
ACET 2015

Office location
50 Liberation Road, Ridge Residential Area, Accra, Ghana
Phone: +233 (0)302 210 240
Email: info@acetforafrica.org

For general inquiries, including press
Ghana Mailing Address:
Cantonments, PMB CT 4, Accra, Ghana

www.acetforafrica.org
Promoting Sustainable Rural Development and Transformation in Africa

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Burkina Faso-Country Report
About the Study

Policy makers and development partners are keen to find interventions that are effective in improving smallholder productivity and raising the income and resilience (including food security) of smallholders. It is ACET’s view that linking the objective of increasing smallholder incomes and resilience to the broader economic transformation agenda will be mutually beneficial to agriculture and the rest of the economy, particularly the manufacturing sector (starting with agro-processing). Such linkage is also likely to raise the profile of agriculture and engage the interest and participation of a wider segment of government and the general population, thereby increasing overall support for improvements in agriculture. This is the rationale for a grant given to the ACET by the Bill and Melinda Gates Foundation (BMGF). ACET seeks, through the study of a number of national crop/livestock value chains, to help create this linkage. The poverty reduction objective of BMGF and the economic transformation objective of ACET led us to select the following value chain studies.

<table>
<thead>
<tr>
<th>Crop/livestock</th>
<th>Kenya</th>
<th>Uganda</th>
<th>Tanzania</th>
<th>Ghana</th>
<th>Burkina Faso</th>
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<tbody>
<tr>
<td>Sorghum</td>
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<td>Millet</td>
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<td>Poultry</td>
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<tr>
<td>Cassava</td>
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<tr>
<td>Cow</td>
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<tr>
<td>Rice</td>
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<td>×</td>
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<tr>
<td>Cotton</td>
<td>×</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Cocoa</td>
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</tbody>
</table>

The overall objective of the study is to identify, through the analyses, the policy measures, institutional reforms, and potential public investments that could: (a) help increase the productivity of traditional smallholders and improve post-production value (storage, processing, and market access—domestic or foreign) in order to increase their incomes and improve food security; (b) support the emergence of small- and medium-scale modern commercial farmers and foster linkages between them and traditional smallholders; and (c) increase agriculture’s contribution to an overall economic transformation through linkages with industry, starting with agro-processing.

The Burkina Faso country report is a synthesis of the four value-chains studies (i.e., on sorghum, poultry, cow and cotton) and will be the basis for convening policy forums that will bring together the finance, agriculture, trade and industry ministries, together with other stakeholders from the private sector, research and non-governmental sector representatives to discuss and advocate for policy positions that can unlock the potential opportunities identified in this study. The study was sponsored by the Bill and Melinda Gates Foundation and conducted in partnership with Laboratoire d’Analyse et de Politique Economiques (LAPE) who did the study on Beef and Poultry and Institut de l’Environnement et Recherches Agricoles (INERA) did the studies on Cotton and Sorghum.

The individual value chain studies can be downloaded on the ACET website: www.acetforafrica.org/agricultural transformation.
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I. Background

A) Role of agriculture in the Burkinabe economy

For the past four decades, agriculture has been the second largest contributor to gross domestic product (GDP) in Burkina Faso after services, averaging 35.6% of GDP between 1992 and 2012. Recent trends in the share of GDP contributed by agriculture show a sawtooth pattern for the period 2000-2012, with a decline from 40% in 2008 to 34% in 2011 and a slight increase to 35% in 2012. In addition to its share of GDP, agriculture employs the largest share of the active population in Burkina Faso, a figure that has barely decreased in 21 years, from 92.35% in 1992 to 92.03% in 2012 (author’s calculations using World Bank data). With such a large share of the population dependent on agriculture for their livelihood, the importance of agriculture to the country’s development cannot be overstated. The sheer proportion of the active population working in agriculture points to low levels of productivity in the sector.

Agricultural productivity as measured by value added per worker is low in Burkina Faso. Indeed, agricultural value added per worker averaged US$265 over the period 1980–2012, well below the average in sub-Saharan Africa (SSA) of US$549 and the ECOWAS average of US $699. Recent agricultural productivity trends indicate that the gap is widening between Burkina Faso and SSA. Figure 1.2, covering the period 1992–2012, shows the gap expanding from 2006 onwards, which is worrisome for the prospect of agricultural transformation in Burkina Faso. While productivity is clearly moving upward for SSA, the trend is more uneven for Burkina Faso, indicating a lack of consistency in improvement on this indicator. In addition, total agricultural value added grew at an annual rate of 4.8% over the period 2003–2012, falling short of the 6% agricultural growth rate set by the Comprehensive Africa Agriculture Development Program (CAADP). This is not sufficient to trigger sustainable agricultural development, especially given the pronounced year-to-year fluctuations.
Turning to trade performance for agricultural products, Figure 1.3 shows the trend in imports and exports of agricultural products in Burkina Faso for the period 1992–2011. Both imports and exports show an upward trend, with imports increasing fourfold and exports fivefold during this period. The country experienced a trade deficit between 1992 and 2000 (except for 1997–1998) and a trade surplus from 2001 to 2011 (except for 2007–2008). This suggests good potential for developing agricultural exports in Burkina Faso by targeting improvements in productivity and quality of agricultural products and diversifying the product set. The top three agricultural exports were cotton lint, sesame seeds, and cottonseed oil in 2000, and cotton lint, sesame seeds, and cashew nuts in 2011, indicating little diversification and limited use of technology to produce and export more sophisticated agricultural products.
In sum, Burkina Faso experienced good results in terms of trade of agricultural products over the past two decades, while results in terms of productivity fell short of expectations. Between 2006 and 2010, the country spent more than 10% of its budget on agriculture, meeting the CAADP goal (MAFAP, 2013a). However, this increase in investment did not have the expected impact on agricultural value-added growth. The mixed performance of the agricultural sector in Burkina Faso, especially in recent years, calls into question the policies that are being implemented in the sector.

B). Agricultural policy in Burkina Faso

The current structure of the Burkinabe agriculture sector was shaped in the 1990s, when the Agricultural Structural Adjustment Program (PASA) was adopted as part of a more general structural adjustment program. Liberalization of trade in agricultural products goes back to the PASA’s implementation in 1992. Other measures taken as part of the PASA include the privatization of agro-industries and all public enterprises operating in the production, processing, and marketing of agricultural products, and the suppression of agricultural input subsidies.

Between 1995 and 2003, several departments of the ministries in charge of rural development designed sector-specific policies and strategies for agriculture (strategic and operational plan, PSO), livestock (Actions Plan and Investment Programme for Livestock Sector, PAPISE), forestry (National Forestry Policy, PFN), food security, water, sanitation, biodiversity, climate change, desertification, and environmental education.

Table 1.1: Sequence of agricultural policies in Burkina Faso

<table>
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</tr>
</thead>
<tbody>
<tr>
<td>Global Development Policy</td>
<td>PAS</td>
<td>CSLP</td>
<td>Revised CLSP</td>
<td>Revised CLSP</td>
</tr>
<tr>
<td>Agricultural Development Policy</td>
<td>PASA</td>
<td>SDR</td>
<td>SDR</td>
<td></td>
</tr>
<tr>
<td>Sectoral Policies</td>
<td>PSO, PAPISE, PFN, etc.</td>
<td>PSO, PAPISE, PFN, etc.</td>
<td>PSO, PAPISE, PFN, etc.</td>
<td>PNSR</td>
</tr>
</tbody>
</table>

Source: Author’s construction

In 2000, prompted by the Bretton Woods institutions, the government of Burkina Faso (GoB) produced its Poverty Reduction Strategy paper (Cadre Stratégique de Lutte contre la Pauvreté, or CSLP) as a replacement for the structural adjustment program. The CSLP was revised in 2003 and states that the objective of the government is to stimulate the contribution of agriculture to economic growth by establishing an enabling environment for private investors and the development of small and medium enterprises (SMEs) in poverty-stricken and rural areas. In July 2001, the GoB created the Coordinating Committee for Agricultural Sector Policies (Secretariat permanent de coordination des politiques sectorielles agricoles, SP/CPSA) to harmonize and ensure the coherence and efficient implementation of agricultural policies. To support the successful implementation of the CSLP, the government adopted a rural development strategy (Stratégie de Développement Rural, or SDR) in 2003, which views sustainable growth in the agricultural sector as the channel for ensuring better food security and proper rural development.

The current countrywide development strategy (Stratégie de Croissance Accélérée et de Développement Durable, or SCADD [2011–2015]) was adopted in December 2010 to replace the CSLP. Its objective is to reach high and sustained economic growth of 10% per annum, offering quality and sustainability to generate a multiplier effect on incomes and quality of life, and in line with the principle of sustainable development. The rural sector is expected to contribute significantly to the national economy, with the goal of achieving an annual growth rate of 10.7% in the period 2011–2015, as stated in the SCADD.

1 Monitoring African Food and Agricultural Policies, an FAO program.
According to MAFAP (2013a), public expenditures in recent years have targeted agriculture-specific policies more than general rural development. Additionally, agriculture-specific expenditure is moving toward more general support (i.e., training, agricultural research, and off-farm infrastructure) and away from direct payments to farmers and other actors in the agricultural sector. The same authors argue that investments in cotton and horticultural products have the greatest impact on economic growth, while investments in cotton (87%) and livestock (59%) have the largest pull effects on the economy. In other words, cotton and livestock have the greatest potential for processing, which can be a source of new jobs and poverty reduction in the country. Yet about 90% of commodity-specific expenditures go to rice and cotton, to the detriment of products such as livestock and sorghum, suggesting a contradiction in the country’s agricultural policy. Cotton provides income for farmers and revenue for the State but its impact on food security is limited. Livestock can positively impact both food security (nutritional value of meats) and farmers’ income. Sorghum has a pull effect of 29% and is an important grain in the Burkinabe diet, especially in rural areas. Although there are spillover effects of fertilizer use by cotton farmers that lead to improved yields for...
maize and sorghum, commodities like sorghum and livestock do not receive the attention based on the value chain approach as cotton does. Why focus only on cotton and rice when other crops can ensure greater food security? Understanding the environment in which these decisions are made can shed light on the observed allocation of resources.

D). Agriculture and the political economy

From the early years of its independence, authorities in Burkina Faso began lending support to cotton production, viewing it as a means for the young nation to acquire the necessary foreign exchange to support development efforts. Indeed, experience from the colonial era showed that cotton could bring in revenue, as it was much in demand at the time. The French pushed for cotton production in Burkina Faso, among other colonies, because their textile industries had trouble sourcing cotton fiber (Madiega and Nao, 2003). The governments that ruled the country afterward pursued the policy with more or less intensity, depending on the period, because the crop had by then become crucial to the economy.

It is important to note that cotton farmers are able to organize themselves under one strong umbrella body and impact government policies to their benefit, which is not the case for producers of other agricultural products, such as livestock. The national livestock farmers’ association is deemed weak due to the peculiarities of livestock production. Geography, diversity of livestock, and the overall heterogeneity of livestock producers were all identified by Gning (2005) as obstacles to the establishment of a strong umbrella organization of livestock producers in Burkina Faso. Unlike cotton production, livestock rearing is spread across the entire country, making it difficult for farmers to organize. The livestock population is also diverse, including a range of different types of animals, which means less commonality between farmers. In addition, many of the Burkinabe who rear livestock do not do so as a primary source of income; therefore, they are less likely to lend support to a long-term organization of the sector.

Turning to the prospects for agricultural transformation to shape the political debate in the country, the sector has the potential to provide jobs for idle youth. For instance, although it has the potential to irrigate 285,000 hectares (ha), the country has achieved less than 20% of that amount so far (Ministère de l'Agriculture et de la Sécurité Alimentaire [MASA], 2013). Investment toward fulfilling this irrigation potential requires a large amount of resources, which the government cannot currently mobilize. However, the 2014 popular uprising in the country, which led to the ousting of Blaise Compaoré before the end of his presidential term, sent a clear message to the authorities. The policy makers must devise ways to successfully mobilize resources for increased investment in sectors that can generate employment for the youth, lest they take to the streets again. Agriculture can be this generator in Burkina Faso, given the country’s endowments.

Despite spending on average 14.1% of its budget on agriculture in the period 2006–2013, Burkina Faso failed to achieve the goal of 6% agriculture output growth. This suggests issues with the efficiency of investments made so far, issues with the crops targeted, and/or that the current level of spending is not adequate for its existing needs. A study by the agriculture ministry, suggesting that the country needs to reach and sustain an agriculture expenditure of 17% of its budget before it can meet the second CAADP goal, gives credence to the third argument. This study posits that the second argument may be part of the issue.
E). Rationale for country crop studies & link to agricultural policy

From the agricultural policy discussion above, it is clear that numerous agricultural development plans have been designed and implemented in Burkina Faso, but so far they have not yielded the expected results of sustained improvement in productivity and better incomes for farmers. Reasons for this lack of success include an inadequate level of investment to ensure effective implementation of the policies, inadequate coordination between all bodies of government working on agriculture, and the lack of consistent use of the value chain approach. This study intends to focus on the value chain approach.

The majority of Burkinabe farmers (72%) are smallholders with less than 5 ha of land (MAFAP, 2013a), residing in rural areas and practicing subsistence farming. As shown above, these farmers exhibit low levels of productivity amid great prospects for exports, as export values increased by 32% between 2002 and 2011. There is thus a need to find ways of raising productivity if agriculture is to contribute the full weight of its transformative potential.

