

The Role of Smallholder Farms in a Changing World



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Abstract Despite progress, multiple burdens of malnutrition persist worldwide: 795 million people are hungry more than 2 billion people suffer from micronutrient deficiencies and over 2 billion are overweight or obese. At the same time, various challenges continue to threaten global food security and nutrition. Smallholder farmers are a key to ending hunger and undernutrition worldwide, but they are increasingly facing barriers to profitability. Yet smallholders should not all receive the same kind of support; they are not a homogenous group. While some smallholders should be supported to move up to commercially oriented and profitable farming systems, some should be supported to move out to seek non-farm employment opportunities. Strategies to promote smallholder agriculture as a business can help to overcome these obstacles and move smallholders with profit potential towards greater prosperity, while also contributing to the achievement of multiple Sustainable Development Goals (SDGs).

1 Introduction

In the coming decades, world agriculture will need to undergo major changes to meet the future food demands of a growing and increasingly rich and urbanised population. Smallholders in developing countries play a key role worldwide in this food security equation. More than 80% (475 million) of the world's farms operate on less than two hectares of land. Although these farms account for only 12% of the world's farmland, they provide an estimated 80% of the food produced in Asia and in sub-Saharan Africa (SSA) (Lowder et al. 2014). Despite the key role smallholder farms play in achieving global food security and nutrition, they are a vulnerable group often neglected by development policy and they account for most of the world's poor and hungry.

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Smallholders face a mix of interrelated risks and challenges which threaten their livelihoods, food security and nutrition. Traditionally, the literature on smallholders has focused on challenges to their livelihood strategies, such as lack of human capital and limited access to infrastructure, markets and technologies. But smallholders have also become increasingly vulnerable to a spectrum of emerging climatic, health, price, and financial risks and challenges. Not only does the occurrence of these shocks endanger already fragile food production systems, but the mere likelihood of their occurrence makes some smallholders more risk-averse and likely to pursue more subsistence-oriented activities, thus causing smallholder poverty to persist (Dercon 2009).

The role of smallholder farms in advancing global food security and nutrition, as well as overall development, is increasingly seen in a broader context. The old wisdom that small is always beautiful because of efficiency gains can no longer be universally applied. Smallholders are not a homogeneous group that should be supported at all costs, but rather a diverse set of households living in different types of economies. Research suggests that small is still beautiful in countries where non-farm growth is weak and the rural population is increasing (such as in agriculture-based economies), but bigger is better where non-farm sectors are booming and the urban population is increasing (as in transforming and transformed economies) (Fan and Chan-Kang 2005). Thus, optimal farm size is a dynamic concept that changes as a country's overall economy grows and as non-agricultural sectors develop (Fan et al. 2013).

Small farmers can therefore prosper either through a 'move up' or a 'move out' strategy. While some small farmers have the potential to undertake profitable commercial activities in the agricultural sector and expand their farm operation, others should be supported in exiting agriculture and seeking non-farm employment opportunities.

More broadly, smallholders have a unique role to play in the new global development agenda—the SDGs which world leaders agreed upon in September 2015. Smallholder agriculture, especially if well-integrated into a diversified rural economy and agrifood value chains, can contribute even more to inclusive growth and employment generation. Even very poor subsistence farmers can be empowered to manage resources sustainably, and benefit from goals around education, peace and gender equality. Assistance, through measures such as safety nets and support through off-farm employment to diversify livelihoods, can also help develop rural communities and interrupt cycles of poverty, hunger and undernutrition. In addition to promoting more inclusive patterns of growth, this support can also cushion the short-term impact of transitioning to non-farm activities.

Although smallholder agriculture is often recognised as a vital sector for development, it has rarely enjoyed the policy and institutional support necessary to allow smallholders and rural economies to thrive. A commitment to treat smallholder farms as viable businesses is a key to unlocking the sector's potential to contribute to a broader development agenda. Enhancing the viability of smallholder farming could serve to both reduce rural poverty and improve food security and nutrition and contribute to the achievement of multiple SDGs.

