



UNDERSTANDING SMALLHOLDER FARMER ATTITUDES TO COMMERCIALIZATION

THE CASE OF MAIZE IN KENYA



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THE CASE OF MAIZE IN KENYA

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Foreword

Food price volatility has had a dramatic impact on the food security of poor households in developing countries. Equally serious has been the impact of long-term trends such as a slowdown of agricultural productivity growth, urbanization and an increasingly sophisticated supply chain. These changes have led governments and development organizations to refocus on smallholder farming as a business activity linked to markets through efficient value chains.

To develop policies and programmes that can have a real impact on smallholder farmers' market integration at scale, an in-depth, refined understanding of smallholder farming is required. In particular, there is a need to recognize the heterogeneity of smallholder farmers, not only in terms of their capacities to engage in commercial farming, but also in terms of their attitudes towards such farming. Furthermore, youth and women who want to engage in commercial farming face additional specific challenges.

Taking the case of smallholder maize producers in Kenya, this study uses extensive primary data collection and analysis to probe the question of how best to facilitate smallholders' transition to commercial farming. Leveraging interdepartmental expertise within FAO, from the Agriculture and Consumer Protection and the Economic and Social Development Departments, this question has been assessed simultaneously through different lenses, such as those of broad-based economic growth, business and value chain development, trade, and disadvantaged groups.

The main conclusion of the report is that there is a clear need for support packages that are far more customized, targeted and based on public-private partnerships than they are at present. Some smallholder farmers need to be supported in realizing their commercial farming ambitions, especially through more innovative collective action models that effectively and efficiently combine the strengths of the public and private sectors. Others need to be assisted in exiting agriculture into decent employment opportunities or non-farming entrepreneurial ventures, either in the food value chain or beyond. Carefully designed and implemented investments in infrastructure, legal and regulatory systems and education are required. This is especially the case for attracting youth into farming and other agribusiness activities.

This study should be of interest to anyone who seeks to address the complex triple challenge of smallholder farmer commercialization, rural poverty eradication and sustainable development of staple food value chains. We hope you will find it helpful.



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Acronyms

ACDI/VOCA	Agricultural Cooperative Development International/ Volunteers in Overseas Cooperative Assistance
ASDS	Agricultural Sector Development Strategy
CB	cereal bank
CBO	community-based organization
DCM	discrete choice model
ERS	Economic Recovery Strategy
FGD	focus group discussion
FFS	Farmer Field School(s)
ILO	International Labour Organization
JFFLS	Junior Farmer Field and Life School(s)
KMDP	Kenya Maize Development Program
KPMC	Kenya Promotion and Marketing Company
KYEDF	Kenya Youth Enterprise Development Fund
MDF	Multidisciplinary Fund
MOA	Ministry of Agriculture
NAAIAP	National Accelerated Agricultural Inputs Access Programme
NAEP	National Agricultural Extension Policy
NASEP	National Agricultural Sector Extension Policy
NCPB	National Cereals and Produce Board
NGO	non-governmental organization
P4P	Purchase for Progress
RATIN	Regional Agricultural Trade Intelligence Network
SACRED Africa	Sustainable Agriculture Centre for Research and Development in Africa
SRA	Strategy for Revitalising Agriculture
USAID	United States Agency for International Development
VCAC	village cereal aggregation centre
WFP	World Food Programme

Executive summary

BACKGROUND

The 2008 food price crisis greatly magnified the vulnerability of smallholder farming households, from both the production and consumption sides. In order to develop policies that effectively reduce this vulnerability, there is need to improve understanding of smallholder farmer dynamics, which in turn requires the recognition that smallholder farmers represent a heterogeneous group. While there has been extensive research on how different capacities such as farm size, education and access to resources influence the commercial behaviour of smallholder farmers, there is less understanding of how these farmers vary in terms of their attitudes towards commercial farming. In addition, these attitudes will likely differ between older and younger farmers, and between female and male farmers.

In this context, FAO initiated the Multidisciplinary Fund (MDF) project in 2010. The overall objective of the project is to develop policies that address the commercialization constraints facing small-scale farmers in Africa. Its multidisciplinary nature allows a more holistic appraisal of the challenges and, thus, more effective policy recommendations.

NATURE OF THE STUDY

This study focuses on maize producers in Kenya and represents one of the key outputs of the MDF project. It reframes smallholder commercialization in the context of staple crops to bring heterogeneity to the forefront of smallholder-focused policy development in eastern Africa. Specifically, it focuses on smallholder maize producers and rural youth with respect to their attitudes, strategies and opportunities related to maize commercialization in two regions of Kenya: Meru and Bungoma. The study does not investigate whether or not smallholder farmers of staple crops should transition towards commercial production, but rather assesses who should be targeted with what strategy for such a transition to occur, at both the producer and policy levels.

1. The analysis is based on a broad set of both primary and secondary data. The former were gathered through numerous key informant interviews, 20 focus groups, a farmer survey and two stakeholder workshops. The survey included 500 farmers with farm sizes mostly in the 0.5–2.5 ha range (averaging 1.3 ha). The data were analysed using a variety of techniques including case study analysis and econometric approaches.

The ultimate objective of the study is to inform mid- to high-level ministry staff, researchers and development facilitators about differentiated approaches to supporting the commercial production of staple crops by smallholders. This objective is a central part of Kenya's long-term development strategy, embedded in its Vision 2030.

MAIN FINDINGS

Recognizing the aspect of farmer heterogeneity, the study takes four perspectives on the challenge of effectively supporting commercial smallholder farming. For the particular case of maize in Kenya, the following are the study questions and main findings.

1. *To what degree are Kenyan smallholder maize producers making farm management decisions consistent with a commercial approach?*

The current farm management approach used by smallholder farmers is clearly far removed from a commercial one for the following reasons:

- *There is a lack of coordinated decision-making.* Production and marketing are not well-linked.
- *There is a lack of trust in markets from the supply side.* Fewer than 20 percent of farmers believe that there will be enough maize to purchase on the market, and 96 percent prefer to grow and consume their own maize.

- *There is a lack of planning.* Although most smallholder farmers plan how much of their maize production to market, production decisions are driven more by the (known) prices of inputs (seed, fertilizer) than the (perceived) market prices for maize grain.
 - *Storage practices are not in line with a commercial approach.* Smallholder farmers store maize for an average of only two months, rather than the economically optimal five to six months, because of urgent cash needs. Furthermore, 75 percent of farmers store their maize in the home, with detrimental effects on the quality of the maize.
 - *Maize quality management is insufficient.* Smallholder farmers are aware that quality affects the price of maize, but do not manage and understand quality issues well.
 - *Farmers are not selling to preferred buyers.* Only 40 percent of farmers sell to their preferred buyer, mainly because the need to receive a direct payment from a local trader overrides the desire to sell for a higher price to a more distant trader, institutional buyer or miller.
 - *Commercial outcomes are in line with commercial practices and attitudes.* This study confirms the existence of commercially focused practices among some smallholder maize producers. These practices are positively related to economic outcomes.
2. *What are the opportunities for Kenyan smallholder maize producers to reach different maize buyers, and do selling decisions differ across producers?*
- *Overall, most maize producers are not poised to undertake commercial production.* The majority of smallholder maize farmers start selling maize within the first two weeks after harvest, because of urgent cash needs.
 - *Nearly half of smallholder farmers are “in the market”, but are not necessarily linked to modern markets on truly commercial terms.* While net sellers of maize account for 45 percent of the smallholder farmers in the survey, only 10–15 percent of these net sellers sell to quality-differentiated markets, because of weak and insecure linkages.
 - *Net sellers implement more quality management practices.* Relative to net buyers, nearly twice as many net sellers implement all four of the quality management practices investigated (57 versus 32 percent). Farmers reported a 5–10 percent price premium for higher-quality maize.
 - *Transaction costs are at least as important as price in choosing a market channel.* Farmers indicated that the ease and low risk of selling to a particular buyer are important factors in their decision-making.
 - *Some farmers are more likely than others to sell into more modern channels that require more commercial practices.* The study found that a smallholder maize farmer is more likely to sell to distant traders or institutional buyers if the farmer has fewer nearby market options, is more specialized in maize, is more quality-conscious, has benefited from the government input support programme (the National Accelerated Agricultural Inputs Access Programme – NAAIAP), and is better informed on market prices. It is interesting that gender and education level were not found to be significantly correlated to selling into more modern channels.
3. *What are the most effective roles for donors, agribusinesses and producers in developing sustainable collective maize marketing models?*
- *Operating as individuals, smallholder maize farmers are locked into the traditional marketing system.* In traditional maize marketing, small traders and millers prefer to buy from individual smallholder farmers for reasons that disadvantage the farmer.
 - *Collective maize marketing by smallholders is undermined by their entrapment in a vicious poverty cycle.* With little money available for inputs, individual farmers have only small volumes available for the market, implying that many of them need to collaborate to reach a better negotiating position with local traders or to achieve the volumes with which larger and more rewarding markets can be targeted.
 - *Collective maize marketing by smallholder farmers has impacts on their income but not necessarily on their commercial status.* While net sellers of maize are more likely to engage in collective action than net buyers, net buyers are unlikely to become net sellers over time purely as a result of collective marketing.
 - *Partnership-driven approaches to support collective maize marketing by smallholder farmers may*

be more promising than traditional project-driven approaches. The more long-term nature of partnership approaches addresses many of the intrinsic weaknesses of short-term projects in terms of resulting in sustainable development outcomes.

4. *What opportunities do rural Kenyan youth see in agriculture, and can maize be positioned as an attractive option given the current resource pool?*
 - *Current farmers see businesses opportunities for youth in agriculture, especially in maize farming.* Many farmers of all ages in the survey believe that there are opportunities in agriculture for the next generation.
 - *Rural youth, especially young women, are generally less optimistic and see more professional opportunities for themselves outside agriculture.* According to exploratory focus group discussions, only 15 percent of rural youth are actively engaged in agriculture. If given a grant, only 40–50 percent of youth would invest in farming.
 - *In agriculture, youth see greater potential for activities other than maize production.* Roughly 10–15 percent of youth see growing maize as a viable economic activity. Youth's constrained access to land (with clear land titles), especially for young women, is a key reason for this overall pessimism.
 - *Training for skills building is not seen as a worthy financial investment by youth, especially not in agricultural activities.* Of the 80 percent of youth who would be willing to take out a loan, only 10–15 percent would invest such a loan in education. While they are aware of public support programmes in this area, most youth do not know how to take advantage of these programmes.

POLICY IMPLICATIONS

These findings have the following implications for policy design.

At the producer-level:

- programmes must recognize that not all smallholders in Kenya grow maize as a business and are prepared to handle many key decisions independently in a commercially oriented model;
- the ambiguity associated with maize standards and measures should be removed to facilitate a more transparent market;
- a new approach to collective marketing is needed – continuous partnerships following a business-driven approach (i.e., with regular firms that are profit- and market-driven) with clearly defined roles for all parties involved offer the best chance of success.

At the institutional-level:

- agribusiness should be viewed as a unique economic sector in which producers, buyers and service providers are partners;
- policies that affect the agriculture sector should be coordinated, for example, school fees should be timed to avoid inhibiting the transition to commercialization;
- a transparent system for exchanging and enforcing property rights should be pursued.

For the next generation of staple crop producers:

- while following through on current recommendations for the sector can make staple agriculture more attractive, complementary, longer-term investments that target youth are necessary.

The report emphasizes that smallholder maize producers are heterogeneous in their skills and attitudes, even though most are trapped in a challenging poverty cycle. New, customized approaches that facilitate a transition to commercial agriculture and recognize these differences are required. According to farmers and other maize industry stakeholders, the current framework of support will not bear the weight of shifting global markets, youth's expectations and urbanization trends unless there are dedicated investments and coordination for building an improved agribusiness sector in East Africa.



1

Introduction

1.1 STUDY BACKGROUND AND OBJECTIVES

The aftermath of the 2008 food price surges motivated a refocus, across the world and within FAO, on smallholders' production of staples. These surges revealed the vulnerability of smallholders not only to large price shocks, but also in exploiting market opportunities and adjusting to a new market environment. More and more expert views have suggested that the modern economic reality signals deteriorating prospects for small-scale farmers.

Often, policy discussion does not address the heterogeneity that characterizes small farmers, and a stronger focus on unraveling this heterogeneity is necessary to assess the strengths and weaknesses of small-scale agriculture and to promote smallholders' inclusion in markets. The recent FAO publication *Smallholder integration in changing food markets* makes a clear case for holding that different categories of smallholder producer face widely different sets of issues and constraints to market participation (FAO, 2013). It is inevitable that some smallholders, especially those who lack commercial skills and assets, may not be able to participate effectively in market development processes, even with appropriate support.

Multifaceted questions require a multifaceted enquiry team. For this reason, this project was

designed to leverage interdepartmental expertise for its investigations. The goal was to look at the smallholder transition through different lenses and to form policy suggestions that could support relevant stages of the long-term path towards transition.

This study and related activities have been supported by the FAO Multidisciplinary Fund (MDF), and the core contributors reflect the multidisciplinary nature of the work, which is the outcome of collaboration among four FAO technical divisions – Agricultural Development Economics; Rural Infrastructure and Agro-Industries; Trade and Markets; and Gender Equity and Rural Employment – and the University of Nairobi.

The focus is on smallholder maize producers in Kenya, but there are many similarities across smallholder maize producers in East Africa. This focus was chosen because, although maize is central to diets and smallholder farming systems, little is known about smallholder maize producers' commercial attitudes and decisions, which are critical to farmers' viability in commercial agricultural commodity production. In addition, it is important to recognize that differences among commodity production and marketing systems (e.g., maize versus tomatoes) are also part of the discussion of smallholder "heterogeneity". Hence, maize and similar staple grains warrant their own investigation.

With regard to geography, Kenya represents both a developing country dependent on smallholder maize and an economic engine of East Africa, with substantial potential and need for con-

Photo: Women trading maize in Meru

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tinued agricultural development. Given the case study design, the expectation is that the questions asked and the insights gathered can be shared and are likely to be applicable beyond Kenya's borders.

The general timeline and approach started with in-country exploratory interviews, focus groups and survey testing in early 2011 (detailed in Section 1.4). The survey was administered in Kenya in mid-2011. In an effort to validate, discuss and disseminate the findings, an East African workshop was held in Nairobi in June 2012 following initial data analysis. More than 80 participants attended, from Kenya, Ethiopia, Rwanda, Uganda, the United Republic of Tanzania and Zambia, representing the voices of farmers, youth, private sector service providers, non-governmental organizations (NGOs), government and academia. This report reflects the data and ideas gathered during each of these activities and aims to define a more comprehensive approach to smallholder maize commercialization in Kenya and to place smallholders in a more dynamic perspective.

Study objectives

The ultimate objective of this case study is to inform decision-makers at the national and project levels, and other researchers about smallholder maize producers' decision-making, attitudes and related issues that have impacts on the transition towards a commercially oriented maize market. Using objective research as a tool, the study investigates practical, real-time issues and provides immediately applicable recommendations. These insights and recommendations target project designers, agro-industry professionals, and mid- to high-level ministry staff involved in smallholder-related policy decisions.

The study reframes smallholder commercialization¹ in the context of staple crops, to bring

heterogeneity to the forefront of smallholder-focused policy development in eastern Africa. Small producers of staples (e.g., maize) are particularly vulnerable in commercial systems, where economies of scale underlie competitiveness and viability. As the commercialization of staple food systems becomes a priority, the smallholder discussion must become more specific and move beyond discrete questions of maize yields and sales towards a more integrated approach.

Specifically, the study focuses on smallholder maize producers and rural youth with respect to their attitudes, strategies and opportunities related to maize commercialization in two regions of Kenya. The study does not ask whether or not smallholder farmers of staple crops should transition towards commercial production.² Instead, the research has been conducted from the perspective of highlighting the elements necessary for such a transition, at both the producer and policy levels. If the goal is to facilitate commercial production of staples by smallholder farmers, what is required? Towards which farmers should the focus be directed?

The following are the four core questions:

1. To what degree are Kenyan smallholder maize producers making farm management decisions consistent with a commercial approach, and what impacts do these decisions have on the likelihood of being a net seller?

maize selling dynamic is masked when certain smallholder farmers view their maize production as food and sell only when necessary, in small quantities throughout the year, which are not regarded as sales.

¹ In this study, commercialization is defined as production for the market with profit objectives. A commercial approach to staple food crop farming contrasts with subsistence farming. In the development literature, commercialization has been defined in terms of the use of commercial inputs and/or the sale of surpluses. Several studies have examined the selling of surpluses, or "commercialization", among smallholder farmers in terms of whether and when "net selling" occurs (Renkow, Hallstrom and Karanja, 2004; Omiti *et al.*, 2006; Stephens and Barrett, 2009; Barrett, 2008; Jayne, Mather and Mhgenyi, 2010). However, major questions remain relating to what small farmers consider as sale of maize and, in turn, whether or not a producer is categorized as selling maize. It is possible that the most common smallholder

² There are diverging views on the direction of development investment and the role of smallholder farmers. The smallholder debate has dogged development economics for over a century and, given the lack of consensus to date, opposing viewpoints are likely to persist. It should be noted that these views are not necessarily mutually exclusive, although they are often presented as such. See Mellor (1976), Poulton, Kydd and Dorward *et al.* (2006), Dorward, Kydd and Poulton (2005) and Barrett (2008) for arguments that promote major investments directed at commercialization in the smallholder farm sector and viewing smallholder production as the main vehicle for pro-poor growth and development of the rural farm economy. In contrast, see and Collier and Dercon (2009) for arguments supporting a shift in rural development efforts towards larger farms with scale economies in skills and technology, finance and access to capital, and organization and logistics for trading, marketing and storage. This school of thought argues that smallholder farmers should exit production, but can still participate in the value chain by providing labour (e.g., for weeding, harvesting).

2. What opportunities are there for Kenyan smallholder maize producers to reach different maize buyers, and how do selling decisions differ across producers?
3. What are the most effective roles for donors, agribusinesses and producers in developing sustainable collective maize marketing models?
4. What opportunities do rural Kenyan youth see in agriculture, and can maize be positioned as an attractive option given the current resource pool?

Each of these questions will be addressed by a chapter in this publication, and each chapter will conclude with policy and programme implications that incorporate smallholder farmer heterogeneity and can effectively support a transition at the producer level and encourage the uptake of staple production by youth.

Throughout the study, the commercialization of staple food producers is regarded as a seasonal farm management process rather than a single decision taken at one point in time. Heterogeneity in farm management decisions and strategies is investigated within this context. Heterogeneity is linked to farmers and programme outcomes (e.g., profitability and sustainability). Moreover, taking a longer time horizon, the study investigates what the heterogeneity in rural youth's attitudes towards employment and agriculture reveals about the next generation of smallholder maize producers.

1.2 STUDY MOTIVATION

Agricultural market actors and institutions are at the core of agrarian revolutions (Lewis, 1954), and agricultural markets are based largely on food staples such as maize, rice and wheat. However, many producers of these crops in eastern Africa remain trapped in a poverty cycle from season to season, which inhibits wealth accumulation, investment and transition to commercial farming.

Another important observation is that since 2000, despite a strong history of maize cultivation, maize consumption in Kenya has outpaced production on a trend basis (Olwande, 2012; Ali-Olubandwa *et al.*, 2011). On a year-by-year basis, the maize supply in Kenya is erratic, with a steadily increasing consumer base. As maize is the principal staple crop in Kenya and provides one-third of the calorie intake of Kenya's population, erratic maize supply not only causes immediate food security problems, but also reinforces poverty cycles. What must change to disrupt these cycles?

Commercialization of staple food production in East Africa, and the subsequent household income growth are hard to conceive of without consideration of smallholder production. Smallholder farmers account for more than half of both all maize producers and all maize volumes in the East African countries of Kenya, Ethiopia, Uganda and the United Republic of Tanzania (Salami, Kamara and Brixiova, 2010). In fact, Kirimi *et al.* (2011) estimate that small- and medium-scale producers account for 75 percent of the maize produced in Kenya. Smallholder producers supply mostly to staple food markets in the rural areas of developing countries.

With respect to staple crop commercialization as part of a domestic agricultural transformation, the questions of how to commercialize and who will commercialize fuel debates around the globe. There are more questions than answers in this enquiry (Barrett, Carter and Timmer, 2010). One thing that is certain, however, is that moving out of poverty into a more sustainable income model at the farm level requires knowledge, planning, profits and investment.

It is difficult for many smallholder producers of staples to think about the next generation, and about "agriculture contributing to economic growth through a variety of linkages" (Johnston and Mellor, 1961), when it is not even clear how to plan from one planting season to the next. Moreover, in such families the idea that there is a tomorrow for the next generation of staple farmers is a tentative assumption at best.

As part of the search for an answer, substantial research has focused on shifting smallholders towards high-value crop production to increase smallholder profitability and address related challenges, often from the perspective of contracted production or inclusion in market and supply chains (Dolan and Humphrey, 2000; Jaffee, 2003; Friedberg, 2004). Less work has focused on specific strategies for market-driven production of staple commodities (Barrett, 2008; Opara, 2011).

In general, infrastructure-related costs and institutional constraints help explain why many smallholder staple farmers in East Africa do not sell or participate in the market (Omamo, 1998; Renkow, Hallstrom and Karanja, 2004; Barrett, 2008; Alene *et al.*, 2008; Chamberlin and Jayne, 2013). Beyond this, however, little is known about smallholders' agricultural decision-making or profitability throughout the season from a business perspective. Is it assumed that smallholder staple producers make commercially ori-

ented decisions? For example, do producers view maize production as a for-profit endeavour? Are producers able to formulate price expectations and link the sowing of seeds with the marketing of grains? Can producers add value to their maize through quality management or temporal arbitrage? Do they even want to? Are costs and revenues documented and managed? In addition, do all smallholder staple producers make similar decisions? The answers to these questions are based on issues of profitability, investment and the capacity and willingness of farmers to transition effectively towards commercial agriculture.

Strategies for reducing transaction costs that have been effective historically in specific circumstances – such as collective marketing – are heavily prescribed in the development context. However, the existence of a sustainable role for third-party support to smallholders in these models is not clear. In eastern Africa, these prescriptions have often translated into donor-led *pull* models of collective marketing, where donors establish groups to achieve predetermined objectives within specified time periods. Here, the success of collective marketing of staples or cereal banking,³ has been limited by both such internal membership and design challenges (Günther and Mück, 1995; FAO, 2002; Shiferaw, Obare and Muricho, 2006; Coulter, 2007).

In addition to supporting sustainable commercial strategies, it is also necessary to identify the farmers who are most likely to make the transition towards commercialization and those others who will transition into labour markets (e.g., as agribusiness service providers or food processors) or to non-agrifood industries. One challenge to developing diversified strategies for a commercial transition is that smallholders are often regarded

as constituting a homogeneous group, vaguely classified by asset endowment and contrasting with large-scale producers.

Smallholder heterogeneity in eastern Africa is not understood, particularly with respect to farm management knowledge and practices (Jaleta, Gebremedhin and Hoekstra, 2009). As a group, smallholders struggle to obtain access to modern agricultural inputs, and producers with better access to land and assets are generally better positioned to sell a larger proportion of their produce in the market (Barrett, 2008; Burke, 2009). However, neither commercialization nor profitability is an automatic consequence of increased output and productivity alone, particularly given substantial post-harvest losses (World Bank, 2011). Moreover, particularly with respect to land, the likelihood of a substantial increase in smallholder landholdings is low unless there are major cultural and policy shifts. Thus, significantly increasing food security in areas such as eastern Africa will require a greater focus on producer-level heterogeneity in human capital and decision-making and then in the design and implementation of associated policy and programme strategies.

From a longer-term perspective, the smallholder transition is neither determinate nor immediate. As Proctor and Lucchesi (2012) argue, youth, representing the next generation of staple farmers, must become a focus in the debate on small-scale agriculture if there is to be any realization of intergenerational succession in staple agriculture. In eastern Africa, the lack of available agriculture-based resources and the observed maize poverty cycle create little incentive for youth to pursue staple food production. Cultural customs that create gender bias, such as the subdivision of land for the next generation of males, further push some youth out of agriculture. Parents often do not desire the perceived difficult life of a farmer for their children, and urge them to pursue further education despite the scarcity of available jobs. Comprehensive agribusiness education programmes are scarce and not easily accessible for rural youth. Recognizing the frustrations of rural youth and promoting agricultural opportunities relate not only to economic growth, but also to overall domestic productivity and stability in agriculture-based countries.

1.3 KENYA'S AGRICULTURAL POLICY ENVIRONMENT

In recent years, the Kenyan government has pursued a number of strategies aimed at commercializ-

³ In Kenya, cereal banking is a relatively general term commonly used to refer to a model of collective grain storage and/or supply. Historically, the local cereal bank model was motivated by the desire to smooth grain supply during the year, primarily for reasons of food security. The term “cereal bank” has evolved to include organizational models with more commercial objectives, such as producers’ gaining of selling and buying power through pooling. Cereal banks often not only sell together, but increasingly also store their grains, purchase inputs and hold training events together. Many cereal banks in Kenya are legally registered as community-based organizations (CBOs). Despite similar “collective” or pooling principles, cereal banks operating as CBOs should not be confused with the highly regulated cooperative structure in Kenya.

ing the agriculture sector, including the prominent smallholder farm segment. One such strategy was the Economic Recovery Strategy (ERS) for wealth and employment creation (Government of Kenya, 2003), which emphasized economic growth and the creation of wealth and employment as a means of eradicating poverty and achieving food security. Under ERS, the government published the Strategy for Revitalising Agriculture (SRA) in 2004, which was the agriculture sector's response and contribution to attainment of ERS goals. The goal of SRA was to transform Kenya's agriculture from subsistence production to a profitable, commercially oriented economic activity. SRA set the target of agricultural growth at an average annual rate of 3.1 percent during 2003–2007, to reach more than 5 percent by 2007. By 2006, agriculture sector growth had surpassed the SRA target, growing at an average annual rate of 5.2 percent and reaching a high of 6.4 percent in 2007.

Following the expiry of ERS, the government formulated Vision 2030 (Government of Kenya, 2007) as the new long-term development strategy for transforming Kenya into a globally competitive and prosperous country with a high quality of life index by 2030. Vision 2030 is based on three pillars: economic, social and political. It identifies agriculture as a key sector for delivering the 10 percent annual economic growth rate envisaged in its economic pillar. Under this plan, the agriculture sector is expected to achieve an average annual growth rate of 7 percent over five years by increasing crop and livestock productivity, based on recommendations from national agricultural research organizations. These productivity increases are expected to arise from the use of yield enhancing crop varieties/seeds, pesticides and fertilizer, and through a strategy that seeks to improve land productivity by: i) transforming land use through the use of fallow land for intensive agricultural production; and ii) developing arid and semi-arid lands. Vision 2030 therefore proposes the intensified application of science, technology and innovations to raise productivity and efficiency in agriculture, and recognizes the critical role played by research and development in accelerating economic growth. Vision 2030 anticipates that more resources will be devoted to scientific research and building the technical capacities of the workforce (Government of Kenya, 2007).

The goals of Vision 2030 are to be realized through the Agricultural Sector Development Strategy (ASDS), which was formulated via a partnership between the agriculture sector ministries

and the private sector. The strategy succeeds SRA and is intended to build on SRA's achievements (Government of Kenya, 2010). It guides the public and private sectors in addressing major development challenges facing the agriculture sector and is tasked with positioning the sector as a key driver in achieving the 10 percent annual economic growth rate envisaged under the economic pillar of Vision 2030. Besides ensuring food and nutrition security for all Kenyans, the strategy also aims to generate higher incomes and employment levels, especially in rural areas. It is also expected to transform agriculture from subsistence to a farming-as-a-business approach by promoting an agribusiness-oriented culture, transparent markets, efficient use of inputs and agricultural credit.

ASDS is also intended to strengthen agricultural research, extension and training at research institutes, to promote demand-driven research and the transfer of research outputs to farms (Government of Kenya, 2012). ASDS calls for pluralism in the delivery of extension services to ensure that modern technologies are adopted at the farm level. In order to realign the agricultural advisory services with the new strategy, the Government of Kenya has changed the National Agricultural Extension Policy into the National Agricultural Sector Extension Policy (NASEP). NASEP focuses on the commercialization and privatization of extension services, and the regulation, coordination, monitoring and evaluation of extension systems and structures for resource mobilization (Government of Kenya, 2012).

The government has also initiated programmes that are intended to improve smallholder farmers' access to agricultural inputs, as a strategy for transforming smallholder agriculture from subsistence to commercial farming. These programmes specifically aim to promote the culture of farming as a business. One of these programmes is the National Accelerated Agricultural Inputs Access Programme (NAAIAP), which has two components: *Kilimo Plus* and *Kilimo Biashara*. The programme is funded by a partnership involving more than eight different funders, including the Government of Kenya. Various funders have been involved in NAAIAP for different periods from 2007 to 2012.

The *Kilimo Plus* initiative targets locally identified poor, vulnerable households and provides such households in maize production zones with one-time input grants of enough fertilizer and seeds to sow 1 acre of land (0.4 ha). Beneficiaries are expected to use the proceeds from the harvest

to purchase inputs for the next season and to continue using purchased inputs in the future. In preparation for receiving the input grant, the beneficiaries receive training in basic crop production, post-harvest handling, and marketing. To foster market access, the Ministry of Agriculture (MOA) complements the NAAIAP input grant with training and the requirement that farmers form cereal banking groups (collective marketing). These groups are then trained in collective produce storage and marketing.

The second component of NAAIAP, the *Kilimo Biashara* initiative, provides agricultural financing. This programme was officially launched in 2008 and coincided with the 2007–2008 food price inflation. The goal of the programme is to reduce production costs (and ultimately food prices) by providing affordable credit to farmers. In addition, the programme also aims to build the business capacity of smallholder farmers, thus supporting the farming-as-a-business strategy. *Kilimo Biashara* is intended to support the *Kilimo Plus* initiative by making affordable credit available to farmers – who may lack equity capital to finance agricultural production – by partnering with financiers to offer loans at 12 percent interest.

Internal evaluations of NAAIAP show increases in crop productivity and overall improved access to inputs for recipients. However, NAAIAP continues to redefine its objectives and target audience. In general, the programme faces challenges associated with inconsistent donor funding, logistical delays and suboptimal uptake of cereal banking by farmers (Mwangi, 2012).

Programmes such as the United States Agency for International Development (USAID)/Agricultural Cooperative Development International/Volunteers in Overseas Cooperative Assistance (ACDI-VOCA) Kenya Maize Development Program (KMDP, 2002–2012), the input bundles scheme of the One Acre Fund (an East African NGO established in 2006), and the World Food Programme's (WFP's) Purchase for Progress (P4P) model are also active in the country, aiming to facilitate the productivity, commercialization and profitability of smallholder staple producers. Domestic government and quasi-governmental organizations such as the Cereal Growers Association, the East African Grains Commission, the Agricultural Finance Corporation, the Kenya Youth Enterprise Development Fund (KYEDF) and the Kenya Women Finance Trust all play roles in the transition of smallholder staple producers.

1.4 RESEARCH METHODOLOGY

General approach

The research questions and methods outlined in previous sections arose from preliminary fact finding interviews with Kenyan farmers, industry, NGOs and government officials during early 2011. The consequent findings and recommendations are based entirely on primary data collected in Kenya from June to December 2011. The research approach included key informant interviews, case studies, focus groups and a survey of smallholder producers. All chapters in this publication are based on the data generated from this research, and follow-up interviews were conducted where needed. Collection of different types of data (quantitative or qualitative) allowed for detailed and nuanced answers to the study questions.

The two study areas were Bungoma and Meru counties in Kenya's Western and Eastern Provinces respectively (see Figure 1). These areas were selected because they are representative of smallholder maize production areas in Kenya. Both counties are home to many smallholder producers and are located in medium- to high-potential maize growing areas, allowing the study to focus on differences across the farmers themselves by largely controlling for differences in agronomic production potential. Especially Western Province, but also parts of Eastern Province, include some of the few maize growing areas in Kenya that produce surpluses for the market (Nambiro *et al.*, 2009). A poor harvest in western Kenya usually results in the importation of maize.

Bungoma county has a population of approximately 1.6 million people according to the 2009 population census. Data were collected from Sirisia and Bukembe divisions, which are among the major maize producing areas in the county. They also experience bimodal rainfall of 1 000–1 200 mm per year, with the long-rain season occurring from March to July and the short rains from September to January (Mukwana, Nyongesa and Ogema, 2005). Maize is grown in both seasons. Farm size in Bungoma averages about 1 ha, ranging from 0.1 to 2.4 ha (Mukwana, Nyongesa and Ogema, 2005). Maize is widely grown as an intercrop with beans. On a typical farm, maize is grown primarily for food, while sugar cane may serve as the main non-food cash crop. Besides maize, a diverse range of other food crops are grown in Bungoma, including beans, sweet potatoes, onions and domestic horticultural crops, especially kale and tomatoes.

Like Bungoma, Meru county is also a predominantly medium-scale and smallholder maize growing area with bimodal rainfall. The population is about 1.4 million people. Data were collected in the Uringu division of the county's Tigania West district. Maize is the main food crop in this district and also serves as a source of cash for urgent household needs. It is grown during both the long- and short-rain seasons, which last from October to January and March to June, respectively. The average farm size in most of Tigania West district is 0.6 ha per household. The majority of households grow maize intercropped with other crops, particularly beans, cowpeas and lablab (dolichos) beans. As well as the intercrops, other food crops grown include green grams, tobacco, cotton, pigeon peas, tomatoes, kale, sweet potatoes and indigenous vegetables.

There is some variety in maize marketing strategies in Bungoma and Meru. Typically, maize is sold on the spot at market, and the main buyers are rural assemblers (popularly known as brokers), truckers (mainly from urban centres),

local traders, millers and the National Cereals and Produce Board (NCPB). The Government of Kenya, through MOA, promotes collective maize storage and marketing based on cereal banking, and collective maize marketing models have operated in both areas.

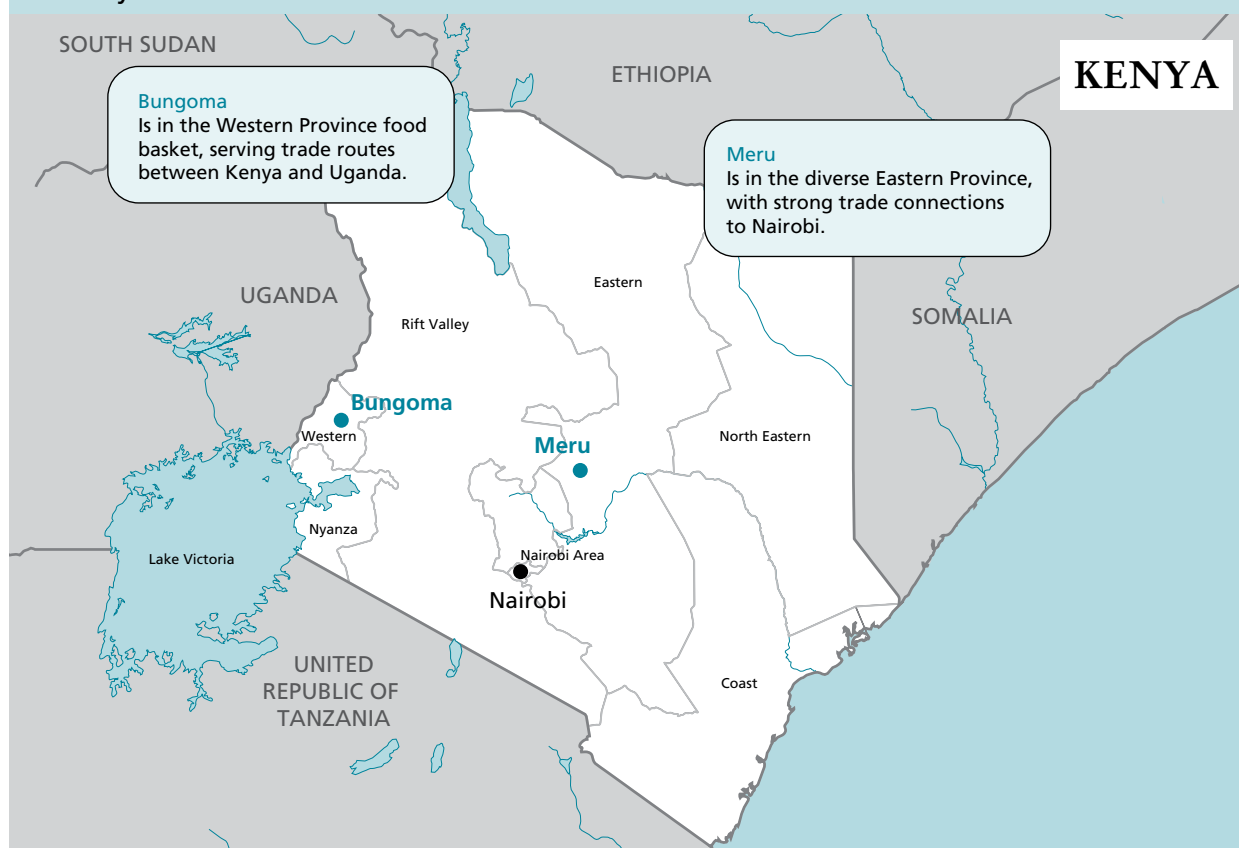
Producer survey

A survey of 500 smallholder maize producers provided the data cornerstone of this study. The survey investigated commercial attitudes and behaviour among smallholder maize producers. Each of the chapters in this report is based to some degree on analysis of the survey data.