The overall objective of this study is to suggest ways to increase smallholder productivity and improve post-production value (storage, processing, and market access, both domestic and foreign) in order to improve the incomes and food security of smallholders, and to increase agriculture’s contribution to an overall economic transformation that reduces poverty in Burkina Faso. This will be done by looking at the value chains of four agricultural products that are crucial to Burkinabe agriculture and livelihood-sorghum, cotton, beef, and poultry—from the point of view of: (a) increasing productivity on—farm, and (b) increasing value capture or value addition along the product value chain (both on-farm and off-farm).

These crops/products were chosen for value-chain analysis because of the potential for synergies in developing their value chains. Indeed, increased productivity and production in the sorghum and cotton sectors can lead to the development of an animal feed industry to support the beef and poultry industries, using sorghum and cotton byproducts as input. Sorghum can also be used as feedstock in beer production, as has been done successfully in Nigeria. Therefore, the simultaneous development of these four value chains can provide a basis for linking the development of the manufacturing sector with that of the agricultural sector, while ensuring food and nutritional security. Table 1.2 summarizes specifics related to the choice of each of these four crops/products.

<table>
<thead>
<tr>
<th>Sorghum</th>
<th>Cotton</th>
<th>Beef</th>
<th>Poultry</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Traditional staple with about 13% share of agricultural output. Per capita consumption is the highest in Africa.</td>
<td>• Important source of income and credit for farm inputs</td>
<td>• Cattle are Burkina Faso’s fourth largest export in terms of value.</td>
<td>• Major cotton producer and thus can support a significant feed industry for poultry production</td>
</tr>
<tr>
<td>• Potential to develop a sorghum-based animal feed industry</td>
<td>• Biggest cotton producer in Africa (&gt; 600,000 MT), but very little downstream activity beyond production (spinning capacity of 7,000 MT compared to 700,000 MT in Nigeria)</td>
<td>• A sizable regional industry for meat. Sahel meat attracts a quality premium over imported meats.</td>
<td>• Internal demand constrained by high prices of poultry. Big regional market (Ghana, Côte d’Ivoire)</td>
</tr>
<tr>
<td>• Potential to use as feedstock for beer being explored, with successful trials completed</td>
<td>• Potential to support a large animal feed industry and a cooking oil industry</td>
<td>• Great potential for raising farmers’ income if price information about regional export markets, such as Nigeria, is conveyed to them</td>
<td></td>
</tr>
</tbody>
</table>
This study embraces the value chain approach to propose ways of taking advantage of low-hanging fruit, as well as other opportunities, in the agricultural sector in Burkina Faso. We do so by focusing on the synergies that can be developed between the sorghum, cotton, beef, and poultry industries in Burkina Faso. Indeed, MAFAP (2013b) argues that agricultural policy in the country lacks a commodity-specific development strategy and that, incentives for Burkinabe producers, such as access to inputs, equipment, credit, infrastructure, price information, and marketing opportunities, are limited, except in the rice and cotton sectors. Efforts to develop and implement an integrated market information system for agricultural products including grains and livestock are underway.

The rest of this report is structured as follows. Section II presents summaries of the four individual value chain analyses: key issues and challenges, value capture opportunities and potential points of leverage, policy recommendations, and what will be required to implement them. Section III presents a value chain rearrangement simulation and its implications for poverty levels in the country. Section IV provides a synthesis of emerging issues, including opportunities arising at different links in the value chain of each of the four crops/products. Policy suggestions for creating synergies between the individual value chains are discussed in Section V, and Section VI proposes the way to move forward.
II. Summary of crop studies

A) Sorghum

1. Key issues along the value chain

Production

Sorghum is the primary food crop produced in Burkina Faso, reaching 39.4% of total food crop production in 2012 (DGPER, 2012). Sorghum is grown in all regions of the country with the Est (Eastern) Region producing the largest share of total sorghum production, 17.2% in 2012. With Burkinabe farm size ranging from 3 to 6 ha on average, virtually all food crop producers, including sorghum producers, are smallholders. Sorghum production reached its highest production level, 1.9 million metric tons (MT) in 2010 (Figure 2.1).

Sorghum also dominates other food crops in terms of acreage, with 44.6% of the total cultivated area in 2012, versus 36.5% for millet, 16.0% for maize, and 2.5% for rice (DGPER, 2012). The average annual growth rate for sorghum production over the period 1961 to 2013 is 7.0%. The cost of producing one hectare of white sorghum is estimated at 235,250 CFA francs (US$ 470.5) and 224,750 CFA francs (US$ 449.5) for red sorghum (Yaméogo (2005). The same author estimates gross profit margin to be 27.5% and 78.0% for white sorghum and red sorghum, respectively. The sorghum yield was estimated at 0.9 MT/ha in 2011, which falls short of the potential yield of 2 MT/ha obtained in fields where soil conservation techniques such as zaï were used (Terre Verte, 2013a, 2013b, 2013c).
The adoption of improved varieties of sorghum is estimated at only 6.1% nationwide, and merely 11.2% of the cultivated area is sown using improved varieties (DGPER, 2012). As for fertilizer use, only 1.2% of white sorghum–cultivated areas receive urea, versus 55.4% for maize.

Farm to market

Post-harvest losses in the field were estimated at 17.7% for white sorghum and 17.2% for red sorghum in a survey of 10 provinces of the country (Alliance for a Green Revolution in Africa [AGRA], 2014). In addition, 14.3% of white sorghum (10.6% of red sorghum) is lost during storage, pointing to the need for better harvesting and storing solutions. Some producers have organized themselves to solve the post-harvest loss problem; one good example is the Union des groupements pour la commercialisation en commun des produits agricoles de la Boucle du Mouhoun (UGCPA/BM), which uses modern warehouses to store many types of grain, including sorghum. Each type of grain is stored separately to avoid contamination.

Table 2.1: Sorghum yield from three experimental stations and farmers’ fields in Burkina Faso

<table>
<thead>
<tr>
<th>Experimental Station</th>
<th>Rainfall in 2013</th>
<th>Yield from farmers’ using traditional methods (kg/ha)</th>
<th>Yield from farmers’ using zaï (kg/ha)</th>
<th>Yield from experimental stations using zaï (kg/ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guiè</td>
<td>766</td>
<td>1201</td>
<td>2009</td>
<td>2007</td>
</tr>
<tr>
<td>Goëma</td>
<td>617</td>
<td>1071</td>
<td>1629</td>
<td>1755</td>
</tr>
<tr>
<td>Filly</td>
<td>657</td>
<td>894</td>
<td>1564</td>
<td>1566</td>
</tr>
</tbody>
</table>

Source: Terre Verte, 2013

Figure 2.1: Production and trade of sorghum in Burkina Faso

Source: Author’s construction using FAOSTAT data
A large number of small-scale processors are responsible for 63% of the sorghum milling in the country. Semi-industrial processors, such as Minoterie du Faso and SITRAC, follow. These processors hold 16% and 11% of the market share, respectively.

<table>
<thead>
<tr>
<th>Company</th>
<th>SODEPAL</th>
<th>SITRAC</th>
<th>MELS</th>
<th>Minoterie du Faso</th>
<th>Small processors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share</td>
<td>2%</td>
<td>11%</td>
<td>8%</td>
<td>16%</td>
<td>63%</td>
</tr>
</tbody>
</table>

Source: African Center for Economic Transformation (ACET) simulation study, 2013

Both traditional milling and brewery activities are conducted mainly by women, who process sorghum into milled products (e.g., biscuits, bread, cakes, steamed and dried lumps for porridge, and couscous) or brewed products (e.g., soft drinks and dolo, the Burkinabe traditional beer). Dolo brewing is done exclusively by women and is a good source of income for the women who practice it.
As Figure 2.3 shows, most processing methods are artisanal or semi-industrial, which limits product development in quantity and quality.

**Marketing and trade**

Sorghum's overall market penetration is small, especially compared to rice and maize. Marketing rates in 2009 were 10% for sorghum, versus 86% for rice and 30% for maize (MAFAP, 2013a). The domestic marketing channels are mostly informal ones linking producers to large urban centers. A small share of production is exported (5,001 MT in 2011), and imports have been nil since 2000, making Burkina Faso a net sorghum exporter. However, difficulties in collecting data because of informal cross-border trade may skew these statistics. The main destination for sorghum exports is Niger.

Cross-cutting issues for all segments of the value chain include low access to credit and inputs, lack of strong farmers’ organizations, and limited incentives and support from the government.

**2. Value-capture opportunities**

**Production**

There is room to improve the productivity and quality of sorghum in Burkina Faso through the adoption of new production technologies, such as improved seeds, fertilizer microdosing, and soil and water conservation techniques. The challenges here are the low adoption rate of improved seeds, reluctance to use fertilizer for sorghum production, and the marginal lands often used for sorghum, as it is believed that this crop can “fend for itself.” There are ways to overcome these challenges, including linking sorghum breeders with farmers from the outset of the research process so as to produce the types of seed that farmers will adopt. In addition, working on creating awareness among farmers about the high yielding improved varieties of sorghum and on improving the distribution system would help increase the adoption of improved varieties. Supporting agro-dealers to establish shops in rural areas close to the farmers, as is done by AGRA, could help farmers respond to the improvements needs in the distribution system.

Microdosing of NPK fertilizer can offer an opportunity to capture value by using less fertilizer than the recommended 150 kg/ha to achieve higher sorghum yields (0.8 t/ha with no fertilizer, 1.3 t/ha with the recommended dose, and 1.6 t/ha with microdosing). Microdosing pilot projects have shown success in encouraging fertilizer adoption in areas of Burkina Faso (AGRA, 2014), and the lessons learned from these pilot projects can be used to scale up the use of microdosing in sorghum production.

Given the widespread consumption of sorghum in Burkina Faso, increased availability of the grain will help improve nutrition and food security in the country. Indeed, grain consumption represents 60% of the caloric needs of the population, and sorghum alone represents 19% (DGPER, 2012, as cited in MAFAP, 2013a). In 2003, 36% of household spending was on sorghum.

**Farm to market**

Value can be captured by helping farmers store sorghum grain in good condition to reduce post-harvest losses and allow them to sell when prices are most favorable. AGRA is supporting the Government of Burkina Faso to elaborate a warehouse receipt system (WRS) strategy. A pilot will begin when the strategy design is completed. This is a step in the right direction, but the government would need to mobilize more resources to scale up this project, given the geography of sorghum production in the country.
Processing

If Burkina Faso is successful at capturing more value from its production, as outlined above, the processing link in the sorghum value chain can derive great benefits as well. There is great potential for the development of products such as animal feed, weaning foods, sugar, and alcoholic drinks. Animal feed is an especially promising area for product development, as the large livestock herd provides a ready market. Additionally, the need for feed is great and increasing, given the reduction in grazing area due to agricultural expansion into new lands and increased urbanization. In order to exploit this opportunity, the environment for sorghum processing must be improved by facilitating access to credit for investing in equipment and in processing technologies to develop new products.

Incentives targeted to the processing industry, especially the brewing industry, would help develop the processing leg of the value chain. For instance, tax breaks for brewers who use locally sourced sorghum as input into beer production will increase linkages between the production and processing legs of the value chain. This type of intervention would need to be accompanied by actions to improve productivity at the farmer level (e.g., through adoption of improved varieties). In addition, actions should be taken to ensure quality as sorghum is channeled through the brewing process as past experience in the country has shown. Indeed, in 1984, under President Sankara’s urging, the brewery BRAKINA released a sorghum-based beer but this product failed due to problems with the quality of the water used and non-compliance with pasteurization requirements that made customers sick (Huetz de Lemps, 2001).

Marketing

Marketing campaigns about the health benefits of sorghum products should be considered to promote both new and traditional sorghum products for human and animal consumption. For instance, given recent improvements in technology and a high rate of cellphone penetration (79% in 2014), voice messages can be sent to cattle producers to promote sorghum-based animal feed. Campaigns can also be conducted via television and radio.

3. Policy recommendations

- Within the production link of the value chain, farmers should be involved in the selection of new sorghum varieties so their needs and preferences may be taken into account. This will require coordination between the research sector, extension, and farmers. Access to inputs—especially good-quality, high-yield seeds, which should be subsidized—must be improved to tackle the issue of low productivity.

- Given farmers’ reluctance to use fertilizer for sorghum, the use of indigenous soil and water conservation techniques, such as zaï in combination with improved seeds use, should be promoted as zaï has proven to raise farmers’ yields to experimental station levels (Table 2.1).

- The country could integrate sorghum product development (for animal feed, flour, porridge, liquor, medical alcohol, and beer, as is done in Kenya and Nigeria) into its industrial development policy and devise marketing strategies to promote these products.

- Across the whole value chain, there is a need to build the capacity of sorghum industry actors to take charge of the chain’s needs. The existing inter-professional body for grains (CIC-B) should be empowered and strengthened to take on sorghum value-chain development issues. Quality standards for production, processing, and marketing of sorghum should also be defined and enforced.
1. Key issues along the value chain

Production

The cotton sector is the best run value chain among the major crops in Burkina Faso. A strong umbrella organization for cotton farmers, l’Union Nationale des Producteurs de Coton du Burkina Faso (UNPCB) plays a major role in that success. However, there is room for improvement along the value chain.