2 The Important but Shifting Role of Smallholders

Ideas about the role of smallholders have evolved over time, and this role is increasingly being seen in a broader economic context. The discussion about smallholder farms should be expanded beyond a strict focus on small versus large farms, to reflect the idea that optimal farm size is a dynamic concept that changes as a country's overall economy grows and as non-agricultural sectors develop. Within this framework, interventions must be tailored to the different types of smallholder farms and the specific contexts in which they operate.

The backdrop to the debate on small versus large farms is the dominance of smallholder farming systems in the developing world. Worldwide, about half a billion farms are smaller than two hectares, and these farms are getting smaller in many countries (Hazell et al. 2007). The continuing decline is due to factors such as growing rural population, urban growth that is not labour-intensive, formal and informal barriers to rural–urban migration and distortionary land policies. Small farms are estimated to produce four-fifths of the developing world's food (FAO 2011a). Moreover, they are home to approximately two-thirds of the world's three billion rural residents, the majority of people living in absolute poverty and half of the world's undernourished people (IFPRI 2005). To gain a better understanding of the role that smallholders play in a country's development, it is important to first look at the broader context of agricultural development. Growth in agriculture has been shown to be an important part of the initial stage of transformation in many countries.

Agricultural growth can provide the economy with much-needed stimuli such as capital, labour and foreign exchange for finance and can fuel growth in non-agricultural sectors (see, e.g., de Janvry and Sadoulet 2009). The connection is not automatic, however, and varies according to country-specific circumstances, especially the country's potential for agricultural and non-agricultural (including minerals and manufacturing) sources of growth (Hazell et al. 2010). Past successes in promoting agricultural development, such as the Green Revolution in Asia, were grounded in interventions and reforms that supported equitable agricultural growth and were led by small farms (Hazell 2009). Policies that enabled smallholder participation in the Green Revolution included the equitable distribution of land and secure ownership and tenancy rights, alongside scale-neutral technologies, temporary input subsidies and large investments in infrastructure (such as roads and irrigation).

A large body of empirical research argues that there are efficiency benefits to smallholder farms. Studies have shown a strong inverse relationship between farm size and land productivity, with smaller farms generating higher per-unit farm output than larger farms (for a summary, see Heltberg 1998). The standard explanations for this inverse relationship focus on small farms' more intensive use of inputs and the lower costs associated with supervising family labour on small farms compared with hired labour on larger farms. Multiple studies, however, have called into question the absolute efficiency advantage of small farms (Helfand and Levine 2004; Barrett et al. 2010). These researchers have argued that larger commercial farms have an advantage in terms of finance, technology and logistics, and that the inverse relationship disappears above a certain farm size, or after factors such as land quality are

taken into account—but even these studies have been challenged. A more dynamic argument about efficient farm size is that small farms have an advantage over large farms in terms of labour supervision and local knowledge, but larger farms gain the advantage as an economy shifts towards technologically advanced, capital-intensive, and market-oriented agriculture (Poulton et al. 2010).

One of the fundamental models of development economics asserts that the development of a dual-sector economy occurs through the transfer of low-productivity agricultural labour to the higher-productivity industrial and service sectors. The flow of labour continues until the marginal productivity of labour—in other words, income—is equal between the farm and non-farm sectors, after adjusting for labour quality and cost of living. This essentially means that workers will move from one sector to the other until wages are equal in the two sectors. Within this framework, farm size is an endogenous variable whose optimal value is the point of equal marginal productivity (again, income). Generally, it is expected that as labourers migrate out of rural areas, operational farm size will increase as those leaving agriculture sell or rent their land to the remaining farmers who can more efficiently expand their operations.