The survey tool was administered in Meru and Bungoma in sampled divisions chosen to capture maize-based smallholder producers and the overlap with producers practising different collective marketing strategies.

Prior to sampling, exploratory focus groups of producers met in Bungoma and Meru to refine the focus and test the survey tool. Next, a population of maize producers was identified by consulting

FIGURE 1
The study areas



Source: Authors.

TABLE 1
Snapshot of producer survey respondents

Demographics and assets	Bungoma	Meru	Total
<i>Individual variables</i>			
Male respondents	142 (52%)	90 (40%)	279 (56%)
Female respondents	131 (48%)	137 (60%)	221 (44%)
Married respondents	247 (91%)	192 (85%)	439 (88%)
Average age	47 years	46 years	46 years
Average years of schooling	9.3 years	7.0 years	8.3 years
Net maize seller in terms of value (net value of maize sales minus purchases)	102 (37%)	113 (50%)	215 (43%)
<i>Household variables</i>			
Average household size	7.7 members	5.5 members	6.7 members
Average number of children	4.3 children	2.4 children	3.5 children
Average area of land owned	1.3 ha	0.9 ha	1.1 ha
Average area of land operated	1.4 ha	1.1 ha	1.3 ha
Average area under maize	0.8 ha	1.1 ha	0.9 ha

Source: Author's calculations from study findings.

division leaders and agricultural extension officers. The target producer population for survey administration was maize farmers farming an area of 2 ha or less. The land size restriction primarily served as a guide to which geographical areas should be sampled, while the maize production requirement was a necessity for inclusion in the sample. Producers involved in collective marketing models were also present in the population. This producer population was randomly sampled, yielding completed surveys from 500 respondents: 273 in Bungoma and 227 in Meru. The numbers of completed surveys from Bungoma and Meru were proportionate to population estimates.

For inclusion in the sample, the respondent was required to be the primary agricultural decision-maker in his/her household, in addition to being a maize producer. Surveys conducted in eastern Africa typically ask the head of household to respond to the survey questionnaire. However, the head of the household is not always the household's agricultural decision-maker. In this case, as the goal was to improve understanding of the commercial decision-making and practices of actual producers, the primary agricultural decision-maker was self-identified and asked to respond. In some cases, the respondent was also the household head, and in others, she/he was not.

The survey tool focused heavily on producers' attitudes and practices. Producers were asked to

respond to questions about their attitudes towards maize production, markets, post-harvest constraints and opportunities for the next generation. Decision power, seasonal planning behaviour, collective behaviour, marketing preferences and marketing choices were captured. Table 1 provides a snapshot of the survey respondents. Each chapter elaborates on relevant data from the survey used in analysis.

Focus groups, key informant interviews and case studies

In addition to the structured, questionnaire-based producer survey, the study also obtained primary data from 20 focus group discussions, more than 25 key informant interviews and two case studies on collective marketing.

Focus group discussions: Twenty focus group discussions with five to ten participants each were conducted in the two areas. Table 2 provides a brief overview of focus group participants. Focus group discussions occurred in parallel with administration of the producer survey, and seven of the 20 focus groups were organized to support the survey. The farmers at these sessions were selected to represent their respective smallholder communities in the sampled divisions of Bungoma and Meru. The goal of the focus groups supporting the producer survey was to explore smallholder

TABLE 2
Focus group participants

Focus group	Average age	Males	Females	Total participants
Survey support focus groups (8)				
Bungoma	46	17	14	31
Meru	42	16	20	36
Youth focus groups (6)				
Bungoma	29	20	12	32
Meru	25	16	9	25
Collective action focus groups (6)				
SACRED Africa (Bungoma)	64	8	5	13
VCAC/KPMC (Meru)	44	9	5	14
Smallholder maize farmers who have not participated in collective maize marketing	40	9	5	14

KPMC = Kenya Promotion and Marketing Company; SACRED Africa = Sustainable Agriculture Centre for Research and Development in Africa; VCAC = Village Cereal Aggregation Centre.

Source: Author's calculations from study findings.

maize farming trends. Ideally, multiple homogeneous focus groups would be consulted in each area, but resources allowed for only one focus group per sampled location. Major efforts were made to represent male and female farmers in different age brackets. The remaining focus groups were used to obtain primary data on youth's participation in agriculture and collective marketing. Six youth focus groups were conducted in six areas, three in each county. The groups' composition reflected youth living in small rural villages. Groups were mixed men and women, which was helpful in tempering gender-based questions.

As opposed to the exploratory nature of the survey support and youth focus groups, the collective action focus groups were conducted to compare two different collective marketing models. Groups were composed to include farmers who sold maize through each model, plus farmers from each area who had never participated in collective maize marketing.

Key informant interviews: Key informant interviews were used both to aid the study conceptualization and as data sources. More than 25 in-depth, supporting interviews with key government, academic and industry sources were conducted during the study period. As well as generally providing supporting data, key informant interviews served as an important primary data source for the collective action case study found in Chapter 4. A list of key informants can be found in Annex 1.

Case studies: The two case studies examined different collective maize marketing models. For each model, data were collected from focus groups, key informant interviews and the producer survey. These data were used to compare the sustainability of the collective maize marketing model cases. Directed by the literature, these models were compared in terms of characteristics found to be fundamental to sustainable collective action models.

1.5 STRUCTURE OF THE REPORT

Linked to the four research questions presented in Section 1.2, the report is structured as follows.

Chapter 2 details the concept of commercialization and introduces a model for commercial decision-making. Using this model, the chapter benchmarks the smallholder farm management decisions captured in the producer survey. The chapter investigates whether these decisions are consistent with commercial or subsistence goals. The question is then asked as to whether commercial attitudes and farm management decisions are related to differences in smallholder profitability and sustainability. Policy options are offered that can help maize smallholders bridge the gap between subsistence and commercial approaches.

Building on Chapter 2, Chapter 3 examines smallholder preferences regarding to whom to sell their farm-produced maize. The choice of maize market is an important piece of the commercial decision-making model. This chapter investigates price premiums available in the market, deter-

mines which smallholders have access to preferred buyers, and illustrates how both preferences and decisions relate to remaining challenges in the domestic marketing environment. The chapter's policy recommendations focus on post-harvest maize management and the role of agribusiness partners in smallholder maize marketing.

Chapter 4 investigates the underlying differences in sustainability across two collective maize marketing models by comparing project- versus partnership-driven models for smallholder collective storage and marketing. Drawing from a combination of focus group, case study and survey data, this chapter looks at lessons learned from two distinct collective maize marketing strategies used in Meru and Bungoma, resulting in

recommendations on the roles to be played by the public sector, the private sector, civil society and smallholder farmers' groups themselves.

The fifth chapter voices rural youth's perspectives on the potential of maize farming as a viable business option for future generations. Rural youth in Bungoma and Meru discuss their perspectives on employment opportunities in agriculture as well as in the maize value chain. Gaps in support that limit the uptake of these opportunities are identified, and complementary policy options are proposed.

Chapter 6 synthesizes the study findings and discusses a range of responses to support smallholder profitability in staple crop production and its expansion for the next generation of producers.

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ANNEX 1. KEY INFORMANTS

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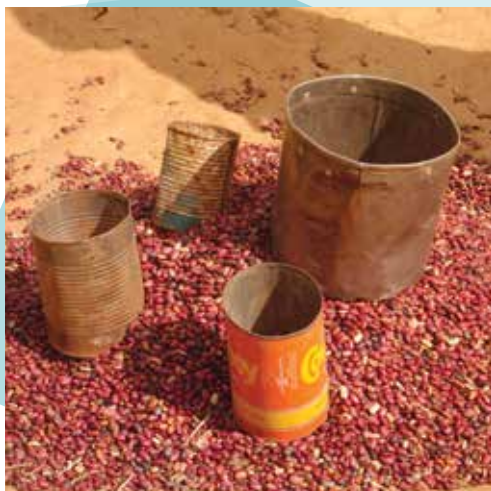
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2

Attitudes and decision-making in smallholder commercialization

*Andrea Woolverton,
Julius Okello, Michele Binci
and David Neven*

Chapter highlights

- The current farm management approach used by smallholder farmers is far removed from a commercial one. Despite advances in production technology, from the management perspective there is a lack of coordinated decision-making, a lack of trust in markets from the supply side, little season-to-season planning, and few incentives for maize quality management. The timing of school fees creates local barriers to storing maize at times of low market prices to enable sales when market prices are higher.
- A higher level of education, more coordinated management decisions, more market-focused planning and storage, more hired workers, and a greater use of cell phones in obtaining market price information characterize smallholder net sellers, who can be considered more commercially oriented.
- Targeting appropriate producers with differentiated policies and programmes will be critical to implementing a commercially oriented farm management strategy.

2.1 INTRODUCTION

Maize represents the central ingredient of most Kenyan diets, and is usually eaten as *ugali*, a tender, white mash. Most of the maize used to make *ugali* to feed Kenya's 41 million people is grown by smallholder producers (ACDI-VOCA, 2010). In Kenya, the term "smallholder" refers to producers farming less than 2 ha of maize; even the largest maize producers in Kenya rarely operate on more than 40 ha (Kirimu *et al.*, 2011; Central Bureau of Statistics, 2007).

Developing the domestic maize value chain and market continues to be both a priority and a challenge for Kenya, in the face of erratic weather patterns, population growth and increasing urbanization (MOA, 2012; Kirimim *et al.*, 2011). Transitioning from subsistence production to a maize-as-a-business approach, or to more commercially oriented decision-making is a recent challenge for many farmers. Despite global improvements in maize seed and fertilizer technology, many – if not most – smallholder maize producers in Kenya find themselves in a cycle of poverty, merely surviving from season to season. This cycle is related to both yield and marketing issues (ACDI-VOCA, 2010; Renkow, Hallstrom and Karanja, 2004).

Facilitating smallholders' transition towards commercial production is on the agricultural development agenda in Kenya, with the National Accelerated Agricultural Inputs Access Programme (NAAIAP) having the goal of "improving access to inputs ... so that [smallholders] can get out of the vicious cycle of poverty and

Photo: Non-standard measurements in the market are a challenge for transparent trading

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participate in agriculture as a business” (MOA, 2012). Increasingly, donors are focusing on staple grains and are investing substantial resources explicitly in helping smallholders develop maize farming as a family business, through in-country initiatives such as the Kenya Maize Development Program (KMDP),⁴ USAID’s Compete, and the One Acre Fund.

In the pursuit of maize as a business, questions related to policy and project goals arise. What will smallholder commercial maize production look like in terms of farm characteristics and commercial approach? What are the policy goals for commercialization? There are many perspectives on these questions. Does the very idea of commercialization, commonly presented in the literature as the sale of some marketable surplus, account for the complex process that leads smallholders to decide whether or not to participate in the market?

If a fundamental goal of commercial producers is to maximize profit, what would be required for smallholders to pursue this goal? Furthermore, which smallholders are positioned to pursue commercial production? It is understood that substantial transaction costs in the market inhibit farmers in East Africa from actively selling (and participating) in the market. Less is understood about the heterogeneity of smallholder producers’ attitudes, objectives and decision-making, which have impacts on an individual farmer’s ability to transition towards more commercial production. Breaking the poverty cycles of smallholder maize producers in Kenya through targeted and effective strategies requires more investigation into the commercial approaches of smallholders, and their heterogeneity.

As Barrett (2008) points out, less research focuses on the development of smallholder-based grain markets in Kenya than on markets for high-value crops. The few empirical studies of staple crops in this region show that only a minority of smallholder maize producers are staple food sellers, and few are net sellers, with the pattern having changed little over the last two decades (Weber *et al.*, 1988; Jayne, Zulu and Nijhoff, 2006; Jayne, Mather and Mghenyi, 2010).

This chapter adds a new perspective to this complex issue, by focusing on defining a commercial model for maize production and evaluating heterogeneity among smallholders. It presents and

explains a model for commercial decision-making in maize production, which represents a goal for transitioning producers. At the producer-level, adherence to this model is assumed to be necessary for any viable, commercial agricultural producer operating in an open market. The model details the commercial decisions that producers must make, in which selling is only one decision point within the larger commercial process, and the information needed along the path to making these decisions.

All producers’ decisions are made within an enabling or disabling domestic environment. While many environmental other factors are out of the producer’s control, an enabling domestic environment is also a requirement of this model for optimal success.

The benchmark model is then used to investigate the heterogeneity among the objectives and decision-making of Kenyan smallholder maize producers. Using the logit regression statistical tool, the chapter investigates smallholders’ heterogeneity in decision-making related to maize sales, and concludes with a discussion of policy implications.

2.2 APPROACHES TO COMMERCIALIZATION

Commercial production contrasts with subsistence production in terms of the surrounding food system and producers’ objectives (Pingali, 2001). Commercially oriented farmers focus on maximizing profits, generally purchase agricultural inputs as well as household food, and tend to specialize in crops that complement each other in terms of land rotation, the machinery used, marketing seasons, etc. In contrast, subsistence farmers produce food for self-sufficiency, generate most of their own agricultural inputs (seed, fertilizer, labour and capital) and produce a broader mixture of crops for household consumption. In general, producer-level agricultural decision-making is guided by these respective objectives, subject to each producer’s constraints.

In research, commercialization – or market participation – is most commonly measured in terms of commodity sales, despite the limitation that this definition considers only one decision point within a presumed overall commercial approach (Renkow, Hallstrom and Karanja, 2004; Pender and Alemu, 2007; Barrett, 2008; Alene *et al.*, 2008). Commercialization behaviour is also associated with the ability to decide when and through which channels to sell in order to maximize profit (Barrett, 2008). In studies of smallholder commerciali-

⁴ A USAID-funded programme running from 2003 to 2011 and operated by ACDI-VOCA.

zation, the single decision to sell is modelled as a *single producer or household decision*. Further refinement has not been made to break down how farm decisions are made within the household, or who is making them.

The most popular theoretical background for informing whether and when smallholders (individuals or households) sell into the market focuses on the transaction costs faced by smallholder farmers. Structural conditions such as household asset endowments, the quality of roads and other transport links, social norms and the rule of law, and the level of technological capabilities all determine the cost of engaging in commerce, with households selling or buying on the market only when the transaction cost of doing so is lower than the difference between market prices and self-sufficiency, also known as “*shadow*”, prices (De Janvry, Fafchamps and Sadoulet, 1991). Individual producers’ attitudes are difficult to incorporate into this theory. Furthermore, there is an implied assumption that producers systematically calculate production costs, which influence this decision. In practice, this assumption is highly questionable and can mask other influences on smallholder producers’ market participation, such as decision-making.

About 40 percent of the maize produced in Kenya is marketed (Alene *et al.*, 2008). There is a visible concentration of sales among a few sellers, with a clear positive association between sale quantities on the one hand, and household wealth, crop income, off-farm revenues, access to market information and access to good agro-ecological growing areas on the other (Nyoro, Kiiru and Jayne, 1999; Renkow, Hallstrom and Karanja, 2004; Alene *et al.*, 2008; Kirimi *et al.*, 2011).

However, while lowering transaction costs and increasing productivity have positive impacts on smallholders’ market opportunities, two other factors also need to be taken into consideration in the quest for smallholders’ transition to commercial farming.

First, the hidden thinking process leading to the decision to sell needs to be analysed, rather than the more readily observed decision itself. Viewing commercialization as merely sales provides little direction for designing transition-focused policy and programme interventions. Instead, viewing the selling decision point as the final result of a comprehensive strategy underlines the importance of the underlying commercial decision-making process more clearly. Furthermore, if multiple household members are making decisions, it is

important to understand who is making which decisions and the degree to which these decisions are coordinated.

Second, analysis of the decision process has to be placed within the context of a producer’s overall commercial attitude. What appears to be a clear association between endowments, infrastructure and technology on one side, and market participation on the other should not be regarded as a direct causal relationship valid for every farmer or for every household. In fact, it is hypothesized that in addition to reductions in transaction costs, the transition from subsistence farming to commercial agriculture entails a substantial alteration of farmers’ attitudes and decisions.

The expectation is that not every smallholder maize farmer will become a commercially oriented producer. While incentives may change for smallholders overall to engage in selling grains, their individual market orientations are based on a combination of their household capacities and idiosyncratic attitudes, which are not easily transformed or measured (Bard and Barry, 2000). Measures based on transaction costs seem to take it for granted that smallholder producers have commercial objectives and possess the technical competence and strategic planning ability required to incorporate these measures effectively into their farming systems.

This chapter attempts to add value to the discussion by expanding the concept of smallholder commercialization, particularly by investigating the previously assumed commercial objectives and decision-making processes of smallholders. Rather than a single sales decision, commercialization is explicitly viewed as a series of decisions made by the producer within a season and linked to the choices in the next season. Hence, this approach treats market participation, or the decision to sell, as the result of a comprehensive decision-making process and not simply a point decision at harvest.

Within this context of commercialization, this chapter investigates the heterogeneity of commercial behaviours across different groups of smallholder maize producers. Failing to understand this heterogeneity across smallholders’ expertise, objectives and resulting attitudes risks resulting in the adoption of one-size-fits-all policies and interventions that are not likely to address the core requirements for smallholders’ transition. Equally important is the recognition that not all smallholders will be able or willing to change their approaches. This means that programmes must be able to differentiate and target different purposes

for different groups of smallholders, with some smallholders expanding their activities in agriculture and others moving into different work areas as development progresses.

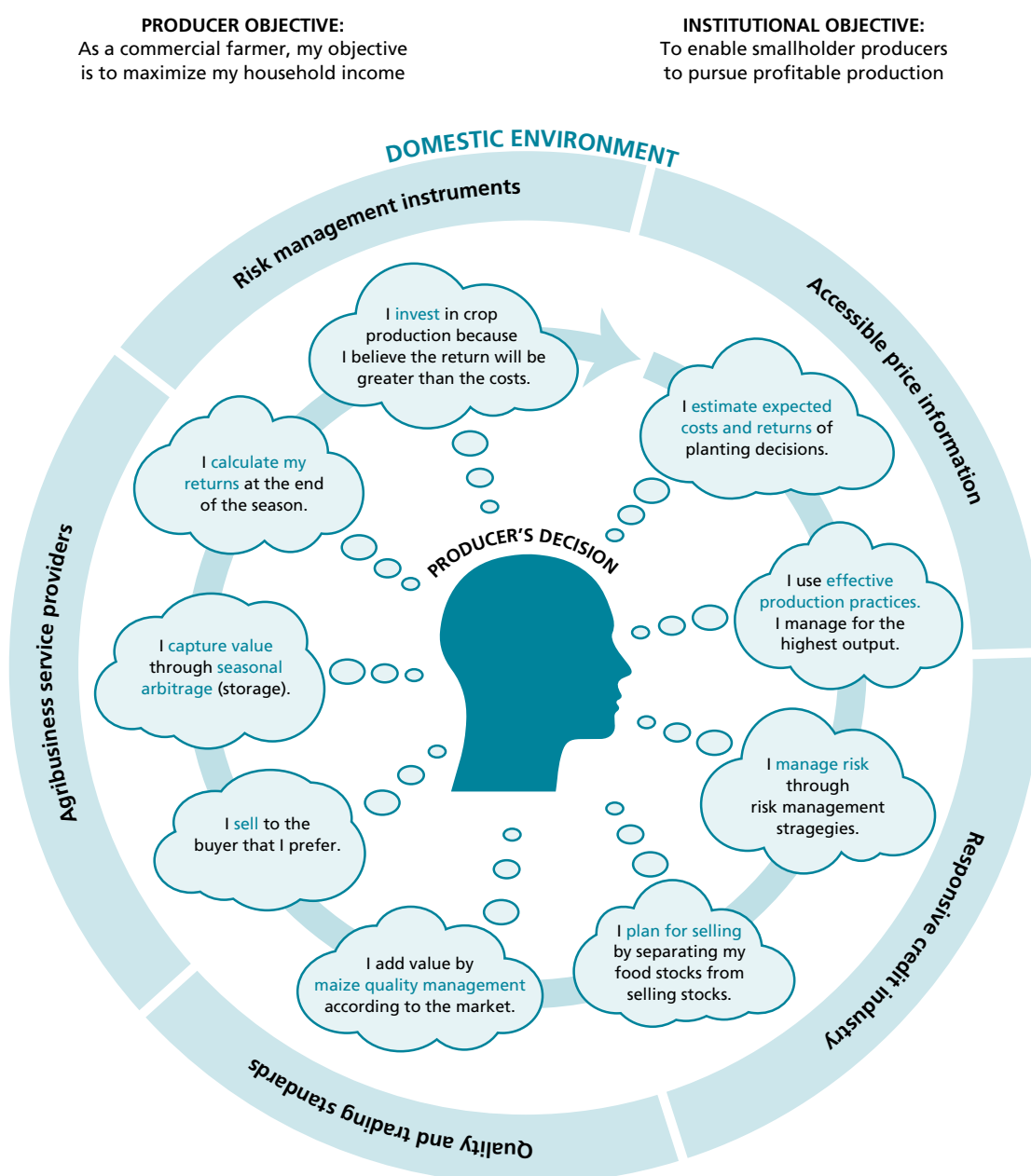
2.3 A COMMERCIAL FARMING MODEL

The assertion is that transition from subsistence production to commercial production, as one

poverty-breaking pathway among many, requires a transition in the approach to decision-making at the producer level. This section presents an optimal model for commercial decision-making that is bounded by domestic market dynamics and institutions (see Figure 2). The model represents decisions that are necessary for commercial farming but are not the current reality for most maize

FIGURE 2

A commercial farming model



Source: Authors' elaboration of commercial farming principles.

farmers in Kenya. In this model, production and sales decisions, often viewed as discrete, are part of a comprehensive strategy that operates on a seasonal cycle.

Commercial producers try to maximize profits and grow their businesses through reinvestment (consistent with Pingali, 1997). In pursuing this objective, the producer makes a series of linked decisions, with one season linked to the next through profits or losses. Each of these decisions is made within the producer's local and domestic food system, which has impacts on price information and price expectations, standards, policies and agribusiness service provision (e.g., credit and risk management). Within this construct, the farmer may choose to organize her/his farming operations in a particular way to maximize profit (e.g., by contracting for production or acting collectively with other producers) or pursue other goals. Price and information transmission is critical.

Who is the producer? The producer may be more than one person; decisions may involve multiple decision-makers. For example, if different individuals make production and marketing decisions, these choices must be synchronized to achieve a commercial approach in which market expectations inform production decisions.

Textbook farm management decisions and actions fall into three main categories: planning, production, and marketing. In an ideal scenario, the commercial producer will make planting decisions based on estimates of expected costs and returns. These estimates require an expectation of seasonal market prices and an understanding of production costs based on past experience and current market prices for inputs. A model assumption is that market price information is based on relevant fundamentals (supply and demand) and moves efficiently from the market to the producer, underlying a producer's ability to make commercial decisions. Producers must be able to form commodity price expectations and act accordingly.

Throughout the season, ideally, the farmer will attempt to manage risk for both prices and yields. Risk management tools such as crop diversification, insurance and production contracts may be used, if they are present. Once crop choices are made, the producer uses the most effective and efficient production practices available, in terms of inputs and timing. The farmer manages production for the highest profit.

Once the harvest is estimated, in the case of a dual-function, food-cash crop,⁵ farmers must plan how much of the harvest to sell and how much to retain for consumption. Along with the potential for seasonal arbitrage and other relevant information (e.g., cash needs, storage capacity), this decision will in turn influence the decision regarding when to sell the grain. Between the harvest and the final sale, maize quality will be managed according to market standards. Meeting market standards for maize by implementing post-harvest quality management practices adds value in a differentiated market. Consistent maize quality management positions producers to sell at a premium to large and/or institutional buyers.

After harvest, producers will do their best to evaluate seasonal arbitrage opportunities for production that are not bound by contracts, by estimating the value of storage between the current and next harvest periods. Grain prices typically follow a seasonal price pattern, shadowing supply and demand. If the producer decides to store some of the harvest, the maize must be stored in a way that preserves its quality. At the point when the producer decides that some produce will be sold, a buyer is sought. Which buyer is preferred will in part depend on the producer's circumstances and preferences. Perhaps the farmer has an established relationship with the buyer. The buyer may provide greater stability, better prices or both. Regardless of the buyer, maize weight measurement, quality determination and payment terms are transparent and agreed mutually.

A crucial task is carried out throughout the seasonal cycle: the farmer estimates the crop returns as accurately as possible. Only when armed with this knowledge can he/she make informed investment decisions on next season's production plan and on short- and long-term investments in farm assets and other improvements.

A general assumption regarding what makes this growth cycle possible is that after several seasons the producer will be making profits that are reinvested in aspects of production. In the countries that grow much of the world's maize, agricultural operating loans that allow the management of seasonal cash flows are available to producers, but ultimately the production enterprise must

⁵ A dual-function crop is one that the producer both consumes and sells, such as maize or beans.

be profitable to be sustainable.⁶ The producer's ability to withstand seasonal losses will depend on her/his individual financial circumstance and, if present, domestic agricultural policies that provide safety nets.

In an environment where third-party trading standards are enforced, measurements are accurate, commodity markets function and operating credit is available, effective commercial decisions require substantial gathering and processing of information. Agribusiness service providers are key to supplementing the producer's ability to gather and process information. Producers may hire agribusiness service providers to assist with market analysis, logistics and market identification.

In a developing country context, where the producer is transitioning to commercial production, this model is difficult to adhere to in practice. First, the individual producer's ability to plan from one season to the next is often seriously hindered by poor management skills and short-term survival needs. Second, from a policy or programme perspective, it is often neither seen as realistic nor understood that smallholder farmers are part of a larger private agribusiness sector that can benefit smallholders by providing fee-based agribusiness services.⁷ For example, these services can be offered by intermediaries, who are often referred to in negative terms.

For smallholder producers in particular, given the challenges they face, this commercial transition is not expected to occur without targeted help. Even if a small producer understands the decisions needed, has the market knowledge necessary for commercial orientation (e.g., planning, investment and marketing knowledge) and has access to the land and inputs needed for commercial maize production, the risks and costs associated with an underdeveloped domestic marketing environment can be disproportionate to the benefits.

⁶ The United States of America is an example where a strong culture of agricultural operating loans makes it possible for young and/or higher-risk farmers to manage seasonal cash flows. In 2011, maize production in the United States of America represented 36 percent of the global maize market. See United States Department of Agriculture (USDA), World Agricultural Outlook Board, World Agricultural Supply and Demand Estimates. <http://usda.mannlib.cornell.edu/MannUsda/viewDocumentInfo.do?documentID=1194> (accessed 18 December 2013).

⁷ See Wiggins and Keats (2013) for a discussion of the differences in stakeholders' roles in Africa's smallholder agriculture development.

The absence of quality and trading standards, formal land markets, credit markets, risk management tools, infrastructure and stable government market interventions creates massive hurdles and disincentives to commercial management, especially for smallholder producers. If such a producer is to operate in the same market as a larger producer, he/she will require bridging support to attain the knowledge needed and to bear the disproportionate risks. As the domestic production, marketing and policy environment improves, so will the incentives for producers to pursue effective management decisions.

2.4 BENCHMARKING OF SMALLHOLDERS' COMMERCIAL ORIENTATION

In this section the commercial behaviour of the study's producer sample is benchmarked through the lens of the proposed commercial model. For smallholder maize farmers in Kenya, there are sufficient challenges to the decision-making model described in the previous section to make it unlikely that many smallholders will be able to adopt it. To move forward with target interventions, it is useful to understand the distance between current decision-making and a more commercially oriented approach. Many of the variables evaluated in the benchmarking process will be included in the heterogeneity analysis.

Who is the smallholder producer?

It is important to understand who is involved in the decision-making process as a first step to understanding smallholder farm management. The survey respondents – self-declared decision-makers in primary agriculture – were asked who makes decisions regarding maize production and marketing for their farms. The main results are shown in Table 3.

Table 3 makes it possible to identify the differences between declared roles and actual decision-making among respondents. All the respondents considered themselves the main household decision-maker, and the vast majority of them, with a noticeable gender disparity, were also the household head. The men responding to the survey as the household's primary agricultural decision-maker all considered themselves also to be the household head, while about 50 percent of the women who were agricultural decision-makers also considered themselves the household head.

It emerged that not all respondents were personally in charge of all farm management activi-

TABLE 3

Household roles and decision-making in maize activities, by gender and geographic area (N = 500)

Decision-making variable	Men	Women	Bungoma	Meru	Total
<i>In your household, are you the...</i>					
Primary decision-maker?	100%	100%	100%	100%	100%
Household head?	100%	50%	76%	81%	78%
<i>Types of decision: Do you decide...</i>					
Crop mix for the season?	90%	91%	95%	85%	91%
When to plant/harvest?	88%	95%	93%	88%	91%
Fertilizer decisions?	93%	80%	83%	92%	87%
Whether to sell or store?	84%	72%	74%	84%	79%
Who to sell to and price?	80%	53%	66%	70%	68%
<i>Overall decision efficiency: Are you...</i>					
Responsible for at least one activity listed above?	98%	99%	100%	98%	99%
Responsible for all the activities listed above?	59%	32%	41%	54%	47%

Source: Authors' calculations from study findings.

ties. In particular, as decision-making moves from production to marketing, more decision-makers become involved, with female respondents clearly having less control than their male counterparts. To emphasize the character of the decision-making process, two new variables were created to capture overall decision efficiency more accurately. These are reported in Table 3, which shows that while almost all respondents were responsible for at least one of the maize-related activities mentioned in the survey, fewer than half of them were in charge of all activities.

The “farmer” is clearly more than one person for the majority of this sample, slightly more so in Bungoma. Women have a considerably smaller role in the entire decision-making process than men. While collaboration can be beneficial when well coordinated, these farms may also be susceptible to inefficiencies arising from management decisions. Focus group discussions suggested that in many cases not only are maize production and marketing decisions made by different household members, but also there is little coordination between male and female decision-makers. Among other decisions, this lack of coordination restricts the ability to make efficient decisions regarding how to plant strategically, plan selling and calculate returns.

Production objectives and preferences

Profit maximization and the willingness to procure food in the market are primary tenets of com-

mercial farm management. In open-ended questions, respondents were asked why they produce maize, and what main factors influence how much maize they decide to plant. In an effort to gauge the willingness to procure maize in the market, respondents were asked about their preferences for buying versus growing maize. The results are presented in Table 4.

The production objective of food consumption clearly emerges as dominant in this sample, with little difference by gender. Although marginal, twice as many farmers in Meru were more oriented towards commercial objectives. This finding is central to smallholder transition strategies. If intervention strategies are designed with the expectation that smallholders have commercial objectives, they are *a priori* likely to have little success. It is apparent from the focus groups that although most producers sell some maize at harvest to cover immediate expenses (e.g., school and medical fees), production is oriented mainly to own consumption (i.e., subsistence) rather than profit generation.

The figures also show that a tension exists in sell-versus-buy decisions. The majority of farmers did not believe that the maize in the market was of the same quality as their own or that maize would necessarily be available when they needed it. Understanding these perceptions will be key to any commercial transition plan.

TABLE 4

Production objectives, determinants and preferences, by gender and geographic area (N = 500)

Production variable	Men	Women	Bungoma	Meru	Total
Production objectives					
Food consumption	89%	91%	93%	86%	90%
To pay school fees	2%	1%	1%	3%	2%
To earn cash income	9%	8%	6%	11%	8%
Procurement preferences					
Would prefer to grow maize	97%	96%	97%	95%	96%
Would prefer to buy maize	3%	4%	3%	5%	4%
Perceives purchased maize to be of lower quality	95%	90%	94%	91%	93%
Believes there is enough maize to buy on the market	17%	18%	17%	17%	17%

Source: Authors' calculations from study findings.

Commercial planning and market awareness

Planning is critical to commercialization. Gathering market information on sale prices is important in enabling smallholders to make informed production, selling and buying decisions. Respondents were asked questions regarding their planning decisions, price expectations and awareness of and linkages to maize markets. Planning was measured by the producer's decisions to plan the amounts of maize to sell on the market at harvest, to put into storage for later sale, or to allocate to household consumption.

Table 5 indicates that a slight majority of respondents practised some form of planning, with respondents in Meru more likely to plan than those in Bungoma, and men more inclined to plan than women. The data show that only a minority of respondents knew the market price of maize or tried to obtain such information via cell phone. In this case, the gender difference is even more marked. In addition, among the respondents who reported having price expectations, a relative majority sold at lower prices, especially in Bungoma, where more than half of respondents obtained lower prices than expected. This may be explained by the fact that farmers in Bungoma are less informed about maize market prices and less likely to adopt a planning strategy.

Planting maize appears to be a given activity for most respondents, as might be expected when the majority view maize production as supplying food. Looking at the main factors that determine how much land to allocate to maize production, the central importance of input prices and the inevitable influence of weather considerations are

immediately apparent. Land availability and the farmer's financial status completed the top four responses to this question. The price of agricultural inputs influences production decisions more in the Bungoma region, while the timing of rains is considerably more relevant in Meru. Decision factors relating to different crop price expectations did not surface in responses to this question.

Post-harvest management and marketing

Seasonal arbitrage: In an effort to understand the issues involved in seasonal arbitrage opportunities and the ability to act on them, respondents were asked about their perceptions of storage and storage practices. In open-ended questions, respondents were asked to identify the most important impediments to storage. In Table 6, the first two indicators show that more than 90 percent of respondents believed that they should avoid selling maize during seasonal price lows at harvest time, to obtain a better prices later, especially in Meru. Slightly fewer respondents, and relatively fewer women than men, estimated that they should store their maize for at least four months, nearing the hunger months, to get the best possible price on the market. This time threshold is particularly interesting because, on average, respondents were found to store their maize for a maximum of two months. When asked whether they would like to store their maize for longer than they currently did, the majority replied that they would, with men again more inclined to do so than women. Other figures shown in Table 6 reveal local factors that prevent respondents from adopting their preferred storage strategy. Storing for as long as

TABLE 5

Planning and information gathering ability, by gender and geographic area (N = 500)

Planning/information variable	Men	Women	Bungoma	Meru	Total
Plans how much maize to sell/store/consume	63%	53%	54%	64%	59%
Uses cell phone to obtain price information	33%	17%	27%	25%	26%
Knows price of maize in main market	49%	28%	33%	46%	39%
Expected a certain price	53%	36%	44%	48%	46%
<i>Of those expecting a certain price, the price received was...</i>					
Same as expected	5%	6%	3%	8%	6%
Higher than expected	30%	39%	32%	34%	33%
Lower than expected	49%	39%	51%	40%	45%
Do not know					16%
<i>Production choice determinants (decision on how much land to allocate to maize)</i>					
Price of seed and fertilizer	64%	51%	65%	50%	58%
Timing of rains	14%	17%	10%	21%	15%
Financial status	6%	7%	7%	7%	7%
Land availability	5%	8%	4%	9%	6%

Source: Authors' calculations from study findings.

desired was not an option for many respondents because they had to sell to meet immediate needs, did not have sufficient marketable surplus, or feared that the stored maize would be affected by pest infestation, the latter being clearly a larger problem in Bungoma.