Cotton is grown in three main areas of the country (Figure 2.4), where three regional monopolies have controlled the cotton market since the sector was liberalized in 2004. SOFITEX operates in the western (green) zone, making up 82% of the cotton area; the eastern (light purple) zone, representing 13% of the cotton area, is controlled by Société Cotonnière du Gourma (SOCOMA); and FASO COTON operates in the central (light blue) zone, 5% of the cotton area (Association Interprofessionnelle du Coton du Burkina Faso [AICB], 2012). In each of these areas, farmers grow regular or genetically modified (GM) cotton; there are also small niches for organic cotton production (dark purple on the map) in Fig. 2.4, mainly carried out by women with support from the Swiss NGO Helvetas.

Although cotton productivity in Burkina Faso has increased since the adoption of GM cotton—1,033 kg/ha for GM cotton versus 875 kg/ha for regular cotton in 2012—it still falls short of the best yield in Africa (2,700 kg/ha in Egypt in 2012). This issue needs attention if cotton is to live up to its full potential for income generation, use of byproducts, and synergies with the other crops/products studied here, and to ensure the sustainability of the whole cotton system. Productivity shortfalls are seriously hindering the competitiveness of Burkinabe cotton and would constrain the development of an animal feed industry, which is the basis of synergies with the livestock and poultry sectors.
Burkina Faso is the largest cotton producer in sub-Saharan Africa. Cottonseed production was estimated at 703,000 MT in 2013, and cotton lint production reached its peak in 2006 at 283,300 MT, though this dropped to 206,000 MT in 2013 (Figure 2.5).

The production cost for one hectare of cottonseed varies by the type of technology used (manual, small traction or large traction) and the type of cotton cultivated (GM, conventional or organic). For one hectare of GM cotton, the production costs are 125,235 CFA francs (US$250.5), 155,153 CFA francs (US$310.3) and 166,626 CFA francs (US$333.3) for manual, small traction and large traction, respectively. To produce one hectare of conventional cotton using manual technology, it costs 112,404 CFA francs (US$224.8) versus 143,003 CFA francs (US$286.0) for small traction technology and 154,905 (US$309.8) for producers equipped with large traction.
Farm to market

In 2014, post-harvest losses in the field were estimated at 11.7% across 10 provinces in Burkina Faso, and storage losses were estimated at 6.7% (AGRA, 2014). This suggests a need for better handling during harvesting and storage to reduce income losses.

Factors that lead to post harvest losses include contamination of harvested cotton before it is packaged in bales, failure to cover the cotton bales properly before pick up by the ginning companies, and exposure to humidity. For instance, the maximum humidity level for storing cotton is 12% (UEMOA-UE-ONUDI, 2006).

![Figure 2.6: Cotton field in Burkina Faso](image)

Processing

The weakest link in the cotton value chain in Burkina Faso is most likely the processing sub-sector, as only about 4% of the cotton lint produced is being transformed domestically, mainly into yarn. Despite its success in the production and export of cotton lint, Burkina Faso has so far failed to develop a strong modern textile industry and to take advantage of opportunities like the African Growth and Opportunity Act (AGOA). The processing issue must be given thorough attention by policy makers in order to increase revenues and employment.

However, the traditional processing of cotton is doing well. Informal sector weavers use raw cotton to produce yarn. Cotton yarn is used by other informal sector artisans to produce dyed fabrics that are used to make clothes by tailors and seamstresses. It is estimated that there are 49,900 weavers, 27,000 dyers, and 10,000 tailors/seamstresses in Burkina Faso and that they represent 80% of the cotton processing industry in the country (Ministère de l’Environnement et du Cadre de Vie, MECV, 2011). Given the large number of actors in this sector, it can be deemed competitive.

Roughly 100 semi-industrial and artisanal trituration companies exist in Burkina Faso with 44 of them belonging to the Economic Interest Group (GIE) GTPOB\(^4\) created in 2007 and 19 to the GIE CPPOD.\(^5\) These companies produce 20% of the country’s cooking oil needs.

\(^4\) Groupe des Transformateurs des Produits Oléagineux du Burkina

\(^5\) Coopérative des Producteurs de Produits Oléagineux et Divers
Marketing and trade

Burkina Faso is a net exporter of cotton lint. The marketing segment of the value chain is doing well, but this success needs to be made more efficient to ensure sustainability. For instance, continued diversification of destination markets for cotton exports is imperative.

In terms of marketing and trade in domestic markets, traditional fabrics made into clothes, bags, shoes, tablecloths, and decorative items are sold in many markets throughout the country. These products are also sold at the international arts and crafts fair of Ouagadougou (SIAO) that takes places every other year, attracting many tourists.

2. Value-capture opportunities

Production

Productivity of seed cotton

Improving productivity in the field can only be achieved by focusing on the factors that could lead to qualitative changes in the production system. The intensification of production will require integrated soil fertility and pest management, access to inputs, equipment, water management, promotion of good agricultural practices, capacity building of farmers through technical training and access to equipment, and cost reduction through the use of alternative technology packages.

Steps to improve productivity must include fighting the decline in soil fertility as a result of land degradation and low use of organic fertilizer, which is seen as one of the main causes of the decline in production. According to the Institut de l’Environnement et de Recherches Agricoles (INERA, 2011), the rate of use of organic fertilizer in Burkina Faso is only 36%. Cotton and maize are cultivated in rotation by many farmers. This should be taken into account when providing incentives for the maize value chain as failing to develop a competitive maize value chain will have a negative impact on the productivity of cotton as inputs will be diverted to the production of maize.

A second challenge to contend with is land tenure insecurity, which results in low investment in the management of soil fertility in some cotton-growing regions. The absence of a minimal level of tenure security is likely to affect the sustainability of production systems. Successful implementation of the 2009 Rural Land Tenure Law6 (Loi no. 034-2009 portant régime foncier rural) will be key to addressing this issue.

6 The design and subsequent adoption in 2007 of the policy on rural land tenure Programme national de sécurisation foncière en milieu rural (PNSFMR) led to enacting the Rural Land Tenure Law in 2009. The implementation of this law benefited from Millennium Challenge Account (MCA) Burkina Faso funds of US$60 million to issue land titles (Attestation de Possession Foncière en milieu Rural, APPR) to people in rural areas.
Another challenge is finding ways to extend longer-term credit to farmers so they can buy equipment for mechanization. Apart from this, an assessment of the technical efficiency of producers (estimated at 81%, Diallo, 2011) shows that current production systems are not optimized, and thus that there is room to increase production without increasing the resources used.

**Refining the quality of cotton made in Burkina Faso through appropriate techniques for harvesting, sorting, and ginning**

Improving the quality of cotton fiber is not simply a quest for perfection but a major challenge for the Burkinabe cotton sector. It requires the use of best practices during storage on the farm before collection by the ginning companies, during ginning to ensure lint quality, and during packaging and transport to destination markets. Ensuring the quality of cotton at all of these stages in the marketing process will yield the best value and a distinctive positioning of Burkinabe cotton on the world market, in effect creating a Burkinabe label. There is no way to achieve this outcome without proper training for all actors involved in the process.

**Adoption of genetically modified cotton seeds, such as GM cotton and organic/equitable cotton seeds**

Mastering the genetic diversity of cotton has made Burkinabe farmers well positioned to adapt to the changing demands of the cotton market. Indeed, four years after the adoption of GM cotton, the results show better control of major cotton pests with the Bt gene, leading to improvement in yields of 20–35%, a 62% reduction in the cost of protection from pests, and an improvement in income per hectare by 22% on average. The co-ownership arrangement between Burkina Faso and Monsanto of local varieties of genetically modified cotton is expected to help the country negotiate a reduction in the cost of biotechnology-derived products (including the Bt gene, genes of the third generation such as drought-resistant genes, etc.).

Organic production and fair trade can serve as niches for small producers and women as part of a policy to reduce poverty. Indeed, organic cotton yields a gross margin per kilogram of US$0.54, versus US$0.31 and US$0.30 for regular and GM cotton, respectively.

**Product diversification in the cotton sector**

Discussions are under way on the diversification of the sector through the inclusion of certain crops (e.g., oilseeds and pulses) in the cotton system. This is considered a strategic move for the cotton sector in the context of the sector’s liberalization. Sunflower production was attempted in a 2013/14 campaign, and scaled-up production is expected in the coming years. The resulting seeds will be used by the trituration company SN-CITEC for oil production. Biofuel production from cottonseed processing units is another opportunity to enhance the Burkinabe cotton industry, while helping to reduce the country’s energy bill.

**Processing**

The lack of strong textile companies was identified above as a great weakness in the cotton value chain in Burkina Faso. Currently, there are two industrial companies, FILSAH created in 1997 and owned by both local and international investors, and FASOTEX created in 2005 and owned by domestic investors. FASOTEX does not process local cotton as its predecessor, FASO FANI (which went bankrupt in 2001) was doing. FASOTEX uses yarn produced by the other textile company, FILSAH, which also produces Maliwatt, a cotton-based material used to package cotton lint for export. The production of Maliwatt increased from 16 tons in 2004 to 459 tons in 2007 (MECV, 2011).
Reducing the yield gap between Burkina Faso and the highest cotton yield in Africa would make more cotton lint available domestically for processing into fabrics. A good opportunity is the production of fabric for school uniforms, which are mandatory in public schools. This is a large market, with over 5,000 primary schools across the country that must be supplied with uniforms. To make this a reality, the business environment in Burkina Faso must be improved, especially access to credit and dependable energy sources for running textile factories. The good news is that the cost of labor in the country is low; however, this potential workforce will need training. Eventually, the textile industry could target regional markets (i.e., other ECOWAS countries) and international markets (through the AGOA) to sell its products.

Marketing and trade

Several opportunities have been identified within the marketing link in the value chain. Developing a more aggressive marketing strategy for branding Burkinabe cotton can add a premium to the cotton lint price for farmers. Improving transport and storage conditions for cotton fiber would help reduce damage and thus increase revenues for smallholder farmers. Revenue from cotton can be optimized by diversifying its customer base into Europe, Asia, and sub-regional trade in the ECOWAS countries, while ensuring the loyalty of current customers. The downward trend and volatility in lint prices may be a threat to revenue optimization, but this can be overcome by developing several marketing strategies (e.g., futures pricing).

In line with the potential of increasing the domestic processing of cotton lint, marketing schemes should be devised to increase the demand by regional markets (ECOWAS countries) and international markets (AGOA) for locally made cotton products. For instance, the now bankrupt FASO FANI textile factory used to have great success in selling its products to Burkina Faso’s neighbors.

3. Policy recommendations

The overall strategy for improving productivity in the field is based on the following four areas: (a) intensification of production (pest control integrated with soil fertility management, input access, equipment, water management, and pesticide management); (b) research and development; (c) capacity building; and (d) reducing production costs.

The intrinsic quality of the country’s cotton must also be improved through measures both upstream and downstream. The overall strategy for improving the quality of the fiber is based on three areas:

- Improving the classification system of seed cotton by (a) obtaining the support of producers with the objective of improving quality, while not losing sight of productivity improvement; (b) defining a clear and harmonized number of grades of seed cotton and associated compensation, differentiated according to grade; and (c) sharing responsibilities among stakeholders to develop the rankings.

- Fighting cotton contamination by foreign objects through (a) use of harvest bales and collection bags or other non-contaminating material; (b) improving the conditions of transportation, storage, and handling at all stages of the value chain; and (c) changing the packaging of cotton bales.

- Automatic classification of the fiber through (a) developing and modernizing a fleet of machines for electronic ranking of the fiber; (b) training technicians on the operation and maintenance of these tools; and (c) certifying a recognized standard (e.g., ISO 17025) from the ranking laboratory.
A strategy to promote additional processed products in the cotton industry should be based on the following three areas:

- Setting up incentives for processing, such as (a) promoting the electrification of the country, especially in cotton-producing areas, as part of community production and interconnection programs; (b) promoting electricity production for industries at competitive prices; (c) applying an industry-friendly taxation system; and (d) continuing efforts to link by road areas of the country in general and cotton-producing areas in particular.

- Improving the processing ability of the industry through (a) efficient equipment and skilled labor; (b) facilitating access to investment loans; (c) taking actions to allow for the upgrading of infrastructure, automation of production equipment, and replacement of aging equipment; and (d) strengthening the sub-regional policy on textiles (i.e., the WAEMU textile agenda).

- Value capture in the artisanal sector, to be accomplished through (a) the promotion and development of export SMEs in weaving, furniture making, and décor production; (b) increasing the visibility and popularity of African fashion (e.g., the Faso Dan Fani textiles worn by officials during the 1983 revolution era and during official ceremonies); (c) increasing the size of companies and their financial and management capabilities; (d) setting up a structure to promote marketing of handicrafts in major markets; (e) capacity building of artisans through the establishment of mechanisms for training on crafts such as weaving, dyeing, and printing; and (f) development of local expertise on craft material.
1. Key issues along the value chain

Production

Cattle are raised in all 13 regions of the country, with the Sahel Region leading in terms of share of national production (20% in 2009). The national cattle herd reached 8,800,000 in 2013, but productivity is a major challenge for the beef sector. Weight productivity (i.e., weight gain per year) ranges from 7–14 kg/year in Burkina Faso, versus 8 kg/year in Mauritania, 12 kg/year in Somalia, 80 kg/year in Botswana, and 300–800 kg/year in Australia (Brokken and Senait, 1992). The extensive nature of the production system, in which 85% of cattle are raised by moving from one grazing area to another, is one of the major culprits behind low productivity.