Yet, over the past few decades, farm structures in many developing countries have been affected by government policies that distort incentives for, and limit the extent of, efficiency-enhancing land transactions. (This is not to deny any justification for equity-oriented redistributive land reforms in certain highly unequal socioeconomic contexts.) Such interventions have included the imposition of ceilings on landholding size in a number of Asian countries, such as Bangladesh, India, Pakistan and the Philippines. Alternatively, many land-abundant developing countries, especially in SSA, have artificially promoted large-scale, commercial farms. These countries include post-independence Nigeria, Sudan and Tanzania, as well as the Democratic Republic of Congo and Mozambique, where more recent large land acquisition deals have taken place.

This artificial promotion of small or large farms, through restrictions on minimum or maximum landownership or rental, has been shown to result in inefficiencies by reducing farm productivity. For example, preliminary findings from the Philippines show that imposing a ceiling on farm size results in the misallocation of resources, causing agricultural labour productivity to drop by 7% and the share of employment in agriculture to increase from 45.1 to 48.5% (Adamopoulos and Restuccia 2013). The same can be seen in India and China, where reduced restrictions on land rental markets improved agricultural productivity by transferring land to more efficient (but often still poor) producers (Deininger and Jin 2005; Deininger et al. 2008). In fact, evidence from China shows that removing constraints on land rental markets has a much more positive impact on productivity gains and rental market participation than does administratively reallocating land, because the latter is weighed down by high transaction costs and imperfect information. Moreover, in Ethiopia, evidence shows that land tenure reform that expanded land renting contributes to improved tenure security, food security and child nutrition, whereas restrictions on land renting may contribute to deeper rural poverty traps and food insecurity (Holden and Otsuka 2014).

3 Typology of Development Pathways for Smallholders

Given the pivotal and substantial presence of smallholders in many developing countries, policies that directly or indirectly affect smallholder farmers have significant effects on the social and economic trajectory of those countries. However, the appropriate livelihood strategies should not be treated as a single pathway but instead as a dynamic process that reflects the different types of smallholders and economies (Table 1). We have created a typology that reflects the diversity of possible livelihood strategies and development pathways for smallholder farmers. This typology distinguishes between (1) the profitability of smallholders within the agricultural sector (subsistence farmers without profit potential, subsistence farmers with profit potential and commercialised smallholder farmers) and (2) the different stages of economic transformation (agriculture-based, transforming and transformed economies).

First, smallholders are a diverse set of households and individuals who face various constraints on their ability to undertake potentially profitable activities in the agricultural sector. Past studies have divided smallholders based on socioeconomic and biophysical variables such as population density, agricultural potential (determined by agro-ecological conditions such as water supply, soil fertility and biotic pressures from pests and diseases) and market access (Omamo et al. 2006). Other determinants of smallholder livelihood strategies include the asset position of households and the characteristics of the production environment (including institutions, power structures and market policies).

Within this typology, subsistence farmers are smallholders who consume the majority of their farm output and who are held back from participating more actively in commercially oriented agriculture by a variety of constraints. The potential to turn production systems into profitable enterprises is greatest among the subsistence farmers who are facing soft constraints—such as limited financial and human capital and asymmetric access to markets and information—that can be addressed through various policy and programmatic channels. In addition to soft constraints, the presence of hard constraints—such as marginal lands that are far from markets are limited in size and have extremely low rainfall and soil quality—severely hampers the ability of other smallholders to increase their production capacity and move towards profitable farming systems. Commercial smallholders are already involved in profitable agricultural activities but are held back from scaling up their commercial activities by factors such as limited access to capital and risk-reducing tools.