Table 6 also shows that the majority of respondents stored maize in their homes. A sizeable proportion of these respondents would have preferred to store maize in a facility outside their homes, but were prevented from doing so by issues such as insufficient quantities, lack of information about storage options and poor security. Hence, even when farmers are aware of seasonal arbitrage opportunities, they face a series of challenges that prevent them from realizing price gains.

Maize quality management and standards: Given the positive relationship between price premiums and quality standards, respondents were asked about their knowledge of and practices regarding four maize quality standards in Kenya. The results are presented in Table 7. It was found that smallholders generally understand that managing these maize quality traits influences the sales price. In particular, more than 90 percent of respondents, with no noticeable difference by gender, knew that the presence of rotten kernels, foreign material

and high moisture content affects the maize selling price, while there was less awareness of the impact on price of broken kernels.

However, figures show that the number of individuals who decided to manage these characteristics was not as high as expected. Depending on the quality characteristic, roughly 60 to 80 percent of the respondents who acknowledged that maize quality management had an impact, actually did something about it. It is interesting that in this case a gender-specific disparity is observed, with fewer women stating that they engaged in the active management of quality characteristics. Similarly, there is quite a sharp regional disparity, with a higher proportion of Meru farmers engaging in post-harvest maize quality management.

On average, respondents reported a higher tolerance for rotten and broken kernels and foreign materials than the industry requires. In contrast, respondents seemed to be more aware of moisture standards and related implications, for which they reported a lower tolerance than required by the industry. Of course, farmers know that moisture, in particular, can quickly destroy stored maize, regardless of end use. However, the minimum and maximum stated values imply great heterogeneity in terms of respondents' awareness of a given standard.

TABLE 6

Storage preferences and capabilities, by gender and geographic area (N = 500)

Storage variable	Men	Women	Bungoma	Meru	Total
Thinks that storing for at least 2 months post-harvest leads to higher sale price	90%	96%	91%	95%	93%
Thinks that storing for at least 4 months leads to highest price	89%	81%	82%	85%	83%
Average maximum storage time	2.6 months	1.9 months	2.6 months	2.2 months	2.3 months
Would like to store longer	77%	67%	74%	72%	73%
Main impediments to longer storage (N = 365)					
Sells to meet immediate cash needs	28%	20%	16%	34%	24%
Insufficient harvest for longer storage	14%	18%	15%	16%	16%
Stored maize is susceptible to pest infestation	12%	14%	19%	5%	13%
Storage area					
Store maize in the home	70%	83%	73%	78%	76%
Would prefer to store outside the home	39%	36%	28%	51%	38%
Main impediments to storing outside the home (N = 190)					
Not enough maize to meet minimum storage quantity	34%	36%	25%	41%	35%
Lack of information about storage	22%	15%	25%	14%	19%
Fear maize may be stolen	15%	13%	27%	6%	14%

Source: Authors' calculations from study findings.

From the producer focus groups and prior studies, it is apparent that smaller maize producers may not realize any added value from managing maize quality if they sell to local traders or bulkers. These producers do not sell at market price premiums because maize sold in small quantities is bulked, and its quality is assessed from the bulk volume. Moisture content is an exception in terms of realizing added value from quality management. However, most smallholders do not have access to appropriate tools for grain drying and moisture measurement. Without tools, farmers guess, using their best judgement.

Choosing a preferred buyer

As a final benchmark, the survey investigated whether farmers were able to sell to their preferred buyers, and whether there were reasons underlying these preferences. Chapter 3 investigates smallholders and selling decisions in greater depth. Table 8 shows responses from the sub-sample of respondents who reported selling some maize in the 2010/11 12-month seasonal cycle.

A minority of sellers (roughly four out of ten) managed to sell to their preferred buyers, with

no differences between genders or locations. This finding indicates that there are barriers to selling to the preferred buyer, complicating the achievement of commercial objectives. Those who sold to their preferred buyers indicated promptness of payment, sale price and the buyer's trustworthiness in terms of weight measurement as the main reasons behind their choices. The fact that a buyer pays promptly appears to be crucial, particularly for women, indicating a relatively immediate need for cash, and possibly associated vulnerability if payment is not received. Farmers in the Meru region valued reliability more than their counterparts in Bungoma, possibly indicating that those Meru farmers that reach their preferred buyer are more satisfied with competition across buyers, and thus implying a higher likelihood of reliable measurement.

The majority of smallholders who did not report selling to their preferred buyers perceived other buyers as differing from their own current buyers in substantial ways. They perceived preferred buyers as offering higher prices, measuring weight more accurately during sales, and conducting sales more easily (with respect to

TABLE 7

Awareness of maize quality standards and management, by gender and geographic area (N = 500)

Maize quality variable	Men	Women	Bungoma	Meru	Total
Rotten kernels (Kenya G1 = 2%/G2 = 4%)*					
Believes they affect price	99%	99%	98%	99%	99%
If so, actively manages	82%	72%	71%	85%	77%
Average percentage of rotten kernels allowed Minimum–maximum	5.6% 0.1–20%	5.8% 0.1–50%	5.3% 0.1–30%	6.2% 0.1–50%	5.7% 0.1–50%
Broken kernels (Kenya G1 = 2%/G2 = 4%)*					
Believes they affect price	72%	71%	72%	71%	72%
If so, actively manages	66%	57%	56%	69%	62%
Average percentage of broken kernels allowed Minimum–maximum	12.7% 0.5–40%	13.7% 1–40%	12.4% 0.5–40%	13.8% 1–33%	13.1% 0.5–40%
Foreign material (Kenya G1 = 0.1%/G2 = 1%)*					
Believes it affects price	89%	91%	96%	83%	90%
If so, actively manages	78%	71%	71%	82%	76%
Average percentage of foreign material allowed Minimum–maximum	4% 0.7–30%	4.1% 0.1–20%	3.8% 0.5–30%	4.4% 0.1–20%	4% 0.1–30%
Moisture content (Kenya G1=13.5%/G2=13.5%)*					
Believes it affects price	99%	98%	99%	98%	98%
If so, actively manages	84%	74%	73%	87%	80%
Average percentage of moisture allowed Minimum–maximum	9.6% 1–26%	10.7% 1–50%	10.3% 1–26%	9.7% 1–50%	10% 1–50%

*Kenya Grade 1 and Grade 2 standards according to the Regional Agricultural Trade Intelligence Network (RATIN) taken from Kenya Bureau of Standards.

Source: Authors' calculations from study findings.

TABLE 8

Smallholders' buyer preferences, by gender and geographic area (N = 254)

Preference variable	Men	Women	Bungoma	Meru	Total
Sells most maize to preferred buyer	37%	41%	38%	39%	39%
If so, why is this a good buyer?					
Pays promptly	25%	49%	36%	33%	35%
Offers a good market price	24%	21%	28%	17%	22%
Measures weight accurately	17%	5%	8%	17%	25%
If not, why is preferred buyer preferable?					
Price received is higher	45%	48%	42%	51%	46%
Measures weight accurately	12%	5%	11%	8%	10%
Selling process is easy	6%	9%	9%	5%	7%

Source: Authors' calculations from findings.

payments, but not necessarily transport). Each of these three issues reflects a lack of transparency between the farmers and their current buyers, or a lack of price information. Across the world,

farmers perceive that they do not receive the highest prices, but issues with weight measurement and sale processes fundamentally obstruct commercial objectives.

2.5 ANALYSIS OF SMALLHOLDER HETEROGENEITY

From the benchmarking exercise, it is evident that the smallholders included in the sample generally face challenges in the commercial transition, as many of the respondents' objectives, planning levels and marketing abilities differ from the necessary decision-making abilities proposed in the commercial model. However, overall descriptive statistics tell little about the relationships among these various behaviours and outcomes. This section describes an exploratory analysis to investigate the possible patterns that define the commercial orientation of this particular population of smallholders.

It is hypothesized that there is a considerable degree of heterogeneity among smallholders in terms of commercial decisions and outcomes, and on the basis of this heterogeneity, the survey sample can be differentiated into subgroups. In this section, and throughout the study, commercial outcomes are defined as net selling measures that provide an indication that a producer is engaging in more commercially oriented production than subsistence production, such as by selling the majority of his/her maize harvest. The commercial model discussed in Section 2.3 requires that farmers produce primarily for the market and must eventually make profits to sustain their farming operations.

Generally, it is difficult to measure exact "commercial outcomes", such as profit levels, within the context of smallholder agriculture. Frequently, costs, gross receipts and harvest records are inexact, if they exist at all. For this reason, and because of limitations in the survey data, farmers are categorized according to the two different commercial outcomes defined in the following paragraph. Although narrow, these categories provide two different perspectives regarding a farmer's overall commercial orientation.

The two categories, from less to more commercial, are:

- category A: net maize sellers in terms of quantity but not necessarily value (48 percent of farmers);
- category B: net maize sellers in terms of value (45 percent of farmers).

Net selling status in terms of quantity is defined as quantity of maize sold – quantity of maize purchased = net selling_{quantity}. In the absence of accurate data for estimating profit, net selling in terms of value is defined as (quantity of maize

sold * price sold) – (quantity of maize purchased * price purchased) = net selling_{value}. To measure accurately the quantities sold and purchased, as well as the prices, enumerators worked with respondents to complete a 12-month table indicating all maize activities throughout the year. Category B is not strictly a subset of category A, but there are very few (three) observations where net sellers in terms of value are not also net sellers in terms of quantity.

As mentioned in section 2.2, a category that measures profits (receipts minus costs) would be ideal in approximating commercial behaviour. Without accurate cost data, the two categories A and B, at a minimum, allow analysis of more commercially oriented versus subsistence farmers, with category B being viewed as more commercial than category A. Category B also allows for differentiation between net sellers in terms of value and the many smallholders who, according to the hypothesis, sell large volumes of maize at low harvest prices and purchase smaller volumes at higher prices later, to consume during Kenya's hunger season.

Impact analysis

The study investigated the impacts of the key variables driving commercial outcomes A and B through regression analysis. As well as taking into account some of the more conventional explanatory factors – such as cell phone use, education, distance to market, size, and wealth – additional variables introduced in the benchmarking exercise were also included, such as decision-making concentration and planning and collective marketing strategies. Descriptive statistics for the variables used in the regression analysis are shown in Table 9.

It is hypothesized that farmers who make decisions that are more consistently in line with the commercial model will be more likely to be net maize sellers (by value and/or volume).

$$\text{Commercial outcomes (farmer category)} = f(\text{industry characteristics, household characteristics, assets, farm management decisions}) + \varepsilon$$

This equation represents the hypothesized relationships between either of the two defined commercial outcomes and the variables included in the regression. The specific type of regression used here is the binary probit model. Essentially, this model estimates the impact of explanatory variables (e.g., characteristics and decisions) on

TABLE 9
Regression analysis variables

Variable	Mean	Standard deviation	Minimum	Maximum
Net seller in quantity	0.507	0.501	0	1
Net seller in value	0.482	0.5	0	1
Gender	0.587	0.493	0	1
Age (years)	44.51	13.95	19	89
Age-squared	2 175	1 399	361	7 921
Marital status	0.895	0.307	0	1
Household head	0.789	0.408	0	1
Household size	6.729	2.669	1	18
Number of children in household	3.536	2.088	0	12
Bungoma region	0.581	0.494	0	1
Distance to market	1.266	0.887	0.002	8
Respondent's years of schooling	8.334	3.143	1	16
Land owned (ha)	3.238	2.488	0	18
Area under maize (ha)	2.323	2.217	0.182	28
Wealth index	0.997	0.818	0	4.094
Decision-making concentration	0.46	0.499	0	1
Planning strategy	0.596	0.491	0	1
Knowledge of market price	0.381	0.486	0	1
Use of cell phone for price information	0.276	0.447	0	1
Number of hired workers	3.3	3.754	0	30
Number of family workers	3.993	2.152	0	12
Degree of crop diversification	4.966	1.938	1	12
Collective marketing	0.128	0.334	0	1
Storage within the house	0.756	0.43	0	1

Source: Authors' calculations from study findings.

the likelihood of the farmer being in either of the groups of farmers exhibiting commercial outcomes A or B. A technical note on this regression type can be found in Annex 2. The analysis is repeated for each commercial outcome to investigate whether the results differ between commercial outcome A and the slightly more restrictive outcome B. Results of these analyses are shown in Table 10.

While it is not possible to identify the exact causes of smallholders' commercial outcomes, these regression results can be used to point out the overall statistical relationships found within the survey data.

Looking first at the individual characteristics of farmers, age is the only variable found to influence

the likelihood of being a net seller. Specifically, age is related to being a net seller in terms of quantity. Age and age squared have opposite signs, which is interpreted as signalling that being of average age (i.e., not too young or too old) increases the likelihood of being a net seller in quantity.

Region exhibits the most significant impact from a household-specific perspective. In this sample, farmers in the Meru area are roughly 20 percent more likely to be net sellers. As net selling is restricted to value, the farmer's distance to the main market has a negative impact on the likelihood of net selling.

Proxies for assets are human capital (i.e., education), access to land and an overall wealth index.

TABLE 10

Likelihood estimates of commercial outcomes A and B

Explanatory variable	Commercial outcome A: net seller in quantity (N = 240) Dummy variable: 1 if respondent is a net seller of maize in terms of quantity; 0 otherwise Pseudo R ² 0.3319 p > Chi ² 0.0000	Commercial outcome B: net seller in value (N = 228) Dummy variable: 1 if respondent is a net seller of maize in terms of value; 0 otherwise Pseudo R ² 0.3532 p > Chi ² 0.0000
Individual		
Gender	0.045 (0.102)	0.037 (0.102)
Age	0.021* (0.011)	0.014 (0.011)
Age-squared	- 0.001* (0.0001)	- 0.001 (0.0001)
Marital status	- 0.105 (0.106)	- 0.145 (0.108)
Household head	- 0.027 (0.107)	- 0.019 (0.108)
Household		
Household size	- 0.012 (0.019)	- 0.025 (0.021)
Number of children in household	- 0.024 (0.022)	- 0.020 (0.024)
Bungoma region	- 0.177** (0.080)	- 0.280*** (0.084)
Distance to market	- 0.042 (0.022)	- 0.060* (0.034)
Assets		
Respondent's years of schooling	0.048*** (0.009)	0.052*** (0.011)
Land owned (ha)	0.025 (0.017)	0.016 (0.018)
Area under maize (ha)	0.034* (0.021)	0.041* (0.022)
Wealth index	0.068 (0.048)	0.114** (0.053)
Farm management decisions		
Decision-making concentration	0.177** (0.072)	0.161*** (0.063)
Planning strategy	0.224*** (0.061)	0.216*** (0.060)
Knowledge of market prices	0.022 (0.065)	0.050 (0.072)
Use of cell phone for price information	0.097* (0.054)	0.043 (0.056)
Number of hired workers	0.045*** (0.011)	0.044*** (0.011)
Number of family workers	- 0.037** (0.018)	- 0.020 (0.018)
Degree of crop diversification	0.019 (0.025)	0.013 (0.026)
Collective marketing	- 0.129 (0.085)	- 0.033 (0.082)
Storage within the house	- 0.238*** (0.064)	- 0.198*** (0.065)

Significance levels = *** (p < 0.01); ** (p < 0.05); * (p < 0.10). Standard errors in parentheses are cluster-robust and the shown coefficients are marginal effects.

Source: Authors' calculations from study findings.

Education and the amount of land planted to maize both increase the likelihood of both net selling outcomes. Wealth enters as an impact factor when net selling is viewed in terms of value rather than quantity, where overall wealth has more than double the impact of education and maize area.

Farm management variables account for most of the original variables in this analysis. For the

overall model, the concentration of farm management decisions (i.e., how many people are making decisions), planning and storage decisions have the strongest impacts on the likelihood of being a net seller in quantity and value, irrespective of region. Farmers who have more control over decisions from planting to marketing, and who plan how much maize to sell versus store are respectively

18 and 23 percent more likely to be net sellers in quantity; and 16 and 22 percent more likely to be net sellers in value. Farmers who store their maize outside the house are 24 and 20 percent more likely to be net sellers in value and quantity respectively. Another proxy for planning, using cell phones to obtain price information, has a positive impact on net selling in quantity.

Labour decisions also have a significant relationship with net selling. The number of hired workers has a positive impact on the likelihood of being a net seller in quantity and value; whereas the number of hired family workers reduces the likelihood of net selling in quantity. More data are needed, but this relationship may be evidence that when more family-based than hired labour is used, harvested maize is used more for subsistence within the family.

Overall, the results confirm that traditional challenges to commercial behaviour, such as transactional cost issues (e.g., distance to market and cell phone usage) and farm size (e.g., land under maize, wealth, hired labour), are also present for the farmers in this study. Age and education are the main producer-specific impact factors.

When controlling for transactional cost issues and producer characteristics, it was found that net sellers and non-net sellers differ from each other in terms of producer-level farm management decision-making. A strong regional difference continues to surface, with farmers in Meru more likely to be commercially oriented. While a definitive understanding of this regional difference is beyond the scope of this chapter, it is important to note that regional heterogeneity is related to commercial outcomes.

2.6 DISCUSSION AND POLICY IMPLICATIONS

The aim of this chapter is to improve understanding of smallholder farm management strategies and decisions and their impacts on commercial outcomes (net sales) in the face of transaction costs and household-level characteristics. It is proposed that smallholders' transition from subsistence towards commercial maize production requires not only reductions in market transaction costs and increased access to a variety of inputs, but also the adoption of a commercial strategy that links production to marketing from season to season. From this perspective, a fundamental challenge to supporting the transition is that little is known about the farm management strategies of most smallholder maize producers.

A benchmarking exercise based on a commercial decision-making model reveals that producers do not usually have objectives that are consistent with commercial production and that they face daunting challenges in planning and making marketing decisions. Constraints are related to knowledge, the centralization of decision-making, storage options and cash flow constraints, with variance across genders and regions. The most pointed gender difference is in the centralization of decision-making – male producers are found to make more of the agricultural decisions, from planting to marketing, than parallel female producers. With respect to region, in most categories, producers in Meru are more commercially oriented than those in Bungoma, despite Bungoma's location in the heart of Kenya's bread basket. The reason for this strong geographic impact is not clear.

Even when maize yields are reasonable, it is understood from focus groups and survey findings that the timing of school fee payments and other cash needs tends to push maize farmers to sell in the market at harvest time. Instead of being able to leverage the production from high-yielding seasons through arbitrage and obtain better prices, smaller producers have to sell a portion of their maize during the period when prices are lowest. Challenges with bulking and maize quality management further reduce the likelihood of smallholders selling at higher prices.

Despite the overall lack of commercially oriented strategies found within this study, the maize smallholders who are able to make decisions more closely aligned with commercial objectives (e.g., by planning to produce for the market) are more likely to achieve positive net sales. There is heterogeneity between net sellers and non-net sellers. Producers achieving net sales in quantity and value are characterized by centralized decision-making, more market-focused planning and storage strategies, middle age (not young or old), higher levels of education, smaller household size, shorter distance to market, more landownership, and greater wealth.

Policy implications

Ultimately, profit is necessary if smallholder maize producers are to be able to treat maize production as a reliable source of income. That said, the development of a commercial orientation is a process, throughout which it is difficult for a smallholder to start making profits if her/his maize investment decisions are not clearly linked to markets and marketing decisions. As the focus of policies and programmes continues to move

towards helping smallholders form commercial rather than production strategies, this chapter provides a useful starting point for the design of appropriate strategies and highlights the need for a parallel understanding of smallholders' decision-making.

1) Education, education, education: invest in enhancing smallholders' access to commercial-oriented education. From this analysis, the most pressing conclusion is that many smallholders who are interested in commercially oriented production lack basic planning and marketing skills. Knowledge and the ability to react to changes in the market are cornerstones to developing and implementing a commercially oriented farm management strategy. There is no dispute that agronomic knowledge and access to inputs are also critical, but smallholders' skills must move from a production-only to a commercial focus.

To mention a few issues, commercially viable farmers must know:

- their production costs;
- their own consumption needs;
- how to decide how much to plant;
- market specifications for quality, which buyers are offering quality premiums, and how to achieve this quality;
- what factors move market prices and how to form price expectations;
- how to obtain access to the providers of essential agribusiness services.

Education can be provided in many ways, but given the heterogeneity of smallholders, a *local approach with a national perspective* is best. Long-term partnerships with the private sector can be developed for providing practical education as part of agribusiness services. However, without support, it is difficult for agribusiness service providers to work with smallholders if they must provide both the services themselves and the basic agribusiness education needed to make the services truly beneficial to the farmers, for example, in planning, maize quality management and credit management.

2) Target appropriate producers with differentiated policies and programmes. Smallholder maize farmers do not all have the same objectives, characteristics and access to resources, nor do they make the same decisions – there is heterogeneity across smallholders. That said, there are some common characteristics among smallholders who

are more commercially oriented and among those who are not. This makes it likely that not every smallholder farmer will be able to transition successfully to a more commercial approach. With heterogeneity in mind, it is important to develop a *best-fit approach for each group of smallholders*.

As part of this approach, it must be recognized that the *producer* is most likely more than one person regarding decision-making, particularly when women are sowing the seeds. The metaphorical *distance* between decision-makers matters, and was found to influence the net selling outcomes in this analysis. In practice, for example, if marketing training is given only to the marketing decision-maker, and does not reach the planting decision-maker, the ability to apply the training properly is reduced. Programmes must be designed to help bridge any relevant gaps among the agricultural decision-makers in a household, with the objective of supporting a cohesive commercial strategy.

3) Develop accurate maize market information, and support access to this information. Price expectations are fundamental to commercial strategies. Access to unbiased market price information provides the infrastructure for developing price expectations and planning strategies. However, from the analysis in this chapter, it appears that fewer than 50 percent of smallholders know local market prices.

Market price information can be as simple as current maize prices in major local markets around the country. Ideally, information regarding quality premiums should also be available. Accurate supply and usage data obtained through robust physical (or geophysical) counting and consumer interviews are also key pieces of the supporting information for all industry players, and need to be developed over time.

Access to market price information may take many forms and may be as simple as facilitated regular farmers' meetings at the local level for exchanging information. Access may also be assisted by the private sector, but the information must be neutral, accurate and accessible. Trust in the market information system, whether public or private, can grow over time.

Given current smallholder constraints, a fee-based system for obtaining basic market price information *de facto* reinforces the hurdles to smallholders' commercial transition. Although using a cell phone to check market prices seems to have a positive relationship with positive net maize

sales, it should be acknowledged that owning a cell phone is not a proxy for the actual uptake of market information. More work needs to be done to alert farmers to the possibilities regarding *how* to use these tools and information.

4) *Agricultural operating capital needs to be available, customized and linked to a marketing plan.* As do most small enterprises, smallholder maize producers, young and old, find transition and growth difficult without access to financial resources. However, the majority of these farmers do not have a coherent commercial strategy for their production, which should include an investment plan for – usually loaned – resources. Smallholders also generally lack access to human resources who can explain loan terms and provide the micro-management often needed with higher-risk borrowers. If financing is not managed and linked to a marketing plan or collateral, loans can quickly become grants. Smallholder farmers in focus groups reported that non-collateralized ordinary loans for agricultural production are frequently used to pay school fees or other expenses, often resulting in loan defaults. This non-collateralized loan default scenario is said to be a contributory factor in the continued smallholder poverty cycle, ensuring that smallholder producers cannot obtain access to the resources needed for investments in inputs and services.

5) *Coordinate policies across agricultural and non-agricultural ministries to reduce unintended consequences and achieve transition objectives.* Policies other than those directly related to agriculture influence smallholders' farm management.

Across the seven focus group sessions in the Bungoma and Meru regions, nearly all smallholders indicated that one of the most pressing reasons for selling maize at harvest time is the need to pay school fees. Simple coordinated policy shifts, such as coordination between the timing of school fees and harvests, can be relatively low-cost strategies for reducing cash flow pressure on smallholders. For example, if school fees must remain, payments could be required in monthly instalments rather than as large, single payments due at harvest. In a supporting role, private or community banks could offer incentives or special accounts for saving money for school fee payments. Local strategies are best determined at the local level, and must be coordinated across ministries that may not typically interact on a regular basis.

These recommendations are not part of a five-year programme; they are part of a plan to support the transition of smallholder maize producers over the next generations. Many of the recommendations require substantial financial and time investments, in addition to the autonomy needed to respond to local heterogeneity. It is important to consider who is best suited to implement such recommendations in the long term, especially when there is heterogeneity. The government is critical for national-level projects. While donors can play a large role through mechanisms such as vouchers, for longer-term development, domestic non-producer agribusiness (i.e., the private sector) must be supported as a major player at the local level. As many commercial staple producers across the world have learned, there can be significant value in developing agribusiness service providers as partners in the pursuit of commercial production.

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ANNEX 2. ECONOMETRIC IMPACT ANALYSIS

The econometric analysis in this chapter employs a binary probit model, with cluster-robust standard errors for estimating the likelihood of impacts on commercial outcomes. While a linear probability model would be unsuitable for this case, the probit model makes it possible to constrain the estimated probabilities to between 0 and 1. In fact, the probit estimation methodology is most suitable when a binary-dependent variable is regressed on one or more explanatory variables. In addition, the clustering of standard errors at the village level takes into account the potential correlation among respondents living in the same village, thus dealing

with heteroskedasticity and within-group error term correlation. Hence, the model can be specified as follows: $Y_{iv}^* = x'_{iv} \beta + \mu_{iv}$, with $Y_{iv} = 1$ if $Y^* > 0$; $Y_{iv} = 0$ otherwise; where Y^* is the unobserved, latent variable that determines the observable value of 1 and 0 for the variable Y ; x is the vector of explanatory variables with their vector β of estimated parameters; i represents the i th of N sample respondents and v indicates the v th of V villages in which the error term μ is clustered. In brief, this estimation method provides a number of statistical advantages compared with other procedures, and provides the most accurate estimates. After estimation of the probit model, the marginal effects with respect to each coefficient were computed.



3

Does selling to different maize buyers matter?

*Julius Okello, Andrea Woolverton
and David Neven*

Chapter highlights

- The opportunities for smallholder farmers to market their grain have increased. However, it is not yet well understood how the characteristics of the household influence the choice of market (buyer).
- The results of a survey of 500 smallholder maize growers in two regions of Kenya, Meru and Bungoma, found that 28 percent of respondents were pure subsistence farmers who did not sell maize in the market; 27 percent were net buyers who sold less in the market than they bought, and 45 percent were net sellers.
- Among these three groups, net maize sellers manage more aspects of post-harvest maize quality and, as a result, can sell to more discriminating and better paying buyers.
- The implications for policy relate mainly to improving the aggregation function in terms of quality and quantity by promoting quality awareness, standardized volume measurement, commercial storage, support to modernizing traders, and more market-oriented extension.

3.1 INTRODUCTION

In commercial maize production, marketing represents a fundamental set of decisions. As the model in Section 2.3 explains, commercial marketing is not just the act of selling. From the producer's perspective, the marketing of staple crops such as maize links value-adding activities such as post-harvest quality management to the choice of buyer and the prices received by the producer. Market prices are expected to differ by quality and location, and buyers may be chosen according to the different services offered, not just according to which offers the best prices.

Chapter 2 describes how most of the smallholder maize farmers interviewed in this study do not focus on commercial production and marketing. Most stated that they produce primarily for food, and sell only for immediate needs. Generally, production and marketing decisions are not closely linked. Despite these commonalities, there is heterogeneity across producers' farm management decision-making. This heterogeneity across such decisions as planning, planting, storage, post-harvest quality management and selling was found to influence commercial outcomes, in terms of both the producer's selling status and his/her profitability.

In this chapter, the aim is to investigate small-scale farmers' heterogeneity in maize marketing in greater depth and to establish whether marketing-related decisions differ among smallholder farmers with similar characteristics as well as across net sellers and net buyers.

Photo: A cereal trading centre in Meru

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Chapter 3 is organized as follows. Section 3.2 discusses the chapter focus and background. Section 3.3 presents the analytics for the chapter. Section 3.4 discusses the chapter findings. Section 3.5 provides conclusions and discusses policy implications.

3.2 THE BACKGROUND TO SMALLHOLDERS' MARKETING IDEAS

Efforts towards improving the welfare of smallholder maize farmers have often focused on improving yields through technology or improving access to commodity markets. The early push for smallholder access to improved technology improved yields to some degree, but in many cases it failed to link improved yields to the marketing of staple commodities in open markets (Shiferaw, Obare and Muricho, 2008; Shiferaw *et al.*, 2011).

The failure of the productivity-anchored strategy to foster smallholder farmers' participation in food commodity markets has led to shifts in strategy towards improving farmers' access to markets. Since the mid-1990s, the literature has identified several constraints that impede smallholder farmers' access to markets, particularly transaction costs (Omamo, 1998; Fafchamps and Gabre-Madhin, 2006; Shiferaw, Obare and Muricho, 2008; De Silva and Ratnadiwakara, 2010). These studies indicate that smallholder farmers face poorly functioning markets that are thin, fragmented and lacking in transparent market information (Okello, Al-Hassan and Okello, 2010; Markelova *et al.*, 2009; Shiferaw *et al.*, 2011). Development and donor strategies of the late 1990s and 2000s therefore focused on making commodity markets work for smallholder farmers, and especially on finding strategies to help reduce transaction costs and facilitate market access.

One major problem with the agricultural development literature of the 1990s and 2000s has been the lack of a universal definition of market access. According to an extensive review by Chamberlin and Jayne (2012), market access refers to a variety of measures, including the distances to the nearest main road, rural market, district/town, development agent and input supply store; the travel times to each of these destinations; and whether an all-weather road passes through the farming area.

Being able to go to the market and sell does not necessarily translate into profits. Jayne and Boughton (2011) found that despite improvements in smallholders' access to food commodity markets, household incomes did not necessarily improve.

Past studies have often cited the relatively low prices that smallholder cereal farmers receive for their produce as an underlying reason for household incomes not necessarily rising with increases in household produce sales. Renkow, Hallstrom and Karanja (2004) highlighted this issue for the Kenyan agriculture sector almost a decade ago. The literature often attributes this problem to a lack of market power. Fafchamps and Hill (2005) and Fafchamps and Gabre-Madhin (2006), for instance, attribute the low prices earned by smallholder farmers to their tendency to sell their grain at the farmgate, where rural assemblers have greater marketing power than the farmers because of lack of competition.

However, recent studies in eastern and southern Africa suggest that there has been a massive increase in the number of traders buying maize in rural areas (Jayne and Boughton, 2011; Kirimi *et al.*, 2011; Chamberlin and Jayne, 2009). These findings suggest that the number of marketing outlets (i.e., buyers) available to farmers has increased. Indeed, the studies suggest that rural grain farmers now have farmgate rural assemblers, rural/local open-air markets, large urban traders, large, distant traders, institutional buyers (schools, millers, cereal banks and grain reserve agencies) and end consumers (e.g., neighbours) as possible outlets through which to sell their grain. Even so, Kirimi *et al.* (2011) point out that few quality premiums are paid to smallholders for maize at the farmgate because different qualities are aggregated by most rural assemblers collecting from the farmgate.

Given the current buyer options facing Kenya's smallholder maize farmers, this chapter examines the factors that condition the choice of market outlet used by smallholder farmers in the producer survey. Past studies have suggested that poor asset endowment contributes significantly to smallholder farmers' failure to take advantage of the opportunities available to them to enhance their participation in the market (Barrett, 2008; Burke, 2009). This chapter examines whether producers' characteristics, including asset endowment and selling status, influence the choice of marketing outlets.

What constitutes a market for the smallholder maize farmer?

When evaluating market access and choices of market, it is useful to define the market concept from the development perspective. A review of the literature by Chamberlin and Jayne (2012) found vague and sometimes confusing definitions of the

market concept. This review suggests that there are as many concepts of a market as there are studies of the topic. In the literature, concepts of what constitutes a market include the local market, the rural market, the urban market, the “usual” market and the commodity market (Wood, 2007; Chamberlin and Jayne, 2012).

Unfortunately, the definitions and concepts of what constitutes a market cloud the real issues. In any rural environment, what constitutes a market will depend on the crop and the type of farmer growing it. Consequently, there can be multiple markets for some products (Vakis, Sadoulet and de Janvry, 2003; Wood, 2007). For a smallholder farmer growing a cereal crop such as maize largely for home consumption, a market for the sale of surplus production can be the farmgate, a neighbour, the roadside (usually under a tree by the main road or at an intersection), the nearest local shopping centre or, ultimately, the nearest urban market. For more market-oriented smallholder farmers in Kenya, a market for the sale of cereal grains can – in addition to these markets – also include local schools, national grain reserve agencies, grain millers, small local traders and large, distant traders.

The development literature attributes the perceived poor participation in grain markets to the high transaction costs of doing business in rural markets (Poulton, Dorward and Kydd, 2005; Okello and Swinton, 2007; Shiferaw *et al.*, 2011). Such costs include the costs of searching for and screening trading partners, negotiating terms of exchange, transportation, monitoring and enforcing agreements (formal or informal) and adjusting the terms of exchange when necessary (Okello, Narrod and Roy, 2011). It is argued that transaction costs dampen incentives for seeking buyers and selling on the market by creating a wedge between the market price and the net price that farmers actually earn after subtracting transaction costs (Omamo, 1998). Thus, farmers may opt to stay out of the market if profits are not high enough (Barrett, 2008).

Several institutional arrangements such as collective action across producer organizations, formal and informal contracts and public–private partnerships are used to help smallholder farmers overcome the challenges posed by high transaction costs (Okello and Swinton, 2007). Common produce marketing models – including cereal banks and collective storage systems – that target smallholder grain producers are emerging in Kenya. Such arrangements involve farmers coming together and storing their grains jointly

for collective sale later in the season, when prices are higher. Some developing country governments and development agencies promote these strategies to resolve commodity market inefficiencies.

Chapter 4 investigates the sustainability of two of these models (collective storage and cereal banks) in particular. Despite the existence of institutional or organizational innovations for improving market access, smallholder staple producers and market operators still often fail to work together well.

This brief discussion indicates that smallholder maize farmers in Kenya, as a whole, are encountering increasingly more opportunities for selling their grain, and may be able to take advantage of different marketing models to overcome impediments to market participation. However, little is known about marketing incentives and decisions within the smallholder group. This chapter examines the issue of farmer heterogeneity, after explaining the empirical methods used.

3.3 EMPIRICAL METHODS AND DATA

This study uses the discrete choice model (DCM) to assess what conditions the market outlet choices of smallholder maize growers who participated in the producer survey⁸ (see Annex 3 for full details of the model specifications). The underlying principle of DCM is that an individual makes a decision to maximize utility within a range of constraints. An individual maize grower's choice of market outlet (buyer) is therefore assumed to be the result of a subjective selection of the most preferred alternative from among a set of options. In the context of this study, the choice is made among five maize market outlets subject to conventional constraints, including income and preferences: rural assemblers (brokers); direct sales to consumers (especially neighbours); local traders; large, distant traders (including truckers); and institutional buyers (schools, the National Cereals and Produce Board [NCPB], millers, hospitals, children's homes, etc.).

When choosing to whom to sell their maize grain, farmers have to consider location-specific attributes, their own farm characteristics, their

⁸ To produce statistical estimates for the DCM specified, this chapter uses the multinomial logit regression model because of the discrete nature of the dependent variable. The model has been widely used to assess discrete choices where, as in this case, the choice is about alternative maize grain buyers (Lapar *et al.*, 2009; see Annex to this chapter).

own preferences, and buyers' attributes (Bond, Thilmany and Bond, 2009). The location attributes that affect market choice include distance to the market and whether the market has many buyers (Chamberlain and Jayne, 2009). However, the choice of market may also be affected by farmer- and household-specific characteristics such as selling status, gender, education, income and landownership. Size of the family/household is also likely to affect the choice of market, especially if income is constraining and different markets pay different prices. In addition, if a price differential for quality exists, the farmer's decision-making regarding farm and maize quality management practices is likely to be related to the her/his commercial market orientation and, hence, choice of market. This model therefore controls for these and other relevant factors in estimating the effects of identified factors on the choice of retail outlet.