<table>
<thead>
<tr>
<th>Production system</th>
<th>Transhumant</th>
<th>Sedentary extensive</th>
<th>Sedentary semi-intensive</th>
<th>Intensive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share</td>
<td>8.8%</td>
<td>85.0%</td>
<td>6.0%</td>
<td>0.4%</td>
</tr>
</tbody>
</table>

Source: Recensement General de l’Agriculture (General Agricultural Survey), 2008, cited in MAFAP, 2013c

Access to credit is another major issue, as only 15% of producers surveyed for this study reported having access to credit. Information from the same survey suggests that lack of financial resources and animal feed are the two major constraints to the development of cattle production.
Yaméogo (2005) estimated the cost of engaging in intensive production of cattle for a herd size of 20 at 6,925,000 CFA francs (US$13,850). This indicates how crucial access to credit is for intensification of cattle production in a country with GDP per capita of US$790 (2014 estimate).

Cattle production increased steadily from 1990 to 2013, with the exception of three low years (2000–2002). Imports are negligible, and exports have been dwindling since 2001 (see Figure 2.8).

**Figure 2.8: Production and trade of cattle in Burkina Faso**

As shown in Figure 2.9, the main mode of transporting cattle to domestic markets is walking (52%). Transport costs range from 5% to 22% of total marketing costs for cattle (Ministère des Ressources Animales [MRA], 2008). Miscellaneous costs of moving cattle to an export market reach 26,750 CFA francs (FCFA)/head (about US$54). Transport and logistics need a major overhaul, and harassment by police and customs officials, who sometimes demand illegal payments from farmers and traders on the way to markets, needs to be addressed so farmers can reap the full benefits of their activity.

**Figure 2.9: Modes of domestic transport used for cattle (%)**

Source: Author's construction using FAOSTAT data

Source: Product study survey
Processing

The processing sub-sector needs major investment in equipment and strongly enforced regulation if the beef sector is to secure a larger share of export markets. There is no industrial processing unit that can target and supply export markets in the region. Indeed, about 73.3% of cattle are exported live, which means loss of income from potential value addition by processing cattle into meat before exporting. Butcheries process meat for domestic consumption but there is a need for training butchers in adopting quality standards. About 45% of the processors surveyed are women who sell grilled meat or cook it in restaurants.

Marketing and trade

Figure 2.8 above shows that Burkina Faso is a net exporter of cattle. During the period 2000–2011, Burkina Faso averaged 269,835 exports of live bovine per year. Ghana (35.21%), Nigeria (23.59%), and Côte d’Ivoire (15.85%) are the main destinations for Burkina Faso’s cattle. Before the political crisis of 2002, Côte d’Ivoire was Burkina Faso’s largest cattle export market; between 2001 and 2002, export volume to Côte d’Ivoire reduced by more than half (52.65%). Since then, Ghana has become the top destination for Burkina Faso’s cattle, except during the period 2007–2009, when Nigeria took over. As seen in the figure, exports have generally dwindled in recent years. The marketing segment of the beef value chain needs better strategies and support in order to provide price information to producers and identify more destination markets into which the country can diversify its exports.

Cross-cutting issues along the whole value chain include low access to credit, lack of support from government, and lack of strong farmers’ organizations.

2. Value capture opportunities

Production

Beyond any increase in numbers, it is essential to work toward increasing the value added of cattle in Burkina Faso. The level of production in cattle breeding, presently dominated by the extensive system, may be significantly increased through intensification. Intervention at production level to increase the supply of cattle can be done in several ways.

To start, farmers need support for increased food resources (such as agro-industrial byproducts) and better health monitoring for livestock. Lack of food, especially in the dry season, and health problems are among the major factors limiting beef production in Burkina Faso. Interventions to correct or mitigate these problems would help to raise the level of production.

Genetic improvement of livestock also seems essential to the intensification of and significant increase in livestock production. The genetic potential of local breeds is relatively low compared to that of Western breeds, and even those of some countries in the sub-region, such as the Azawak breed in Niger and the Gudali breed in Nigeria. Hence, the two alternatives are pursuing local selection in order to isolate the best-performing breeds, or cross-breeding. The country has so far opted for crosses between local breeds and exotic breeds through artificial insemination. Artificial insemination operations are conducted by the National Center for Breeding of Performing Animals (CMAP), in partnership with various projects, such as the Agro-Sylvo-Pastoral Network Support Project (PAFASP), the agricultural productivity and food security program (PAPSA), etc. In this way, 3,568 cows were inseminated in 2013, to the benefit of producers. The most commonly used cattle semen comes from the Alpine Brown, Holstein, Montbéliarde, Tarentaise, Gir, Azawak, and INRA 95 breeds.
Similarly, CMAP has supported the dissemination of 36 performing cattle breeds among producers in order to improve herd productivity (Ministère des Ressources Animales et Halieutiques [MRAH], 2014). As part of the implementation of the Project Azawak, 57 purebred Azawak were imported from Niger and made available to breeders of National Union of Azawak Farmers of Burkina (UNEAB). However, local selection is a must to ensure the lasting improvement of the genetic potential of local breeds. Indeed, this operation will help control local cattle genetics, further optimizing all operations for improvement, including the introduction of foreign genes. Local selection will become an especially urgent need as the progressive depletion of the capacity of natural ecosystems will require stabling cattle in the near future; the high costs of feeding current breeds of cattle would make stabling unprofitable if it were introduced now.

Other interventions necessary to improving cattle farmers’ productivity include:

- More opportunities for producers to access loans, which will encourage better maintenance of livestock in terms of food, health, equipment, and herd size. Without direct access to credit, the establishment of a guarantee fund to convince banks to lend to farmers is imperative.

- Support for producers’ organizations to strengthen their capacity is essential to increase productivity and success in cattle rearing.

- Raising awareness among farmers and training them on the need to transition into more productive systems (intensive and semi-intensive).

- Securing pastoral resources (pastoral areas, water system, and a resolution of land rights issues between crop farmers and herders).

- Efficient use of inputs, accomplished through better utilization of food resources to increase production using the same level of inputs—i.e., greater intensification of production. This will reduce production costs, thus promoting greater value added for the producer, as it will reduce energy losses associated with long distances traveled in search of pasture and water points.

### Processing and product development

If the cattle industry in Burkina Faso succeeds in raising productivity, there is a great opportunity to expand processing of cattle meat in order to capture markets in the region, then target international markets, as was done in Botswana. Figure 2.10 indicates that beef exports have dropped down to zero in recent years; however, data from a beef study conducted in 2013 show that, as mentioned earlier, 73.3% of Burkinabe cattle is exported live, while 26.7% is exported after slaughter. This suggests issues with data gathering and reporting.

A lack of adequate equipment and organization means that very little processing is done before exporting, resulting in loss of value. It will take a carefully crafted set of incentives (e.g., tax breaks, reliable energy, and skilled labor) and regulations in line with international health standards to establish a thriving beef industry in Burkina Faso.

Though the processing of products is limited compared to other countries, there are real opportunities for product development in the cattle sub-sector. The industrialization of cattle processing provides the ability to develop new products, such as canned meat. Similarly, some byproducts, such as waste, blood, and other debris, can be recycled for agricultural fertilization or as feed for some animals (dogs, cats, pigs, poultry, etc.). Horns and hooves can also be valuable in crafts and decorating.
Improving the value of cattle in Burkina Faso will require:

- Improving the capacity and hygienic conditions of national abattoirs and butcheries to reduce the export of live animals
- Raising awareness, supporting value chain actors’ organizations, and training them on product quality
- Supporting existing processing units
- Defining and implementing quality standards

Marketing and trade

An analysis of the cost of access to the domestic market shows that the cost of corruption and illicit taxes is on average 471 FCFA per cow. In addition, the intervention of collectors costs about 5,700 FCFA, and traders realize a margin of 17,800 FCFA on average. A reduction in these costs would lead to efficiency gains and increased competitiveness in the sector, which could result in an increase in value-added at the producer level of about 5,000 FCFA per head.

Looking at the costs faced by actors to access the international market, we find that they pay informal fees estimated at 10,000 CFA per animal, export-related labor at the high cost of 12,500 CFA, loading costs estimated at 250 CFA per head, and the cost of hiring a shepherd to lead the animals from the landing zone and the external market at 4,000 FCFA per head. This adds up to about 26,750 FCFA per head just to transport cattle from the domestic market to the international market, higher than the margins earned by traders (about 7.5% of the price of cattle). The use of transport services from amateur providers (MAFAP 2013c), coupled with harassment from officials suffered on the roads, may explain these high transport costs. Reducing these costs would increase the efficiency of the sector and provide incentives for producers and traders. The expected gain in value added would be about 25,000 FCFA per cow.

7 US$1 = 500 FCFA in 2014.
Potential measures to reduce access costs include:

- Support for traders to acquire storage facilities in order to help better organize their packages before hiring transporters
- An increase in the frequency of security patrols on the roads generally used by cattle traders
- Better links between the various actors in the beef industry

Reducing transaction costs, the number of intermediaries for exporters, and the unit cost of transporting animals through a rational mobilization of transport will increase efficiency at the marketing level, providing better income to traders (butchers, exporters, etc.).

**Strengthening ties between actors in the value chain**

Increased performance can be stimulated through the proper organization of value chain actors. Currently, there are no strong ties linking the various players in the beef industry. Strengthening these ties through better organization is necessary to lowering access costs and reducing the number of intermediaries, which will create opportunities to add value.

### 3. Policy recommendations

The recommendations outlined here are based on a modification of those proposed in the National Policy for Sustainable Livestock Development that are relevant for cattle. This policy suggests actions organized around four strategic pillars, namely: (a) strengthening the capacity of stakeholders in the sector; (b) secure and sustainable management of pastoral resources; (c) increasing productivity and livestock production; and (d) improving the competitiveness and marketing of animal products.

**Strengthening the capacity of stakeholders in the sector**

A diagnostic analysis of the livestock sector highlights institutional constraints, specifically, limited capacity for planning and implementation of development activities of the ministry in charge of animal and fishery resources. This translates into an insufficient and inadequate public extension system, unable to meet the needs and concerns of stakeholders. At the same time, private provision and community support services in consulting and animal health remains low and cannot fill the void left by the shortage of public services. The objective of this pillar is to strengthen the response capacity of sector actors in order to promote the emergence of a public–private partnership that can carry out livestock projects based on professionalism and market orientation.

It is proven that farmers learn from other farmers. Training leads farmers to intensify cattle production, so that they can act as role models in their communities and help other pastoralists adopt modern practices to enhance productivity. Though they are art of the umbrella farmers’ organization in the country (Confédération Paysanne du Faso, CPF) farmer-based organizations (FBOs) in the livestock sector are not well organized and would greatly benefit from the experience of the cotton umbrella FBO, UNPCB; efforts should therefore be made to link them. In addition, literacy programs targeted at cattle producers, including basic business classes, will help build their capacity to run farms that are better linked to markets.
Secure and sustainable management of pastoral resources

Implementation of the second pillar requires that action be taken in the following priority areas:

- Securing land rights through wide dissemination and implementation of the 2009 Rural Land Tenure Law would help the intensification of animal production by strengthening the legal framework and facilitating the promotion of areas for intensification of animal production (ZIPA) and ranching.
- Securing access to water through (a) inventory of existing structures, (b) development and adoption of standard plans and specifications, (c) rehabilitation of existing structures, (d) development of new water infrastructure, and (e) capacity building of management bodies and maintenance.
- Prevention and management of crises and vulnerabilities in the livestock sector through the establishment of (a) a means of defense for and restoration of grazing areas, (b) an early warning system against risks of fodder and water crises, and (c) a way to mitigate the effects of crises in relation to the environment and other areas.

Increased productivity and animal products

The goal of the third pillar is to increase productivity and livestock production to generate surpluses for wealth creation and food security. With a projected deficit of 250,000 MT of meat and more than 256 million liters of milk in 2015 (Initiative Élevage Pauvreté Croissance [IEPC], 2005), Burkina Faso must address cattle sector productivity for better incomes and improved nutrition.

The priority areas of action for achievement of this goal are:

- Developing a quality feed industry to facilitate the intensification of production, protect and restore degraded areas for increased fodder production, and ensure access to feed concentrate as a supplement in the short term.
- Improving the genetic potential of animals through (a) the identification and traceability of animals and animal products, (b) the introduction and proliferation of gene enhancers, (c) mass selection and the fight against inbreeding, and (d) the preservation of local genetic heritage.
- Fighting animal diseases through (a) strengthening the fight against infectious diseases in extensive farms, (b) strengthening epidemiological surveillance of priority diseases (RESUREP), and (c) close health monitoring in intensive farming systems.
- Development of veterinary services and strengthening of veterinary public health through (a) strengthening the capacity of technical and logistical services and the national breeding laboratory to ensure analysis and diagnostics, (b) effective implementation and enforcement of legislation on veterinary medicines, and (c) enhancing the safety of animal products by creating a single national framework for the coordination of food safety in relation to the ministries in charge of health, agriculture, environment, trade, justice, territorial administration, and security.
Improving the competitiveness of livestock products

The traditionally competitive products from Burkinabe farming are increasingly being challenged in the domestic market and the markets of coastal countries in West Africa. Indeed, international trade rules make animal products imported from outside the WAEMU and ECOWAS cheaper in the sub-region than meat, milk, and eggs produced locally. At the microeconomic level, the high and growing cost of farm inputs, including feed, are likely to increase production costs. All of these factors together strain the competitiveness of local livestock products in the domestic market for milk and eggs and the sub-regional market for livestock and meat. Moreover, significant efforts are needed to ensure that local products meet consumer demands and international standards for quality.