Second, the appropriate development pathway for smallholder farmers also depends on the level of transformation within the country's economy. The transformation process involves increased productivity and commercialisation in agriculture, alongside economic diversification and growth. The exact duration and character of the transformation vary across developing countries, but it includes several fundamental changes in the structure of the economy: a declining share of agriculture in gross domestic product (GDP) and employment, increasing rural-urban migration, the rise of a modern industrial and service economy, and a demographic transition to lower birth and death rates (Timmer 1988). In this typology, agriculture-based

Table 1 Move up or move out. *Source* adapted from Fan et al. (2014) and Fan et al. (2015)

WHICH PATH?		
Whether a small Farmer should be targeted to 'move up' or 'move out' of agriculture depends on whether they face the hard constraints that inhibit profit potential:		
SOFT CONSTRAINTS	MOVE UP	MOVE OUT
Limited access to markets and information	•	•
Limited financial capital	•	•
Limited access to infrastructure	•	•
Limited access to smallholder-friendly technologies	•	•
HARD CONSTRAINTS		
High population density		•
Low quality soil		•
Low rainfall and high temperatures		•
Remote location		•
WHICH STRATEGY?		
The best supportive strategies to aid farmers in either moving up or moving out depend on the type of economy:		
AGRICULTURE-BASED ECONOMY	MOVE UP	MOVE OUT
Productive cross-sector social safety nets that combine long-term tools with short-term support	•	
Investment in infrastructure, agricultural research and extensión, and smallholder-friendly and climate-smart technologies	•	
Access to innovative financial services	•	
Social safety nets		•
Nutrition-focused crop production for own consumption		•
Education and training for nonfarm employment		•
Migration to urban centers and other agricultura areas with greater profit potential		•
TRANSFORMING ECONOMY		
Flexible arrangements for land transfer	•	•
Risk reduction and management tools	•	
Access to market information	•	
Pro-smaller, nutrition-sensitive value chains	•	
Social safety nets	•	•
Improved access to housing, education, and health services for rural migrants	•	•
Vertical and horizontal coordination to meet safety, quality, and quantity standards	•	
Enhanced role of farmers' organizations, particularly for women farmers	•	
Education and training for nonfarm employment		•
TRANSFORMED ECONOMY		
Provide incentives for high-value production	•	
Reduced trade restrictions and subsidies	•	
Flexible arrangements for land transfer	•	•
Efficiency and quality-enhanced production systems	•	
Vertical and horizontal market coordination	•	
Social safety nets		•
Improved access to housing, education, and health services for rural migrants		•
Education and training for nonfarm employment		•

economies are those that derive a significant portion of their economic output and growth from the agricultural sector. This group includes most countries in SSA. Transforming economies, which lie mainly in East and South Asia, are those in which agriculture's significant role is being gradually replaced by the manufacturing and service sectors, although poverty continues to be heavily concentrated in rural areas. Finally, transformed countries, which are mainly in Eastern Europe and Latin America, are those in which agriculture has become a minor source of economic growth.

4 A Spectrum of Challenges Hinders the Profitability of Smallholder Farms

Smallholder farms are increasingly faced with a mix of challenges, including those that are naturally occurring and those that are caused by man, that influence their capacity to increase production and move towards profitable farming systems. These challenges lead farmers to undertake lower-risk and lower-yielding agricultural activities that perpetuate a cycle of poverty, including those with little or no profit. Women on small farms—who account for on average 43% of the agricultural labour force in developing countries—are particularly disadvantaged in accessing productive resources, such as land, livestock, agricultural inputs, technology, markets, and extension and financial services (FAO 2011b). Yet women play a vital role in improving agricultural output, enhancing food security and nutrition in the household and promoting overall development. High production constraints also make agriculture unattractive to young people—the very ones who can bring energy, vitality and innovation into the agricultural labour force in many developing countries (Brooks et al. 2013).

4.1 Limited Farm Size

Over the past few decades, high population growth and inheritance-based land fragmentation have resulted in decreasing farm size and high population density in many Asian countries and parts of Africa (Eastwood et al. 2009; Thapa and Gaiha 2011). Recent trends indicate that SSA will continue to experience declining farm size, while Asia is showing signs of farm consolidation (Jayne et al. 2014; Masters et al. 2013; Otsuka and Place 2014). An analysis of the relationship between increasing rural population density and smallholder farming systems in Kenya shows that, in addition to declining farm size and incomes, increasing rural population density is associated with decreasing agricultural labour productivity after a certain population density threshold (Muyanga and Jayne 2014). This inverse relationship is potentially the result of unsustainable agricultural intensification (Drechsel et al. 2001).