3.4 ANALYSIS RESULTS

Characteristics of the study respondents

Table 11 presents descriptive statistics for the variables used in this chapter and a t-test for differences between the means for smallholder maize farmers in Bungoma and Meru. The results show striking differences between farmers in the two regions. Among the farmer-specific variables, results indicate that farmers in Bungoma have, on average, a higher education level than their Meru counterparts. The average length of education of farmers in Bungoma is nine years, compared with only five years in Meru. Women are more likely to be involved in growing maize in Bungoma than in Meru. This is because men in Bungoma have off-farm and other priority farm activities. Unlike their counterparts in Meru, male household members in Bungoma can find off-farm employment with the Nzoia Sugar Company or, given the flatter terrain in Western Province, they can more easily work as a *boda-boda* operator (bicycle or motorcycle transport provider).

Among the farm-specific variables, summary statistics indicate that farmers in Meru are located much further away from the market and that far fewer farmers participate in the National Accelerated Agricultural Inputs Access Programme (NAAIAP)⁹ in this region than in Bungoma.

⁹ NAAIAP provides input packages (one bag of maize seed and one bag of fertilizer) to targeted poor and vulnerable rural households on a one-off basis. See Section 1.3 for more discussion of NAAIAP.

Farmers in Bungoma also have a more diversified production base than their counterparts in the east. Focus group discussions with some farmers revealed that the high level of enterprise diversification is linked to high risks of crop damage from armyworms and hailstones.

Results suggest that farmers in Meru also differ markedly from their counterparts in Bungoma in terms of asset and capital endowments. As shown, farmers in Meru sowed larger plots of maize than those in Bungoma. However, more farmers in Bungoma owned bicycles (in part because of the flatter terrain), ox ploughs and cell phones than their counterparts. The results also indicate that farmers in Bungoma earned higher incomes from maize than their counterparts in Meru. In general, the higher income could be due to the different market dynamics in Western Province, where more maize is sold on the market. The results of summary statistics indicate that farmers in the two regions do not differ in terms of their attitude towards farming, except with regard to the perception that farming represents a future employment opportunity for youth. Farmers in Bungoma were more convinced that growing maize provides an opportunity for future generations to make a living than were their counterparts in Meru.

From a farm management perspective, there are few striking differences in the variables used between regions. Smallholders in Meru are slightly more autonomous in their decision-making and plan maize sales and storage quantities more often.

Selling dynamics

Focus group discussions with farmers in the two study regions indicated that households participate in maize grain markets as sellers, buyers or both. The majority of the farmers indicated that they started selling some of their maize within the first two weeks of harvest. Such early sales were mostly to meet: i) urgent major household needs such as medical, funeral or late school fee expenses; and ii) normal basic household needs, including lighting (kerosene), food (salt and sugar) and clothes. There are gender distinctions in terms of who does the selling. Men usually sell maize when the need being addressed is urgent or major, and therefore involves a large volume of grain. Women, on the other hand, are involved in the sale of small volumes of grain for meeting minor household needs.

Figure 3 examines the primary reasons why farmers sell maize grain. The majority of the respondents in both Bungoma (50 percent) and

TABLE 11

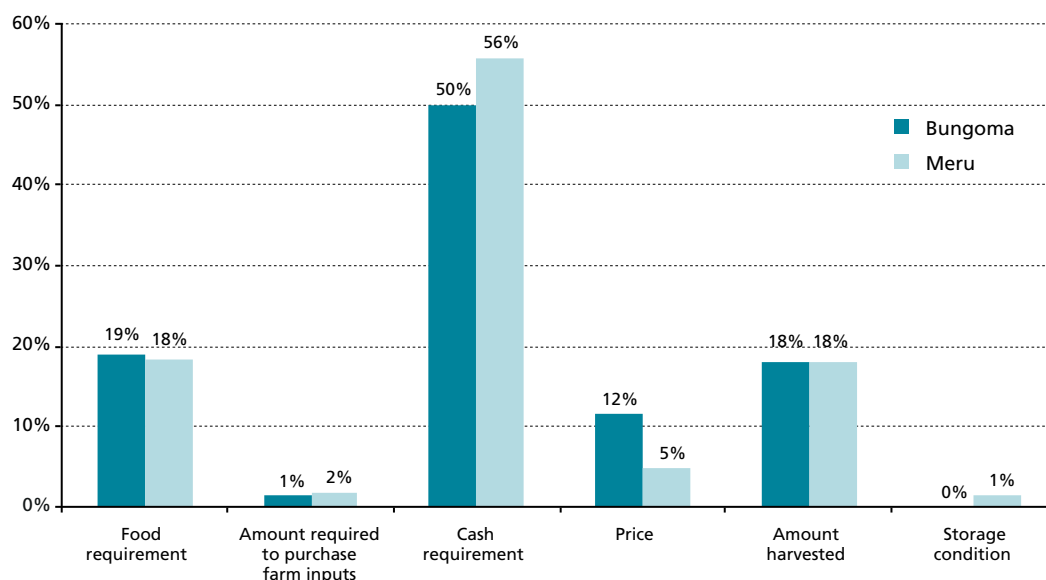
Statistics of the variables used in estimations

Variable	Bungoma	Meru	t-stat	p-value
Farmer-specific variables				
Age (years)	46	45	0.64	0.518
Education (years)	8.80	4.82	9.13	0.000
Gender (1 = male, 0 = female)	0.52	0.60	-1.87	0.068
Farm-specific variables				
Distance to market (km)	7.02	20.26	-25.35	0.000
Distance to a road (km)	7.09	6.73	0.86	0.391
Number of crops cultivated	7.70	6.95	4.18	0.000
NAAIAP (1 = inputs received, 0 = otherwise)	0.16	0.26	-2.73	0.007
Contact buyer by cell phone	0.17	0.20	-0.98	0.328
Number of traders coming to farm in long-rain season	10	12	-1.49	0.138
Capital endowment variables				
Maize area (acres)	1.73	2.66	-2.59	0.013
Owns plough/oxen? (1 = yes, 0 = otherwise)	0.34	0.11	7.67	0.000
Owns cell phone? (1 = yes, 0 = otherwise)	0.77	0.59	4.27	0.000
Owns bicycle? (1 = yes, 0 = otherwise)	0.75	0.47	6.80	0.000
Maize income (natural log)	10.22	9.76	2.56	0.011
Attitude variables				
I believe there is opportunity for youth in agriculture (4-point Likert scale; 1 = strongly agree, 4 = strongly disagree)	1.73	2.10	-4.65	0.000
I view maize farming as a business (1 = strongly agree, 4 = strongly disagree)	1.47	1.46	0.20	0.899
I believe that storing maize will likely allow me to sell for higher prices later (1 = yes, 0 = otherwise)	0.212	0.22	0.21	0.416
Farm management variables				
I make all farm management decisions (1 = yes, 0 = otherwise)	0.41	0.54	-2.77	0.002
Number of maize quality management practices (maximum = 4)	3.44	3.33	1.32	0.171
I check prices in market before selling (1 = yes, 0 = otherwise).	0.91	0.89	1.24	0.197
I plan quantities for selling and storage (1 = yes, 0 = otherwise)	0.54	0.64	-2.19	0.015
I participate in a group (1 = yes, 0 = otherwise)	0.41	0.48	-1.55	0.121

Source: Authors' elaboration of study findings.

FIGURE 3

Most important reasons for selling maize grain, by region (percentages of farmers)



Source: Authors' elaboration of study findings.

Meru (56 percent) sold maize grain to meet immediate cash requirements. This finding is not surprising. Most farmers in the two study areas use maize sales as the main source of cash for meeting various kinds of need. Among the various cash needs, school fees and unplanned expenditures for medicines or “luxury” foods such as fish and butter were ranked highest in focus group discussions. The discussions revealed that these needs are usually the main reason for selling maize grains within the first two weeks of harvest. Figure 3 shows that household maize requirements and the quantity of maize harvested also determine sales. The price received is important, especially in Bungoma, but is distinctly less of a driver of sales, suggesting that farmers who are pressed for cash are likely to sell their maize to whoever comes around, regardless of the price. The need for immediate cash is therefore the main reason why farmers sell their maize at harvest time, even though they are aware that they can get better prices by storing the grain for some weeks.

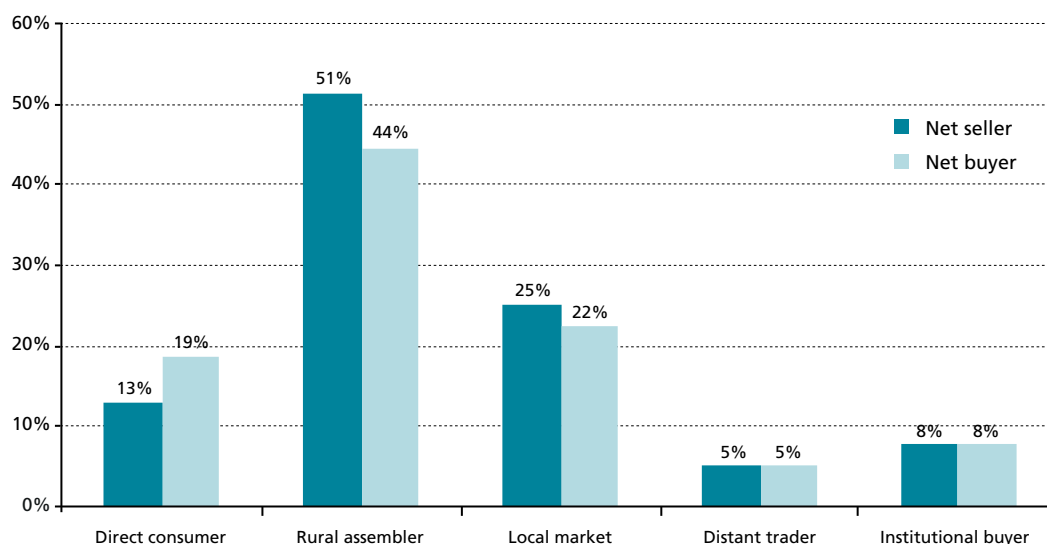
Analysis by gender reveals no differences between men and women in the timing of maize sales. However, as revealed in the focus group discussions, selling maize in larger volumes to meet larger cash needs is more pronounced among male farmers than their female counterparts.

Past studies have often cited a lack of price information as a reason why farmers accept low prices at the farmgate (Fafchamps and Gabre-Madhin, 2006; Aker, 2008). Indeed, survey results suggest that more than half of the study respondents in both study regions did not know the price of maize in the nearest major market. Even farmers in the Bungoma area – who are located an average of only 7 km from Chwele town, which serves as a major regional market in Western Province – did not know maize prices in that market. It is interesting that more farmers in Meru villages were aware of the prices offered by traders in Meru town market (the major market in the area), even though they are an average of more than 20 km further away from this market than their counterparts in Bungoma are from their main market. In terms of gender, results show that more male farmers (49 percent) were aware of the prices of maize in distant major markets than female farmers (28 percent).

Selling outlets and commercial outcomes

Analysis of the data indicates that there are three types of farmer in the study areas. First, some farmers produce only the maize they need for their own food needs, and therefore do not currently participate in the market – they are purely *subsistence farmers*. This type of farmer comprised

FIGURE 4
Primary selling outlets, by commercial outcome/orientation (percentages of farmers)



Source: Authors' elaboration of study findings.

approximately 28 percent of the survey sample of 500 producers. The second group of farmers consists of *net sellers* of maize. As defined in the literature, these farmers produce more maize than they need to satisfy household food needs. Consequently, they sell more maize than they purchase. The net sellers made up 45 percent of the sample. Third, some farmers purchase more maize from the market to meet their household food needs than they produce (*net buyers*). Such farmers made up 27 percent of the sample.

Figure 4 shows the primary selling outlets used by the net sellers and net buyers among the study households. It suggests no unexpected patterns in selling habits. As expected, most of the net sellers and net buyers sold their maize through rural assemblers and the local market. Only a small minority sold maize to distant traders or institutional buyers. This fact may be attributed to the quality and volume requirements of these two types of buyer.

Net sellers continue to sell to rural assemblers instead of other buyers. In the focus groups, producers reported that NCPB often announces a price that is higher than the local market price. The producers take their maize to the nearest NCPB depot, independently or collectively, but when they arrive, NCPB is no longer accepting maize – regardless of quality. At this point, the

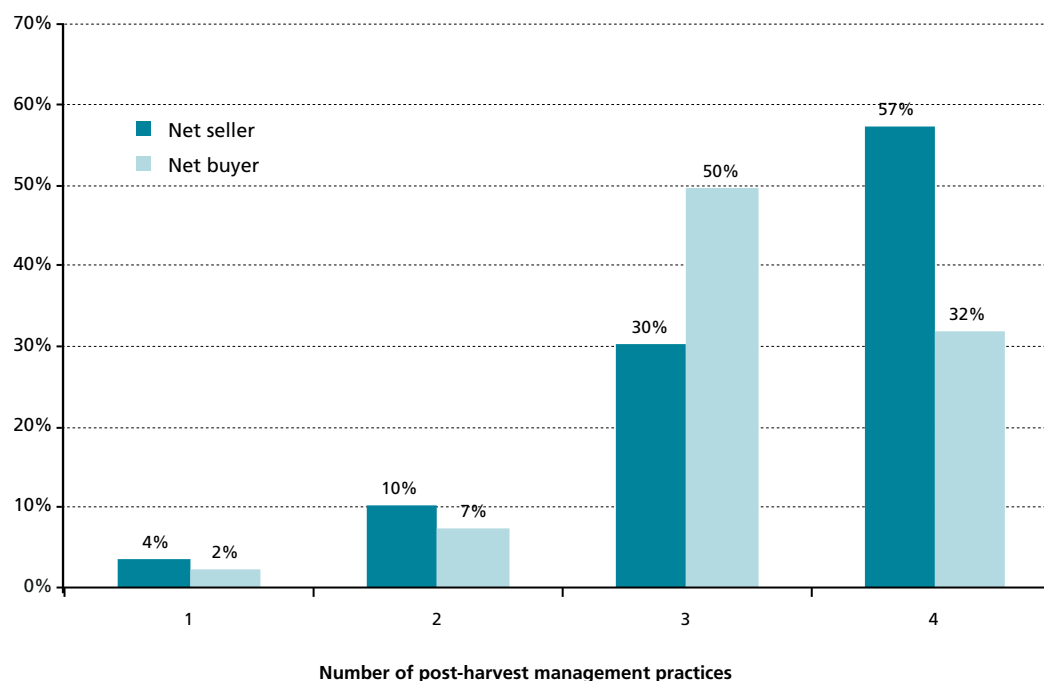
producers have incurred transport costs and can easily be persuaded to sell to assemblers in the area at a price that is lower than the NCPB price, to avoid even more transportation costs. This dynamic describes a scenario in which higher prices are announced, while smallholder maize farmers may receive prices that are even lower than their market returns, because of unnecessarily high transportation costs. As stories of this experience spread, the incentive or desire to seek NCPB as a buyer becomes smaller.

Difficulties in quality differentiation and the securing of benefits from adding value remain. This chapter investigates farmers' efforts to prepare maize grain for the market despite these difficulties. In particular, the number of quality management practices that farmers undertake in preparing the maize for sale is assessed. The quality management practices considered are: i) removing rotten and discoloured grains; ii) managing grain moisture levels; iii) removing broken grains; and iv) removing foreign materials.¹⁰ According to NCPB, millers and other institutional buyers, these practices affect the sales price of maize.

¹⁰ See Section 2.4 for a more detailed explanation and statistics on producers' post-harvest maize quality management.

FIGURE 5

Numbers of quality management practices in which producers engage, by commercial outcome/orientation (percentages of farmers)



Source: Authors' elaboration of study findings.

Figure 5 presents the relationship between the commercial orientation of the farmer and the number of quality management practices undertaken. Two main observations can be discerned. First, nearly all the net buyers and net sellers undertook at least one of the quality management practices considered. Second, 57 percent of net sellers versus 32 percent of net buyers engaged in all four practices. These findings indicate that the net sellers make more effort to prepare their produce for the market.

An expectation of a well-functioning commodity market is that a farmer who undertakes marketing functions such as managing moisture and sorting the maize will yield a price premium for doing so, all other factors being equal. There is some evidence to suggest that this expectation is being met in the Meru and Bungoma maize markets. Although the impact of maize quality management was not isolated, survey findings indicate that smallholder net sellers received a higher average price from the sale of maize than did smallholder net buyers (K Sh 27/kg

versus K Sh 25/kg).¹¹ On average, this price difference translates into a price premium of K Sh 180 (US\$2.04) on a 90 kg bag of maize. From the study data,¹² it is not possible to estimate accurately the opportunity cost of this premium, although it is important to note that the prices received are significantly different.

Factors affecting smallholders' choice of markets for maize

Chapter 2 indicated that price is not the only factor influencing producers' preferences for maize buyers. Many buyer-specific factors such as low transport costs, easy payment collection, trustwor-

¹¹ These prices cannot be extrapolated to maize revenues received by larger producers in Kenya.

¹² The study did not have data on the amount of labour and the weight loss associated with cleaning a bag of maize grain, or on the opportunity cost for family labour, which may be close to zero. The study could therefore not determine whether cleaning results in a net profit to the farmer.

thy maize measurement by the buyer (in terms of both weight and standards), and the potential for credit all influence a producer's choice of buyer.¹³

This chapter investigates the producer-specific rather than the buyer-specific factors that affect smallholders' selection of buyers for their maize. Multinomial logit regression was used to estimate how each factor affects the likelihood of selling to a particular market outlet. The statistically significant results of these estimations are presented in Table 12 (see Annex 3 for full results table with specific values). The signs show the direction of the impact of the variable on the likelihood of selling to the respective buyer. When numbers accompany a sign, the effect is relatively large with a coefficient (estimate) greater than 1.

It is important to discuss a few data dynamics that affect the interpretation of results. First, the average maize prices received from buyers across both regions differ by approximately K Sh 4/kg (US\$0.045), signalling that there are price incentives for selling to certain buyers, all other factors held constant. Rural assemblers buy at the lowest average price and distant traders and institutional buyers at the highest. Final consumers buy at similar prices to those found in the local market, but purchase smaller volumes. Second, the estimates should be interpreted as indicating how much more (or less) likely it is that a smallholder farmer with the specific characteristic sells to the specific buyer, relative to a benchmark, which in this example is selling to the rural assembler; the rural assembler is the most common buyer of smallholder maize in Kenya.

This analysis produced several insights into the differentiating factors among the smallholders who sell to various other buyers rather than rural assemblers.

For the purpose of this chapter, the analysis results are used to identify key characteristics of the smallholders who sell to the buyers that pay higher average prices for maize – distant traders and institutional buyers. To start with, gender and education level become less important as defining characteristics in selling to higher-paying buyers. From a regional perspective, being located

in Bungoma has a strong negative impact on the likelihood of selling to either distant traders or institutional buyers rather than rural assemblers. Other geographical indicators such as longer distance to market seem to push smallholders to more local buyers or to those that come to the farm (i.e., distant traders), rather than selling to an institutional buyer. Smallholders with fewer traders servicing their area are more likely to sell to the local market or an institutional buyer, where prices may be more competitive than those of rural assemblers.

From a capital endowment perspective, smallholders with greater access to higher-paying buyers are more likely to use cell phones to check market prices and are larger, in terms of both area planted to maize and income generated from maize. These findings may indicate that these farmers are more focused on maize as an income generator than a source of food for the household. Furthermore, these farmers have received NAAIAP resources, which has a strong impact on the likelihood of selling to distant traders.

A key attitudinal difference is that farmers who perceive that the Kenyan maize markets pay a premium for storage are more likely to sell to institutional buyers. The other higher-paying buyers – distant traders – buy most maize at harvest time, so storage is not a factor. In contrast, institutional buyers purchase relatively high-quality maize throughout the year. If a smallholder farmer is oriented towards using storage, the opportunity to sell to institutional buyers rather than rural assemblers increases, other factors held equal.

Farm management practices are the final area of differentiation that was analysed. The results indicate that farm management decisions are relatively important in determining the likelihood of smallholders reaching higher-paying markets. Farmers selling to these markets instead of to rural assemblers manage more aspects of post-harvest maize quality and are more likely both to check prices in the market prior to selling (most likely with a cell phone) and to plan how much maize to sell immediately at harvest versus keeping for later.

The key correlations between farmer and farm characteristics and the choice of buyer are summarized in the following boxes.

3.5 DISCUSSION AND POLICY IMPLICATIONS

Poor participation in the market is one of the principal challenges facing smallholder agriculture in developing countries. However, selling

¹³ The scales used in transactions between maize buyers and sellers are not usually inspected by an authorized third party. In addition, smallholders generally find that they have little bargaining power if there is disagreement in quality standards at a point of sale away from the farmgate.

TABLE 12

Factors affecting the producer's choice of maize grain buyer (multinomial logit regression)

Variable	Dependent variable = major buyer of maize grain; base region is Bungoma			
	Final consumer/ neighbour (K Sh 26.7/kg)	Local market (K Sh 26.5/kg)	Distant trader (K Sh 29.5/kg)	Institutional buyer (K Sh 29.2/kg)
	Coeff.	Coeff.	Coeff.	Coeff.
Farmer-specific characteristics				
Gender: male	-	+	n.s.	n.s.
Education	+	n.s.	n.s.	n.s.
Farm-specific variables				
Region: Bungoma	- (2)	n.s.	- (2)	- (2)
Distance to market	+	+	+	n.s.
Distance to road	n.s.	n.s.	-	n.s.
Number of traders	n.s.	-	n.s.	-
Number of crops	n.s.	+	n.s.	n.s.
Capital endowment factors				
Owens a bicycle	+	n.s.	n.s.	n.s.
Contacts buyer by cell phone	n.s.	n.s.	+	n.s.
Maize income (ln)	n.s.	-	+	n.s.
Maize area (acres)	+	+	n.s.	+
Owens a plough	n.s.	n.s.	n.s.	n.s.
NAAIAP recipient	n.s.	n.s.	+	n.s.
Attitudinal factors				
I believe there is opportunity for youth in agriculture	+	-	n.s.	n.s.
I view farming maize as a business	n.s.	+	n.s.	n.s.
I believe that the market pays a premium for maize storage	n.s.	n.s.	n.s.	+
Farm management variables				
I make all farm management decisions (1 = yes, 0 = otherwise)	n.s.	-	n.s.	n.s.
Number of maize quality management practices engaged (maximum = 4)	n.s.	-	+	+
I check prices in market before selling (1 = yes, 0 = otherwise)	n.s.	n.s.	+	n.s.
I plan quantities for selling and storage (1 = yes, 0 = otherwise)	n.s.	n.s.	+	n.s.
I participate in a farmers' group	n.s.	n.s.	n.s.	n.s.
Constant	n.s.	n.s.	n.s.	n.s.

Source: Authors' calculations from study findings.

in commercial markets is a primary requirement for commercial production. Current development efforts funded by the public sector seek to spur commercial agricultural development by sig-

nificantly increasing productivity through genetic improvements to crops and livestock. However, such efforts are unlikely to be fruitful without simultaneous strategies that support maize pro-

BOX 1

Selling to a neighbour

A smallholder maize producer is more likely to sell maize to a neighbour than to a rural assembler if the farmer:

- is female;
- has more education;
- lives in Meru;
- lives far from the main market;
- owns a bicycle;
- has a large area under maize;
- believes that farming represents an opportunity for the next generation.

BOX 2

Selling to the local market

A smallholder maize producer is more likely to sell maize in a local market than to a rural assembler if the farmer:

- is male;
- lives far from the main market;
- lives in an area with few traders;
- diversifies by farming more crops;
- has low maize income;
- has a large area sown to maize;
- sees limited opportunities in farming for the next generation;
- makes all the farm management decisions;
- engages in few post-harvest maize quality management practices.

ducers' entry into a differentiated market while understanding that some smallholder farmers are in a better position than others to transition in the near term. Despite the finding, indicated in Chapter 2, that many smallholder farmers do not actively pursue commercial strategies, differentiation exists within this sample of smallholder maize producers. External factors such as distance to market, and producer characteristics farm size, attitudes and farm management practices also affect whether smallholders become net sellers or net buyers. This chapter also finds that many of these factors influence the choice of buyer to which smallholders sell.

Key findings

- Although most smallholder maize producers sell their maize primarily to rural assemblers for immediate cash requirements,

heterogeneity can be found in selling options and decisions.

- Smallholder farmers who are net maize sellers tend to manage more aspects of post-harvest maize quality than do net buyers – putting themselves into a better position to sell to more discriminating and better paying buyers.
- Selling to the buyers that pay the highest prices is more likely among farmers who not only have access to larger maize plots and better infrastructure, but also make more commercially oriented farm management decisions.
- Price incentives for value addition may be present in the smallholder market, but do not appear to be strong, because rural assemblers aggregate maize of variable quality from different farms.

BOX 3

Selling to a distant trader

A smallholder maize producer is more likely to sell maize to a distant trader than to a rural assembler if the farmer:

- lives in Meru;
- lives far from the main market;
- lives close to a main road;
- uses a cell phone to find a buyer;
- has higher maize income;
- has been an NAAIAP recipient;
- does not perceive that storing maize yields more maize income;
- engages in more post-harvest maize quality management practices;
- checks prices in the market prior to selling;
- plans how much maize to sell and how much to keep for the main harvest season.

BOX 4

Selling to an institutional buyer

A smallholder maize producer is more likely to sell maize to an institutional buyer than to a rural assembler if the farmer:

- lives in Meru;
- lives in an area with few traders;
- allocates large land areas to maize;
- perceives that marketing maize later after harvest yields higher prices;
- engages in more post-harvest maize quality management practices.

The study found that while opportunities for smallholder farmers to sell maize have expanded, smallholders still produce maize mainly for their own food consumption. Boosting productivity and generating greater surpluses continue to be a challenge for all smallholders. At the same time, smallholders' ability to take advantage of the expanded marketing opportunities is constrained by ongoing challenges related to the storage and sale of maize. In particular, poor storage conditions and a tendency (need) to sell early in the season (and thus at low prices) dampen incentives to increase production.

Policy recommendations

Several recommendations and policy implications emerge from this study. Increasing productivity remains critical to smallholder commercial maize production. However, increased productivity

without planning and post-harvest quality management will not bring farmers higher revenues. The recommendations in this chapter centre on enabling smallholder maize producers to capture more value through quality improvement and better timing of sales.

1) Increase the access of both buyers and sellers to quality and management standards for the maize industry. This recommendation has two parts: part 1 involves making existing maize quality and measurement standards more accessible by educating both buyers and sellers; and part 2 involves linking smallholders to maize quality management practices such as maize drying and to maize quality measurement tools such as moisture meters.

2) Encourage the standardization of unit measurements for buying and selling in the maize

subsector. Smallholders report that trusting the buyer's weight measurement of their maize is one of the top three reasons for choosing a buyer. However, farmers also made it clear that they did not know how to convert a *gorogoro* (volume) measurement into a kilogram (weight) measurement. Furthermore, smallholder producers in this study generally knew the price for a *gorogoro* (tin) of maize, but not the corresponding market price for a 90-kg bag. To reach higher-paying and higher-volume buyers, maize must be sold in 90-kg (or more practical 50-kg) bags, not *gorogoros*. Inconsistencies in measurement, especially when moving between volume and weight measurements, put the smallholder producer at a disadvantage when selling maize. In a well-functioning market, weight and volume measures would be trusted and agreed to, to avoid creating unnecessary market inefficiencies associated with corrupted measurement. For example, facilitating the availability of trusted scales in the local village could help move smallholders towards the use of more standardized weight measurements.

3) Encourage smallholder maize producers to use commercially oriented storage. Commercially oriented storage with the primary functions of maintaining quality and exploiting temporal market price differentials is a complementary and necessary element of planning maize marketing and the management of maize quality. Maize farmers in the survey indicated that current institutional options in Kenya are not working for them. Storage can greatly lessen the severity of the hunger period for farmers, and delay the sale of maize. Stored grain can serve as collateral for the operating credit that farmers need during the early weeks of harvest. However, realizing the full potential of maize storage will require that storage be designed to be affordable, to maintain the quality of the maize and to reduce the likelihood of theft. If smallholder farmers are to trust an *away-from-home* storage option in the near future, at a minimum, they will need access (via purchase or

rental) to maize storage facilities that can accept small volumes (e.g., a single 90-kg bag).

4) Recognize the importance of medium-sized and large agribusinesses in developing the maize value chain, and facilitate their role in this regard. Agribusiness partners can be a smallholder producer's friends, rather than foes. Even when a smallholder producer has increased productivity, improved maize quality management and stored the harvested maize adequately, reaching a better-paying buyer may still prove difficult. It is challenging for smallholder producers to build relationships with large millers and supply maize to them on a reliable basis. Thus, supporting smallholders' access to trusted agribusiness partners could have a positive impact on their access to buyers. For example, rather than focusing on production alone, voucher schemes that are gradually phased out after they have helped smallholder farmers to pay for management, logistics and marketing services can be combined with productivity-enhancing support measures. The public sector can also partner agribusiness service providers, rather than competing with them, to achieve public goals for the development of smallholder farmers.

As part of the concept of partnering agribusiness service providers, it is important to recognize that rural assemblers represent a core player in the smallholder maize market in the immediate term. If rural assemblers or brokers are supported as agribusinesses in ways that allow them to differentiate the maize they purchase by quality and to manage seasonal storage and cash flow fluctuations, they will be more able to pass on competition-induced price incentives to smallholder producers. Such support to assemblers can be similar to that offered to smallholder producers, such as seasonal credit for trading, credit for buying or renting equipment, access to storage, and marketing education. The point is to move from a focus on solely the *smallholder farmer* to a focus on developing the *smallholder segment of the subsector*.

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ANNEX 3. MULTINOMIAL LOGIT MODEL

The multinomial logit model typically allows estimation of the probability that the i th market outlet is chosen relative to the base/alternative. The dependent variable in this case is therefore a discrete choice corresponding to the market (buyer) type selected by the farmer as the main buyer. The choice is made from among rural assemblers, consumers (including neighbours), local traders, large urban traders, and institutional buyers. Explanatory variables include farmer/household-specific variables, farm-specific factors, capital endowment factors, and a set of attitudinal variables.

The estimated multinomial logit model can be expressed as:

$$p_i = (Y_i = k | X) = \frac{\exp(\beta_i + \sum \beta_{ix} x_i + \varepsilon_i)}{\sum \exp(\beta_i + \sum \beta_{ix} x_i + \varepsilon_i)} \quad (1)$$

where β represents the vector of coefficients to be estimated; X is the vector of covariates; and ε is the stochastic term.

The implicit functional form of the empirical model estimated in this study is specified as:

$$\text{buyer} = \text{buyer}(F, T, K, A, M) + e \quad (2)$$

where *buyer* is the main buyer/outlet chosen by the farmer; F is a vector of farmer-specific variables; T is a vector of farm-specific variables; K is a vector of capital endowment variables; A is a vector of attitudinal variables; M is a vector of farm management variables; and e is the error term assumed to have a logistic distribution. The specific variables included under each category are as follows:

Farmer-specific variables (F): *gender* = a dummy variable, 1 for male, and 0 for female; *education* = years of education.

Farm-specific variables (T): *region* = 1 for western, 0 otherwise; *dstmkt* = distance to main market in kilometres; *dstroad* = distance to all-weather road in kilometres; *traders* = number of traders operating in the village; *cropmix* = number/count of crop enterprises (a proxy for risk).

Capital endowment variables (K): *bicycle* = 1 if farmer owns a bicycle, 0 otherwise; *phonecont* = 1 if farmer uses cell phone to find maize buyer, 0 otherwise; *lnmzincome* = natural log of income earned from maize; *mzacres* = area of land under maize in acres; *ownplough* = 1 if farmer owns a

plough, 0 otherwise; *naaiap* = 1 if farmer received input support from NAAIAP, 0 otherwise.

Attitudinal variables (A): *opportunity* = 1 if farmer agrees that there is opportunity for youth doing farming as a full-time business, 0 otherwise; *farmbus* = 1 if farmer perceives farming as a full-time business, 0 otherwise; *storemz* = 1 if farmer perceives that storing maize earns higher future income, 0 otherwise; *mktlat* = 1 if farmer perceives marketing later in the season to yield higher prices, 0 otherwise.

Farm management variables (M): *alldecis* = 1 if farmer makes all maize management decisions, 0 otherwise; *checkpric* = 1 if farmer checks market price prior to selling, 0 otherwise; *numqlty* = count of quality management activities undertaken; *longsnplan* = 1 if farmer plans how much maize to sell and keep during long season, 0 otherwise; *group* = 1 if farmer belongs to a farmers' group, 0 otherwise.

Factors affecting the producer's choice of maize grain buyer (multinomial logit regression)

Dependent variable = major buyer of maize grain; base outcome is the rural assembler/broker								
Variable	Final consumer/ neighbour		Local market		Distant trader		Institutional buyer	
	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
Farmer-specific characteristics								
Gender: male	-0.671	0.066	0.586	0.085	0.012	0.978	0.764	0.180
Education	0.135	0.005	0.065	0.176	0.045	0.510	0.019	0.803
Farm-specific variables								
Region: Western	-2.142	0.000	0.166	0.780	-2.036	0.016	-2.246	0.000
Distance to main market	0.098	0.004	0.078	0.016	0.125	0.026	0.062	0.120
Distance to road	-0.082	0.660	0.063	0.144	-0.241	0.035	-0.025	0.619
Number of traders	-0.027	0.171	-0.142	0.000	-0.021	0.576	-0.062	0.032
Number of crops	-0.039	0.639	0.153	0.061	0.080	0.613	0.120	0.496
Capital endowment factors								
Owns bicycle	0.719	0.079	-0.360	0.315	-0.413	0.451	0.123	0.802
Uses cell phone for buyer	-0.039	0.943	0.333	0.377	0.952	0.082	0.582	0.238
Maize income (ln)	-0.059	0.128	-0.078	0.073	0.160	0.019	0.020	0.741
Maize area	0.241	0.004	0.157	0.066	0.124	0.338	0.161	0.093
Owns plough	-0.289	0.454	0.535	0.161	0.888	0.138	0.477	0.110
NAAIAP recipient	-0.484	0.318	0.276	0.479	1.438	0.026	0.228	0.714
Attitudinal factors								
Opportunity for youth	0.394	0.089	-0.417	0.063	0.422	0.248	-0.094	0.757
Farm as a business	0.204	0.508	0.790	0.002	-0.126	0.785	0.435	0.267
High-price storage	-0.403	0.182	-0.269	0.343	-1.187	0.045	0.219	0.530
High-price market ltr	0.108	0.698	-0.438	0.104	0.063	0.887	0.704	0.063
Farm management variables								
Makes management decisions	-0.233	0.542	-0.661	0.065	-0.243	0.669	-0.696	0.143
Maize quality management	-0.072	0.767	-0.541	0.008	0.592	0.039	0.539	0.054
Checks prices in market	0.003	0.586	0.001	0.840	0.024	0.024	-0.005	0.463
Plans to keep/store	-0.442	0.246	0.082	0.840	2.165	0.002	0.284	0.622
Participates in group	0.195	0.558	0.010	0.977	0.025	0.961	0.247	0.629
Constant	-0.002	0.999	0.260	0.887	1.750	0.494	-2.400	0.337

N = 397; Wald Chi-square = 268.19; p-value = 0.000; Pseudo R-square = 0.227.

Source: Authors' elaboration of study findings.



4

Collective marketing by smallholder farmers – shifting from projects to partnerships

David Neven, Andrea Woolverton, Julius Okello and Michele Binci

Chapter highlights

- Operating as individuals, smallholder maize farmers are locked into the traditional marketing system.
- Collective maize marketing by smallholders is undermined by the smallholders' entrapment in a vicious poverty cycle.
- Where collective maize marketing by smallholder farmers does emerge, it has positive impacts on their income but not necessarily on their commercial status.
- Partnership-driven approaches to supporting collective maize marketing by smallholder farmers may be more promising than traditional project-driven approaches.

4.1 INTRODUCTION

Food security and adaptation to transforming food value chains are two key challenges for smallholder producers of staple foods. The latter are often net buyers of the very commodities they produce, and those that are net sellers trade mostly on unfavourable terms because of their low market power. Furthermore, as Chapter 2 indicated, producers do not necessarily produce with commercial objectives, and they base their market choice decisions on factors other than price received. Chapter 3 indicated that even if farmers are incentivized by existing price premiums for higher-quality maize grain, they often lack the capacity to respond to these opportunities.