This axis aims to improve the competitiveness of Burkinabe cattle in the domestic, sub-regional, and international markets. To achieve that, priority actions must be taken in the following areas:

- Infrastructure development through the promotion of basic infrastructure and strengthening the management capacity of actors
- Improving the quality of animal products through the development of normative acts and the dissemination and application of standards. Butchers need to be trained on quality issues and this could be done through their professional organizations.
- Providing tax incentives to local cattle producers to engage in intensive production by stabling their cattle in ranches

Improving access to finance for farmers implies restoring banks' confidence in smallholders, including reducing the mortality rate among farms to help limit the risk of charges of non-payment by banks.
1. Key issues along the value chain

The extensive nature of the poultry production system (80% of poultry farms use an exclusively free-range system) limits the production and productivity of the poultry sector in Burkina Faso. Both weight productivity and egg productivity are low: Burkinabe poultry weight productivity is 5 to 12 g for local breeds, versus 40 to 60 g for exotic breeds, and the laying rate of local breeds’ egg layers is 60%, versus 85% in industrialized countries. Production can be increased if farmers receive support to access vital inputs such as vaccines, feed, and training in best practices. Poultry producers currently face very high costs for inputs (94% of the farm-gate price); this must be addressed to ensure successful development of the poultry value chain.

The chicken flock in Burkina Faso was estimated at 42,500,000 in 2013. Bird production almost doubled from 2004 to 2013, but exports also collapsed during that period due to the Ivorian crisis in 2002 and the avian influenza outbreak in 2006. The poultry sector stands to reap huge benefits, given the existence of a sizable regional market (especially in Côte d’Ivoire and Ghana), if it succeeds in improving its productivity and production. Imports have historically been low, but increased around the time of the avian influenza crisis before dropping again.
Turning to production costs, the farm gate price for poultry production in the traditional system was estimated at 1,088 FCFA per unit across three provinces of Burkina Faso (CAPES/PAFASP, 2011). Their study showed that 94% of this goes to inputs, 0.5% to power, 0.1% to labor, 0.4% to other costs and 4.94% to gross margin. Thus input costs are a high burden for producers.
Farm to market

Poultry is transported to Ouagadougou markets using cars (70%) and bicycles and motorbikes (30%). These modes of transport are often overloaded (see Figure 2.13), leading to losses of birds. Modes of transport for exports include train, cars (Figure 2.14), and carts for those areas close to international borders.

Figure 2.13: Poultry transport by motorbike

![Poultry transport by motorbike](image)

Data source: CAPES/PRAFASR, 2011

Figure 2.14: Poultry exporters preparing to transport birds to Côte d’Ivoire

![Poultry exporters preparing to transport birds to Côte d’Ivoire](image)

Photo Ouattara, 2008

Processing

The processing sector is mainly occupied by artisanal and semi-industrial processors, which limits product development and income generation. Women are highly involved in the cooking of poultry meat and egg processing. Burkina Faso is famous for its traditionally processed chicken called “poulet bicyclette,” highly demanded by both locals and visitors for its taste. The preference for local chicken explains the low penetration of imported frozen chicken meats compared to countries like Ghana.
CAPES/PAFASP (2011) estimated the price of traditionally processed chicken to be 2,234 FCFA. Figure 2.15 shows the cost structure for a traditional poultry processor (based on three provinces) in Burkina Faso. Inputs capture the largest share at 71.58%, followed by processor margin at 19.03%, which is almost four times the producer’s margin.

**Marketing and trade**

Marketing of poultry products needs to be streamlined, as there is potential to develop a niche market for Burkinabe chicken and guinea fowl products in the sub-region.

Cross-cutting issues across different segments of the value chain include access to credit and inputs, lack of strong farmers’ organizations, and inadequate support from the government.

Data source: CAPES/PAFASP, 2011
2. Value capture opportunities

Several avenues exist for improving the profitability of poultry farming in Burkina Faso. Indeed, a few simple actions would be sufficient to significantly increase productivity and improve the marketing and processing of poultry production. However, they require strong political will.

Production

Working with current resources and constraints, the industry reached a flock of 36 million heads in 2009 and grew by an annual average of 19% from 2003 to 2009. This suggests that with extra effort, production could be significantly boosted. Producers are unanimous about the possibility of doubling production if they had more resources and better support to address current challenges.

The business dimension of the poultry industry is still marginal, with the exception of a few farmers who borrow from the experience of fattening cattle and sheep. Since economic liberalization, support services for livestock and agriculture have declined, and producers are no longer able to meet the costs of these services. Expanding support services to poultry producers will increase production. In addition, there is a need for training not only in the management of poultry production but also in entrepreneurial production management. Emerging breeders can serve as units of integrated learning/action, as service providers, and as producers, and may be able to lend training, testing, and marketing facilities at each stage of poultry rearing (inputs, pullets, and mature birds).

Producers need support for increased access to livestock inputs (industrial raw materials) and veterinary access. The difficulties of access to quality poultry feed, or inputs used in producing quality feed, are a major constraint to the development of poultry production. This situation is especially drastic for traditional poultry farming, which faces not only the cost but also the scarcity of these products. Regarding veterinary services, although enormous efforts have been made by the state through the center for the promotion of aviculture (CPAVI), much of the country still is not regularly supplied with veterinary products, including pesticides and vaccines against Newcastle disease. Actions to improve the availability of veterinary inputs may be expected to increase the level of poultry production; indeed, the availability of poultry feed or other inputs used to feed poultry in rural communities will allow producers to access supply in real time. Veterinary products will help strengthen the cold chain and operational capabilities of CPAVI through strengthening its fleet.
As with the cattle industry, genetic improvement of local breeds seems essential to the intensification of poultry rearing and a significant increase in production. The productivity of local breeds is relatively low compared to that of exotic breeds. Faced with this situation, two approaches are possible: the pursuit of local selection to isolate strains with high egg-producing potential and fast-growing strains, or cross-breeding. The country has so far opted to cross local breeds with exotic breeds through the dissemination of roosters, called enhancers, across multiple projects and CPAVI. Various races, such as ISA Brown, Sussex, North Holland Blue, Silver, and Rhode Island Red, are available. By 2013, more than 8,000 cocks of this type had been distributed; however, this operation has produced few results, in part because the products of the cross did not exhibit the growth potential expected, and in part because they were too sickly. This underscores the need to implement a policy of mass selection of local breeds, for both chickens and guinea hens, or conduct research to identify stabilized, enhanced exotic roosters to meet the current challenges.

The poultry industry is the agricultural sector most neglected by financing systems because of its possible risks, making access to credit a major challenge. At this level, it is appropriate to create opportunities for contracting loans for the benefit of producers, which would encourage better maintenance of birds in terms of food, health, equipment, and flock size. Without direct access to credit, the establishment of a guarantee fund, which will convince banks to lend to farmers, is required. Such funding will allow producers to set up farms with coops able to meet the requirements of the local, often harsh climate.

Management skills are lacking in traditional poultry rearing; in general, very few farmers have received basic training before starting their farming activities. Poultry populations are therefore raised based on indigenous knowledge, characterized by leaving birds to fend for themselves in their first weeks, often in unsuitable habitats. This leads to high mortality (42–76% for chicks, 82% for adult birds) and low growth. Organizing training in cascades, whereby one group of trainees passes on their knowledge to the next, will solve this problem.

Better utilization of food resources is needed to increase production using the same level of inputs, which will reduce production costs and thus promote an increase in the value added of producers. This kind of intensified farming must be accomplished by improving farmers’ level of supervision, through increased specialization of managerial technicians, to build producer capacity. The resulting increase in efficiency could lead to the modernization of farming conditions for local poultry breeds.

In addition to the above items, farmers require greater awareness and training on the need for a shift to more productive intensive and semi-intensive systems, as well as support for their organization and supervision to strengthen capacity.

**Processing and product development**

Increasing the efficiency of processors implies making healthy and competitive products available to customers. Similarly to the case of producers, this will require building processors’ technical capacity through training activities conducted by both state and private technical services.

The weakness of the current traditional poultry production system lies in its very atomistic nature, which makes it difficult to aggregate production waste that can be used to produce organic manure for agriculture. One way to overcome this is to support the development of both butcheries (SMEs) and an industrial processing unit. The SMEs will serve as a central point of improving the processing and distribution of chicken products. The industrial unit can use contract farming with smallholders farmers to facilitate aggregation for processing and target exports markets in their region for selling its products. Good road links will be crucial to the success of such an endeavor.

Poultry processing can be further disaggregated into fresh whole chicken and chicken cuts and their frozen counter parts if the country’s cold chain is improved.
Marketing and trade

Efficiency at the marketing level can be increased by reducing market access costs, including the unit costs of transporting animals (i.e., through a rational mobilization of transport), transaction costs, and the number of intermediaries for exporters. A reduction in these costs should provide better revenue for merchants if accompanied by appropriate and effective policies. The following supportive measures could contribute to the welfare of players in the poultry marketing segment:

- Training on basic conditions for poultry transport
- Improved conditions for access to credit
- Reinforcement of security systems to ensure that merchants are not robbed

Exporting is a very profitable segment within the marketing channel, but it constitutes only a small part of marketing (less than 5%). The Burkinabe poultry sector can add value by targeting the export markets as it has been shown that exporters capture the highest gross margin in the poultry value chain, 51.22% of the export price of 3,050 FCFA (Figure 2.18). The exporter’s margin is 10 times larger than the producer’s margin and exporters spend 48.78% of the export price on purchasing poultry from retailers or producers.
Rethinking the export system in terms of meat rather than live poultry holds the potential to improve income (Centre d'Analyse des Politiques Economiques et Sociales/Projet d’Appui aux Filières Agro-Sylvo-Pastorales [CAPES/PAFASP], 2011). As mentioned above, establishing a large industrial processing unit can help achieve improvements in income for smallholder farmers linked by contract farming with such a unit, provide jobs and income to those working in the processing plant, and increase revenue for the State.

**Strengthening links between actors in the value chain**

Currently, there are no strong links between poultry industry players. In light of the high access costs for players in various segments of the poultry sector, the strengthening of ties between them is necessary to negotiation of a lower cost of access to inputs and other services and a reduction in the number of intermediaries. Better organization will also create opportunities to add value and is a prerequisite for any significant boost in performance.

Two inter-professional organizations already exist, IPVL and APOFAM, in addition to the organization of poultry producers (Maison de l’Aviculture), but the task remains to strengthen the links between these entities so they can fight common battles. It is also appropriate to encourage these national professional groups to better organize themselves to take advantage of opportunities, such as the experience and funding of regional and continental organizations.

### 3. Policy recommendations

Analysis of the traditional poultry value chain in Burkina Faso shows that the system’s greatest weakness is the extensive nature of its poultry producers and its fragmentation, as it consists of many small farms. These farms are increasingly unable to meet the needs of the market, hence the need to promote more efficient, modern systems, with advantages in terms of access to inputs, alongside existing systems.
Intensification of farming and farmer training

At the level of production, poultry farming systems must be intensified through better nutrition, adequate housing, an improved health care system, and better organization of producers. To achieve this, farmers need capacity building through training in literacy, in best practices for poultry rearing, and in business skills. Strengthening FBOs is crucial to removing constraints to the development of the poultry value chain in Burkina Faso. Lessons may be learned from the cotton farmers' umbrella organization.

Increased productivity

If it is to be sustained, the industry requires an increase in productivity which is tied to increased access to quality feed and vaccines. Cotton and sorghum can be the basis for developing quality feed to support the productivity of the poultry sector. The high mortality rate in poultry farming is due mainly to lack of or improper vaccination of birds; therefore, quality vaccines and an adequate supply of veterinary services should be made available through public–private partnerships. In addition, selection of the best local breeds will be necessary to improve the genetic potential of poultry given the fact that cross-breeding with exotic breeds has failed.

Improving the competitiveness of poultry products

As mentioned, exports of Burkinabe poultry products to the markets of coastal countries in West Africa have declined significantly in the past decade, and distortions to international trade rules have made locally produced poultry products more expensive than those imported from outside the sub-region. Given this plus the high domestic demand for poultry, most of the poultry produced in Burkina Faso is consumed in the country.

In addition, the high cost of farm inputs, including feed, vaccines, energy supply, and provision of adequate shelter for birds, have diminished the competitiveness of local poultry products on the domestic market, with the result of increased imports in recent years (see Figures 2.11 and 2.15). If Burkinabe poultry is to reclaim its competitiveness on both the domestic and the international markets, significant efforts are needed to ensure that local products meet consumer quality demands and international standards. To this end, priority action in the following areas is needed:

- Development of export infrastructure through (a) the promotion of basic infrastructure such as rural roads, electricity for cold chain development, and support to reduce the cost of vaccines and veterinary services; (b) strengthening the management capacity of actors in poultry markets; (c) support for the development of processing units to process birds into chicken parts and cuts for sale in neighboring countries, such as Côte d'Ivoire and Ghana.

- Improving the quality of animal products through the development of regulatory texts and the dissemination and strict application of standards.

- Industry-friendly taxation to allow the development of feed production units and of meat processing units.

- Improving access to finance, which will require farmers to restore banks' confidence in their operations. This can be achieved by reducing the mortality rate among farms, which would help limit the risk of charges of non-payment by banks.