4.2 Access to Financial Services

Many small farmers are excluded from productivity-enhancing financial services, such as loans and saving accounts, and are thus unable to secure much-needed capital and lack the buffer against adversity and shocks that financial services offer. An analysis of maize farmers in Ghana reveals that small farms face more credit constraints than large farms (Kuwornu et al. 2012). In rural areas, where the majority of smallholders reside, access to formal financial services is particularly limited (Demirguc-Kunt and Klapper 2012). Reasons for this include dispersed demand and the high cost of service in low-population areas; weak administrative capacity of rural banks; agriculture-specific risks such as variable weather patterns, pests and price fluctuations that affect whole communities; and lack of formally defined property and land-use rights to act as collateral for loans.

4.3 Climate Change

The growing incidence and intensity of extreme weather events increasingly threaten the global food system (Zselezky and Yosef 2014). If business as usual continues and the world becomes 3–4 °C warmer by 2050, crop yields could decline by 15–20% (World Bank 2013). In some African countries, yields from rainfed agriculture could decrease by up to 50% by 2020, with small-scale farmers being hit the hardest (IPCC 2007). In Malawi, smallholder farmers have experienced greater economic losses during droughts than have large landholders, in part because smallholders grew more drought-sensitive crops (Pauw et al. 2010). Smallholder farms are particularly vulnerable to more frequent extreme weather events because of such factors as chronic food insecurity, lack of access to formal safety nets, and high reliance on climate-dependent agriculture, coupled with limited resources and capacity for mitigating and adapting to the effects of climate change (Harvey et al. 2014).

4.4 Price Spikes and Volatility

Recent food price volatility and spikes have affected both producers and poor consumers. The complex set of factors behind the recent food price crises in 2007–2008 and 2011—including diversion of crops for biofuel, extreme weather events, low grain stocks and panicky trade behaviours—is still present or has the potential to re-emerge. The magnitude and direction of the impact on smallholder farms depend on several variables, including whether input costs increase, whether the farmers are net buyers or sellers of food, farmer capacity to step up production and to bring the increased output to market, and off-farm income (Anríquez et al. 2013). Recent studies in Bangladesh and Malawi suggest that an increase in the price of staple crops

(rice and maize) resulted in a higher welfare loss for small landholders compared with large landholders (Karfakis et al. 2011).

4.5 Access to Modern Markets

Profitable market access by smallholders is challenged by a multidimensional set of factors. The participation of smallholders in modern market channels has a positive effect on their income, but participation is determined by a mix of non-land assets, with varied findings on the role of farm size in determining participation. These non-land assets include rural infrastructure (such as road access and irrigation), membership in cooperatives, education, modern market participation of nearby farms and rural non-farm employment (Hernandez and Reardon 2012; Rao and Qaim 2011). Lack of information (regarding price, supply and demand, and quality standards) leads smallholder farmers to face higher prices from opportunistic middlemen and traders, as well as lower market participation (Omiti et al. 2009). Amid rapid economic growth, urbanisation and globalisation, food supply channels are becoming longer geographically but shorter in terms of participants (Reardon et al. 2009).

5 Smallholder Farms Need to Move Up or Move Out

As stakeholders continue to deliberate on action plans for supporting sustainable smallholder farms, it is important to recognise that there is no ‘one-size-fits-all’ policy. The appropriate development pathway and livelihood strategies for each smallholder farm should reflect its particular characteristics and the level of transformation within the country’s economy. Public policy should support smallholder farms in either moving up to commercially oriented and profitable farming systems, or moving out of agriculture to seek non-farm employment opportunities.