The smallholder's ability to sell profitably into staple food markets is eroding over time because of the transformation process that is taking place in both the formal (modern) channels of large processors/traders and urban markets and the informal (traditional) channels of small processors/traders and rural markets (see, for example, Reardon *et al.*, 2012 for the case of Asia). This transformation is characterized by shorter channels (fewer intermediaries), technological upgrading (e.g., storage) and institutional change (e.g., contracts, quality standards). In this changing environment, collective marketing in bulk, directly through a producer organization or indirectly through collaboration with a marketing service provider, is a necessary condition for smallholder producers to overcome the double challenge of high transaction costs and low market power at

Photo: Kenya Agricultural Commodity Exchange (KACE) franchise – Chwele market resource centre

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the individual farmer level. This is especially the case for staple foods such as maize. Achieving commercial viability with low unit values and low marketing margins necessitates even larger maize volumes and greater operational efficiency. The fact that staple foods such as maize are widely traded and are politically sensitive compounds the challenge.

The challenge of including smallholder farmers in staple food value chains in developing countries requires extensive capacity building and has become an increasingly important focus not only for the public sector (government programmes, donor projects), but increasingly also for the private sector. The strategies of larger processors are gradually shifting from image boosting corporate social responsibility to competitiveness enhancing, shared-value business models. At the same time, in response to changing consumer demands and increased competition, value chain actors in the informal channels are also trying to upgrade their links to smallholder producers, who often account for the bulk of staple food production. Individually or in partnership, both the public and private sectors have attempted to facilitate linkages between smallholder farmers and these changing value chains and end markets, with varying success. The nature of the facilitation effort – most notably project versus partnership models, with differences in terms of aligned objectives and time horizons – plays an important role in determining long-term success.

A collective action business model is a strong candidate for smallholder staple producers, but achieving commercial viability and inclusiveness adheres to the “Anna Karenina principle”: an endeavour in which there is a deficiency in any one of a number of critical factors will fail.¹⁴ Applied here, this principle means that the success of a business model does not depend on the presence of a particular positive trait, but rather on the lack of any number of possible negative traits (i.e., the presence of any one of these negative traits would lead to failure).

Most fundamentally, the costs of collective action have to be lower than the benefits. Whether

or not this result is achieved depends on a number of factors, most of which require extensive capacity building in managerial, financial and marketing skills, transparency, the ability to meet quality standards and minimum trading volumes consistently, the commercial orientation of group members, and so on. The degree to which these capacities are built, and whether or not they will keep improving over time, is highly dependent on the nature of the model under which they were developed. Using the case of maize in Kenya, this chapter contrasts two distinct models of facilitating smallholders’ collective marketing of staple foods, with different storage and management approaches and distinct roles played by the private and public sectors. The differences in performance between the two models expose some of the critical failure factors.

The chapter is structured as follows. Section 4.2 reviews the literature on collective marketing by smallholder producers. Section 4.3, based on primary data gathered for this study as discussed in Chapter 1, presents and assesses Kenya’s experience of two contrasting business models for the collective storage and marketing of maize: one driven by the public sector, which has a project nature; and the other driven by the private sector, which has a partnership nature. Section 4.4 concludes with a summary and implications for the design of policy and support programmes.

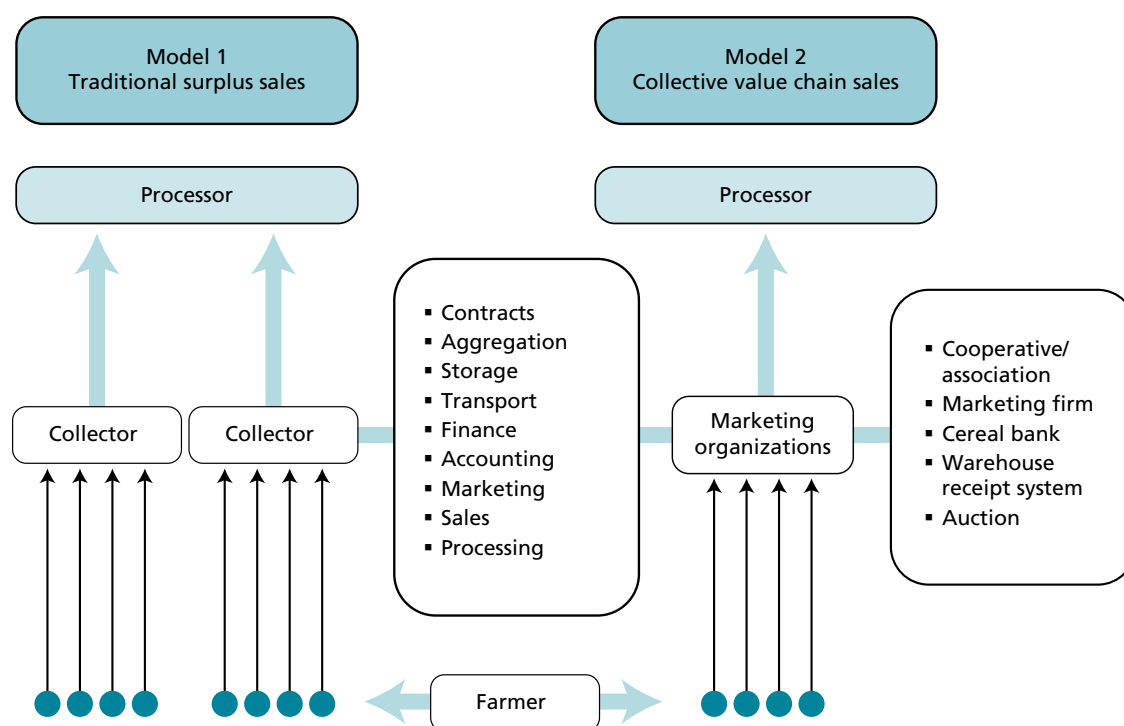
4.2 LITERATURE REVIEW

Since the early 1990s, a structural transformation process has been under way in the global agrifood system and, subsequently, in the agrifood systems of developing countries (Reardon and Barrett, 2000). For smallholder farmers, participation in the emerging modern marketing channels entails a shift from traditional spot market transactions to highly coordinated value chain transactions, as depicted in Figure 6. As traditional collecting agents buying at the farmgate or at rural collection points largely lack the capacity to meet the requirements of emerging buyers such as large processors or retailers (e.g., larger volumes, more regular supplies, and compliance with standards), new types of collective marketing organization have emerged. Examples of such organizations include marketing cooperatives or associations, marketing firms (as traders or service providers), cereal banks, warehouse receipt systems and auctions.

Given this increased importance of collective action by smallholder producers, the research literature on the topic has grown and started to

¹⁴ The Anna Karenina principle was popularized by Jared Diamond (1997) who uses this principle to illustrate why so few wild animals have been successfully domesticated throughout history, as a deficiency in any one of a great number of factors will make domestication of a species impossible.

FIGURE 6
Traditional spot marketing versus collective marketing by smallholders



Source: Authors.

develop new perspectives (Ostrom, 1990; Bromley, 1992; Reuben, 2003). A number of field studies have shown that people act collectively in certain circumstances, when they appreciate that they would become better off by voluntarily contributing to a collective action (Montgomery and Bean, 1999; Markelova and Meinzen-Dick, 2009). Particularly in rural areas, individuals have been found willing to overcome various aspects of their short-term, self-interested behaviour given the potential benefits associated with collective action in activities such as planting, harvesting, marketing and rule enforcement at the local level (Ostrom, 2004). Several authors have argued that collective action realizes scale economies by pooling smallholders' resources and that it enables smallholder groups to adopt technologies, increase their bargaining power, and overcome land size, asset and other wealth-related constraints (Moser, 1996; Stringfellow *et al.*, 1997; Meinzen-Dick, Raju and Gulati, 2002).

While evidence has proved that collective action is effective in ensuring efficient and sustainable resource management, research indicates that

smallholder producers find it more challenging to pursue shared objectives as a group in other areas, including collective marketing (Barham and Chitemi, 2009). In particular, the transaction costs associated with organizing a collective marketing strategy, including ensuring access to common storage facilities and undertaking thorough quality control, often appear to be higher than the cumulative benefits derived from collective marketing (Berdegúé Sacristán, 2001). At the same time, some evidence seems also to show that as a result of specific enabling conditions, collective market development can assist poor smallholders in overcoming unfavourable market conditions by facilitating innovation and value addition (Markelova and Meinzen-Dick, 2009; Devaux *et al.*, 2007).

A substantial body of empirical evidence highlights the challenges of collective marketing, especially for crops with a traditionally low market profile such as staple foods. In this regard, the largely failed attempts to establish cereal banks in Africa are symptomatic of the problem. In response to the famines of the 1970s and 1980s, a number of African countries introduced the

concept of cereal banks, which for a while became the most popular structures around which to build new staple crop producer organizations. These cereal banks were sponsored by development agencies and NGOs and generally had a large range of short-term social and economic goals, aimed at improving smallholder market access and breaking the vicious cycle of selling at low prices and buying at high prices. Several studies have shown that these groups failed to achieve their objectives and gradually disappeared over time, mainly because they were institutionally unsustainable (Günther and Mück, 1995; FAO, 2002). The main issues undermining the cereal banks included a lack of good management, an overdependency on external support, and a confusing mix of business and social objectives. When the cereal bank model was replicated in Kenya in 2002 (see model 1 in Section 4.3), a similar set of problems emerged, with poor results attributed to slow collective decision-making procedures, endemic corruption and an unsustainable model of business enterprise (Coulter, 2007).

The formation and efficient functioning of smallholder farmers' marketing groups roughly depend on the interaction across three broad categories of factors: i) the characteristics of the agricultural products and rural markets; ii) the characteristics of the farmers themselves; and iii) the institutional arrangements (Markelova and Meinzen-Dick, 2009).

Impact of product and market characteristics

As far as the type of market is concerned, collective action tends to be more useful (and necessary) in reaching urban, regional and international markets rather than local rural markets, because the latter can be relatively more easily reached by individual farmers. On the contrary, access to larger markets is characterized by high transportation costs and more complex quality standards; hence, groups of smallholders are better equipped than individual smallholder farmers to overcome these scale and quality issues.

At the same time, the incentives for acting collectively differ depending on the agricultural products grown by smallholders. As cash crops and horticultural production require more expensive as well as more extensive storage and transportation facilities, producers of these products are keener to work collectively (FAO, 2007). A few Kenyan producer organizations have succeeded in adopting a marketing strategy for their horticultural products (Markelova and Meinzen-

Dick, 2009). Maize and other staple crops are usually sold to local markets for eating and are relatively easy to transport. As a consequence, maize producers often do not see a clear indication of the potential benefits associated with the formation of a marketing group. However, in grain-deficit areas, where farmers sell shortly after harvest and buy from markets during the hunger season later on – a widespread scenario – collective action for storage near the farm or village has at least some economic logic behind it as it saves two sets of transportation costs and removes the trader's margin. Furthermore, such collective storage would increase the farmer's awareness of saving and planning from season to season.

Impact of farmer (group) characteristics

Evidence also shows that relatively smaller marketing groups tend to be more successful because they manage to maintain a higher level of internal cohesion and apply a better system of internal monitoring. To take advantage of scale economies, these small and more homogenous groups can build a federation of cooperatives, thus acting as a larger group made up of distinct entities (Markelova and Meinzen-Dick, 2009).

The internal composition of a group can affect its overall stability and effectiveness, depending on the degree of socio-economic differentiation among its members. While less differentiated groups have the immediate advantage of being more integrated, a more hierarchically structured marketing group can benefit from knowledgeable and skilled leadership, which increases its probability of success. In fact, strong leadership was found to be crucial for groups to achieve good farming contracts in the United Republic of Tanzania, and is generally more important than internal cohesion in increasing the chances of success (Barham, 2006). Similarly, a lack of leadership has been singled out as the most significant impediment for producer organizations in Mali to function correctly (Coulter, 2007). For leadership to be respected and effective it needs to be trusted by the rest of the group, and this is more easily achieved if members know each other and are used to working together and sharing other activities within the community (FAO, 2007; Wei *et al.*, 2003). This point highlights the parallels between the collective action literature and the social capital theory. A number of studies have demonstrated that successful collective action in agriculture is underpinned by structural and cognitive forms of social capital, which include attitudes, trust and

the resulting social networks, especially in community-based groups (Uphoff and Wijayarathna, 2000; Krishna, 2001). Social capital, expressed in terms of interpersonal trust and established business relationships, has been shown to contribute positively to the success of agribusiness cooperatives and cooperatives for staple crop marketing, especially during the early stages of enterprise formation (Jones, Freeman and Lo Monaco, 2002; Johnson, Suarez and Lundy, 2002; Coulter, 2007).

Impact of institutional arrangements

Social capital also entails common rules and procedures, which are part of the “rules of the game” (Dorward *et al.*, 2005). These institutional arrangements are critical to the success of any form of collective action because they represent the necessary governance and coordination mechanisms of the group, which enable market transactions. Well-crafted institutions reduce the high transaction costs faced by farmers, including transportation and information costs, and help link producers to markets and facilitate the processes of exchange (Markelova and Meinzen-Dick, 2009). Institutions are also responsible for the legal status of a group, which influences its ability to undertake certain transactions or interact with other actors on the market.

Shiferaw, Obare and Muricho (2006) point out that Kenya’s Producer Marketing Groups, a collective initiative formed to improve smallholders’ market access, are put at a disadvantage by being registered according to the Kenyan law as self-help groups (social groups) rather than business enterprises. This legal framework prevents staple producers from obtaining access to credit from formal financial institutions, which is one of the main constraints to collective action for marketing organizations. As they are not recognized as business enterprises, these marketing groups cannot sue or be sued in case of liability, and financial institutions are unwilling to engage with them in such circumstances. Being granted the most appropriate legal status is therefore an essential element for marketing groups to obtain access to complementary services that can facilitate their collective action (Shiferaw, Obare and Muricho, 2006).

Collective action and the role of the public sector

The specific form of organization that best suits the needs and goals of a marketing group depends on various factors characterizing the local context, and different arrangements can have different effects. In this regard, the relationship between

collective marketing groups and external agents, including donors, NGOs, policy-makers and the private sector, is a critical aspect that needs to be taken into account.

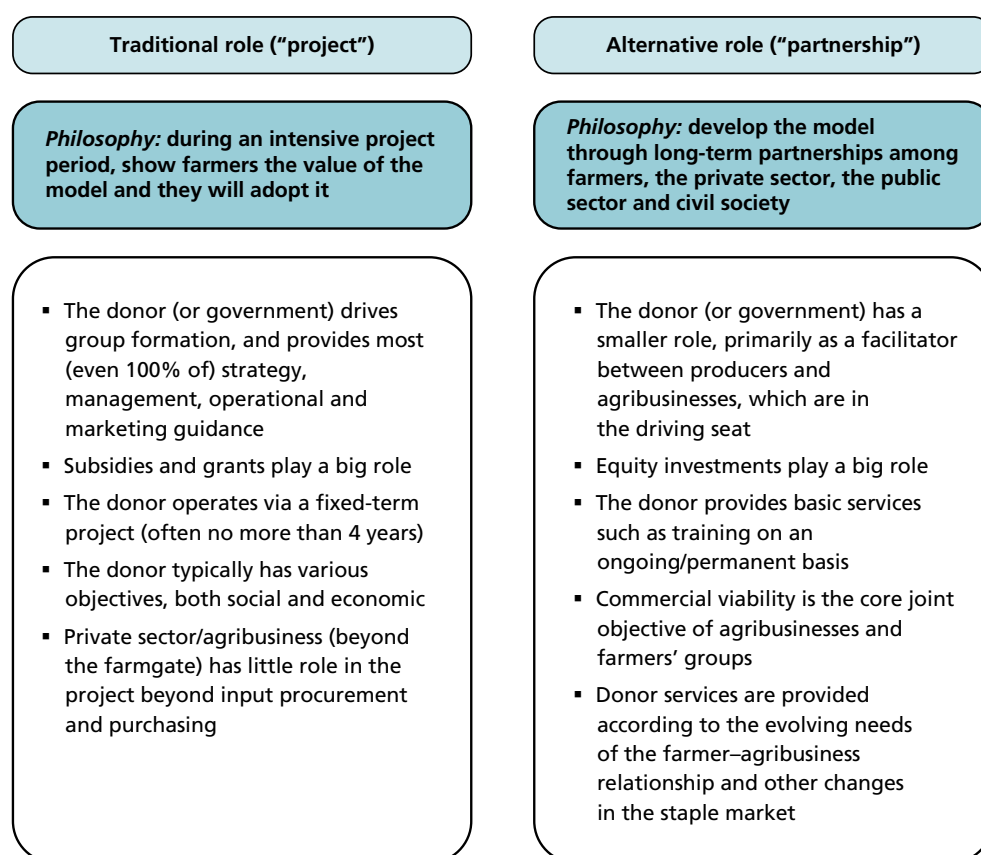
In particular, the concurrent role played by public donors and private agents has come under increasing scrutiny, with public–private partnerships emerging as a valuable option for creating virtuous synergies (Markelova and Meinzen-Dick, 2009). The role of national governments or other major donors, such as the World Bank, as public good providers is commonly deemed necessary for the provision of basic needs such as infrastructure, credit access and market information. In Uganda, for example, market information is broadcast by FM radio stations in local languages and English, with the support of a dedicated government agency (Robbins *et al.*, 2004). These public goods are prerequisites for farmers’ groups to organize themselves around collective marketing strategies, with the prospect of participating in more challenging markets (Kelly, Adesina and Gordon, 2003). Therefore, governments need to provide the appropriate macroeconomic framework and legal environment, while external organizations and donors can play a supporting role in the formation and development of farmers’ groups by reducing transaction costs and enhancing information and awareness among group members (Robbins *et al.*, 2004; FAO, 2007).

However, when cooperatives and groups are directly established or even run by governments, donors or NGOs, a number of issues appear to undermine the effectiveness and sustainability of the collective action. The case of the cereal banks discussed earlier in this section is a stark example of this. Non-merit-based elite groups can take advantage of the subsidized assistance provided by donors, capturing all the benefits that should be shared by the group. This has happened in Zambia, for example, where resources allocated by the World Bank to build community stores were hijacked by local elites and used for unintended purposes (FAO, 2007).

In addition, big donors, being tied by rigid implementation agreements, are normally unable to take a flexible approach and find it more difficult to learn from mistakes and adjust according to the constantly changing domestic and export markets. Furthermore, if sustainable linkages between farmers’ groups and private sector intermediaries are not put in place, and group members are not provided with business training and technical back-up, farmers risk losing all contacts with the

FIGURE 7

The public sector's role in supporting collective marketing models



Source: Authors.

market when the government, NGOs or aid agencies withdraw their support (FAO, 2007). As an example, when the Agricultural Development and Marketing Corporation was no longer able to support Malawi's smallholder "farmer clubs", most of these groups collapsed, especially those producing staple crops (Coulter, 2007).

Innovative approaches that encourage the simultaneous participation of the public and private sectors as well as civil society organizations seem to be preferable in assisting smallholders in moving towards high-value agriculture and participating collectively in the market (Markelova and Meinzen-Dick, 2009). Marketing information provided via private services, for instance, tends to be more tuned to market needs than most public statistics, and the private sector is generally seen as more efficient in providing a large set of business development services such as microcredit, technical expertise and product development

assistance (Narro *et al.*, 2007; Markelova and Meinzen-Dick, 2009). In his study on a relatively recent example of Uganda's producer marketing organizations, Coulter (2007) points out that encouraging farmers' groups to engage directly with private sector buyers has helped them to grow and improve their marketing arrangements. More specifically, producing and organizing the groups' marketing strategies to respond to market demand while avoiding donors' cash hand-outs and externally imposed top-down structures is indicated as the basis for success of these Ugandan marketing organizations.

These findings translate into a distinction that can be made between two development models based on fundamentally different development philosophies and with markedly different roles for the public sector: a traditional project approach ("push model"), and an alternative partnership approach ("pull model") (see Figure 7).

Collective action and the poorest of the poor

Although the involvement of the private sector brings competency and efficiency, the resulting distribution of marketing benefits has historically often been biased against vulnerable smallholder groups, because the most competitive commercial agents are also those who tend to capture most of the profits. Studies in Kenya and other African countries confirm that the poorest farmers risk being left out of certain farmers' groups because of unaffordable entry, membership or service fees (Narrod *et al.*, 2007; Markelova and Meinzen-Dick, 2009). Hence, there is a strong case for the State or donor agencies to play a part in making sure that marketing services also reach smallholder groups engaged in staple crop production, which would otherwise be excluded by the private sector as they represent an unprofitable investment because of the high transaction costs they face (Markelova and Meinzen-Dick, 2009).

Nevertheless, even among smallholder farmers there is great heterogeneity in terms of their ability to participate in staple food value chains on a commercial basis (i.e., farming as a business). Many smallholders produce only to subsist, and not because they see their farms as their main businesses. The effective integration of smallholder producers thus implies recognition of this segmentation. That is, collective marketing should focus on the top layer of smallholder farmers – those who can, or could with some assistance, engage in truly commercial farming and expand their farms over time. Subsistence farmers will benefit from job creation on larger farms and from spill-over effects (multiplier), and may need to be assisted through social support programmes.

4.3 FINDINGS FROM KENYA'S MAIZE VALUE CHAIN

The buyers' perspective

From the maize miller and trader survey conducted for this study, a picture of the traditional maize supply chain in Kenya emerges. Typically, small traders and small millers (*posho* mills) buy maize from individual farmers, whereas large traders and millers buy mostly from brokers (i.e., intermediaries buying directly from farmers) or the National Cereal and Produce Board (NCPB). The grain is usually transported by the supplier to the buyer at the former's cost, either directly or, if the buyer picks the grain up from the farmer, at a transport cost of K Sh 10–20 per bag (depending on volume and distance), which is deducted from the agreed

price.¹⁵ It should be noted that transport costs are further increased by a cess fee of K Sh 40 per bag (which key informants indicated is often replaced by a bribe). The NCPB price sets the benchmark, but local market conditions will take prices higher or lower from this point. NCPB's stringent quality standards discourage many farmers from selling to it. Furthermore, few smallholder farmers enter into maize production contracts in the maize value chain, mostly because the volatile market prices that result from unpredictable weather conditions and political decision-making will quickly lead to side-selling or side-buying. Contract production also requires more and higher-quality inputs, and thus bigger production loans, which farmers are often wary of taking up, especially if their farms have to be used as collateral in the process. Consequently, open spot market operations prevail.

Small traders and millers (i.e., those handling fewer than 100 bags per week – 500 bags over a three-month trading period) like buying from smallholder farmers directly because: i) farmers tend to use less standard bags or tins, meaning that their "extended 90-kg bags" weigh more than 90 kg at the same price per bag, and thus the maize is cheaper for the trader (see Section 3.5); ii) farmers desperately need cash, which implies that the traders are in a strong negotiating position and can set the price; iii) farmers supply fresh (not stored) maize of homogeneous quality (as it is not blended with other maize); iv) negotiating a deal with an individual farmer is easy and fast; and v) farmers bring the grain to the trader, which is not only convenient and saves costs, but is also safer as the trader does not have to take money into the production area. Unsurprisingly, these traders are not keen on buying from farmers' groups because doing so would undermine these advantages.

Essentially, these traders set a daily take-it-or-leave-it price and buy any volume offered by farmers at that price, as long as the trader's storage capacity and cash flow allows it. When a farmer calls to indicate that he/she has maize for sale, the trader sends an inspector to the farm to assess the quality of the maize. On acceptance of the quality and the price, the farmer then arranges for transport to take the maize to the trader, or

¹⁵ An alternative model is one in which a measurement cup (*gorogoro*) holding just over 2 kg is used while the farmer is paid for exactly 2 kg. This discrepancy caters for transport costs and allows traders to sell at a profit.

the trader picks it from the farm at a price that is discounted by the transportation cost. Farmers are paid cash-on-delivery. Establishing more coordinated links between such traders and farmers is challenging, as farmers are price-responsive rather than buyer-responsive.

Large traders or millers (e.g., those handling 100 tonnes per month) need more regular and larger supplies than they can get directly from smallholder farmers. While most large traders and millers will buy from farmers who can supply minimum quantities (e.g., 50 bags) of at least a minimum quality, they depend largely on supplies from brokers, local markets or NCPB, particularly if the miller has preferred access to NCPB grain stocks. Brokers are the key suppliers and are preferred because they can supply the required volumes on time and when needed, based on a phone call, and because they typically offer trade credit. Brokers in turn buy from farmers or open markets and provide their own transport, handling volumes in lorry loads of 30 tonnes. As suppliers, brokers have the disadvantage of supplying maize that is of less homogeneous quality (because it is a blend originating from many maize farms) and is less fresh (their maize is stored longer).

These disadvantages are even more pronounced for NCPB supplies, in which maize that has been stored too long has acquired a bitter taste or may even become mouldy. Furthermore, buying from NCPB is a lengthier process than buying from brokers, and NCPB does not transport the grain, thus increasing the costs for clients. However, NCPB grain is better graded, cleaned and treated, and prices are more competitive, especially when supplies are low. Brokers are more expensive, but competition implies that buyers are willing to pay a premium for reliable larger-volume supplies, delivered on time. Consequently, large traders and millers are more interested in buying from groups of farmers, especially if these groups can improve on the broker's offer through fresher maize or a lower price. Another reason why millers like buying from farmers directly is that they can inspect how the maize is dried.

The larger maize handlers represent more formal businesses than their smaller competitors and, as such, are subject to more costs, creating an uneven playing field. For example, large traders and millers both have to pay business licence fees and weighing scale fees (to the Kenya Bureau of Standards). Large millers claim that small *posho* mills do not adhere to official standards and thus

sell a lower-quality product cheaply and competitively on the market, especially for lower-income consumer segments.

All buyers inspect the quality of the maize, including by checking the moisture level (which is often too high, above the required 13.5 percent, especially just after harvest), colour (discolouration), percentage of broken kernels, and presence of insects (e.g., weevils), moulds or other foreign material (sand, pebbles). Testing for aflatoxins is not commonly done because of the high cost. Larger buyers are more demanding in this regard, especially millers who are concerned about processing efficiency. The higher standards demanded by these millers make them riskier market options because there is a higher chance of rejection of the maize supplied to them. For example, these millers prefer large kernels with higher fat content, which allows for more efficient and profitable milling, and they care more about clean transport because sand in the grain represents a problem for them. In this context, maize buyers also care about the origin of the maize, as some regions have a reputation for high sand content, high or low moisture content, high quality (softness, taste) and so on. Further downstream, end market consumers care only about quality (visual appearance, taste, freshness) and price. They do not care about variety, grade or source of origin.

Buyers are concerned mainly about the lack of a maize supply that is reliable in quantity and quality, evenly spread over time, and competitive in price, indicating that better access to farm inputs, more staggered production, better production and post-harvest handling practices, government drying facilities, and improved road and rail infrastructure would be the key pathways to addressing problems.

The farmers' perspective

Discussions with farmer focus groups revealed that the vicious circle that keeps smallholder farmers entrapped in poverty also undermines their efforts to engage in collective marketing. As discussed in Chapter 2, the precarious position of the smallholder runs along the following lines. Many farmers rely heavily on crop production, and during the crop growth period have little income and need to postpone cash expenditures for as long as they can (e.g., on margarine, fish, clothes, etc.). At harvest time, to address the backlog of cash needs, as well as new cash expenditures (most notably school fees, but also medical costs and clothes),

farmers have to sell much of their grain.¹⁶ The need to sell is amplified by the fact that farmers have few good storage options, putting any stored grain at risk of spoilage and theft. As, to a large degree, farmers harvest and market at the same time, they sell at the lowest prices of the year (when supplies are highest). In any case, for price information, farmers are largely dependent on the very traders to whom they sell their grain.

As the year continues and the new planting season comes around, farmers find themselves without cash to buy the inputs (quality seeds, fertilizer) needed to obtain the full potential of 70–90 bags of maize per hectare from their land.¹⁷ Instead, they harvest perhaps as few as 10–20 bags per hectare, which undermines their income and thus their food security. Breaking the cycle is as much a matter of improving farm and financial management (e.g., through access to loan products, planning, capacity building) to get the business model right as it is a matter of improving production practices. The smallholder support programmes implemented in Kenya by USAID (KMDP) and the One Acre Fund, which provide packages of inputs and training on a loan basis, appear to be examples of approaches that work in breaking the poverty cycle in the Bungoma area.¹⁸

As farmers have got used to an absence of profits, or as they realize that any profits will be pulled off into family support (“pull down”) or go towards buying small livestock (savings strategy), they generally do not engage in planning of their production with a particular business or marketing strategy in mind, as indicated in Section 2.4,¹⁹ nor are they engaged in thinking about how to invest the illusive profits in upgrading their farming operations. Because as individuals they have such small volumes to sell, getting to commercial

volumes implies bringing large numbers of farmers together. However, farmers differ greatly in their cash/food needs, their tolerance of risk, the volumes they want to market, and the urgency with which they need to sell, and thus any group of farmers can quickly represent a heterogeneous group that will find it difficult to manage its operations in a business-like, market-oriented way. The cut-throat cash flow situation also implies that a great deal of trust is required for farmers to offer their meagre harvests for other farmers to sell on their behalf. This trust is often absent.

Low literacy and numeracy levels compound the challenge (e.g., the inability to read receipts or calculate returns), leading to the risk of “elite capture”; a lack of understanding of how markets operate; the need for cash-on-delivery payments; farmers’ lack of trust in weights and measurements, especially with regard to the buyer’s scales as opposed to volume measurement, despite the fact that the 90 kg bags and 2 kg *gorogoro* tins²⁰ generally used in transactions are not standardized; a lack of understanding of the relation between moisture content and weight; and the associated negative experiences of past attempts at collective marketing (generally because of weak management and often also internal fraud).

As NCPB storage facilities are often far from the farm, on-farm storage is the only storage solution for many farmers. Given the prevalence of theft, most farmers store grain in-house, although some have lockable metal silos.²¹ As home storage implies a high-humidity setting, it often leads to aflatoxin problems. In combination with high exposure to the larger grain borer (locally called *osama*), this implies large post-harvest losses for on-farm storage. The best alternative for farmers in this case is often to sell at harvest (minimizing storage and even selling below the cost of production if desperate enough). NCPB, which may offer a better price than the trader, is a challenging buyer to sell to because it may take a while before the farmer receives payment, and because NCPB wants at least 50 bags per delivery and sets higher quality standards, which may be difficult to achieve for smallholder farmers who do not have the right equipment. For example, the hand

¹⁶ School fees can be anything from K Sh 10 000 to K Sh 20 000, depending on the specifics. This expenditure represents five to ten bags of maize.

¹⁷ USAID’s Kenya Maize Development Program (KMDP) has shown that such yields can be attained with the right inputs.

¹⁸ In the big picture, it is not realistic to expect that this cycle can be broken for all subsistence farmers. Facilitating a transition to off-farm jobs is likely to be a more significant pathway for escaping poverty.

¹⁹ Rather, they plan their consumption, rationing grain to make it last as long as possible. When they run out of maize, they resort to the sale of other crops (e.g., vegetables and fruits) and off-farm income to survive through the hunger season until the next harvest.

²⁰ The *gorogoro*, basically a reused tin food container, is a unit of volume used in grain trading in western Kenya. Although the size of the tin is not standardized, the weight is roughly 2.25 kg of dry maize kernels.

²¹ Many of these metal silos were designed by FAO, locally made by artisans and distributed by NGOs.

threshing practised by most smallholder farmers leads to a much higher percentage of broken grains compared with mechanical threshing.

Does collective action make a difference in marketing by smallholder producers?

Given the daunting challenges smallholder farmers face when marketing their maize individually, collective marketing appears to be the most logical strategy to adopt if it can be done effectively, i.e., if the organizational costs are significantly lower than the increased transaction benefits. The survey conducted for this study differentiated between producers who engage in collective marketing and producers who do not. This allowed for a statistical and econometric assessment of the impact of collective marketing along various dimensions.

Comparing smallholder farmers who participate in collective marketing with those who do not, significant differences were found (see Table 13). Members of collective marketing groups are characterized by a higher concentration of decision-making by the main agricultural decision-maker in the household, and they see themselves much more as commercial farmers who produce for the market and who are more willing to take risks. Given the presence of group storage, members store less in the house. Furthermore, member farmers have smaller households, keep larger stocks for home consumption, and have better access to support programmes (training, inputs). As could be expected, members are much more likely to sell maize (80 percent versus 50 percent of non-members) and to be net sellers in both volume and income terms. When broken down by region (western, eastern), these differences persist.

In a next step, the impact that collective action among smallholder farmers has on their income derived from maize was tested in a linear regression. (See Annex 4 for the specific model and regression results.) Controlling for education level, distance to markets, district and farm size, it was found that the *collective marketing models in which farmers in this study engage have a significant and positive impact on the income derived from maize production and marketing*.

Similar regressions found that collective storage and selling also:

1. have a positive impact on the share of income from maize sales in total income;
2. facilitate access to production and marketing training;
3. do not have any significant effect on the farmer's net seller status related to maize.

The last finding implies that joining a collective storage or marketing group leads to selling more maize in the market, but does not affect the farmer's buying and selling dynamics to the point where he/she shifts from being a net buyer to a net seller, i.e., the farmer manages to make more from selling maize than she/he spends on buying maize for household consumption. In other words, at this stage and in these regions, *the transformational effect of collective marketing in terms of a shift to commercial farming is constrained*, and the larger impact is perhaps felt in areas that are characterized by more self-consumption and local sales.

Two distinct approaches to collective marketing

This subsection compares two distinct approaches to facilitating collective marketing among smallholder producers. The first is a community cereals bank model in the Bungoma area (Western Province), which is of the project type described in Section 4.2. The second is a village-level aggregation model in the Meru area (Eastern Province), which is of the partnership type.

Collective marketing can take many forms. In each area and for each commodity and group of farmers, the execution of collective marketing differs. As can be derived from the discussion in the previous subsection, the success of smallholders' collective marketing efforts depends strongly on a number of factors that can be organized into a number of functional areas (see Table 14). The two collective marketing business models discussed here are described, and their performances are evaluated using these criteria.

Model 1: cereal bank model ("project model")²²

Nature of the model: The cereal bank programme of the Sustainable Agriculture Centre for Research and Development in Africa (SACRED Africa) smallholder marketing movement ran in western Kenya over the period 2003–2006. This cereal bank effort was motivated by the high price volatility observed in Kenya's maize markets during the 1997–1998 period. When farmers experienced high-yield seasons, maize prices collapsed as maize flooded the open market during harvest. This price volatility was the main motivation for creating the

²² Largely drawn from Mukhwana, Nyongesa and Ogemah (2005) and Mukhwana (2012).

TABLE 13

Characteristics of farmers, by collective marketing group membership status

Member of group initiative for storage/selling (marketing)	Non- member	Member
Gender of household member	0.55 [0.02]	0.58 [0.06]
Age of household member (years)	45.93 [0.71]	47.66 [1.48]
Respondent is household head	0.78 [0.02]	0.81 [0.05]
Respondent is household head's spouse	0.22 [0.02]	0.19 [0.05]
Respondent is responsible for <i>all</i> activities (high level of responsibility)	0.43*** [0.02]	0.70*** [0.06]
Respondent's years of schooling	8.43 [0.16]	7.7 [0.36]
Number of members in household	6.74* [0.13]	6.15* [0.28]
Number of children below 18 years	3.52* [0.10]	3.04* [0.23]
Owns plough	0.28 [0.02]	0.19 [0.05]
Owns ox/donkey	0.27 [0.02]	0.24 [0.05]
Distance of farm to nearest village market, in km	1.27 [0.04]	1.26 [0.09]
Respondent stores inside the house	0.79*** [0.02]	0.54*** [0.06]
Quantity of maize lost from recent harvest, in kg	55.19 [6.72]	59.08 [11.64]
Total amount lost, in kg	71.87 [11.35]	61.81 [12.86]
Number of crops cultivated (differentiation)	4.88 [0.09]	4.75 [0.21]
Acreage of land operated in 2011	3.14 [0.12]	3.09 [0.28]
Total acres of maize	2.26 [0.11]	2.61 [0.22]
Sees him/herself as a commercial farmer	0.20** [0.02]	0.31** [0.06]
Plans how much maize to sell, keep or consume	0.57* [0.02]	0.69* [0.06]
Prefers to store maize longer than she/he typically does	0.71 [0.03]	0.76 [0.05]
Amount of maize kept for household, in kg	140*** [13.95]	302*** [50.81]
Uses cell phone to obtain maize market price information	0.25 [0.02]	0.31 [0.06]
Access to marketing training is not a challenge	0.55** [0.02]	0.69** [0.06]
Access to production training is not a challenge	0.43*** [0.02]	0.63*** [0.06]

TABLE 13 (Continued)

Member of group initiative for storage/selling (marketing)	Non- member	Member
Respondent is a current or past recipient of NAAIAP	0.15*** [0.02]	0.63*** [0.06]
Respondent is generally fully prepared to accept risk	0.81*** [0.02]	0.94*** [0.05]
Total maize purchased, in kg	133.1 [9.55]	93.49 [23.31]
Average price for maize purchased, in K Sh/kg	39.52 [0.93]	36.35 [2.90]
Average price for maize sold, in K Sh/kg	27.23 [0.60]	26.1 [0.93]
Total income in absolute terms, in K Sh	135 816 [6 019.03]	123 920 [13 665.58]
Position in terms of total income, of 3 income levels	2.01 [0.04]	1.94 [0.10]
Selling status (is a seller household)	0.52*** [0.02]	0.81*** [0.05]
Selling margin (net seller in kg)	0.46** [0.02]	0.61** [0.06]
Household is net seller in income terms	0.43*** [0.02]	0.64*** [0.06]
Household is net buyer of maize	0.43** [0.02]	0.27** [0.05]

Standard errors of means in brackets – t-test on means: * significant at 10%, ** significant at 5%, *** significant at 1%.