Unfortunately, funding acquired for the implementation of policies outlined in the national livestock development policy, PNDEL, does not always meet actual needs. Therefore, it is important to review this funding in order to adapt to resources and thus maintain realistic perspectives.
III. Value chain rearrangement simulation: implications for poverty

In this section, price and welfare simulations are conducted for the four value chains studied here. After shocking the market structure of the supply chain, we observe price changes in each of the agricultural products. Comparative statics are also conducted.

The simulations for sorghum, cotton, beef, and poultry were carried out using household data from the 2005 “Enquête annuelle sur les conditions de vie des ménages” of Burkina Faso, which contains information on 8,500 households. We introduce here the supply chain model, in which farmers must decide what to consume and what to produce given prices and various constraints, such as endowments, transport costs, production costs, and infrastructure access. In the case of exported cash crops (cotton), farmers sell products to oligopsonies, which then handle the international trading. In the case of exported food crops (cattle, for instance), oligopsonies are in charge of exports, but a domestic residual market also exists for net consumers. As for imported foodstuffs, excess demand is met via international trade, and net consumers must purchase these agricultural goods from oligopolies.

Food crop and livestock producers operate in a relatively free market, in which the forces of demand and supply determine the trading price. In some very rare instances, especially during times of crisis, the government intervenes to control the price. This is not the case for the cotton sector, in which the price is determined every year before the season begins by a consortium made up of cotton companies and the cotton farmers’ organization, under the auspices of the government.

The market for cereal crops is in general highly atomized, with the largest company controlling about 16% of the market (Table 3.1). In the cattle and poultry sectors, on the other hand, only a few players control the market. As described in Section 2, the structure of the cotton sector is characterized by the existence of three companies: SOFITEX, Faso Cotton, and SOCOMA, with each company operating in a different region of the country. Although each company maintains the same type of “one-stop” cotton farming system, cotton prices are now negotiated among the principal stakeholders within the cotton sector in the country. Through UNPCB, cotton producers have been influential in determining price levels since 1999 and own a 30% share of the ginning sector. All three companies, therefore, purchase cotton at the same price and follow a pan-territorial pricing scheme.

<table>
<thead>
<tr>
<th>Table 3.1: Market shares for crops/products studied in Burkina Faso</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cotton</strong></td>
</tr>
<tr>
<td>Company</td>
</tr>
<tr>
<td>Sofitex</td>
</tr>
<tr>
<td>Socoma</td>
</tr>
<tr>
<td>Faso Coton</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Poultry</strong></th>
<th><strong>Sorghum</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Company</td>
<td>Shares</td>
</tr>
<tr>
<td>Ferme MOABLAOU</td>
<td>71.5%</td>
</tr>
<tr>
<td>Ferme Kuna</td>
<td>6.3%</td>
</tr>
<tr>
<td>Ferme Konkobo</td>
<td>12.7%</td>
</tr>
<tr>
<td>Ferme Samora</td>
<td>9.5%</td>
</tr>
<tr>
<td></td>
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</tbody>
</table>

*Source: Author’s construction using MOSTAT data*
Welfare impact simulations

We are interested in the role of the supply chain in agriculture on household well-being, in whether the poor are affected more or less than the non-poor, and in whether the complementarities between the structure of markets and household constraints can inform policies to amplify or mitigate those poverty impacts. This is the goal of this section.

The analysis is done using standard techniques from the literature. We adopt the first-order approximation analysis of Deaton (1989, 1997), which implies that we can approximate the impact of a price change using income shares and budget shares as measures of exposure. The first-order approximation works well if price changes are small and if supply and consumption responses are limited. It is, in general, a very powerful and useful tool for evaluating the welfare effects of price changes.

These effects for each value chain—cotton, cattle, sorghum, and poultry—are reported in Tables 3.2–3.5. In addition to showing the impact of shocks to the market structure, we illustrate the complementarities by showing results for a combination of shocks to both market structure and international prices (with commentary on the results for other complementarities at the end). We also report average results for the total population, the poor, and the non-poor, with separate results for producers.

Some regularities can be detected in the simulation results. For example, increased competition and complementary policies in cotton show positive welfare impacts across households. These impacts are obviously larger for cotton producers. Competition among exporters in a cash export crop implies higher farm-gate prices and, consequently, higher farm income from cotton production. Since raw cotton is only produced and not consumed directly by households, real farm income is higher in the end. Overall, increases in competition and international prices in the cattle sector have positive welfare impacts in Burkina Faso, though the effect is larger for non-poor households. Despite net production of sorghum, competition and higher prices create (small) welfare losses because of the distribution of consumption shares among both producers and consumers.

To a large extent, the welfare impacts are small for all types of households: for most crops, shocks, and affected populations, the welfare impacts of the proposed simulations are less than 1% of total household expenditure. The only exceptions are in the livestock industry and cotton production, where some sizable impacts can be established.

Table 3.2: Cotton price changes and household welfare

<table>
<thead>
<tr>
<th>% Change in Household Welfare</th>
<th>Baseline</th>
<th>Leader Split</th>
<th>Leaders merge</th>
<th>Exit of largest</th>
<th>Equal market shares</th>
<th>Perfect Competition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Competition Policy</td>
<td>0,00</td>
<td>0,20</td>
<td>-0,03</td>
<td>-0,22</td>
<td>0,34</td>
<td>0,73</td>
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<td>International Price</td>
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<td>1,81</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>Competition Policy</td>
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<td>-0,16</td>
<td>0,25</td>
<td>0,53</td>
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<tr>
<td>International Price</td>
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<td>0,57</td>
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<tr>
<td>Non Poor</td>
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<td></td>
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</tr>
<tr>
<td>Competition Policy</td>
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<tr>
<td>International Price</td>
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<td>1,11</td>
<td>0,73</td>
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<td>Competition Policy</td>
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<td>-1,96</td>
<td>3,04</td>
<td>6,52</td>
</tr>
<tr>
<td>International Price</td>
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<td>10,03</td>
<td>7,05</td>
<td>4,64</td>
<td>11,80</td>
<td>16,27</td>
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</table>
Table 3.3: Cattle price changes and household welfare

<table>
<thead>
<tr>
<th>% Change in Household Welfare</th>
<th>Baseline</th>
<th>Leader Split</th>
<th>Leaders merge</th>
<th>Exit of largest</th>
<th>Equal market shares</th>
<th>Perfect Competition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Competition Policy</td>
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<td>International Price</td>
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<tr>
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<td>Non Poor</td>
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<tr>
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<td>3,09</td>
<td>2,75</td>
<td>4,60</td>
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</table>

Note: The above four tables represent only the first-order impact on household welfare.

Table 3.4: Sorghum price changes and household welfare

<table>
<thead>
<tr>
<th>% Change in Household Welfare</th>
<th>Baseline</th>
<th>Leader Split</th>
<th>Leaders merge</th>
<th>Exit of largest</th>
<th>Equal market shares</th>
<th>Perfect Competition</th>
</tr>
</thead>
<tbody>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Competition Policy</td>
<td>0,00</td>
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<td>-0,03</td>
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<td>-0,15</td>
<td>-0,17</td>
<td>-0,20</td>
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<tr>
<td>Poor</td>
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Table 3.5: Poultry price changes and household welfare

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<tr>
<th>% Change in Household Welfare</th>
<th>Baseline</th>
<th>Leader Split</th>
<th>Leaders merge</th>
<th>Exit of largest</th>
<th>Equal market shares</th>
<th>Perfect Competition</th>
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<tr>
<td>Total</td>
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<tr>
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<tr>
<td>International Price</td>
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</tr>
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<td>International Price</td>
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<tr>
<td>Producers</td>
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<td>Competition Policy</td>
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<td>International Price</td>
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<td>0,81</td>
<td>0,89</td>
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</tbody>
</table>
These results are expected, given the nature of the exercise considered here, and are also comparable to results from existing literature on the topic (see the review in Lederman and Porto, 2014). Various elements must be taken into account. First, the income shares and budget shares used in the first-order approximation are typically small. Some crops are relevant separately on both the production side and the consumption side; however, as a price change affects both net-consumer and net-producer households, the net effect tends to be small. Second, the market for some of the crops/products considered here was already characterized by some degree of competition, thus leaving little room for sizable price changes. Small price changes combined with small net benefit ratios (Deaton, 1997) imply small impacts.

However, the fact that the impacts are typically small does not mean that they are not important. As we argued above, small results are expected in this area of literature given the context (household survey data and baseline market structure), but are still reasonable. We aim only to assess the short-run impacts of price changes caused by changes in exporters’ market power and their combination with complementary factors. It is important to note that these complementary factors exert an independent effect on household welfare, which we do not attempt to measure here. If, for instance, the cost of crop production declines due to an improvement in infrastructure, access to cheaper and better inputs, access to knowledge or credit, etc., there will be a direct impact on welfare as well as an indirect one via the combination with changes in market structure. Here, we measure only this additional impact. It happens that these additional impacts are small, but because they do not carry additional costs (such as fiscal costs, if the complementarities are funded by the government), they generate only benefit.
IV. Synthesis of emerging issues: opportunities for rural transformation

A) Opportunities for improving farm-level production

1. Combining improved seeds, fertilizer microdosing, and soil and water conservation techniques. Experiments with sorghum show that using soil and water conservation techniques (namely, zaï) can increase yields from 1,201 kg/ha to 2,009 kg/ha within the same farmers’ fields, and to 2,007 kg/ha in experimental stations. This suggests that a combination of soil fertility management, improved seeds, and fertilizer microdosing can lead to further increases in productivity.

2. Improving and sustaining cotton quality to create a Burkinabe label. The adoption of GM cotton has led to productivity gains in Burkina Faso’s cotton sector. However, actors in the cotton industry still need to be trained in best practices for storage on the farm before collection by ginning companies, during ginning to ensure lint quality, and during packaging and transport to destination markets. Ensuring the quality of cotton at these different stages in the marketing process will yield the best value and contribute to the distinctive positioning of Burkinabe cotton worldwide.

3. Turning improved sorghum and cotton productivity into improved beef and poultry productivity. The development of an animal feed industry drawing from increased production of sorghum and cotton in the country could be one of the best opportunities for increasing productivity in both the beef and the poultry sectors. Indeed, reliable access to quality feed is one of the major constraints to beef and poultry production.

B) Opportunities for improving post-harvest logistics

1. Capitalizing on existing projects to reduce sorghum post-harvest losses. Post-harvest losses in the field and during storage are high in the sorghum sector. The agriculture ministry, in collaboration with AGRA, is looking into implementing a warehouse receipt system to address storage losses. This should be complemented with systematic training in post-harvest handling and quality management among farmers. Supporting capacity building among sorghum FBOs can also encourage them to store their production collectively in aggregation centers, enabling them to sell in bulk to modern sorghum processors and potential animal feed producers.

2. Tackling cotton lint quality issues through improved storage. There are opportunities to improve farm storage methods for cotton. Local cotton producer groups have built storage facilities in their respective localities in which to keep cottonseed before collection by the ginneries (GIZ, 2011), but these structures are subject to contamination by foreign objects, reducing the cotton quality and therefore the price received by farmers. A project to prevent the contamination of seed cotton in West Africa, funded by the EU and the Common Fund for Commodities (CFC), was launched in 2013 and is scheduled to last three years. Among its activities is the training of 27,000 farmers from Burkina Faso, Côte d’Ivoire, and Mali to build cotton storage racks. In Burkina Faso, 11,500 farmers belonging to 1,000 producer groups will be targeted. How many producers have actually been trained and have adopted the storage rack technique is not known, as the results of the halfway-point evaluation are not yet available. Another EU initiative targeted at the storage challenge among cotton producers, called STABEX (Stabilization of Export Earnings), has established credit lines to fund the construction of storage warehouses for the GPCs (village-level producer organizations), as well as communal buildings for the UPPCs (provincial producer organizations) and motorbikes and computers for UNPCB (GIZ, 2011).

3. Addressing training needs and infrastructure development in poultry and cattle transport. Transport conditions for cattle and poultry lead to losses of animals en route to destination markets. Training on best practices for livestock transport would help curb these losses. In addition, better road links between production areas and main markets are needed to ensure better market access for producers, and thus better prices. Rural road funding should be increased to develop road infrastructure.
C) Opportunities for strengthening the processing sector and improving linkages to smallholders and markets

1. Facilitating sorghum producers’ market inclusion. Sorghum is currently processed by traditional and semi-industrial units into flour, couscous, grits for porridge, local beer (dolo), and other products. Sorghum processing can be made more efficient if these units have access to credit for better equipment, which will increase their processing capacity, thus allowing them to buy more grain from smallholder farmers for processing. Incentivizing or requiring bread and beer producers to use a certain percentage of sorghum in their production would boost smallholder farmers’ inclusion in markets.

2. Cotton processing: an opportunity to travel roads not yet taken. Cotton lint processing is a missed opportunity for Burkina Faso’s industry development. Indeed, the country has failed to take advantage of the AGOA, which would allow it to develop its textile industry with the assurance of access to the US market. As only 4% of the cotton lint produced in Burkina Faso is processed locally, there is room to increase domestic processing of cotton lint into yarn and textile garments to take advantage of both AGOA and existing or future domestic opportunities. Policy makers can take measures to require that school uniforms, which were reintroduced in public schools in the 2000s, be made from Burkinabe cotton. This would provide a ready and sizable market for the domestic textile industry, while creating a new market for smallholder cotton farmers by linking them to textile factories through contracts. One major constraint to the development of a vibrant textile industry in Burkina Faso is the high cost of electricity. This can be partially overcome by using cotton hulls, a byproduct of cottonseed processing, to produce electricity and reduce the power bills of textile companies, as is currently done by the oil production company SN-CITEC.