In agriculture-based economies, it is important to focus on advancing policies that move up small farmers that have the potential to become profitable by increasing their productivity. In both transforming and transformed economies, it is equally imperative to help such small farmers move up by promoting high-value agriculture and improving links to urban and global markets. For smallholder farms that are already profitable, policies to help scale up commercial activities are essential. Smallholder farms without profit potential, however, will require humanitarian assistance in the short term, and viable exit strategies out of agriculture to engage in urban and non-farm economic activities in the long term. To move smallholder farms with profit potential towards greater prosperity while at the same time improving global food security and nutrition and health outcomes, a number of steps must be taken, as outlined below.

5.1 Promote Land Rights and Efficient Land Markets

Given the heterogeneous character of economic growth and structures across developing countries, optimal farm size depends heavily on context, including the stage and structure of a country's economic and demographic development. Because well-functioning land sale and rental markets can have a major impact on agricultural productivity, governments in developing countries should not implement policies that promote cookie-cutter farm structures (for both rental and owner-occupied farms), which can lead to misallocation of resources.

Institutional reforms are needed to facilitate the efficient transfer of land through the certification of land rights and through well-functioning and transparent land sales and rental markets. Lifting restrictions on minimum or maximum landownership or land rental markets and securing property rights improves agricultural productivity. It does so by encouraging the transfer of land from small and poor farmers who have less ability or willingness to undertake agricultural activities (but who stay in agriculture due to fears of unfair compensation for land transfers) to more efficient (but often still poor) producers with more interest and resources (Deininger et al. 2008).

5.2 Enhance Risk Management, Mitigation and Adaptation Strategies

Smallholder farms urgently need better access to risk management tools and strategies to increase their resilience to a spectrum of shocks, including weather and price shocks. Tools such as index-based insurance can help farmers take productivity-enhancing risks, although their commercial viability for a smallholder clientele is still being studied. In the face of volatile crop prices, collaboration is needed among the private sector, governments and donors, to design innovative and flexible market-based price stabilisation tools—such as hedging in futures markets—that are suitable for smallholder farms. These tools limit the risk exposure of producers, without the distortionary effects and high costs of current price support measures (such as input, output and consumer price subsidies).

Reducing risks associated with price volatility requires supportive macroeconomic policies. National governments should encourage transparent, fair and open global trade, by eliminating formal and informal export restrictions and refraining from imposing new ones. Although export bans may help to secure domestic food supplies, they tend to exacerbate global price hikes, thus hurting the poorest net buyers of food. Food prices have been increasingly linked to energy prices, because of the growing diversion of food crops towards biofuel production as energy prices increase.

In terms of climate-induced shocks, a pro-poor climate change policy that creates value for smallholder farms and integrates them into global carbon markets is essential, although a viable modality has not yet been developed (De Pinto et al. 2010). Investments in triple-win agricultural practices and technologies can be effective in raising smallholder productivity alongside climate change mitigation and adaptation strategies (Bryan et al. 2013).

5.3 Support Efficient and Inclusive Food Value Chains

Linking smallholder farms to modern agrifood value chains is critical for improving agricultural productivity, food security and nutrition. Overcoming barriers to accessing modern value chains requires institutional innovations for coordination among smallholder farms, including group lending and producer associations. Such mechanisms require strong institutional capacity, in a stable policy environment that promotes private-sector investments adapted to the needs of smallholder farms. Information and communication technologies also offer the opportunity to link smallholder farms to markets, by helping them to reduce transaction costs, increase their bargaining power and acquire real-time market information. Financial services (bundled with, e.g., insurance) and investments in rural infrastructure also need to be scaled up. By bundling financial and non-financial solutions (such as insurance and agricultural advisory services), an environment that allows for comprehensive risk management solutions can be created (Vargas Hill and Torero 2009).

Furthermore, participation by smallholder farms in modern value chains can be leveraged for better nutrition and health. Greater investments in the development of nutrient-rich crop varieties accessible to the poor, coupled with public information campaigns and pricing policies, can help to increase the availability and consumption of nutritious foods (Hawkes and Ruel 2012). Sound regulatory and monitoring systems along the entire chain can also help to ensure that agricultural intensification does not harm people's health through, for example, foodborne and waterborne diseases, occupational hazards and environmental damage.