Source: Authors' elaboration of study findings.

TABLE 14

Key determinants of successful collective action by smallholder farmers

Functional area	Determinants of success
1. Origin and legal status	Voluntary and homogeneous nature of the farmers' group; focus on farmers with surpluses and a commercial attitude; activities driven by farmers and the private sector; government/donor role limited to catalyst/facilitation; legal status allowing engagement in contracts, commercial loans, asset ownership and legal recourse; clear distinction between overall commercial goal and social support elements
2. Operations	Holistic, integrated, economically sound, systemic solutions – storage, post-harvest handling, extension
3. Management structure	Trust, strong leadership, business skills, checks and balances
4. Marketing and sales approach	Strong incentives for group marketing, win-win solutions, market responsiveness, networks
5. Finance and accounting	Transparency, record-keeping, risk management tools, adapted loan products

programme, which – through aggregation, storage and selling back to farmers at fair prices – aimed to smooth household maize expenditures and increase household incomes from selling maize.

The core part of this model was a set of community-based cereal banks (CBs) in Western Province (Bungoma region). These banks

were set up by district-level NGOs under a broader programme (Smallholder Marketing Movement) implemented by a national NGO (SACRED Africa) and financed publicly (The Rockefeller Foundation). Kenya's NCPB was a key partner, bringing expertise in grading, processing and marketing.

Each of the CBs was a newly formed community-based organization (CBO), organized to behave as a business entity, but technically lacking the associated legal privileges and responsibilities. Each CBO was managed by a committee elected from among the community members of one or more villages, and set up to purchase, store and market grains (mostly maize) within the village and to buyers beyond. Participating farmers paid a membership fee and bought shares (in-kind, with a minimum deposit of two bags of grain, to be paid for after sale). The CB operated a rented or owned improved storage facility. Each community (or local) CB was affiliated with a central CB, established and administered by a district-level NGO, in which all community CBs were represented, as well as professionals from the maize industry (e.g., NCPB). The central CB provided the procedures, protocols and systems to be adhered to and also performed auditing functions for each of the community CBs. Marketing could be done through each community-based CB or, for larger orders, through a central CB.

The CBs were intended to handle grain from both members (deposited) and non-members (purchased); at a fee of 2.5 percent of the value of the grain per month of storage (at the grain price for that month), non-members could also store their grain at the CB. Members deposited their grain (at least the two bags required for membership) and were paid a partial payment and received a deposit certificate. These deposits remained available for withdrawal as long as they were not sold (and with subtraction of any advance payment made). Sales could only take place after all members agreed to accept the price offered by the buyer. At the end of the year, audited results were presented and final payments made. New committee members were elected at this time. The only paid workers in the CB were the auditor (part-time), the organizing secretary (daily) and possibly one or more guards (full-time as long as the storage was not empty). The organizing secretary managed and kept records of all maize received and sold. All the other activities related to the operations of the CB were based on a voluntary duty roster.

SACRED Africa brought the maize farmers together as marketing groups to manage the CBs, and organized training related to the main business tools used: bulking, post-harvest handling (drying, cleaning and bagging, fumigation), quality control, storage, transport, credit, market information (a hotline to call for prices), forward contracts, and group leadership. Initial group formation and

business training lasted one week, with additional training provided as necessary and available. After the initial week of training, CB officials were elected and constitutions were written that included such issues as requirements for farmers' maize shares, eligible crops, and the gender composition of the CB management committee.

The added investment in these largely new business activities was expected to yield a positive return by capturing higher prices (e.g., through skipping intermediaries, selling later in the season, producing higher-quality grain), reducing losses (through better storage to combat the grain borer) and improving efficiencies (through economies of scale, better production practices). The improved year-round availability of maize, stocked by the CB and in part sold locally, was also assumed to have positive impacts on food security.

SACRED Africa's involvement included facilitating group formation and CB establishment; facilitating the upgrading of storage space (e.g., making storage burglar-proof); providing training on business practices (management, strategy, planning, accounting and finance, marketing, sales negotiation) and post-harvest operational practices (storage, quality control); facilitating sales by contacting numerous potential buyers and providing market information (commodity prices, through collaboration with the Kenya Agricultural Commodity Exchange); providing low-interest, start-up loans for trading (of K Sh 180 000, or US\$2 400 per local CB, enough to purchase 15–20 tonnes of maize, to be paid back at 10 percent interest in six monthly instalments, with a four-month grace period for trading); and even making a lorry and the initial stationery available. SACRED Africa also brought in lawyers to facilitate conflict resolution. Public sector support to the CB was reduced to zero over a three-year period, facilitating a gradual transition to independence.

Performance of the model:²³ By its end, the project involved 15 000 farmers across 100 local CBs operated via ten central CBs in six districts of Western Province. The CBs allowed some smallholders to shift part of their sales from local assemblers to direct sales to large millers in Nairobi at a price that was roughly 50 percent higher (such direct-to-miller sales relate to minimum orders of 100

²³ This section is based on interviews with the leaders of the best and worst performing CBs, as well as on interviews with, and reports developed by, SACRED Africa.

tonnes). For example, in a deal brokered by the NGO, maize worth K Sh 10 million (US\$130 000) was sold directly to millers in 2003. This increased revenue was partly offset by increased transaction costs (storage, transport, management). The larger volumes aggregated through the CBs allowed some sales from Bungoma to be transported to Nairobi by rail instead of road, which halved the unit transport costs. For some sales, the CBs also facilitated bulk input procurement, which reduced unit prices.

While these achievements demonstrated that the economics can work out as anticipated, the temporal arbitration did not work out well in practice because of the higher storage cost structure relative to that of traders and the insufficient price variation over time, on average (Coulter, 2007). By the second year, few farmers were bringing their maize to the CBs, because of a lack of maize surpluses, trust, or interest in the model. The low farmer participation rate forced CBs to buy from both members and non-members. As this stage, many CBs effectively became traders. The “trader” status of a CB also eroded the farmers’ physical shares in the CB (in terms of bags of maize).

The model largely failed, with all CBs dissolved shortly after the end of the support programme (a few survived briefly for longer), not only because of the temporal arbitration, but also because the soft aspects – socio-cultural, organizational and institutional – of the model were insufficiently addressed. The external support was too top-down, too removed in terms of monitoring beneficiaries, particularly with respect to bookkeeping, and too short-term to leave behind robust CBs that could manage on their own. Although farmers were trained, their attitudes and behaviour towards commerce changed little. The design and execution of the NGO’s envisioned exit strategy did not work in terms of achieving a sustainable outcome. Dependencies were too great. The group governance structures were not sufficiently clear for the farmers, and many questions were left unanswered in farmers’ minds: Who organizes? Who handles the maize? Who shares the costs? How will profits be distributed?

The lack of managerial knowledge of operations and marketing, and the variable levels of commitment to the enterprise among the CB management teams quickly eroded the CBs’ profitability. For example, delayed pesticide treatments led to losses during storage, and trading loans were used to buy and sell grain from non-members at loss-making terms. The farmers who managed the

CBs, operating in an environment of ubiquitously available grants, were (or claimed to be) confused by the loan nature of the funds provided under the programme and by the business nature of the CBs, leading to low repayment ratios. As a result, even CBs that did not suffer from fraudulent practices decapitalized quickly.

Internal checks and balances were insufficient to avoid failure from within. The old problem of mismanagement, even theft, by the management team was not avoided in this CB model. Because the programme established new groups in which people did not know each other well, rather than working with existing groups, trust levels were low to start with, and the need to show successful impact was therefore increased. In addition, audits by distant and uncommitted group auditors were too infrequent (once every couple of months) and were thwarted by stalling tactics and fraudulent accounting documents.²⁴ In some cases, for example, maize was sold without the knowledge of the CB members, and part or all of the associated proceeds were appropriated by the organizing secretary, who for some CBs was also the storekeeper and salesperson, and who could have bribed the guard to complete the scam. Support programme loans did not go to individuals but to the CBs, creating a second opportunity for corruption and resulting in the trading loans not being repaid.

Profit margins in the maize value chain are too thin to allow for fraud. According to some key informants, corruption was perceived as being stimulated by traders and politicians from the region, who wanted to see the model fail in order to prevent it from undermining their own activities.

The legal nature and constitution of the CBs also made legal action close to impossible. Suing for money or maize stolen from the CB represented a judicial process that was expensive, protracted, complicated and itself open to corruption. For example, when a miller who bought maize from a CB claimed that the weight was less and the moisture content higher than agreed, he was sued by the disagreeing CB and it took a year before there was a court ruling. While this ruling was in favour of the CB, there were high costs, such as grain held up in railway wagons and extra transportation costs; cash flow was dramatically

²⁴ Other programmes have far more regular supervision. For example, the heifer programme supervises its beneficiaries every other week, and reclaims any animals given to the farmers that are not cared for.

affected; and the CB members were confused by the whole process. In the traditional chain, traders built such tactics by millers into the (lower) prices they pay farmers. It seems that CBs had little alternative to following the same strategy while they established trustworthy long-term relations with selected millers.

Observing these events, member farmers lost interest and the schemes collapsed shortly after the programme ended. The main positive outcomes from the programme were that CB members improved their knowledge of maize production and storage and some farmers borrowed the ideas on quality standards and collective marketing, leading to new self-selected groups. Some of the farmers involved most directly in the marketing operation became traders in their own right. At least this shows again that there is profit to be made in the marketing of smallholders' grain. The public funder, who first pushed for rapid scale-up, finished the programme abruptly in 2007. An evaluation of lessons learned is not publicly available to the authors' knowledge.

Model 2: village cereal aggregation centre model ("partnership model")²⁵

Nature of the model: A Kenyan agribusiness firm, Kenya Promotion and Marketing Company (KPMC),²⁶ designed and piloted the village cereal aggregation centre (VCAC) model in 2008. The model was piloted with funding from USAID in the Bura district of Coast Province (Kenya). The VCACs were motivated by the observed maize losses in the irrigated Bura region during high-yielding seasons when farmers lacked effective maize storage. The result of this lack was that farmers found it difficult to leverage large maize harvests to improve their incomes and, ultimately, their food security.

The dual-purpose VCAC is a collective maize storage and marketing model based on a business partnership between KPMC and farmers'

groups. Central to this model is collective maize storage, which enables collective maize marketing. KPMC is the exclusive distributor in Kenya for a proprietary hermetic grain storage technology developed by the United States firm GrainPro Incorporated.²⁷

With the aim of delivering a complete, integrated solution, KPMC markets these storage facilities along with associated maize quality management and marketing services to farmers' groups in Eastern Province (including Meru). In turn, each farmers' group is responsible for choosing the physical storage area, ensuring that sufficient maize quantities are delivered for storage, and guarding the stored maize.²⁸ Maize delivery and sales records are kept under the mutual supervision of KPMC and the farmers' group. KPMC identifies buyers for the stored maize and advises farmers. The farmers' group then votes on whether to sell the maize or not. Proceeds from maize sales are deposited directly into individual farmers' bank accounts, the opening of which is a requirement for participation in the VCAC. Furthermore, KPMC connects farmers to crop insurance and credit services that are collateralized by the stored maize. The VCAC is a concept/product that, if proven to work in eastern Kenya, is expected to be rolled out to western Kenya and beyond. KPMC's operations are partially supported through partnerships within the private sector (Equity Bank) and through public funds (e.g., MOA, National Irrigation Board, USAID).

The storage cocoons are not cheap (e.g., US\$3 000 for a 20-tonne cocoon) and can represent a risky investment, as one unfortunate move-

²⁵ Information in this subsection is derived in part from interviews with Ms Maina (MD) and Mr Maingi of KPMC. See also <http://kpmcholdings.com>.

²⁶ KPMC Ltd is a Kenyan agribusiness firm headed by Ms Bilha Maina, which began operations in 2006 by distributing GrainPro storage technology in East Africa, selling to farmers and traders of crops that require quality maintenance during storage and transportation (e.g., coffee, maize and beans). KPMC has expanded its operations by launching the VCACs as well as buying and selling commodities.

²⁷ GrainPro's on-farm, village-level hermetic storage units have positive impacts on reducing post-harvest losses without the need for fumigation (given low oxygen conditions). The firm produces three types of storage unit: SuperGrainbags with capacities varying from 10 to 1 000 kg, which can also store moist maize; (mega) cocoons with capacities varying from 5 to 1 000 tonnes; and TranSafeliners, which are inner liners that turn shipping containers into hermetic storage facilities for transporting grain. The technology is claimed to reduce post-harvest losses by 25 percent. GrainPro also produces and sells complementary technologies such as aflatoxin test kits and portable solar drying systems (coverable plastic drying surfaces). More details on GrainPro's products can be found at www.grainpro.com. (accessed 6 January 2014).

²⁸ Maize storage security is provided via a partnership between KPMC and the farmers' group. Each supplies half of the security personnel required.

ment from a cow's horn can rip the fabric, nullifying its hermetic capacity. Cocoon placement and management are critical in reducing both theft and the risk of physical damage to the cocoon. By renting out rather than selling the storage units (and other equipment), as well as insuring them, KPMC has absorbed this risk for the farmer. The all-in commercial storage fee for the farmer is K Sh 350 for three months (K Sh 117 per month), although typically a fee is first negotiated with the group, depending on the size of the cocoon rented; in some new areas KPMC starts with an introductory fee of K Sh 40–70 per month to get the model under way. As the business model is driven largely by storage revenues and sales commissions, other post-harvest services (equipment rental) are provided by KPMC at low cost (grain thresher) or no cost (drying mat).

The insurance covers both the storage units and their contents, extends anywhere within the East African Community, and covers all losses up to US\$450 000 of the aggregated commodity. Input insurance is also provided as part of the input provision to participating farmers. This weather index insurance pays back 80 percent of input costs in case of crop failure due to drought. The presence of input insurance, as well as the increased opening and use of bank accounts, facilitates associated input loan programmes (e.g., through Equity Bank, the Cooperative Bank of Kenya and other financial institutions linked to the MobiKash network). These loans are up to K Sh 10 000 per farmer and are paid in-kind through agrodealers with whom KPMC pre-negotiates a bulk price.

The VCACs introduce this technology for near-farm cereal storage with the same sort of overall economic reasoning behind it as was behind the cereal banks: to increase food security and the capacity to trade competitively. Apart from the hermetic storage units, VCACs also comprise grain processing and bulking facilities, which are equipped with aflatoxin test kits and moisture meters as well as threshing, drying and bagging equipment. In collaboration with MOA extension services, KPMC's staff of ten introduce these technologies as a package that can be customized to the needs of the farmer, and also provide farmers with comprehensive training in post-harvest management, including aflatoxin and pest control methods, grain marketing and trading standards, and business and financial management. It should be stressed that in this model, KPMC does not take ownership of the maize at any point, nor does it take out loans to lend to farmers.

In practice, pre-existing farmer-based organizations form a CBO to participate in the scheme. These CBOs are thus self-formed groups that already have a commercial focus and are looking for ways to add value, by purchasing a small-scale *posho* mill, for example. As well as meeting to discuss sales opportunities, the CBOs meet monthly, and the MOA meets each CBO committee twice a month. According to Kenya's CBO constitution, a CBO consists of member groups, each of which is registered as a self-help group and pays a membership fee.

Each CBO is led by a management committee of elected members (at three-year election intervals), has its own bank account and keeps accounts. Financial auditing is in principle done internally by a member who is not on the committee and does not have another official function. Third-party auditing and reporting to the government are not required by law. KPMC enters into a written agreement with the CBO for the equipment rental and marketing arrangements. Given that the members of CBOs in Kenya are self-help groups, the registration of which does not confer legal identity and which thus cannot act as legal entities, the agreement is not a legal contract with the CBO, but rather a memorandum of understanding. While KPMC cannot take legal action against a CBO, to settle disputes it can engage in legal prosecution against CBO members as individuals.

KPMC has its own full-time staff on site during the post-harvest phase to supervise the process and the CBO members who execute it, to make sure that records are kept correctly and to provide a quality guarantee to potential buyers. The NCPB standard is used (e.g., maximum 5 percent broken grains). The cost of security (guards) is split equally between the CBO and KPMC. A given amount of maize is then processed and stored. Not all of this stored grain is for sale. Some of it is merely stored for individual farmers. However, the quantity established for commercial sale is clearly marked and cannot change after this point. KPMC, which is a grain trader in its own right, then includes the VCAC maize earmarked for sale in its own sales activities, thus allowing smallholders to achieve scale by piggy-backing on KPMC's trade volumes. When KPMC has identified a buyer and received an offer, it presents this offer to the CBO, which decides (by a two-thirds majority) whether or not to accept. When the offer is accepted, KPMC completes the transaction and pays the farmers directly into their

individual bank accounts, unless the volume is less than five bags, in which case payment is made in cash. As part of the CBO-KPMC agreement, farmers are expected to open bank accounts and are shown how they can visit any M-Pesa point or bank agency outlet in the region to obtain cash.

Performance of the model: The model is still in an incipient stage. In 2011–2012, after a successful pilot phase in 2010, KPMC provided outreach training to about 7 500 farmers. Since 2010, 5 000 of these farmers have sold at least 2 000 tonnes (22 000 bags) of maize through eight VCACs with GrainPro storage units. These 2 000 tonnes were sold to Unga, one of Kenya's largest milling operations. In addition, 100 tonnes of beans and 120 tonnes of sorghum were sold to a packer and a brewer respectively. Another 2 500 smallholder farmers used the VCACs as service providers (for post-harvest processing). With 2 900 tonnes of installed storage capacity, the infrastructure operated at roughly 66 percent of capacity in its first two years. As far as the authors of this study are aware, the claim that post-harvest losses are reduced by 25 percent under the VCAC storage model has not been analysed. However, the study found that on average losses were roughly halved, from 75 kg to 30 kg per farm per year, although this finding suggests that losses are perhaps not as large as often indicated and that consequently the impact of loss reduction is smaller.

Whether or not the scheme will grow remains to be seen. Growth is important in achieving the volumes that create the economies of scale necessary to make the model work, in terms of both processing services and storage/marketing. Currently, KPMC is around the break-even point. Some of the VCACs that were tried in Meru failed, at least for the storage component, probably because of poor harvests and associated high market prices and school closures, which meant more consumption at home (and therefore less storage for markets). In such locations, a VCAC with only post-harvest handling services (threshing, drying) could still be viable. In order to address the slow growth of volumes coming through the VCACs during the start-up phase relative to the minimum volumes demanded by the large processors that are targeted, KPMC combined smallholder maize from the VCACs with additional maize bought on the market (80 percent/20 percent distribution). Large millers have expressed an interest in setting up contracts with clearly defined quality standards, volumes and prices, but are reluctant to

engage in these contracts before the maize is safely stored in reliable storage facilities (which is what the VCACs aim to achieve).

It remains to be seen whether the model will reach its target of having 10 000 farmers using VCACs by the end of 2013. A key challenge at this initial stage is that investment costs for outreach training exceed the financial capacity of KPMC. By investing perhaps more in this activity than is sensible from a business perspective, and by heavily courting donors and the government to encourage investment, KPMC is blurring the lines between the commercial and the social aspects of the firm.

Conclusion on the two models

When comparing the two models, the differences between the Bungoma and Meru regions need to be recognized. The smallholder maize farmers surveyed by this study in Meru have larger areas under maize than those in Bungoma (1.1 ha versus 0.8 ha), but nearly all of the Meru smallholders' farmland is devoted to maize, whereas Bungoma farmers use only roughly half of their cultivated land for maize. Meru farmers are also less educated on average, relative to their counterparts in Bungoma (with seven years of schooling versus nine). Total household incomes are slightly higher in Bungoma (10 percent).

Maize production is also seen more as a business in Bungoma than in Meru, where maize is regarded more as a food crop. In the Bungoma region, farmers can grow two maize crops a year and have a wider range of other cash crops (e.g., cowpeas, groundnuts, vegetables) than farmers in Eastern Province. It is interesting, however, that fewer farmers in Bungoma are net sellers of maize, as they both sell and buy more maize than their counterparts in Meru. The range of buyers in the Bungoma region, close to the border with Uganda, is also broader, with buyers from further away coming to buy maize. The larger number of buyers notwithstanding, and in line with the higher percentage of net buyers, seasonal price differences are also much more volatile in the Bungoma region, where prices can double over the course of the year and farmers have to pay twice the price at which they sell, whereas in Meru prices go up only slightly (although this depends on the specifics of time and place – e.g., droughts). In Bungoma, profits go more towards trading maize, whereas in Meru farmers tend to invest more in diversifying their farming operations.

Nevertheless, the two areas are similar in most respects (capacities, size). In both regions, the same

TABLE 15
Comparison between two collective marketing business models

Functional area	CB model	VCAC model
1. Origin and legal status	Set up and driven by a donor-funded project. New farmer groups created to take ownership of the CBs through shares and to manage them through elected committees. CBs are CBOs, making legal claims by or against them nearly impossible	Driven by a private sector firm establishing partnerships with existing homogeneous farmers' groups (choice by the farmers). High cost of initial extension needs creates pressure to bring in more donor support, thus muddling the commercial and social objectives. Farmers engaging in VCACs do so via CBOs, making legal claims by or against them nearly impossible
2. Operations	Focus mostly on storage. All skills created through training of farmers. Storage is in fixed locations, with a high percentage unused. Storage fee of K Sh 50 per bag per month, but fumigation required at K Sh 100 per bag. Higher risk of aflatoxin	An integrated solution combining improved storage with post-harvest handling services. Many skills provided by the private sector partner. Storage can be moved among production areas with different harvest times, enabling storage costs to be spread over a greater volume. Storage cost of K Sh 70 per bag per month, and no fumigation required. Lower risk of aflatoxin
3. Management structure	Entirely developed by farmers' groups, with a dispersed, limited-duration training project. Complicated management structure not clear to many farmers. Level of transparency and control low, and management mostly lacking skills and commitment. Commercial attitudes do not develop	Developed by farmers' groups, but some business functions supported through a continuous partnership. With all services linked to fees and with facilitated linkages to markets, the commercial nature of the model is emphasized to farmers
4. Marketing and sales approach	All members have to agree a price. Marketing done by the farmers, after initial support by the project	Private sector partner establishes marketing network, farmers decide on the acceptability of identified market opportunities
5. Finance and accounting	Insufficient checks and balances. Low interest loans made available for trading, but largely seen as "grants" by farmers, and some managers become traders on their own, using cereal bank infrastructure. No insurance provision	Accounts jointly supervised by farmers' groups and marketing services provider. Various forms of input insurance built into the model

Source: Authors' elaboration of study findings.

sort of selling for urgent cash needs occurs, and in both regions there are good arguments for collective action on storage and marketing: the price differential in Bungoma (making storage efficiency key), and the lack of market alternatives in Meru (making aggregation in larger volumes key).

Table 15 compares the two models using the five criteria that are listed in Table 14. What emerges clearly from the comparison is that the conditions for success are more apparent in the VCAC model than in the CB model. The resulting differences in performance are thus largely explained by the differences in how the business models emerged and how they are structured.

While both models looked promising on paper, success was more elusive in practice. Comparing the performance of the two models, i.e., the failure of the first and the fragility of the second, it becomes apparent that sustainable business models for collective grain storage and marketing by smallholder farmers are characterized by at least three important traits.

First, they are unlikely to come about through a unilateral drive by either the public or the private sector. Partnerships around a business-driven approach (with regular firms that are profit- and market-driven) with clearly defined roles for all parties involved offer the best chance of success. Even so, the two cases illustrate that the process is time-consuming, therefore continuous partnership-based approaches rather than limited-duration, project-based approaches seem more appropriate.

Second, integrated models that combine sufficiently effective and efficient levels of technology and management skills in post-harvest handling, storage and marketing are needed to be able to meet the requirements of the various market segments in terms of, for example, quality standards, minimum volumes and payment terms.

Third, the targeting of the right types of farmer and farmers' group, i.e., those with stronger commercial potential in terms of skills and interest, and the legal nature of these farmers' groups are critical factors in facilitating the initiation and growth of

the model. Unless collaborating farmers are intrinsically motivated to make the model work, and unless individual interests align with group interests and with the interests of the group's business partners, opportunities for scaling up the model will remain limited. In this context, it is interesting to note that neither of the two models compared here is based on farmers' groups that have taken on a status qualifying them as legal entities that can sign contracts, sue or be sued, and so on.²⁹ Furthermore, if a lack of partnerships, technologies, skills or incentive structures results in the failure of a model of collective action, the impact of this failure will not be limited to the model alone. The failure of the cereal bank model in western Kenya discussed in this section can be expected to undermine future, and perhaps more promising, attempts at collective action in this region, and thus points to the need for carefully assessing the nature of the business model and thinking it through from all angles before embarking on implementation.

4.4 SUMMARY AND CONCLUSIONS

This study started off with the observation that transforming food value chains represents daunting challenges for smallholder producers, who include most of Kenya's maize farmers. The minority of these maize farmers, who want to sell into markets on a commercial basis, find it increasingly difficult to do so. Both the public sector (for food security) and the private sector (for supply chain security) have, over the years, tried to address this challenge. Governments and donors design and implement multi-year public support projects, while agrifood firms restructure their supply chains on the basis of new technologies, governance mechanisms and standards. Operating individually, however, has proved to be challenging, and the success rate has been low. Consequently, the two parties are coming together to find solutions through public-private partnership models. This chapter examines this trend in the context of collective marketing by smallholder maize producers in Kenya.

The vast literature on the topic highlights the challenges associated with collective marketing by

small-scale staple food producers in developing countries. These challenges include difficulties in physically reaching rewarding markets at the right time, low marketing margins, low group cohesion, faltering internal monitoring systems, weak leadership, lack of trust, non-commercial attitudes, weak legal environments, and so on. Success can be secured only when each of these issues is addressed simultaneously, for which integrated holistic solutions, in the form of the right business model, are required.

Section 4.3 compared two distinct business models, one a traditional public project (cereal bank model) and the other a modern partnership model, which both aimed to achieve the same objective, i.e., profitably linking groups of smallholder maize farmers in two comparable regions of Kenya to modern commercial markets.

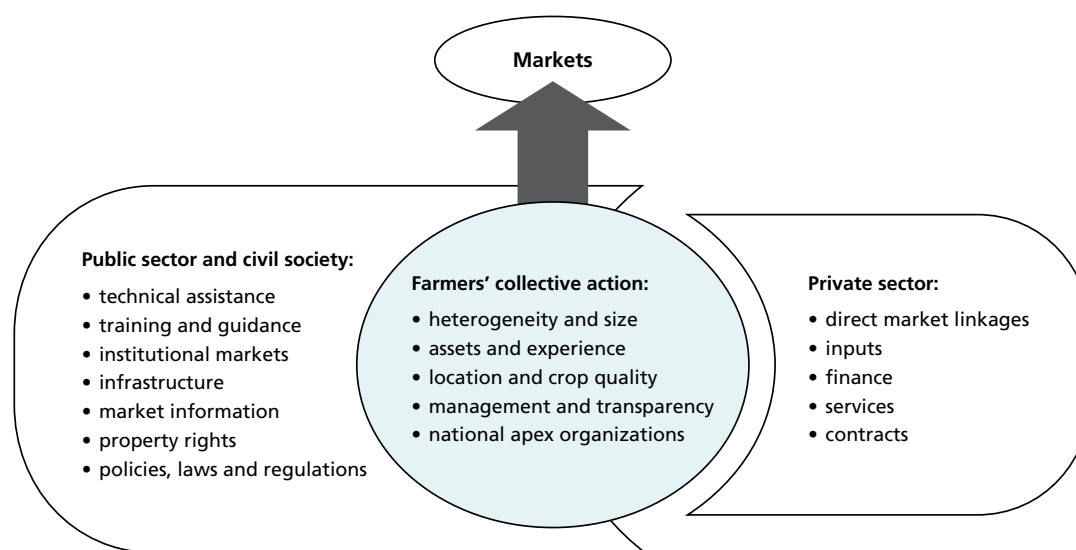
Although the data allow for only an exploratory analysis and discussion, the study found that a case can be made for shifting from a project-based approach that uses public funds to a partnership-based approach that pools resources from all parties – public sector, private sector, farmers and civil society. Each party brings complementary elements, both financial and non-financial, to the overall model on a long-term (continuous) basis (see Figure 8).

In such a partnership approach:

1. *the public sector and civil society groups* restrict themselves largely to creating an inclusive enabling environment (e.g., policy, property rights, roads and market infrastructure, regulatory supervision), providing subsidized or free services that are fiscally sustainable on a continuous basis (e.g., certain extension services), and maintaining institutional procurement strategies that aim to be inclusive (e.g., WFP's Purchase for Progress [P4P] programme);
2. *the non-farm private sector* (input suppliers, service providers, banks, value chain actors) provides commercially viable linkages to smallholder farmers' groups based on bottom-of-the-pyramid innovations and upgrading (e.g., new input insurance, new loan products, technical services embedded in contracts, new storage technology);
3. *smallholder farmers*, crucially, initiate their groups themselves and focus first on meeting the quality standards of larger buyers, aggregating outputs to market larger volumes, and group management; over time, as their capacity and internal trust grow, they take on more

²⁹ A legal status as a business entity also increases access to additional forms of public support. For example, Kenya's 4 000 agrocooperatives, while paying taxes and undergoing annual audits by a third party that submits annual statements to the Ministry of Cooperatives and Marketing, can receive various kinds of support (training) from district cooperative development officers.

FIGURE 8

Framework for a partnership approach to smallholder collective marketing

Source: Authors.

tasks initially done by the private or public sector, thus capturing a larger share of the value added; at the same time, farmers' groups are increasingly strengthened in networks managed through apex organizations; donor support, almost all of a temporary nature, is mostly used to facilitate one-off changes (e.g., design of innovations, facilitating partnerships).

The following are the specific policy recommendation that follow from this:

- Invest in a high-quality analysis of the current farmer marketing situation and upgrading opportunities – drill down to the core issues, which may be related to finance, attitudes, knowledge and many other drivers of behaviour.
- Bring all parties together – public, private and civil society – in designing a business model aimed at linking smallholder farmers to markets; commodity associations in which all are represented may provide a platform from which to launch such new business models.
- Make sure that all the parties that need to be part of the collective marketing solution participate in the design of the model (banks, service providers of various kinds, input suppliers, etc. can all be key partners).
- Have clear responsibilities for each partner, making sure that all the key players that need to be included are present, playing into

the strengths of each and avoiding overlaps, conflicts and mismatches between task and implementer; for example, do not ask more from farmers' groups than they can handle at each stage of the development of the model.

- Let smallholder farmers drive their own group formation process, including group composition, although this process should be facilitated in most cases.
- Design the business model in detail, making sure that each of the technical, organizational and institutional elements that could lead to failure are addressed (holistic, integrated solutions).
- Assume from the start that the realization of successful collective marketing models for smallholder producers is a time-consuming learning process (to build trust, networks, skills) that requires flexibility (to adapt to changing circumstances).

In conclusion, if the objective is simultaneously to achieve business success, long-term sustainability and poverty reduction, both the associated theoretical literature and the empirical evidence discussed in this chapter indicate that collective action must be voluntarily chosen and endogenously regulated by smallholders, with the concurrent assistance of the public and private sectors in their respective areas of expertise, on a commercially and fiscally viable basis.

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ANNEX 4. REGRESSION RESULTS

The following simple linear regression model was tested:

$$\text{LogMaizeInc} = \text{constant} + c_1 * \text{CollMarket} + c_2 * \text{Gender} + c_3 * \text{Age} + c_4 * \text{AgeS} + c_5 * \text{Married} + c_6 * \text{HHhead} + c_7 * \text{Education} + c_8 * \text{HHmembers} + c_9 * \text{HHchildren} + c_{10} * \text{LandTOT} + c_{11} * \text{LandMAIZE} + c_{12} * \text{Hiredwork} + c_{13} * \text{Familywork} + c_{14} * \text{Distance} + c_{15} * \text{Phoneinfo} + c_{16} * \text{Knowsprice} + c_{17} * \text{Decisionpow} + c_{18} * \text{Planning} + c_{19} * \text{WealthINDEX} + c_{20} * \text{Hardfloor} + c_{21} * \text{lnIncomeTOT} + c_{22} * \text{WESTERN}$$

where the dependent variable is:

LogMaizeInc: logarithm of the income derived from maize, where the logarithm allows the interpretation of the coefficients (c_i) as a percentage change in income from maize per unit change in the explanatory variables.

And the explanatory variables are:

CollMarket:	takes value 1 if the farmer is a marketing group member (storage/selling);
Gender:	takes value 1 for male respondents;
Age, AgeS:	age of respondent and age squared;
Married:	takes value 1 if respondent is married;
HHhead:	takes value 1 if respondent is household head;
Education:	years of schooling;
HHmembers:	number of household members;
HHchildren:	number of children in the household;
LandTOT:	total area of land operated;
LandMAIZE:	acres dedicated to maize;
Hiredwork:	number of labourers hired;
Familywork:	number of family members working the land;
Distance:	distance in kilometres from nearest village market;
Phoneinfo:	takes value 1 if respondent uses phone for access to maize price information;
Knowsprice:	takes value 1 if respondent knows price of maize in the market;
Decisionpow:	takes value 1 if respondent decides on all main farming activities;
Planning:	takes value 1 if respondent plans amounts of maize to store/sell/consume;
WealthINDEX:	index of wealth, based on assets;
Hardfloor:	takes value 1 if house floor is not mud/earth;
lnIncomeTOT:	logarithm of household total income;
WESTERN:	takes value 1 if household located in western region.

The regression results are presented in the following Table.