3. Beefing up export revenue. Although current exports of beef and poultry meat are low, Sahel meat attracts a price premium in regional markets. An opportunity exists to export more beef and chicken to regional markets such as Nigeria, Ghana, and Côte d’Ivoire, and even capture market share in new destination markets in Africa. State-of-the-art abattoirs and modern industrial processing units for meat will have to be developed to successfully produce and export meat regionally, and eventually target markets worldwide.

D) Opportunities for improving processor-to-market logistics

1. Training the transporters to save grain. Some transport of sorghum grain to markets is done using trucks owned by transporters who do not know best practices and mix products that should not be moved in the same vehicles, leading to quality issues and losses. Transporters have their own professional associations through which training can be provided to improve transport conditions.

2. Developing a reliable cold chain to reach new markets. The cold chain for beef and poultry meat in Burkina Faso is very weak, another reason why meat exports are low. Developing a cold chain is a prerequisite to successful market penetration regionally and internationally. The planned construction of a solar energy unit to be connected to the national electricity grid will help alleviate the problem of access to reliable energy for developing the cold chain.

3. Implementing quality standards in poultry and beef processing. National abattoirs and butcheries do not currently meet international standards in producing beef and poultry meat. Action should be taken to train the processors in quality standards and enforce existing regulations. Respecting quality standards is a must if the country is to successfully tap into regional markets for processed beef and poultry products.
E) Opportunities for product development and market channel development

There are many potential products to be developed within all four sectors, but the low-hanging fruit that will provide the greatest synergy among the value chains are sorghum fodder, sorghum-based poultry feed, cotton-based cattle feed, and fertilizer from beef and poultry waste.

1. Sorghum- and cotton-based fodder to improve cattle and poultry productivity. Fodder can be produced through increasing sorghum production by smallholder farmers, who can sell it to cattle farmers, especially during the dry season when feed resources become scarce. Increased production of both sorghum and cotton would provide a basis for developing the animal feed industry and increase smallholders’ access to the market. For instance, industries with use for sorghum and cotton can develop outgrower schemes.

2. Increased cattle and poultry productivity to improve productivity of cotton, sorghum, and others crops. Synergies between industrial policy and agricultural policy can be most clearly seen in the production of fertilizers from beef and poultry meat production waste. The successful development of industrial production of beef and poultry meat would facilitate the aggregation of waste, which can then be used to produce much-needed fertilizers for improving the productivity of sorghum, cotton, and other crops.

3. Savings on foreign exchange through increased local production. Other opportunities for product development include the use of sorghum in bread and beer production, as is done in Kenya and Nigeria. Cotton lint can be used to produce medical and hygienic products (e.g., cotton swabs, cotton wool, sanitary pads, gauze, etc.) instead of importing them; this would provide many jobs and save on foreign exchange.
V. Policy imperatives arising

A) Product-specific policies

1. Sorghum

Scaling up fertilizer microdosing and soil fertility management through training and subsidies

The current policy of government provision of fertilizer subsidies to farmers should be repackaged as microdosing combined with soil fertility management interventions (e.g., zaï) and widely implemented in the country. This combination has shown very promising results in improving sorghum yields in Burkina Faso and, along with crop rotation, will aid the productivity of other crops. Improved seeds could also be added to the mix, but given the cost it would entail and the reluctance of farmers to adopt new sorghum varieties, this should be delayed.

Promoting the development of a sorghum-based animal feed industry

Developing a sorghum-based animal feed industry would solve several problems faced by economic agents in Burkina Faso: a market for the additional crop production expected from a sorghum yield increase, much-needed animal feed to increase poultry and cattle production, revenues for the state, and jobs for qualified workers in feed production units. Reliable energy sources are necessary for the industry to operate efficiently.

2. Cotton

Promoting the development of a Burkinabe cotton label

Quality products can attract a price premium on international markets (e.g., the market for cocoa from Ghana). After pushing hard to become the leading cotton-producing country in SSA, Burkina Faso should develop a policy to improve its cotton quality through the training of all actors involved in quality aspects of cotton lint. The price premium it may then be able to attract would help curb the negative impact of cotton price volatility on the country’s economy.

Promoting the development of a cotton-based animal feed industry

Supporting farmers to increase the technical efficiency of cotton farms and use improved seeds would lead to increased production in the cotton sector. As with sorghum, this additional production can be used to develop a cotton-based animal feed industry that would provide feed to the livestock sector, revenues for farmers and the state, and jobs for qualified individuals. In addition, after lint production, cottonseed can be used for oil production and cotton hulls for biofuels, reducing the energy bill of cotton-related industries.

Promoting the development of a textile industry

Using school uniforms to ensure a ready market for a sustainable textile industry is one way to increase domestic processing of cotton lint and link agricultural and industrial policies to make each more successful. A textile industry can also increase the country’s export revenues by targeting regional and selected international markets (e.g., AGOA) if it is able to meet quality standards.
3. Beef

Extending the subsidies for artificial insemination to improve cow genetics

Given the relatively low genetic potential of local breeds, artificial insemination using better-performing breeds should continue and be scaled up to improve productivity in the short term. Ultimately, however, selection of the best-performing local breeds will be required to continue increasing productivity in order to supply modern beef processing units.

Improving producers’ market access by investing in transport and market infrastructure

Better access to markets would help cattle farmers sell at higher prices. Currently, 52% of cattle are walked to markets, leading to decreases in weight by the time they reach the market, and thus lower prices. Strong measures are needed to improve road access from cattle-farming areas to markets, as well as to curb corruption and illicit taxes along transport routes. With improvement in market infrastructure and road access to markets, marketing opportunities would increase and transaction costs for producers and traders would be reduced.

Supporting the development of the industrial production of beef

Increased quantity and quality of animal feed from cotton and sorghum would lead to productivity increases in the cattle sector. More cattle implies more inputs for producing beef, which can be exported to regional markets and eventually to international markets, if regulation of sanitary conditions improves and quality can be ensured. Here, too, developing industrial beef production provides an opportunity to link agricultural and industrial policies. Waste from beef production can be aggregated and used to produce fertilizer for sorghum, cotton, and other agricultural crops.

4. Poultry

Supporting increases in poultry productivity through adequate vaccination

Productivity increases in the poultry industry are tied to access to quality feed and vaccines, whereas lack of or improper vaccination results in high mortality rates, as noted earlier.

Therefore, quality vaccines and an adequate supply of veterinary services should be made available through public–private partnerships. Along the way, investment in the selection of the best local breeds will be crucial to improving the genetic potential of poultry, given the fact that crossing with exotic breeds has failed.

Promoting the development of a chicken meat industry

As with beef, feed from sorghum and cotton would help increase poultry productivity and production, providing the basis for industrial production of poultry meat for export to countries such as Côte d’Ivoire, where the convenience of prepared meat is preferred. In addition, better-fed poultry would lead to increased egg production, which would find a ready market in schools where lunch is provided. Supporting the development of butcheries will help improve the modern processing of chicken, supply ready meats for domestic consumption and ease the distribution of chicken meat across the country. Industrial production of poultry meat would facilitate aggregation of waste, which can be used to produce fertilizers for agriculture, linking agricultural and industrial policies for the sustainable development of both sectors.
B) Agricultural policy

Well-laid-out agricultural and industrial policies are required to ensure successful coordination between the development of the value chains of these four crops/products. Thus far, Burkina Faso’s agricultural policy has been a mix of projects, programs, and trade policies and plagued by a lack of clear prioritization (MAFAP, 2013a). Efforts have been made to harmonize interventions in the agricultural sector with the creation of a committee for the coordination of agricultural sector policies, but there is still much room for improvement.

Effective implementation of the 2009 Rural Land Tenure Law would help farmers invest more in their lands and farms. This law pertains to rural areas of Burkina Faso, yet many rural residents are not aware of its existence. Informational campaigns need to be held across the country to make farmers aware of the law and explain the benefits (collateral, dispute settlement services, bequeathing, etc.) of having their land titled and registered with authorities.

Cotton and, more recently, rice have received the greatest attention from policy makers in Burkina Faso in the form of government incentives and financial support (MAFAP, 2013a). The failure to focus on specific crops that are crucial to food security is a serious hindrance in achieving better agricultural development outcomes (including increased production, better food security, and better incomes for smallholders). Each of the four crops/products studied here should be given the same attention as cotton. This entails applying the Burkinabe cotton model without the monopsony element to sustainably improve smallholders’ livelihoods and create a springboard for agricultural transformation in Burkina Faso.

Rural infrastructure development is a must if such a transformation is to succeed. The Rural Access Index rating for Burkina Faso is estimated at less than 32% (World Bank), indicating that great efforts must be made to build and maintain roads so farmers can get inputs from and outputs to markets. Irrigation programs are now under way in Burkina Faso, but these will need to be scaled up to the level of the Moroccan irrigation project to have a transformative impact on the Burkinabe agricultural sector.

Education and training are another essential element of any agricultural policy design. Agriculture involves highly scientific content, which can be learned through formal schooling, as well as knowledge and techniques acquired through experience over time. Reimers and Klasen (2013) estimate that one additional year of schooling raises agricultural productivity by 3.2%. Therefore, it is imperative that people be trained to become effective farmers. This training should be inclusive, as women participate extensively in agricultural labor, especially in rural areas.

C) Industrial policy

As can be seen from the above discussion, agroprocessing should be the basis for industrial policy in Burkina Faso, with the sorghum, cotton, beef, and poultry sectors feeding into each other to spur product development and improvement in productivity. In a hypothetical linked agricultural and industrial policy based on the four value chains studied here, the first set of products include sorghum- and cotton-based animal feeds and agricultural fertilizers. A second generation of products can be developed to strengthen the country’s industrial base, including cotton swabs, cotton wool, sanitary pads, gauze, sorghum-based beer and bread, and canned meats.

Industries cannot function without energy, and the cost of electricity in Burkina Faso is among the highest on the continent. Investment in reliable energy for running agroprocessing units will be crucial to the competitiveness of these industries, and alternative options such as solar, wind, and biofuel from cotton hulls should be considered. One move in the right direction is the recent signing of a contract with Windiga Energy, a Canadian company, to build the largest solar energy plant in Africa (20 megawatts).

As with agricultural policy, industrial development policy must go hand in hand with a skills development policy, which will help actors adapt to changes in the market and enable policy adjustments to make use of existing comparative advantage opportunities or develop new ones.
VI. Moving forward

A) Aligning agricultural and industrial policies

Political vision and will are at the forefront of well-aligned agricultural and industrial policies. Synergies between the sorghum, cotton, beef, and poultry value chains can be the starting point for linking these policies in Burkina Faso. One of the reasons for the success observed in the country’s cotton sector is the collaboration between the trade and industry and the agriculture ministries in managing it.

After the popular uprising in Burkina Faso of October 2014, it is expected that any government that comes to power will feel pressure to perform and deliver on campaign promises made. To do so, they will need to demonstrate vision in identifying and supporting promising products, and monitor market changes in order to be able to adjust those policies when needed. This implies the need for an effective coordination mechanism involving the ministries of agriculture and food security, animal resources, water and fisheries, trade and industry, infrastructure, and transport. Policy design, implementation, and monitoring in both the agricultural and the industrial sectors should always be carried out by this coordinating body so as to ensure alignment of these sectors’ policies.

Diversification of production and exports in agriculture will lead to similar diversification in manufacturing if agricultural and industrial policies are synchronized. This alignment ensures the sustainability of both sectors through the recursive multiplier effects between them.

B) Financing and motivating budget reforms

As noted early in this paper, Burkina Faso currently spends more than 10% of its budget on agriculture, though this percentage dropped from 18% to 14% between 2006 and 2010. This means that the country meets the CAADP goal of investing 10% of the national budget in agriculture. The issue is that 77% of total expenditure on agriculture comes from foreign sources (MAFAP, 2013a), which is not sustainable. The country needs to devise ways to increase the share of its own funds in agricultural expenditures. Revenues from the current gold mining boom, and from manganese extraction when the mine becomes operational, can be used to increase investment in agriculture and rural development.

In recent years, there has been an inspired shift away from direct payments to farmers and other actors in the sector toward training, agricultural research, and off-farm infrastructure, but marketing and storage have not benefited much. Yet markets and storage are crucial to the process of agricultural transformation. Without markets to sell to, it is pointless to increase productivity, as this would only discourage farmers. Investments in warehouses and in an effective market information system for smallholder farmers are effective ways to link smallholder farmers to markets and help them earn more revenue from arbitrage between markets.

Access to credit is a major constraint for producers of all four crops/products studied here, except for cotton farmers, who get inputs from ginneries. However, cotton farmers still need credit for mechanization. Agricultural finance is unusually complex because of the risks involved in agriculture and their frequent covariation (for example, pests can attack vast swaths of land, making it impossible for insurers to spread risk) and because production decisions today depend on past prices, except in the case of cotton (prices are set at the beginning of the season). Innovative ways of providing access to credit, including targeting women, must be devised to get around the peculiarities of agricultural financing. One way is to set up a guarantee fund that will enable domestic banks to venture into financing agricultural investments for the benefit of smallholder farmers. Interventions to increase access to credit should be tailored to each of the four commodities to take into account their specificities.
C) Stakeholder engagement: developing policy advocacy platforms

Value chain development must involve regular discussion among various stakeholders about ways to remove bottlenecks at different segments of the chain. One of the major reasons development projects are seen as ineffective in spearheading economic transformation is that they are only projects—projects end, and any momentum built fades away once the money runs out. Likewise, this report would see the same fate as many previous reports if the project stopped at the report’s production and (initial) dissemination. Fortunately, an advocacy platform was built into this project as a way of keeping discussion between stakeholders alive. Several institutions can be engaged to ensure the results of this study are carried forward and advocate for them to be integrated into policy. The various stakeholders among the four value chains are listed in Tables 6.1–6.4 below.

