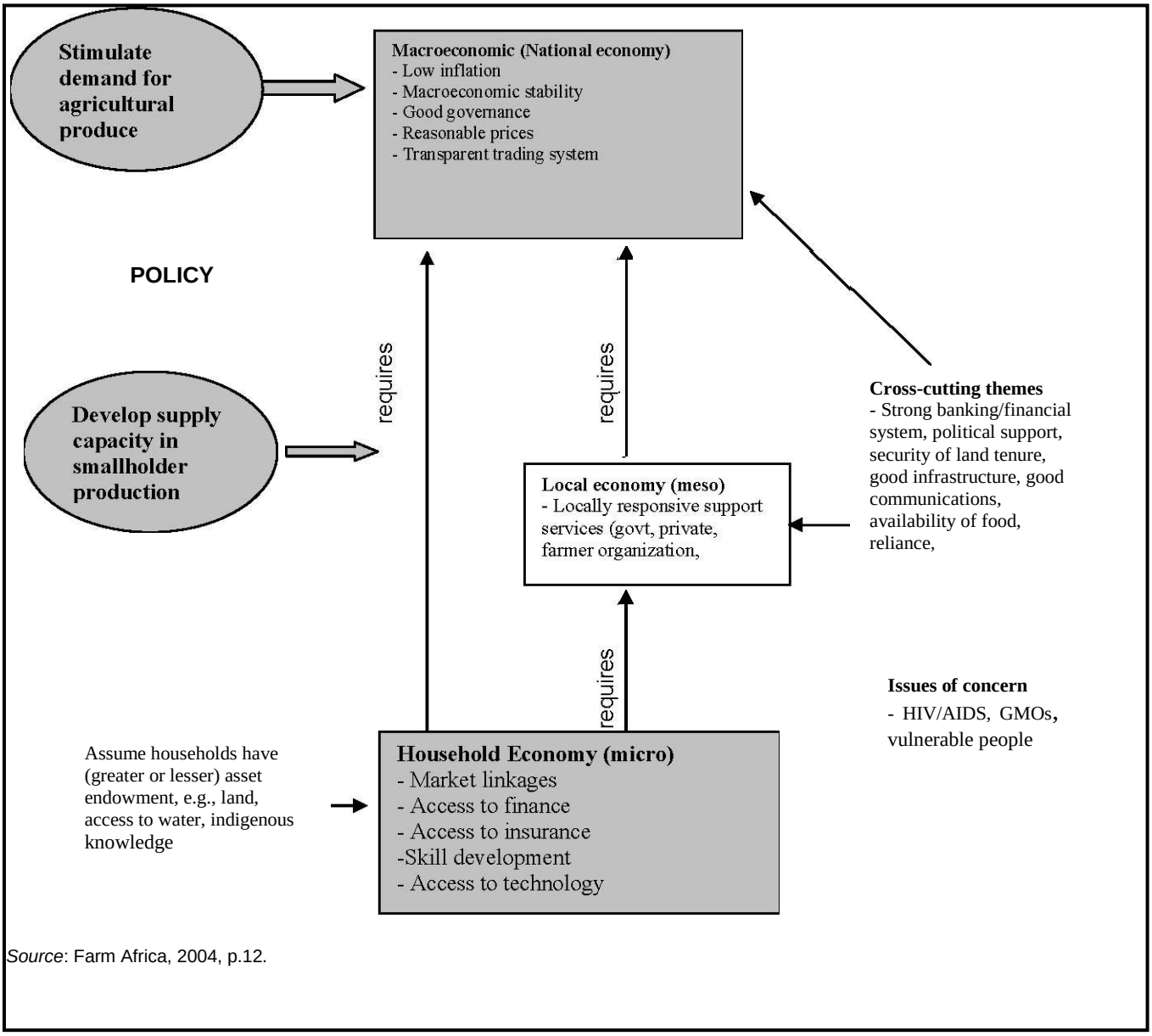
Appendix 1. Competitive Strengths and Weaknesses of Different Farm Types

	Smallholder farmers		Small Investor-farmers	Large-scale farming
	Non-commercial	Small-scale commercial		
Land	*	**	**	**
Finance/Credit		*	**	***
Inputs: access/purchase	*	*	**	***
Skilled labor: access		*	**	***
Unskilled labor: motivation, supervision	***	***	**	*
Contacts/network	*	**	**	***
Market knowledge	*	**	***	***
Technical knowledge	*	**	***	***
Product traceability and quality assurance			*	***
Risk management	*	*	**	***

* = poorly positioned (no star is worse), *** = well-positioned

Source: Future-Agricultures, 2007

Appendix 2. Necessary Conditions for Smallholder Agriculture Growth



Source: Reproduced in Kisamba-Mugerwa, 2005[124]

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