(Std. Err. adjusted for 59 clusters in village)						
	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	

Robust						
LOGMaizeInc						

CollMarket	.4335804	.2265158	1.91	0.061	-.0198403 .887001	
sex	.2597237	.2637129	0.98	0.329	-.2681549 .7876024	
age	.0281936	.0285187	0.99	0.327	-.0288929 .0852801	
ageS	-.0003281	.0002836	-1.16	0.252	-.0008958 .0002396	
Married	-.3755059	.3718132	-1.01	0.317	-1.119771 .3687592	
HHhead	-.0161957	.3079116	-0.05	0.958	-.6325477 .6001562	
Education	.1142864	.033267	3.44	0.001	.0476953 .1808774	
HHmembers	-.0227793	.0744351	-0.31	0.761	-.1717773 .1262186	
HHchildren	-.0496497	.0786979	-0.63	0.531	-.2071806 .1078812	
LandTOT	.1305459	.0656575	1.99	0.052	-.000882 .2619737	
LandMAIZE	.1061358	.0641993	1.65	0.104	-.0223731 .2346448	
Hiredwork	.1172904	.0373708	3.14	0.003	.0424847 .1920962	
Familywork	-.0902951	.056663	-1.59	0.116	-.2037184 .0231282	
Distance	-.1865508	.1024621	-1.82	0.074	-.3916511 .0185494	
Diversifies	-.0157481	.0760416	-0.21	0.837	-.1679619 .1364656	
Phoneinfo	.330682	.2366586	1.40	0.168	-.1430417 .8044057	
Knowsprice	.1989717	.2179196	0.91	0.365	-.2372417 .6351851	
Decisionpow	.4112327	.2387865	1.72	0.090	-.0667504 .8892158	
Planning	.9002407	.1958195	4.60	0.000	.5082653 1.292216	
WealthINDEX	.1006622	.1294823	0.78	0.440	-.1585249 .3598493	
WESTERN	-.3999349	.227982	-1.75	0.085	-.8562905 .0564208	
_cons	5.360112	.9560809	5.61	0.000	3.446308 7.273916	



5

Rural youth and smallholder commercialization

*Andrea Woolverton, Julius Okello,
Monika Percic and David Neven*

Chapter highlights

- Current farmers see business opportunities for youth in agriculture, especially in maize farming. However, rural youth, especially young women, are generally less optimistic and see more professional opportunities for themselves outside agriculture. According to exploratory focus group discussions, only 15 percent of rural youth are actively engaged in agriculture, and most see their future incomes coming not from agriculture but from service or low-skilled jobs. In agriculture, youth see greater potential for activities other than maize production.
- To encourage their entrance into agriculture, today's youth require customized approaches. Education and access to individually tailored finance instruments are critical. Professionals from agribusiness programmes that target planning, production, marketing and logistics can become the drivers of a commercially oriented staple agriculture sector.

5.1 INTRODUCTION

The transition from subsistence to commercial farming in small-scale staple agriculture in Kenya, with all its associated challenges, will not take place within a vacuum. Kenya's transition to a more commercially oriented agriculture sector will take many generations. A new generation of young, energetic potential entrepreneurs is emerging in Kenya and other East African countries without a clear path towards creating income and employment in agriculture. If the objective is to develop a commercial maize industry, in part by facilitating interested smallholders' transition from subsistence farming, rural youth must be targeted as part of a long-term transition strategy.

The next generation of agribusiness entrepreneurs will be created by today's youth learning to be commercially oriented farmers and service providers. As discussed in previous chapters, transitioning from subsistence to commercial agriculture is not solely about the decision regarding whether or not to sell maize at a particular point in time. Transition is also about farmers building their capacity and developing a commercially oriented strategy, which includes choosing to sell as well as developing the surrounding agro-industry with decent employment principles³⁰ in mind.

Photo: Young woman trading beans and other commodities in the market

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³⁰The Decent Work Agenda, developed by the International Labour Organization (ILO) in 1999 and subsequently endorsed by the United Nations system, underscores that both the quantity and the quality of

A competing force for the emergence of the next generation of staple crop producers is that many youth are leaving the agriculture sector and rural areas in Kenya and many other East African nations and taking their potential impact to urban areas (Proctor and Lucchesi, 2012; FAO, 2007).³¹ In fact, Kenya is one of the youngest and fastest urbanizing countries in the world (see Figure 9) (KNBS, 2009; World Bank, 2010; 2011).

This is not to say that evidence suggests that all rural youth should stay in rural areas for agriculture. In fact, evidence suggests quite the contrary. For example, Florida (2002) observes that there are strong positive effects when the young and educated congregate in hospitable cities, contributing to economic development and stability.

The problem is that when the youth left behind in rural areas are ignored, particularly in developing countries, the positive effects of the creative class have been found to be countered by a lack of human capital development in rural areas (Artz, 2003; Beine, Docquier and Rapoport, 2008). In other words, the rural areas tend to lose relatively more than the urban areas gain, when there is an absence of complementary policies. Thus, there is a balance to be achieved between rural and urban development goals.

With respect to the smallholder transition in Kenya, a rural brain drain without any policy or programme interference will likely translate into smallholders continuing on the path towards subsistence. To avoid this, and to build a commercial staple crop sector, rural areas must compete for motivated youth and facilitate the uptake of opportunities. From an aggregate perspective, rural areas in Kenya are not currently competing. Rural earnings in Kenya account for

only 45 percent of total wage earnings, although 70 percent of the population resides in these areas (World Bank, 2011).

Although few studies focus on youth in agriculture, recent global reports try to understand how young people will respond to opportunities and whether small-scale agriculture can meet their aspirations (Proctor and Lucchesi, 2012; FAO, 2010). An overarching issue found in East Africa is that many young adults see agriculture as an unattractive area to work in, with few opportunities for providing an income. Youth face global challenges in taking up agriculture, including limited access to credit, land and education, a hierarchy that precludes youth from decision-making, a lack of social services, poor infrastructure, and little technology transfer.

Returning to the purpose of this chapter, the intent is exploratory as a first step in motivating more detailed research on how policies and programmes can be designed to incentivize youth to stay and invest in agribusiness in Kenya. To date, there has been a substantial focus on the current challenges faced generally by smallholders in transitioning from subsistence agriculture, but little focus on young farmers and their specific needs for a future in commercially oriented agriculture that includes staple crops.

In this first step, the aim is to improve the understanding of rural youth's specific aspirations and challenges. Do youth want to be involved in staple agriculture in the first place? If so, how can policy facilitate this involvement?

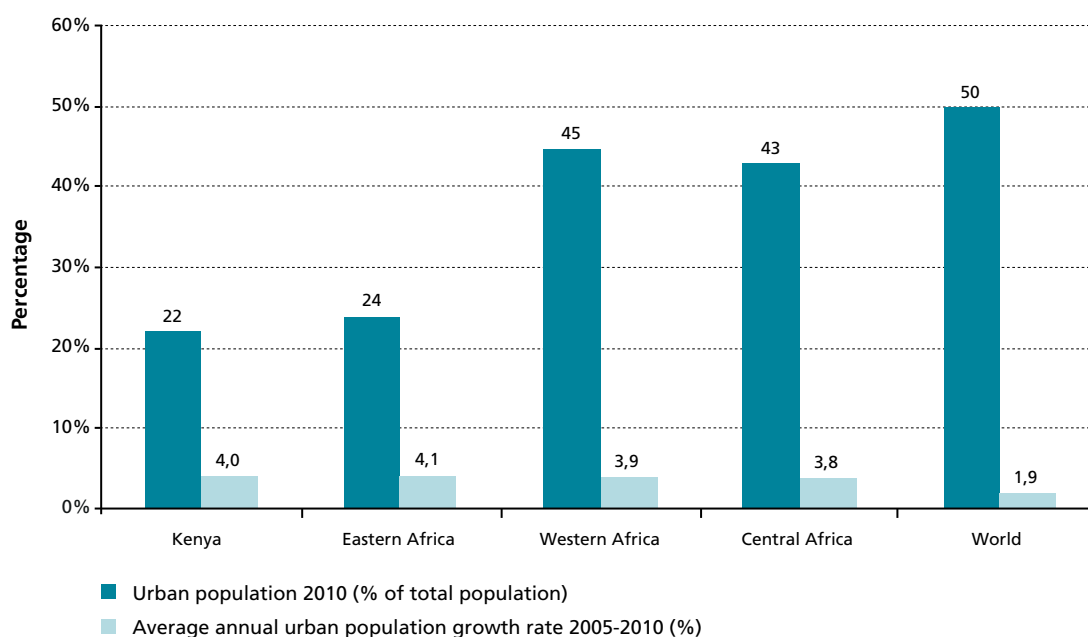
This chapter investigates the attitudes of Kenyan youth towards engaging in agribusiness. Drawing directly from the rural youth perspectives extracted from focus group discussions, the chapter explores: i) youth's perceptions on agriculture and non-agriculture sector opportunities for earning an income; ii) their perceptions on the resources needed to pursue agribusiness opportunities; iii) their personal willingness to invest in the needed skills; and iv) their frustrations with current education and income-generating opportunities.

The chapter proceeds with a brief discussion of youth-focused policy in Kenya, which is followed by the core results of the study's investigation of youth. Consistent with previous chapters, this one ends with a presentation of policy implications and recommendations related specifically to youth's uptake of agribusiness.

employment are essential for human well-being. Under decent working conditions, agricultural productivity can increase, and particularly benefit the "working poor" – those who are often engaged in jobs that lack social protection and safety nets to guard against times of low economic demand, and are typically unable to generate sufficient savings to offset an economic crisis.

³¹ Retaining youth in agriculture and rural areas is not a challenge unique to Kenya or East Africa. Otherwise referred to as addressing the "brain drain", countries across the world – developed and developing – are contemplating strategies for building (or rebuilding) rural areas as part of an economic strategy. However, as farmers age and opportunities arise in commercial agriculture, new incentives surface. A challenge is the intergenerational loss of farming knowledge.

FIGURE 9
Comparative urbanization rates in Africa and the world



Source: United Nations Population Division, 2011.

5.2 BACKGROUND TO AGRICULTURE AND YOUTH POLICY IN KENYA

During the opening of the 2012 Agriculture Sector Forum in Nairobi, Kenya's President Kibaki stressed that "we must attract and develop a young generation of farmers ... who will bring ... innovating and modernized farming methods" (Daily Nation, 2012). However, the plan for and commitment to facilitating the next generation of farmers are not well defined.

Since the 1960s, Kenyan youth have been largely left out of the country's development agenda. With this in mind, the country's Ministry of Youth Affairs agreed a National Youth Policy in 2006 (MOYAS, 2006). This policy identifies the key issues standing in the way of a successful youth programme, which include large youth populations, youth's lack of appropriate skills, unclear and uncoordinated youth programmes and policies, funding constraints for youth, and a general feeling among youth that they have a low social status in the country. The new policy establishes youth rights, State and parental obligations towards youth, the importance of youth in Kenya's priority focus areas (health and education), and priority groups within youth (disabled, street and female youth). However, there is no

explicit mention of agriculture or how Kenya's youth policy will be implemented or funded.

National recognition that youth represent a critical group is new and, because of various constraints, targeted policies have not always translated into allocations of public funds. Between 2006 and 2009, a youth institution and programme were started in conjunction with the youth policy. The new institution, the Kenya Youth Enterprise Development Fund (KYEDF), is a government-backed lending agency that offers loans to youth for starting enterprises, both agriculture- and non-agriculture-related. *Kazi Kwa Vijana* is a youth work programme that aims to facilitate the employment of youth in building national infrastructure around the country. Few statistics are available regarding the short-term jobs created or the funds lent under the programme's tools, and questions remain regarding its reach and sustainability (OECD, no date). As a result, the World Bank was reported to have stopped funding for *Kazi Kwa Vijana* due to misappropriation of operational funds (Daily Nation, 2011).

Additionally, agricultural education, a cornerstone of agribusiness development, is wavering. In Kenya, where it generates 25 percent of gross domestic product, agriculture has been deprior-

itized in the curricula of education institutions and extension services (Ngugi *et al.*, 2002). This fact was confirmed during a 2012 East African regional workshop, where participating decision-makers from Kenya and other East African countries, including Malawi, Rwanda, Uganda, the United Republic of Tanzania and Zambia, discussed national resistance to bringing agriculture back to the forefront of their respective education curricula (FAO, 2012). The recently published National Education Support Strategy for Kenya indicates that agriculture is viewed as important to Kenya's economy and that education should be redesigned, but there is no explicit link between the two issues (UNESCO, 2010).

So far insufficient support has been provided to meet the expectation that Kenya's youth will become the cornerstone of agricultural production and agribusiness entrepreneurship. Under Kenya's recent comprehensive plan for national development, Vision 2030 (*Ruwaza ya Kenya 2030*), agriculture is expected to contribute substantially to the achievement of economic pillars (Government of Kenya, 2008b). The question then becomes: How can agriculture make such a contribution if the children of current farmers are leaving the farms because too many obstacles exist for farming to represent a sustainable livelihood?

5.3 EMPIRICAL METHODS AND DATA

The study relied on youth focus groups, key informant interviews and survey data to investigate and compare the attitudes of current maize farmers and Kenyan youth towards agricultural and non-agricultural income-generating opportunities, as detailed in Chapter 1. The producer survey conducted in the Meru and Bungoma areas provided an opportunity to interview local rural youth. Questions directed to maize farmers about agricultural opportunities for rural youth were included in the survey tool, which allowed for some quantification (see Section 1.4 for the producer survey's descriptive statistics). In both areas, mixed-gender youth focus groups were organized in the same geographic divisions as the producer survey sample.

During the focus group discussions (FGDs), youth were asked about employment opportunities in agriculture and about related government support programmes and their frustrations with these. Key informant interviews in Nairobi complemented the focus group and survey findings (see the Annex 1 in Chapter 1 for a list of key informant interviews).

Six FGDs, with a total of 57 young people, were executed in environments that were familiar to the youth, for example, sitting under a tree or at the local school. The youth represented rural youth engaged in both agricultural and non-agricultural activities (see Table 16 for a demographic description of focus group participants).

The youth who were not directly engaged in agriculture were employed in the local village or nearest small town in tertiary activities that depend on the agricultural economy.

Ideally, the focus groups would have been controlled for age and education across regions. However, because of study limitations, there were some variations in the age and gender compositions across regions. As Table 16 shows, participants from Meru were older on average. Overall, more young men than young women participated. Where applicable, attitudinal differences relating to age or gender are pointed out in the following analysis. While the target age group was 18 to 35 years, i.e., youth as defined by the Government of Kenya, the perception of what constitutes "youth" is subject to cultural interpretation.³² In this sample, the average age of the interviewed youth was 27 years.

Education levels did not vary greatly across regional participants or genders. The average level of education was nine years, which is the Kenyan equivalent of having completed primary school and attended a few years of secondary school. Only two of the participants, both men, indicated that they had received some years of university-level education.

Most youth indicated that they still intended to finish secondary school (12 years equivalent), one year at a time as funds allowed. It is important to note that primary school fees are paid by the government in Kenya and are provided through a social programme, although costs associated with uniforms and tests are not included. If uniforms and other fees are not paid for, the child is not allowed to attend school. Public secondary school

³² Definitions of youth differ. For example, the United Nations definition of youth is 15 to 24 years of age, whereas according to the 2009 National Youth Council Act, the Government of Kenya defines youth as 18 to 35 years, and Kenyan youth employment projects target those in this age range. In Kenya, youth refers to a cohort of relatively young workers in society, while dependants under 18 years of age are considered children. Each focus group was asked to define youth, and the majority indicated an age of between 18 and 35 years.

TABLE 16
Basic demographics of youth focus group participants

Demographics	Women	Men	Total	Average age (years)	Average education (years)
Bungoma	12	20	32	25	10
Meru	9	16	25	29	8
Total	21	36	57	27	9

Source: Authors' calculations based on study findings.

is not included in the social programme, and tuition and associated fees for the four years of study must be paid privately. Many rural youth reported finishing secondary school only when they could afford it, so a secondary education is not a given for Kenyan youth. Hence, the average age of a secondary school leaver may vary widely from that in a more developed country context in which most youth aged 18 have completed secondary school.

5.4 PERCEPTIONS OF THE CURRENT GENERATION OF FARMERS

The current generation of farmers influences the next generation directly through knowledge transfer, and less directly through attitudes. To connect youth's perceptions regarding the economic opportunities in agriculture and other sectors with the environment in which they grow up, the study canvassed the attitudes towards agricultural opportunities among the current generation of maize farmers. Specifically, in the producer survey, producers were asked whether they thought that there were opportunities for the next generation in agriculture and, if so, in which crops these opportunities existed.

Attitudes towards agricultural opportunities for the next generation vary by both region and age (see Table 17). Overall, the majority of respondents expressed positive attitudes towards agricultural opportunities for youth, in contrast to the findings of Kirimi *et al.* (2011) from a larger survey. In the Bungoma region, 82 percent of respondents believed that there are opportunities in agriculture for the next generation, whereas in the Meru region only 50 percent did.

In both regions, young adults (those of less than 35 years) were more optimistic regarding agricultural income-generating opportunities than older adults (those over 55 years). Fewer respondents were optimistic in the Meru area than in Bungoma. Across the board, the respondents who were optimistic, saw maize as the main crop for generating income-earning opportunities. In the

Meru area, maize was followed by beans, groundnuts and green grams, while in the Bungoma area, horticulture (tomatoes, kale) and beans provided the main opportunities after maize. Respondents who were not optimistic about the opportunities for youth to earn an income from agricultural activities indicated rural youth's preference for non-agricultural jobs as the main reason for their pessimism. Based on youth focus groups, the next section discusses these perceptions in more detail.

5.5 PERCEPTIONS OF RURAL YOUTH REGARDING OPPORTUNITIES

Perceptions regarding income-earning opportunities

Using open-ended questions in FGDs, youth were asked about the opportunities for them to earn an income. As an observation, they generally identified opportunities only in the areas that they were already engaged in or familiar with. Approximately 15 percent of youth in the FGDs were actively engaged in agriculture. These youth engaged in agriculture tended to have higher education levels and were supported by their families through knowledge transfer and capital provision.

In terms of numbers, the majority of perceived income-generating opportunities for these youth were in employment outside agriculture. Opportunities ranged from medium-skilled, service sector jobs (e.g., in salons, tailoring, transport) to relatively low-skilled, casual employment as labourers (see Figure 10). However, agriculture was regarded as an important source of livelihood as most service sector jobs were seen to rely on receipts from the local agro-economy. For example, local tailors of clothes such as school uniforms reported that their businesses fell drastically when the local area experienced a poor agricultural season.

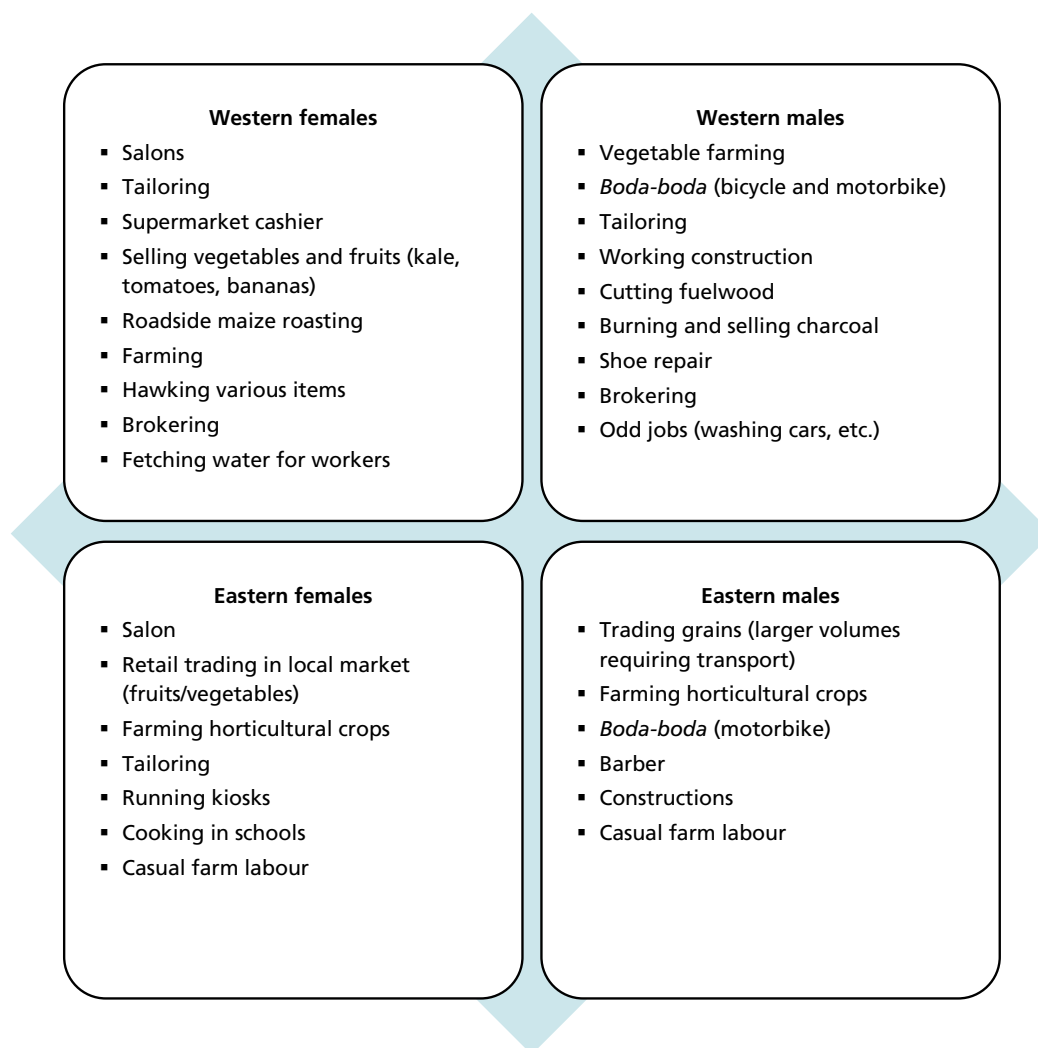
From a non-agricultural perspective, young women across regions saw opportunities in working as salon employees, tailors or supermarket cashiers, as well as in trading or hawking of agricultural products in the local market. In some

TABLE 17
Producer survey respondents' attitudes regarding opportunities for youth in agriculture (N = 500)

Question	Bungoma				Meru			
	Young adults (< 35 years) N = 72	Middle-aged adults (35–55 years) N = 131	Older adults (> 55 years) N = 70	Regional total N = 273	Young adults (< 35 years) N = 64	Middle-aged adults (35–55 years) N = 103	Older adults (> 55 years) N = 60	Regional total N = 227
There is opportunity for youth?	93%	76%	81%	82%	66%	61%	48%	59%
If believes there is opportunity:								
Main reason why	Can generate income (49%)	Can generate income (51%)	Can generate income (47%)	Can generate income (50%)	Can generate income (43%)	Gives enough income (29%)	Lack of other jobs (41%)	Can generate income (29%)
Top three crops for which there is perceived opportunity	Maize 51%	Maize 38%	Maize 44%	Maize 43%	Maize 60%	Maize 54%	Maize 62%	Maize 57%
	Tomato 15%	Kale 22%	Kale 21%	Kale 20%	Beans 14%	Beans 14%	Grams 14%	Beans 11%
	Kale 15%	Beans 14%	Beans/tomatoes 7%	Beans/tomatoes 11%	Groundnuts 10%	Groundnuts 8%	Groundnuts 7%	Groundnuts 8%
If believes there is not opportunity								
Main reason why	Youth prefer non-farm jobs (80%)	Youth prefer non-farm jobs (87%)	Youth prefer non-farm jobs (100%)	Youth prefer non-farm jobs (90%)	Youth prefer non-farm jobs (45%)	Youth prefer non-farm jobs (58%)	Youth prefer non-farm jobs (77%)	Youth prefer non-farm jobs (61%)

Source: Authors' calculations from study findings.

FIGURE 10
Perceived employment opportunities across eastern and western rural youth



Source: Youth focus groups.

cases, these opportunities required travelling to and from the nearest town every day. Young men predominantly saw working opportunities in short-distance transport (e.g., bicycle-based transport referred to as *boda-boda*), trading in grains and tailoring. It is interesting that neither women nor men regarded trading of agricultural products as working in agriculture or agribusiness.

In both regions, there were strong gender-specific roles with regard to work opportunities, especially for some of the more lucrative opportunities. It was made clear that *boda-boda* driving was for men because “people do not think ladies can drive a motorbike”, and salon work was for

women as “it is not customary for a man to touch the hair of another man’s wife”, although men traditionally cut the hair of other men. According to the FDGs in Bungoma, “construction is not for girls, the work is too hard. Ladies can cook for labourers”. Across both regions, among those looking to become involved in larger or more formal trading, men dominate, whereas women dominate in the trading of small volumes of produce. From the FDGs, this dynamic seems to be the product of social norms in which men are in charge of relatively large revenues entering the household, regardless of who provides the labour to produce the crops.

From an agricultural perspective, perceptions regarding crops of interest varied by region and gender. First, it is important to mention that few of the youth (fewer than 10 percent) discussed maize as a viable income-generating crop, despite the optimism of current maize farmers (see Table 17). With current production and marketing practices, maize production is viewed as a relatively low-margin endeavour. Generating positive net income from maize production requires sufficient land and other inputs to produce the volumes needed. Both the men and women who were more optimistic about maize-based farming opportunities said that improved inputs had to be used, although all agreed that even with high yields, it was not clear how to make a profit in the maize market. Respondents had not seen many examples of local, small farmers who were able to increase their margins, through either higher prices or lower input costs, and expand their farm operations.

In general, the farm or *shamba* made available to a youth comes only from her/his parents, who at the same time use the land for their own production, food and income. Hence, this land can only be used by youth for part of the year when their parents are not using it. This is an unattractive, if not impossible, proposition for most young rural people trying to support themselves.

For men (sons), it is culturally and legally possible to inherit land. For women (daughters), it has not been legal to inherit a *shamba* until recently. However, even though women have been granted the legal permission to inherit, strong cultural traditions make it unlikely that a daughter will effectively inherit a *shamba* in the near future, particularly if there is a son in the immediate family.

For horticultural crops, the story is different. Farming of horticultural crops is seen by youth as one of the top three activities in terms of earning potential. Horticultural crops require substantially less land than maize production to generate income, and short-season horticultural crops can be grown in the maize off-season. However, for some youth, maize production is seen as being easier to enter because knowledge and seeds are relatively easily available and maize is always in demand for food. For many horticultural crops, knowledge and hired labour are needed for production to succeed.

In the Bungoma region, the crops that were perceived as offering the highest economic potential include kale, cowpeas, tomatoes, watermelons, onions, spinach, bananas, peppers (*pilipili*) and

parsley. Poultry and cattle farming were also gaining ground in Bungoma, where capital is more readily available.

Youth in the Meru region also saw potential in horticultural crops such as tomatoes and kale, but horticulture is slightly less diverse there, with grains and beans being more dominant in the overall production system. This regional difference suggests that entry costs for horticulture are higher in the Meru than the Bungoma region, as less horticultural knowledge is readily accessible. In addition to vegetables, youth see income potential in tobacco and groundnuts.

For young women, a regional difference exists with respect to perceptions of the potential of horticulture as an income-generator. Young women in the Bungoma region considered themselves unable to produce horticultural crops that require substantial labour input for spraying, cutting and erecting poles (e.g., passion fruit, tomatoes), even if these crops tend to yield higher margins on the market. Young women in the Meru region highlighted a cultural difference that could help explain the different perceptions associated with cultivating particular horticultural crops. One young woman in Meru suggested that “in western Kenya, women carry water and other objects on their heads. Here in Meru, we use our backs. So putting a sprayer on our backs for, say, tomato production is nothing new. We carry pumps in the same way as we carry water containers”.

For young women, agriculture generally represents an uncertain future. In the FGDs, women were clear that, when they could not afford to rent land, entering agriculture was seldom possible. In contrast, as discussed, men often inherit land, which reduces overheads. About 94 percent of households in Kenya reported that inheritance of land that is already being used is the primary source of land (as cited in Proctor and Lucchesi, 2012). The study could not ascertain exactly how the inherited land that is already in use is allocated throughout the year, but the point is that the rental market for cropland does not seem to be well-developed or liquid.

If given some portion of the family *shamba* to grow horticultural crops, young women indicated that “it can be taken back at any time”, which discourages them from investing in any land improvement. In the Meru region, despite a willingness to do manual labour, young women from the focus groups found it hard to buy or rent land because it is a tradition to put the land under the husband’s name, creating a potential conflict on

usage down the line. Most young women reported that they preferred to seek employment in the nearest town rather than work on a farm. Most said that they did not want to marry a farmer and be forced to work on the farm for him without access to the proceeds.

Perceptions regarding investments

For youth to move from casual labours to agribusiness entrepreneurship or other professions, skills and access to capital must be acquired. To pursue agriculture as a viable business, youth need training in production, management and marketing, as well as physical and financial inputs. To pursue jobs such as hairdressing, *boda-boda* driving or construction, youth need both technical training and capital to invest. However, the youth in the FGDs did not seem to be aware that there is a limited demand for service sector jobs and the local market quickly becomes saturated. In this case, technical skills become even more important for pursuing new and more skilled opportunities.

As many rural youth seem to believe that non-agriculture opportunities are easier to pursue, the study drew on the youth focus groups and the Kenyan network of Farmer Field Schools (FFS) to gain a perspective on the investment versus return trade-offs across these endeavours. According to these sources, average reported wages for the opportunities listed range from US\$25 to US\$125 per month, with shopkeepers and manual labourers at the bottom and supermarket cashiers towards the top of the range. While these figures may not be representative of the country, they represent perceived earnings and would therefore be part of any investment decision made by the youth interviewed.

Completing secondary school is a fundamental investment for the majority of opportunities listed by the youth, as secondary school is where all the basic academic requirements needed to succeed in an enterprise are taught (e.g., maths, reading, writing). However, the costs and logistics associated with attending secondary school make completion difficult for many, as students are expected to attend a full-time programme and thus largely forego the earning of wages. As an average figure, secondary school fees, exams and supplies can total US\$650 per year over a period of four years. Students are not able to earn much outside income while they attend school. Few rural lifestyles allow for this situation.

From a short-term perspective, purchasing a bicycle or motorbike can be an attractive alterna-

tive if investing in a secondary school education is not an option (e.g., a US\$40 investment in a bicycle to generate US\$50 per month in earnings). Similarly, a salon certificate represents a relatively low investment compared with the associated wages (e.g., a US\$150 investment for US\$100 per month of earnings). Construction training requires more investment at a reported US\$850 for two years of tuition. Of course, even when the return on investment is considered to be sufficient, the young person must have access to both the funds to invest in training or assets and the funds to live on in the meantime (in the case of training).

Non-agricultural opportunities can seem to represent easy money, but how many hairdressers and *boda-boda* drivers can a rural area in Kenya support without the simultaneous growth of the local agrifood sector?

Pursuing agriculture may be associated with poverty, but a look at a sample budget from certain farming activities for the 2011 season suggests that profitability is possible (see Table 18).³³ This budget was offered by the Bungoma FFS network from its experience in 2011. The network is composed of approximately 20 farmers who meet weekly and were previously part of the FAO FFS programme. When these farmers were interviewed in 2011, many had recently been trained on tomato and other horticultural production and were starting to grow these crops.

This budget is intended for illustrative purposes only, and not as a representation of average returns across Kenya, or even Bungoma. In fact, the FFS farmers represent those who have received various agricultural training and have pursued new opportunities, which are likely linked to their above-average reported maize yields. In this example, when extrapolated to hectares, these FFS farmers yield 2.5 to three times Kenya's national average maize yield and slightly less than the 2012 United States average for non-irrigated maize (FAOSTAT, 2012; USDA-NASS, 2012). According to experts from the ACDI/VOCA Kenya Maize Development Program (KMDP), these reported yields are consistent with those of the smallholder farmers they worked with

³³ It is important to note that farmer's own labour is not accounted for in this budget, in line with most farmers' budgeting across the world. Ignoring own-labour costs reduces the input costs and exaggerates the return on investment, assuming that the farmer could have worked elsewhere. In addition, land is assumed to be part of the family *shamba*; land rents would reduce the net income.

who implemented good production practices (e.g., using hybrid seed and fertilizer, not intercropping) and received good rains.

Comparing maize with tomato production, Table 18 also suggests that producing horticultural products could generate a return that is three times as high as that of maize production under the current production approach. If maize is to be adopted as a commercial crop with matching production practices, the economic incentives for doing so must be apparent. At a minimum, this sample budget demonstrates the need for a better understanding of potential costs and returns across crops and regions in Kenya.

When contrasted with employment in the service sector, positive returns from agriculture hint that there is a potential upside from entrepreneur-driven agriculture that would be difficult to achieve in the service sector (e.g., hairdressing or *boda-boda* transport). The farmer is not limited to merely satisfying demand in the immediate geographic area, and agriculture

can be a seasonal occupation that allows time to attend secondary school or participate in other income-generating activities.

Rural youth were also asked about their interest in a variety of economic endeavours, their willingness to invest in training, and the available sources of support for training and securing capital. First, the youth were asked how they would use a K Sh 50 000 (US\$570) grant if the government were to provide one. Overall, all FGD participants responded that they would invest in activities expected to generate income relatively quickly (see Table 19). The activities focused mostly on independent, entrepreneurial endeavours. Diversification was a theme across the FGDs, as rural youth generally indicated that they would invest in different services or couple activities in the service sector with those in agriculture, such as farming and trading maize or farming and selling fertilizer.

In part, the investment ideas are consistent with the perceived opportunities. In the Meru region,

TABLE 18

Sample variable cost and return estimates from the Bungoma FFS network for maize and tomatoes planted on 0.5 acres in 2011

Average variable costs of production for 0.5 acres	Amounts (in K Sh)	
	Maize	Tomatoes
Land preparation: first and second ploughing	3 000	3 000
Seeds: 6 kg of hybrid maize and 50 g of tomato seed	1 200	4 500
Planting fertilizer: 1 bag of DAP	4 000	4 000
Top-dressing fertilizer: 2 bags of CAN for maize; 1 bag for tomatoes	5 000	2 500
Pesticide: 1 litre	-	3 500
Fungicide: 1 kg	-	2 400
Foliar feeds: 2 litres	-	2 600
Planting, weeding, spraying, pruning, top-dressing	-	9 000
Total average variable costs for 0.5 acres	19 200	36 500
Estimated yield	15 bags of 90 kg	1 000 picked stems
Sales price per unit of production	K Sh 3 500/bag	K Sh 150/stem
Total average revenue for 0.5 acres	52 500	150 000
Average net income for 0.5 acres (excluding farmer's own labour, land costs, transport and post-harvest losses)	33 300	113 500
Average return on cash investment for 0.5 acres	173%	311%
Note: Land costs for 0.5 acres	US\$17 rent \$US1 700 purchase	US\$17 rent US\$1 700 purchase

Source: Bungoma FFS network.

TABLE 19

Rural youth's plans for investing the funds from a hypothetical grant

<i>Investment of K Sh 50 000 (US\$570) grant</i>	Meru		Bungoma	
	<i>Young women</i>	<i>Young men</i>	<i>Young women</i>	<i>Young men</i>
Start or expand service-based business (e.g., grocery, boutique, boda-boda, tailoring, restaurant)	50%	26%	19%	19%
Rent land to farm maize or beans	12.5%	16%	10%	9%
Rent land to farm horticultural crops, tobacco, sugar cane		21%	29%	19%
Invest in trading of maize/beans/horticultural crops	25%	26%	10%	9%
Start an agribusiness (e.g., agrodealing, maize storage, leasing out of implements)	12.5%	11%	19%	7%
Invest in dairy production	-	-	5%	22%
Invest in poultry production	-	-	5%	9%
Invest in rental property or hotel	-	-	3%	6%
Total	100%	100%	100%	100%

Source: Authors' calculations from study findings.

50 percent of young women and 26 percent of young men would invest in non-agrifood, service-based businesses (including grocery stores and restaurants at the end of the agrifood value chain). However, the remaining responses were directly related to agribusiness (farming, trading in raw agricultural materials, farming-related services). For the 13 percent of young women and the 37 percent of young men in the Meru region who would invest in farming, land rental was key to any future investment in productive agriculture. Trading of agricultural products was seen as a good investment, as were other downstream agribusiness activities, including input sales and leasing out of maize storage facilities and implements.

In the Bungoma region, similar activities were mentioned, although more youth favoured diversification into dairy and poultry production. More young women in this region were interested in horticultural production and other agribusiness activities such as agrodealing and storage, whereas there was less interest in trading. It is interesting that in both regions, youth did not think that trading in agricultural products was involvement in agriculture.

Across the two regions, the FGDs indicated that 10–15 percent of rural youth would take up commercial maize production as a business to invest in. This implies that although there is a potential next generation of commercial maize farmers in Kenya, they will need a sufficiently

supportive business environment, and even then will represent a relatively small group of farmers.

After discussing the potential use of grants, the youth were asked whether they would take out a low-interest K Sh 50 000 (US\$570) loan if offered, and for what purpose they would use it. In particular, they were asked whether they would be willing to use such a loan for some type of training, such as may be required to pursue the activities seen as opportunities.

Overall, there was hesitancy about accepting a loan, although there was an indication that a loan was more likely to be taken for starting a business than for training. About 80 percent of the youth indicated that they would take a loan, of whom 10–15 percent (i.e., 8–12 percent of the total sample) would use the loan for training. Most ideas concerning business loans were in line with the ideas about grant use.