5.4 Close Gender Gaps and Develop Young Farmers

Addressing the inequity in access to productive resources, services and markets for women farmers (who account for a large percentage of smallholder farmers) is not only a rights issue, but also an efficiency issue. Gender inequality also leads to inefficient allocation of resources, which in turn means reduced agricultural productivity and poor nutrition and health outcomes. Evidence from Nigeria and Uganda suggests that lower productivity persists in female-owned plots and female-headed households (Peterman et al. 2010). Closing the gender gap in agriculture has high returns that accrue to the entire society, not just women (Meinzen-Dick and Quisumbing 2013).

Developing youth participation in agriculture is also essential to realise agricultural growth, improve food security and nutrition and promote overall development. Interventions to increase the profitability of smallholder farms should be targeted at young farmers. Such steps would include better agricultural training, improved land rights and enhanced access to financial and non-financial services.

5.5 Scale up Productive Cross-Sector Social Safety Nets

Productive cross-sector social safety nets that combine long-term tools (to build productive and resilient livelihood strategies) with short-term social safety support (to provide a cushion against shocks) can be of great benefit to small farmers. Ethiopia, for example, has created the Productive Safety Net Programme (PSNP) and Other Food Security Programme (OFSP)/Household Assets Building Programme (HABP), which provide a portfolio of productivity-enhancing mechanisms. These programmes are targeted at food-insecure households, most of which engage in small-scale farming (Berhane et al. 2014), and they are designed to ensure a minimum level of food consumption, protect and build assets and assist households in boosting income generated from agricultural activities. Based on recent evidence, the creation of the PSNP reduced the length of the hungry season by one-third compared with households with no programme benefits. Households with access to both PSNP and OFSP/HABP had even greater reductions in their hungry season and increases in their livestock holdings.

6 Conclusion

World agriculture will need to undergo major changes if the demands of a growing and increasingly rich and urban population are to be met, against a background of increasing scarcity of natural resources and other emerging challenges. Smallholders are an important part of the development equation. However, smallholders are not a homogeneous group, and development policies should not treat them as such. Instead, the development pathways of smallholders consist of dynamic processes that vary according to the constraints they face and the stage of economic transformation. While some smallholder farmers have the potential to undertake profitable commercial activities in the agricultural sector, other farmers should be supported in exiting agriculture and seeking non-farm employment opportunities. For smallholder farmers with profit potential, agriculture is risky in the face of climate change, price shocks, limited financing options and inadequate access to healthy and nutritious food. Smallholders can successfully adapt their livelihood strategies to these challenges but need a supportive policy environment.

These policies and investments should focus on (1) promoting land rights and efficient land markets; (2) enhancing risk management, mitigation and adaptation

strategies; (3) supporting efficient and inclusive food value chains; (4) closing gender gaps and developing young farmers; and (5) scaling up productive cross-sector social safety nets. As with all public investments, the costs of investments and programmes designed to improve smallholders' productivity need to be compared with the likely benefits in each country. Public funds have alternative uses, such as other investments within or outside agriculture. Moreover, in many circumstances, agricultural development requires addressing the obstacles faced by groups of agricultural producers other than smallholders.

This chapter has identified several areas in which further research could shed light on the opportunities for smallholder farmers with profit potential to move from subsistence to commercially oriented agricultural systems, as well as the challenges to their doing so. It is now time for governments in developed and developing countries, the research community, and private companies to focus their investments, innovations and policies on helping these smallholders manage risk, improve their resilience to shocks, and increase their access to finance and capital, while promoting future growth. All of these measures, adapted to each country's stage of economic development and transformation, will play a critical but varying role in bringing down barriers to profitable and efficient agricultural operations by smallholders.

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