Although business loans were more appealing than training loans, the rural youth expressed several caveats to be considered when accepting a loan. First, is the loan allocated to a group? There was strong scepticism associated with funds loaned to a group. The respondents knew of many instances where responsibility for the group loan was ill defined and/or the sum loaned was insufficient to meet the needs of the group's proposed activities.

Second, concern was expressed regarding the repayment schedules and interest rate conditions.

The youth explained that the timing of repayments and the interest rate structures were frequently not transparent or easily understood. Moreover, loans were not viewed as being customized to fit the needs of youth or agriculture. For example, loans were not designed specifically for agriculture by corresponding with seasonal cycles.

Despite indications of a need for training to pursue opportunities successfully, few youth thought that loans for training were a suitable means of making progress. They argued that they would also need capital to invest in a business that used the skills acquired through the training, and securing capital was very hard. They also argued that it was hard to pay back training loans because of the usual requirements for initiating repayments immediately, despite the likely impossibility of being able to earn an income during the training period. Furthermore, loans can normally be secured for only the actual tuition, leaving living expenses to be financed from other sources. If the loan had a long grace period that enabled the recipient to get a job, more respondents said that they would take a loan for training. It was immediately apparent among all those canvassed that taking loans for training was risky because the loan would have to be repaid, even though there was no guarantee of getting a job.

Agricultural training, in general, is not a priority for youth. In the western region, youth emphasized the lack of an agribusiness infrastructure, which decreased the value of training. Many suggested that although they could increase their skills, uncontrollable factors such as adverse weather conditions could prevent them from being able to repay the loan. Many young women indicated that there was little point in agricultural training. Although there is recognition that producing new crops, including fruits and vegetables, requires new knowledge, there was not full appreciation of the fact that effective trading and agribusiness require management and marketing skills.

Perceptions regarding available resources

The youth of Meru and Bungoma made it clear in the FGDs that resources are needed to pursue any opportunities beyond manual labour, but they were not aware of the resources available to them nor how they could obtain access to these resources. To understand better the need for resources, respondents were encouraged to discuss their knowledge of available resources.

Most of these discussions centred on access to capital for pursuing business (agricultural and non-agricultural) ventures, but there was also some discussion of government-based agriculture programmes. Kenya's input subsidy programme, the National Accelerated Agricultural Inputs Access Programme (NAAIAP), was thought to target senior individuals and those organized into groups, with little reference to youth and independent farmers (see Section 1.3 for more information regarding NAAIAP).

The respondents suggested that a donation from an NGO or well-wisher represented the most likely source of training funds or actual training. Nothing was mentioned about publicly financed options, such as extension or scholarships for obtaining tuition assistance or training.

Loans were viewed as the primary resource for pursuing business opportunities in rural areas. Lending options centred on village moneylenders, commercial banks such as Equity Bank, local merry-go-round schemes, the Kenya Women Finance Trust and individual foreign sponsors of young people. Often the only option is working to save money. Fear was expressed regarding repayment terms and interest rates, which can reach 50 percent, as in the case of microloans offered by a village moneylender.

The loan process discussion, as well as additional interviews with staff at the Kenya Youth Foundation, revealed a critical issue concerning the effective use of resources: the need for a business plan. Loans are often taken out without the need to develop and demonstrate a solid business plan. There is little support for youth in developing clear one- to five-year business plans that include expected revenues, costs and debt obligations. According to the Kenya Youth Foundation, both rural and urban youth, as a group, lack the skills to develop such plans, which immediately undermines their ability to repay loans and manage their business ventures.

Youth's experience of policy responses

Youth unemployment persists in Kenya (Wamalwa, 2009). From the FGDs, it was estimated that 50 to 70 percent of rural unemployed youth engage in destructive activities, such as theft or drinking, driven by frustration and/or desperation. The Government of Kenya has responded by launching support initiatives that are youth-focused, such as *Kwazee Kwa Vijana*, a public works programme, and KYEDF, a government-funded microlending programme.

The *Kwazee Kwa Vijana* programme was part of the response to the 2008 riots in Nairobi and was intended to create jobs for youth through road repairs and other infrastructure projects throughout the country. According to the FGDs, the implementation of such projects did not necessarily follow government guidelines and some respondents indicated that there was bias, with some of the regions provided with programme funds receiving only minimal government oversight to ensure that an impact was generated among the intended groups.

According to the youth, this lack of oversight resulted in local officials reducing the intended daily salary rates. One youth, for example, claimed that even in the presence of a published rate of K Sh 400/day for road maintenance, in practice, when the work was finished, only K Sh 200/day was paid. In other cases, labour from the wider region was brought in to do the work, rather than being recruited locally for local projects. A recent World Bank study also reported the presence of favouritism and nepotism in some of the initiatives implemented under the programme (World Bank, 2009).

In the years following the 2008 riots and the launching of the work programmes, the saying “*kazi kwa vijana, pesa kaw wazee*” (“work for the young, money for the old”) surfaced as a description of the public work programmes and general work culture concerning young people. In the FGDs, the youth were asked if they agreed with this statement and what it meant to them. Across all focus groups, more than 80 percent agreed that the statement effectively captured the culture in which they were trying to advance. To them the statement meant that they had little voice in the government’s programme and were expected to work hard for relatively low pay, with scarce opportunities to pursue education.

KYEDF was launched to fill part of the perceived resource void by offering microfinancing to Kenyan youth in a sustainable manner. KYEDF is a Kenyan State corporation established in 2006 as part of the Ministry of Youth Affairs and is 100-percent government-funded (at the time of writing). In addition to finance, the KYEDF provides marketing support for participation in trade fairs and connects qualified Kenyan youth with employers outside the country.

According to KYEDF interviews, most KYEDF lending is to agriculture-based enterprises, mostly for the transport and marketing of agricultural commodities (Mwenda, 2011). While young men and women organized into groups are

the core target for loans, products for individuals are also becoming increasingly available. As part of the financing process, each young person must complete a business training programme focusing on business basics and linking ideas to market realities. In 2010, K Sh 750 million and K Sh 420 million were lent to youth groups and individual young people respectively. In 2011, KYEDF developed agricultural loan products with repayment grace periods that matched the type of agriculture being practised. Agricultural loans for staple production continue to present repayment challenges. At the same time, few risk management instruments are available for a relatively volatile staple market such as that for maize.

As KYEDF is one of the few government-based resources supporting them, rural youth were asked if they had heard of it or had any experience of it. Approximately one-third of the youth in the Bungoma region FGDs were aware of the KYEDF. In clear contrast, nearly 75 percent of youth in the Meru region were familiar with KYEDF. It is not clear why this large difference in awareness is observed, but KYEDF indicated that its reach is limited; Meru is much closer to Nairobi than Bungoma. Most of the youth aware of the fund had learned about it through radio, public meetings or group meetings. Even when rural youth were aware of the KYEDF, the majority said that they did not know how to apply for funds and perceived the process as being complicated.

To some degree, KYEDF is bridging the gap between rural youth and the support they need for training and starting agricultural ventures. However, as the only government-backed agency, this is a tall order. During the informant interviews, the fund stated that it hopes to reach more youth, particularly in rural areas, but that it suffers from inconsistent government funding and low loan repayment rates.³⁴ KYEDF believes that it must finance substantial business training for Kenyan youth, which is more expensive for youth who have not completed more than eight years of schooling. In addition, there is a lack of coordination with other social funders such as the Kenya Women Finance Trust. This lack of coordination and information sharing has resulted

³⁴ When KYEDF first started, some staff members stated that many politicians used it as a political tool, indicating to many youth that the loans did not have to be repaid. The fund is working to overcome this legacy and to change perceptions regarding repayments.

in instances of loan recipients paying off one loan with another, thus furthering repayment problems (Mwenda, 2011).

5.6 DISCUSSION AND POLICY IMPLICATIONS

This chapter has explored the opportunities that rural Kenyan youth see in staple agriculture and how such opportunities can be exploited. From FGDs with rural youth in the Bungoma and Meru areas of Kenya, the study team learned that youth are optimistic regarding the earning of income through agriculture, although for many young people, particularly women, service-based, non-agricultural jobs are more attractive than agriculture. Access to land is a chief constraint to pursuing agriculture for youth, while limited access to capital comes a close second. Youth are not fully aware of the need for the agribusiness skills that are essential for successful participation in the agribusiness sector.

Youth interested in agriculture see opportunities in both agribusiness service provision and agricultural production, which is a positive sign for development of the sector. However, maize was not top of the list of the crops that youth would engage in, even though maize production has some distinct advantages: low entry costs relative to other crops such as vegetables and tobacco; widespread knowledge of maize production among farmers; little need for pest protection; labour requirements that are not excessive; relatively simple grain storage; and excess production that can be consumed.

Regardless of the crop or service concerned, successful uptake of the perceived opportunities is unlikely without clear access to land, capital and technical knowledge. For rural youth, the needed resources are interdependent: land cannot be secured without capital and clear property rights; capital cannot be secured without a solid business plan; solid business plans cannot be designed without technical knowledge; and investment in technical knowledge is not possible without an expectation of a positive return to investment. Most rural youth expressed little interest in investing in their own education because they did not expect a high return, nor could they pay their living expenses while engaged in training.

It is easy to relate to the difficult decision regarding whether to invest personal funds in training that might not bring dividends in an uncertain future, versus investing in an activity likely to generate an immediate income, even

though that income might not be sustainable in the long term. Given this uncertainty, the prospects of independent rural youth investing in agribusiness skills or staple agricultural production are poor, even assuming that youth possess the necessary resources to invest.

Although this chapter is only exploratory in nature, relevant policy options emerged for encouraging youth to pursue opportunities in agribusiness to facilitate the development of Kenya's commercial maize sector. New programmes and institutions are not necessarily required, but there must be a commitment to taking account of the key messages for policy-makers that emerged from youth focus groups.

Key messages from Kenya's rural youth to policy-makers

Agribusiness is more than production. Youth are interested in offering services that play a critical role in driving the modernization of the agriculture sector. Services in the supply chain, such as storage and transport, or – with more training – agronomy, tool repair, input provision, output marketing and agricultural lending, are all potential areas of opportunity for youth employment. Unless the funders of support programmes buy into the idea that commercial agriculture requires investment in services, it will be difficult for youth to pursue opportunities in supporting the production side of agribusiness.

Formalized land rental markets are critical for investment. Youth made it clear that it is hardly feasible for them to purchase land for production in Kenya's current land market. As in many other countries, cultural norms and market signals discourage the sale of productive land. Effective land rental markets, on the other hand, can provide access and success if there are clear, enforceable user rights. Formalizing the informal agreements that are currently used in many parts of Kenya into written and enforceable rental contracts would improve transparency in land markets and make agricultural investment easier for rural youth. Without such contracts, there is no incentive to invest in land improvement for agricultural production (e.g., soil improvement or irrigation) as the investing producer may lose the land to the owner after only one season.

Support to recent landownership laws will create space for women in agriculture. Young women represent as much of Kenya's agricultural future

as their male counterparts. However, despite the explicit legalization of land property rights for women in Kenya's 2008 Constitution, young rural women made it clear that they do not expect to obtain access to land anytime soon. Enforcing existing laws and helping these young women to know their rights will help gradually to change the social norms that currently prevent young women from becoming landowners.

Youth-focused programmes require better targeting and more funding to reach rural areas. Rural youth do not benefit from proximity to programmes and centres to the same degree as urban youth do. Rural youth are spread further apart and are more difficult to reach. Many of the youth in the discussions had never heard of Kenya's primary youth programme, KYEDF. Reaching these youth does not require an overhaul of the system, but rather delivery of the promised funding, solid management and a strategic plan for creating rural access. It is up to youth to take advantage of the resources, once they are aware of them; in the meantime, awareness cannot be assumed.

Agribusiness operating credit for youth requires support services. By itself, loan provision is not an effective approach to bringing youth into agribusiness. Operating loans are required for youth to invest in agriculture. However, loans made without clear business plans will not work. Furthermore, loan terms do not necessarily match agricultural cycles, and youth often find repayment difficult. Hence, a general fear of loans and loan default develops. A comprehensive and customized approach to agricultural financing is needed for small business development. However, offering more comprehensive loan services definitely requires more time and investment. KYEDF is trying to move towards a more comprehensive lending approach, but its budget is reported to be insufficient and its projects are more urban-focused.

Access to education that focuses on agricultural commerce and production is a must for sector development. Primary education is a start, but not enough. Youth need access to a mixture of vocational and liberal arts training as the economy and the agriculture sector change, and therefore the approach to providing youth with

access to education matters. The Kenya Youth Policy (2006) acknowledges that the current education system is releasing ill-equipped youth on to the labour market, particularly in lacking the skills needed for entrepreneurship. The Kenya Minister of Youth Affairs and Sports recently underlined this issue by pointing out that many Kenyan youth have some formal education, but few of the vocational skills that are needed in a developing economy (Otuoma, 2011). Currently, vocational schools are underfunded and considered inferior to universities, even though youth with more liberal arts education are less likely to be employed (Wamalwa, 2009). The majority of rural youth see little incentive for funding investments in their own education unless this education is integrated with income-earning opportunities. Building up Kenya's current vocational programmes to offer work-based tuition is one approach. Another model of a more integrated approach is the FAO Junior Farmer Field and Life Schools (JFFLS) approach (see Annex 5), which combines support to vocational educational training opportunities with employment promotion and access to markets.

Embracing such integrated approaches requires that the Ministry of Education communicate with MOA, and particularly with agricultural extension programmes. From the workshop discussions held as part of this study, it was clear that these two sectors are seen to be mutually exclusive. From various conference and workshop reports and invitee lists, it appears that the interests of agriculture, youth and education in Kenya have not been brought together, despite the advice from the Kenya Youth Policy (MOYAS, 2006; FAO, 2012).

In conclusion, even though rural youth face high unemployment levels and need to take over agricultural production from an ageing farmer population and adapt farming to changing market conditions through the establishment of agribusiness services, few young men or women are interested in investing in agriculture (and even fewer in maize). The few that are interested face daunting challenges in terms of access to a variety of interdependent resources such as land, capital and knowledge. Hence, the government, together with donor, civil society and private sector development partners, should strive to meet the challenge and make agriculture attractive as an economically viable livelihood for young entrepreneurs.

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ANNEX 5. JUNIOR FARMER FIELD AND LIFE SCHOOLS (JFFLS)

To address the specific challenges faced by youth in rural areas, FAO initiated the JFFLS approach in 2004; to date it has been expanded to 16 countries in Africa, Asia and the Near East. JFFLS are a concrete manifestation of the important linkages that exist among rural employment, poverty reduction and food security. The high adaptability of the learning approach to the needs of different countries makes it suitable for addressing different contexts and populations, and it has been included as one of the main activities in various United Nations joint programmes. Field evaluations have shown that the approach has supported the devel-

opment of the entrepreneurial and agricultural skills of youth, as well as youth's self-esteem, helping them to become healthy and positive young adults. Furthermore, it has strengthened national institutions' capacities to address rural youth employment at both the operational and policy levels. The main partners in the countries involved in JFFLS are ministries of agriculture, education, labour, youth and trade; producer and farmers' organizations and unions; trade unions, fair trade and youth organizations; and sister United Nations agencies such as the International Labour Organization (ILO), the United Nations Environment Programme (UNEP) and the United Nations Industrial Development Organization (UNIDO).



6

Summary and policy implications

Chapter highlights

- Support programmes must recognize that not all smallholders in Kenya inherently practise maize production as a business and are prepared to handle many key decisions independently in a commercially oriented model.
- The ambiguity associated with maize standards and their measurement should be removed to facilitate a more transparent market.
- A new approach to collective marketing is needed. Continuous partnerships built around a business-driven approach with clearly defined roles for all parties involved (public, private, civil society) offer the best chance of success.
- Policies that affect the agriculture sector, even if they fall outside of agriculture, should be better coordinated. Most notably, the timing of school fee payments should not inhibit the emergence of commercial agriculture.
- Making commercial staple food agriculture more attractive requires not only direct support measures, but also complementary, longer-term investments that target youth (e.g., education).

6.1 NATURE OF THE STUDY

Executed in 2011/12, this study is part of a multidisciplinary project based on collaboration by various technical divisions within FAO. The study aimed to develop a better understanding of the participation of different types of small-scale farmers in different types of markets, to inform policies for addressing the constraints to commercialization facing small-scale farmers in Africa in general, and to facilitate the sustainable integration of these farmers into modern value chains and markets in particular. The emphasis was on staple food crops, and the project started from the premise that increased value chain participation for some smallholder producers may be associated less with marketing their own farm produce than with working off-farm in agribusinesses, including commercial farms, elsewhere in the value chain.

The project focused on the case of maize production in Kenya. Along with other East African countries, Kenya is taking measures to shift staple food sectors, particularly that for maize, away from subsistence and towards commercial production. The motivation is that a more commercially oriented approach will result in increased net farm incomes, food security and economic independence. In the longer term, if this transition succeeds and incomes improve, a gradual agricultural transformation is expected, freeing resources such as labour for the development of other economic sectors. This mutually dependent development will occur gradually as public and private investments are made in research, education, industry

Photo: Woman selling produce at a traditional market

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and infrastructure. The numerous smallholder maize producers in Kenya represent a critical variable in this model of economic development for East Africa.

The transition from subsistence to commercial production by smallholder farmers in East Africa is unlikely to occur at any significant scale without a catalyst that takes into account the day-to-day realities of, and the attitudinal and capacity differences among, smallholder farmers. Many smallholder Kenyan maize farmers find themselves in a cycle of poverty that is difficult to break, although not every smallholder is in the same position and not all will respond in the same way to particular interventions. Furthermore, only a minority of subsistence farmers can be expected to escape poverty through improvements in their own farming operations. Most will have to break the cycle through jobs created in agrifood systems and other economic sectors. How does this heterogeneity across smallholder farmers affect policy design and, ultimately, the sustainable uptake of a more commercially oriented approach to farming?

This study thus aimed to move the view of commercialization from that of simply selling to that of developing a comprehensive strategy involving a set of related decisions to be made throughout the growing season. With an appreciation of the heterogeneity of smallholder farmers comes an understanding that support strategies must move towards a best-fit rather than a traditional one-size-fits-all approach, as well as towards improved targeting. For example, a national fertilizer subsidy programme is not likely to achieve the goal of commercial transition without an understanding of whether the programme is really what the targeted smallholder segment needs.

In summary, the overall goal of this study was to derive policy implications from a reframing of the smallholder commercialization challenge in the context of staple food crop production and individual farm-level decision-making by a heterogeneous smallholder farmer population. In the specific context of maize production in Kenya, the study focused on four fundamental research questions:

1. To what degree are Kenyan smallholder maize producers making farm management decisions consistent with a commercial approach, and what impacts do these decisions have on the likelihood of being a net seller?
2. What are the opportunities for Kenyan smallholder maize producers to reach different maize buyers, and do selling decisions differ across producers?
3. What are the most effective roles for donors, agribusinesses and producers in developing sustainable collective maize marketing models?
4. What opportunities do rural Kenyan youth see in agriculture, and can maize be positioned as an attractive option given the current resource pool?

Each of these questions was addressed in some detail in the previous four chapters, based on an extensive primary data gathering effort. This effort included key informant interviews, case studies, focus group discussions and a structured survey of 500 maize farmers in two key maize production areas of Kenya (Bungoma and Meru). The volume and variety of data sources, and the geographic coverage provide a solid basis for assessing maize marketing by smallholder farmers in Kenya.

6.2 MAIN FINDINGS

Given the four unique attitude-related angles from which the familiar challenge of how to strengthen smallholder farmers' linkages to markets was approached, some interesting new findings emerged from this research. Grouped around the four research questions, the main findings are the following.

1. To what degree are Kenyan smallholder maize producers making farm management decisions consistent with a commercial approach, and what impacts do these decisions have on the likelihood of being a net seller?

The current farm management approach used by smallholder farmers is clearly far removed from a commercial one:

- *There is a lack of coordinated decision-making.* A truly commercial approach to maize farming is hindered by the fact that in many rural households not all commercial decisions are made by the same person, and there is often little communication for coordinating maize-related activities. For example, for maize farming, women are more involved in production decisions and men in marketing decisions. The implication is that "the farmer" in the majority of households is not a single person. Where a single person is responsible for all related decisions that person is far more often a man than a woman.
- *There is a lack of trust in markets from the supply side.* Far from having commercial

objectives, maize production by the household is first and foremost an expression of a lack of trust in markets from a consumption perspective. With less than 20 percent of farmers believing that there is enough maize to purchase on the market, and 93 percent of them perceiving purchased maize to be of lower quality, 96 percent of farmers prefer to grow their own maize.

- *There is a lack of planning.* Although the study found that a majority (about 60 percent) of smallholder farmers plan roughly how much maize production to consume and how much to market, production decisions are driven more by the (known) prices of inputs (seed, fertilizer) than the (perceived) market prices for maize grain (58 versus 46 percent). Furthermore, only 40 percent of farmers know the price of maize in the nearest main maize market, and only 26 percent use cell phones to obtain price information.
- *Smallholder farmers' storage practices are not in line with a commercial approach.* To maximize the financial benefit that can be derived from storing maize to exploit seasonal price differences, maize should be stored for about five to six months after harvest, when prices can be 50–100 percent higher than at harvest time (albeit with great variation from one year to the next). However, farmers store maize for an average of only two months. This is largely because of a need to sell maize for urgent cash requirements. Furthermore, three-quarters of farmers store their maize in the home, partly because they do not have the volumes and/or knowledge to store the maize in more commercial (but safe) storage facilities (on- or off-farm). Home storage also has a detrimental effect on the quality of the maize, and hence on its market volume.
- *Maize quality management is insufficient.* Nearly all smallholder farmers are aware that quality affects the price of maize, especially in terms of rotten kernels and moisture level, but only 60–80 percent of them – depending on the quality characteristics – actively manage maize quality. This is partly explained by the fact that there is largely no quality premium in the traditional trader market into which most smallholder farmers sell. It is interesting that women were found to manage maize quality less actively than men. The study also found that the quality levels believed to be demanded by markets

vary greatly among farmers. Related to the most critical quality element – moisture level – most smallholders also lack the appropriate tools to dry and measure moisture levels.

- *Farmers are not selling to preferred buyers.* Only four out of ten farmers are able to sell to their preferred buyer, mostly because the need for a direct payment from a local trader overrides the desire to sell for a higher price to a more distant trader, institutional buyer or miller.
- *Commercial outcomes are in line with commercial practice and attitude.* Net sellers, who can be considered more commercially oriented, are characterized by a higher level of schooling, more coordinated management decisions, more market-focused planning and storage, more hired workers, and a greater use of cell phones in obtaining market price information. These findings confirm the existence of an elite group of commercially focused smallholder maize producers.

2. What are the opportunities for Kenyan smallholder maize producers to reach different maize buyers, and do selling decisions differ across producers?

- *Overall, most maize producers are not poised to undertake commercial production.* The majority of smallholder maize farmers start selling maize within the first two weeks after harvest because of urgent cash needs. In practice, the maize volumes sold and the expenditures to be paid from the proceeds are larger for men than for women.
- *Nearly half of smallholder farmers are “in the market”, but are not necessarily linked to modern markets on truly commercial terms.* While net sellers of maize, i.e., households that sell more maize than they buy over the year, make up 45 percent of the smallholder farmers in the survey, only 10–15 percent of these net sellers sell primarily to more modern and quality-differentiated markets such as distant traders and institutional buyers. The same importance of the modern channels is reported by the 27 percent of the smallholder farmers who are net buyers of maize. About 10–15 percent of net buyers sell primarily into modern channels. Weak and insecure linkages to these modern markets constrain farmers from selling more into them. The main difference in channel choice, which

reflects commercial attitude, is that net sellers sell slightly more than net buyers to rural assemblers and local markets, as opposed to selling directly to nearby consumers (75 versus 66 percent). The study also found that 28 percent of smallholder maize producers are not in the maize market, as either sellers or buyers.

- *Net sellers implement more quality management practices.* The study found that relative to net buyers nearly twice as many net sellers implement all four quality management practices investigated (57 versus 32 percent). Farmers reported a 5–10 percent price premium for higher-quality maize. The practices considered were removing rotten grains, managing moisture level, removing foreign materials, and removing broken grains. While the first three are of relevance in any market channel, the last one indicates that net sellers have a somewhat more market-focused approach than do net buyers.
- *Transaction costs are at least as important as price in choosing a market channel.* Farmers indicated that the ease and low risk of selling to a particular buyer are important factors in their decision-making. These factors also include low transportation costs, trustworthy quantity measurement and direct payment. In addition, the potential for obtaining access to credit was a factor in channel choice.
- *Certain farmers are more likely than others to sell into more modern channels that require more commercial practice.* The study found that a smallholder maize farmer is more likely to sell to distant traders or institutional buyers if the farmer has fewer nearby market options (farmgate traders, rural markets), is more specialized in maize, is more quality-conscious, is more likely to have benefited from the government input support programme NAAIAP, and is better informed on market prices across various market channels. It is interesting that gender and education were not found to be significantly correlated to selling into more modern channels. However, the study found a significant regional difference, in that farmers in the Meru area are more likely to sell maize into more modern markets than farmers in Bungoma. A key explanatory factor for this difference is that farmers in Meru are more specialized in maize than their counterparts in Bungoma,

where there is a greater variety of income generation activities.

3. *What are the most effective roles for donors, agribusinesses and producers in developing sustainable collective maize marketing models?*

- *Operating as individuals, smallholder maize farmers are locked into the traditional marketing system.* In traditional maize marketing, small traders and millers prefer to buy from individual smallholder farmers for reasons that disadvantage the farmer. For such traders, individual smallholder farmers sell in extended bags (selling more weight of maize for the same price); have little negotiation power, as they urgently need cash; supply fresh maize of homogeneous quality; are easier to deal with than groups; and often bring the grain to the trader (saving on transport costs). Modern maize marketing is essentially not an option for individual smallholders: institutional buyers and national millers, which typically offer better prices, need regular, large and consistent high-quality maize supplies.
- *Collective maize marketing by smallholders is undermined by their entrapment in a vicious poverty cycle.* With little money available for inputs, individual farmers typically have small volumes available for the market, which implies that many of them need to collaborate to reach a better negotiating position with local traders or to achieve the volumes with which larger and more rewarding markets can be targeted. The needs of individual farmers vary, among other factors in terms of how quickly they need or want to sell their maize after harvest (e.g., to pay for school fees), making it difficult to reach agreement. Smallholder farmers do not own storage facilities individually or do not have village- or higher-level storage available, or these facilities are insufficient in terms of capacity, quality or safety (risk of theft).
- *Collective maize marketing by smallholder farmers has impacts on their income but not necessarily on their commercial status.* The study found that engaging in collective storage and marketing has a significant and positive impact on the income that smallholder farmers derive from maize (in both absolute and relative terms), but a transformational effect in terms of a shift to

commercial farming is constrained. In other words, net sellers of maize, who can be seen as more commercially oriented, are more likely to engage in collective action than net buyers, while net buyers are unlikely to become net sellers over time purely as a result of collective marketing.

- *Partnership-driven approaches to support collective maize marketing by smallholder farmers may be more promising than traditional project-driven approaches.* In comparing a project-driven approach, cereal banks in Bungoma, with a partnership-driven approach, aggregation centres in Meru, the study found that while the former failed entirely, the latter appears to be commercially viable. Some fundamental differences between the two models imply that these findings apply far beyond the two cases, with success depending on a farmer-driven process; homogeneous membership; integrated solutions combining adapted post-harvest handling, storage and marketing technologies with outsourced services, on commercial terms through partnerships; a public sector focused on the enabling environment aspects; a strong management structure; and a transparent financial system with effective checks and balances. This outcome is possibly influenced by the fact that farmers in Bungoma have more income-generating opportunities than those in Meru, and thus perhaps less of an incentive to make a particular opportunity work.

4. *What opportunities do rural Kenyan youth see in agriculture, and can maize be positioned as an attractive option given the current resource pool?*

- *Current farmers see businesses opportunities for youth in agriculture, especially in maize farming.* Many farmers of all ages in the survey believe that there are opportunities in agriculture for the next generation, albeit less so in Meru than in Bungoma (80 versus 50 percent). In both regions, young adults (under 35 years of age) are more optimistic than older farmers (over 55 years). Those who are optimistic see maize as the main income-generating crop for youth.
- *Rural youth, especially young women, are generally less optimistic and see more professional opportunities for themselves outside agriculture.* According to exploratory

focus group discussions, only 15 percent of rural youth are actively engaged in agriculture, and most see their future incomes coming not from agriculture but from service jobs such as transport or hairdressing, or from low-skilled jobs such as casual labour or produce hawking. If given a grant, only 40–50 percent of youth would invest in some form of farming, with the exception of young women in Meru (only 10 percent). Youth do not seem to realize that the opportunities for such jobs in rural areas depend on the incomes generated from agriculture (spill-over effect) and that as long as agriculture is constrained, these jobs are limited in supply and markets will be quickly saturated.

- *In agriculture, youth see greater potential for activities other than maize production.* Roughly 10–15 percent of youth see maize production as a viable economic activity. Youth's constrained access to land (with clear land titles), especially for young women, is a key reason for this overall pessimism. Horticulture and poultry, which allow greater income generation per unit of land, are seen as more promising than maize. Stylized profit calculations indicate that growing tomatoes can bring a net income per hectare that is three times that of maize, thus supporting this belief of youth. For these agricultural activities, youth face constraints in terms of investment capital and technical knowledge, especially in Meru.
- *Training for skills building is not seen as a worthy financial investment by youth, especially not in agricultural activities.* Of the 80 percent of youth who would be willing to take out a loan, only 10–15 percent would invest such a loan in education. Part of their reservation stems from youth's expectation that loan products are not designed for delayed-return investments such as training, and part from their belief that a lack of rural infrastructure and other constraints would prevent them from using their new skills in a profitable farming business. Support programmes such as NAAIAP are seen as targeting older farmers, not youth. Youth also lack the skills to develop the business plans needed to secure entrepreneurial loans. Youth are aware of public support programmes in this area, such as KYEDF, but the majority do not know how to take advantage of these programmes.

6.3 POLICY IMPLICATIONS

Each chapter in this study investigated the challenge of developing strategies for smallholders' commercial transition from a different angle. This section presents overarching policy recommendations drawn from the conclusions to each chapter.

At the producer-level

Programmes must recognize that not all smallholders in Kenya inherently practise maize production as a business and are prepared to handle many key decisions independently in a commercially oriented model.

Commercially oriented production practices (e.g., maximizing yields) are just one element in a commercial approach. Planning and selling are others. Breaking the cycle of subsistence agriculture is as much a matter of improving farm and financial management (e.g., planning, access to loan products, and building of relationships with buyers) to get the business model right as it is a matter of improving production practices.

Remove the ambiguity associated with maize standards and measures to facilitate a more transparent market.

Smallholder farmers who manage more aspects of maize quality have greater access to buyers offering premiums for differentiated quality. However, many costs remain in obtaining access to these buyers. Moreover, disagreements over quality and weight measurement between buyers and sellers will continue in the absence of a neutral third party. Smallholder producers are less able to endure these disagreements. The incentives for post-harvest maize quality management vanish if there is no clear path towards a price premium for these efforts.

A new approach to collective marketing is needed. Continuous partnerships built around a business-driven approach (i.e., with regular firms that are profit- and market-driven) with clearly defined roles for all parties involved offer the best chance of success.

Voluntary, integrated models that combine effective and efficient levels of technology with management skills in post-harvest handling, storage and marketing are needed to be able to meet the requirements of the various market segments in terms of, for example, quality standards, minimum volumes and payment terms. For-profit firms are well-designed to partner smallholders in creating a strategy that clears the path between production and access to markets throughout the year. Targeting of the right types of farmer and

farmers' group (i.e., those with stronger commercial potential in terms of skills and interest, groups that can legally engage in business operations) is another critical factor in ensuring that the model is adopted and grows.

At the institutional-level

Respect agribusiness as a unique economic sector in which producers and service providers are partners.

Unlike many other more continuous economic sectors, the staple food subsector – and associated subsectors – operates on a seasonal cycle that depends on natural phenomena. Agriculture requires not only specially designed input products, but also purpose-designed service products (e.g., loans) that reflect the seasonal and often erratic nature of production. These services need to be offered by professionals who are trained to understand agriculture and to anticipate the sector's needs.

Service providers in the sector also need support. For example, it is difficult for small buyers and brokers to offer differentiated prices to smallholders who engage in post-harvest quality management if the buyers do not have the cash flow for grading or transport. To help smooth large fluctuations in the maize market over regions and time, buyers in the value chains must also have access to storage and credit.

As a recognized part of the agriculture sector, agribusiness services can be an important area in which youth can develop and become engaged. Services such as quality management, storage, transportation and marketing are all key and will be increasingly needed as producers transition towards a commercial approach.

Coordinate policies that affect the agriculture sector. Do not allow the timing of school fees to inhibit the transition.

Seemingly simple policy shifts, such as better coordination of the timing of school fees, could represent relatively low-cost strategies for reducing cash flow pressure on all smallholders in the current environment. There are likely to be other examples. Understanding how all policies, not only those originating from MOA, affect smallholders' decisions is central to creating a policy strategy that can help achieve transition goals.

Pursue a transparent system for the exchange and enforcement of property rights.

The weak capacity to exchange and enforce property rights continues to undermine agribusiness development in Kenya. Scarce access to land for maize production deters current producers and

inhibits youth from entering the sector. Enforcing current property right laws and facilitating a transparent land rental market could improve access to agricultural land.

In addition, many smallholders have only maize to use as collateral when funds are needed to develop their businesses. To use this collateral, farmers and lenders need to be able to operate in a system where contracts and property rights can be enforced.

For the next generation of staple crop producers

While following through on current recommendations for the sector can make staple agriculture more attractive, complementary, longer-term investments that target youth are also necessary.

To encourage their entrance into agriculture, today's youth require investment in customized approaches. Although not dissimilar to many other smallholders, youth also need intensive guidance in developing business plans and obtaining access to individually tailored loan products, with oversight. Past experience suggests that many youth have trouble sustaining a business without guidance in planning and operating during at least the first few years. Currently, youth are moving either towards crops other than maize or out of agriculture altogether because it is economically unattractive.

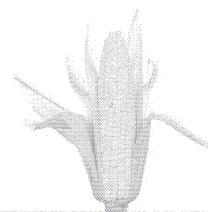
Invest in education for the youth of tomorrow.

For the next generation, education is critical.

At a minimum, youth need access to training in basic business skills to succeed in any area of the agribusiness sector. Ideally, the next generation of farmers will have access to the agricultural education programmes that best fit their interests and needs. Professionals from agribusiness programmes that target planning, production, marketing and logistics will become the cornerstones of a commercially oriented staple agriculture sector.

Conclusions

Most research reports focusing on smallholders begin and end by stating that smallholders are fundamental to developing their countries' staple agriculture sectors. This report is no different. In contrast to more developed agro-economies, smallholder staple producers in East Africa represent the majorities of both producers and production in their respective countries. This report emphasizes that this group is heterogeneous in the skills and attitudes of its members, even though most are trapped in a challenging poverty cycle. New customized approaches that recognize these differences and facilitate the transition to commercial agriculture are required. According to the farmers and other maize industry stakeholders, the current framework of support will not bear the weight of shifting global markets, youth's expectations and urbanization trends unless there are dedicated investments and coordination for building an improved agribusiness sector in East Africa.



UNDERSTANDING SMALLHOLDER FARMER ATTITUDES TO COMMERCIALIZATION

THE CASE OF MAIZE IN KENYA

Using the case of maize production in Kenya, this study reframes the challenge of smallholder commercialization in the context of staple food crop production and individual farm-level decision-making by a heterogeneous population of smallholder farmers. While many smallholder growers of staple crops find themselves trapped in a cycle of poverty, they differ greatly in their abilities to break this cycle and in their attitudes towards using commercial farming as the pathway for doing so. With an appreciation for the heterogeneity of smallholder farmers comes an understanding that supporting policies and programmes must move from traditional one-size-fits-all approaches to more targeted, customized approaches that are more likely to facilitate the sustainable uptake of a more commercially oriented approach to smallholder farming. Based on extensive primary data analysis, various innovative options for such strategies are presented in this study.

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