Given that the SP/CPSA is headed by the agriculture ministry, it should be given a major role in the advocacy process. Ultimately, however, as this report is about helping to improve smallholder livelihood, and as producer organizations stand to gain significantly from the proposed policy changes, FBOs should take the lead. Political will and vision alone can achieve the needed improvements, but influence from the beneficiaries would go a long way toward getting results faster.

Table 6.1: Stakeholders in the sorghum value chain

<table>
<thead>
<tr>
<th>SORGHUM</th>
<th>Description of role</th>
<th>Proposed role in advocacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP/CPSA</td>
<td>Coordinating body for sector-specific agricultural policies, headed by the minister of agriculture, includes ministry of trade and industry</td>
<td>Provide access to top government officials</td>
</tr>
<tr>
<td>CICB</td>
<td>Inter-professional body for cereal and cowpea producers</td>
<td>Advocate on training for farmers, support to access credit, and land tenure security; help implement microdosing</td>
</tr>
<tr>
<td>Direction du développement des filières agricoles (DDFA, a sub-department of DGPER)</td>
<td>Department of the ministry of agriculture in charge of promoting value chains</td>
<td>Push for the value chain approach and for incentives for sorghum producers, as well as feed industry development; provide market information</td>
</tr>
<tr>
<td>INERA</td>
<td>National agricultural research institute</td>
<td>INERA implemented the microdosing project funded by AGRA, so can push for scaling up microdosing</td>
</tr>
<tr>
<td>Ligue des consommateurs</td>
<td>Consumer protection organization</td>
<td>Push for legislation on quality standards</td>
</tr>
<tr>
<td>Financial service providers (ECOBANK, BANK of AFRICA, RCPB, 8 MFIs, 9 etc.)</td>
<td>Sources of credit</td>
<td>Advocate for a guarantee fund to help them provide loans to farmers</td>
</tr>
<tr>
<td>APEX</td>
<td>Export promotion agency</td>
<td>Push for investment in export infrastructure and look for opportunities</td>
</tr>
</tbody>
</table>

8 Réseau des Caisses Populaires du Burkina
9 Microfinance institutions
### Table 6.2: Stakeholders in the cotton value chain

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Description of role</th>
<th>Proposed role in advocacy</th>
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<tbody>
<tr>
<td>SP/CPSA</td>
<td>Coordinating body for sector-specific agricultural policies, headed by the minister of agriculture, includes ministry of trade and industry</td>
<td>Provide access to top government officials</td>
</tr>
<tr>
<td>UNPCB</td>
<td>Umbrella cotton farmers’ organization</td>
<td>Advocate for quality standards, access to credit for mechanization, and land tenure security</td>
</tr>
<tr>
<td>APROCOB</td>
<td>Association of ginneries</td>
<td>Advocate for improvement of road and energy infrastructure</td>
</tr>
<tr>
<td>INERA</td>
<td>National agricultural research institute</td>
<td>Research new varieties</td>
</tr>
<tr>
<td>Cotton oil producers</td>
<td>Trituration companies that produce oil and use cotton hulls for energy generation</td>
<td>Push for investment in productivity-enhancing measures and biofuel production</td>
</tr>
<tr>
<td>Textile companies</td>
<td>Produce textile yarn and garments</td>
<td>Push for investment in productivity-enhancing measures and biofuel production</td>
</tr>
<tr>
<td>Ligue des consommateurs</td>
<td>Consumer protection organization</td>
<td>Push for legislation on quality standards</td>
</tr>
<tr>
<td>Bank consortium</td>
<td>Credit source for ginneries</td>
<td>Push for good management of smoothing fund</td>
</tr>
<tr>
<td>Direction du développement des filières agricoles (DDFA, a sub-department of DGPER)</td>
<td>Department of the ministry of agriculture in charge of promoting value chains</td>
<td>Push for feed industry development; provide market information</td>
</tr>
<tr>
<td>Helvetas</td>
<td>Swiss NGO supporting organic cotton farming</td>
<td>Advocate for land tenure security and women’s access to land</td>
</tr>
<tr>
<td>APEX</td>
<td>Export promotion agency</td>
<td>Push for investment in export infrastructure and look for opportunities</td>
</tr>
</tbody>
</table>
### Table 6.3: Stakeholders in the beef value chain

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Description of role</th>
<th>Proposed role in advocacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP/CPSA</td>
<td>Coordinating body for sector-specific agricultural policies, headed by the minister of agriculture, includes ministry of trade and industry</td>
<td>Provide access to top government officials</td>
</tr>
<tr>
<td>FEB, UNEAB</td>
<td>FBOs</td>
<td>Advocate for quality standards, access to credit and inputs, and land tenure security</td>
</tr>
<tr>
<td>APEX</td>
<td>Export promotion agency</td>
<td>Push for investment in export infrastructure and look for opportunities</td>
</tr>
<tr>
<td>DGDPA</td>
<td>Directorate for the development of livestock production</td>
<td>Push for value chain approach, access to credit and inputs, and investments in road and energy infrastructure</td>
</tr>
<tr>
<td>Financial service providers ECOBANK, BANK of AFRICA, RCPB, MFIs</td>
<td>Sources of credit</td>
<td>Advocate for a guarantee fund to help them provide loans to farmers</td>
</tr>
<tr>
<td>SOFAB, SOGEAO, SOPROLAIT</td>
<td>Organizations representing animal feed producers, abattoirs, dairy product industry</td>
<td>Push for improvements in productivity, access to inputs, and road and energy infrastructure</td>
</tr>
</tbody>
</table>

### Table 6.4: Stakeholders in the poultry value chain

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Description of role</th>
<th>Proposed role in advocacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP/CPSA</td>
<td>Coordinating body for sector-specific agricultural policies, headed by the minister of agriculture, includes ministry of trade and industry</td>
<td>Provide access to top government officials</td>
</tr>
<tr>
<td>Maison de l’Aviculture, IPVL, and APOFAM</td>
<td>FBOs</td>
<td>Advocate for quality standards, access to credit and inputs, and land tenure security</td>
</tr>
<tr>
<td>CPAVI</td>
<td>Aviculture promotion center providing training and technical support</td>
<td>Push for the value chain approach and for incentives for poultry producers, as well as feed industry development; push for training in business skills</td>
</tr>
<tr>
<td>APEX</td>
<td>Export promotion agency</td>
<td>Push for investment in export infrastructure and look for opportunities</td>
</tr>
<tr>
<td>Ligue des consommateurs</td>
<td>Consumer protection organization</td>
<td>Push for legislation on quality standards</td>
</tr>
<tr>
<td>Financial service providers ECOBANK, BANK of AFRICA, RCPB, MFIs etc.)</td>
<td>Sources of credit</td>
<td>Advocate for a guarantee fund to help them provide loans to farmers</td>
</tr>
<tr>
<td>SOFAB, SOGEAO</td>
<td>Organizations representing animal feed producers and abattoirs</td>
<td>Push for improvements in productivity and access to inputs</td>
</tr>
</tbody>
</table>
References


Universitaires de Bordeaux (Coll. « Grappes & Millésimes »), 658 p.


## Appendixes

### Appendix 1: Tables from price simulations

#### Table A1: Simulation results for cotton

<table>
<thead>
<tr>
<th>% Change in price</th>
<th>Baseline</th>
<th>Leader Split</th>
<th>Leaders merge</th>
<th>Exit of largest</th>
<th>Equal market shares</th>
<th>Perfect Competition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competition Policy</td>
<td>0.00</td>
<td>3.67</td>
<td>-0.51</td>
<td>-4.02</td>
<td>6.24</td>
<td>13.39</td>
</tr>
<tr>
<td>Increase of 10% in:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marginal Cost of Producing Cash Crop</td>
<td>3.89</td>
<td>6.51</td>
<td>3.89</td>
<td>0.44</td>
<td>8.21</td>
<td>13.39</td>
</tr>
<tr>
<td>Fixed Cost of Producing Cash Crop</td>
<td>0.18</td>
<td>3.94</td>
<td>-0.28</td>
<td>-3.76</td>
<td>6.44</td>
<td>13.39</td>
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<tr>
<td>Endowment</td>
<td>-0.66</td>
<td>2.62</td>
<td>-1.34</td>
<td>-4.55</td>
<td>5.37</td>
<td>13.39</td>
</tr>
<tr>
<td>Preference Parameter</td>
<td>0.75</td>
<td>4.89</td>
<td>0.47</td>
<td>-3.29</td>
<td>7.18</td>
<td>13.39</td>
</tr>
<tr>
<td>Food Crop Price</td>
<td>2.44</td>
<td>5.27</td>
<td>2.44</td>
<td>-0.31</td>
<td>7.15</td>
<td>13.39</td>
</tr>
<tr>
<td>Marginal Cost of Producing Food Crop</td>
<td>-0.27</td>
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<td>-0.92</td>
<td>-4.71</td>
<td>6.15</td>
<td>13.39</td>
</tr>
<tr>
<td>Transaction Costs on Crop Production</td>
<td>7.15</td>
<td>8.85</td>
<td>6.22</td>
<td>4.09</td>
<td>10.41</td>
<td>14.36</td>
</tr>
<tr>
<td>Transaction Costs on Inputs</td>
<td>1.13</td>
<td>1.89</td>
<td>1.13</td>
<td>0.13</td>
<td>2.38</td>
<td>13.39</td>
</tr>
<tr>
<td>Non-Farmer demand</td>
<td>0.00</td>
<td>3.67</td>
<td>-0.51</td>
<td>-4.02</td>
<td>6.24</td>
<td>13.39</td>
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</table>

Source: Simulation results from the model of supply chains

#### Table A2: Simulation results for cattle

<table>
<thead>
<tr>
<th>% Change in price</th>
<th>Baseline</th>
<th>Leader Split</th>
<th>Leaders merge</th>
<th>Exit of largest</th>
<th>Equal market shares</th>
<th>Perfect Competition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competition Policy</td>
<td>0.00</td>
<td>1.63</td>
<td>-0.99</td>
<td>-2.26</td>
<td>3.93</td>
<td>10.88</td>
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<tr>
<td>Increase of 10% in:</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>International Price</td>
<td>14.36</td>
<td>16.85</td>
<td>12.10</td>
<td>10.77</td>
<td>17.99</td>
<td>32.11</td>
</tr>
<tr>
<td>Marginal Cost of Producing Cash Crop</td>
<td>-2.00</td>
<td>-0.17</td>
<td>-3.31</td>
<td>-4.55</td>
<td>1.74</td>
<td>10.84</td>
</tr>
<tr>
<td>Fixed Cost of Producing Cash Crop</td>
<td>-1.39</td>
<td>0.44</td>
<td>-2.55</td>
<td>-3.83</td>
<td>2.56</td>
<td>10.84</td>
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<tr>
<td>Endowment</td>
<td>0.84</td>
<td>2.31</td>
<td>0.08</td>
<td>-1.19</td>
<td>4.60</td>
<td>10.84</td>
</tr>
<tr>
<td>Preference Parameter</td>
<td>1.96</td>
<td>3.19</td>
<td>1.51</td>
<td>0.37</td>
<td>5.56</td>
<td>10.84</td>
</tr>
<tr>
<td>Cash Crop Price</td>
<td>4.39</td>
<td>5.37</td>
<td>4.36</td>
<td>2.97</td>
<td>8.36</td>
<td>10.84</td>
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<td>Marginal Cost of Producing Food Crop</td>
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<td>1.23</td>
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<td>6.18</td>
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<td>5.20</td>
<td>4.63</td>
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<tr>
<td>Transaction Costs on Inputs</td>
<td>0.52</td>
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<td>10.84</td>
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<tr>
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Source: Simulation results from the model of supply chains

#### Table A3: Simulation results for sorghum

<table>
<thead>
<tr>
<th>% Change in price</th>
<th>Baseline</th>
<th>Leader Split</th>
<th>Leaders merge</th>
<th>Exit of largest</th>
<th>Equal market shares</th>
<th>Perfect Competition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competition Policy</td>
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<td>-0.12</td>
<td>1.19</td>
<td>2.11</td>
</tr>
<tr>
<td>Increase of 10% in:</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Marginal Cost of Producing Cash Crop</td>
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<td>0.35</td>
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<tr>
<td>Fixed Cost of Producing Cash Crop</td>
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<tr>
<td>Endowment</td>
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<td>1.19</td>
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<td>Preference Parameter</td>
<td>1.14</td>
<td>1.19</td>
<td>1.12</td>
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<td>2.11</td>
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<tr>
<td>Cash Crop Price</td>
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<td>0.26</td>
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<td>Marginal Cost of Producing Food Crop</td>
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<tr>
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<td>0.06</td>
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<tr>
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<td>-0.07</td>
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<td>2.11</td>
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</table>

Source: Simulation results from the model of supply chains
Table A4: Simulation results for poultry

<table>
<thead>
<tr>
<th>% Change in price</th>
<th>Baseline</th>
<th>Leader Split</th>
<th>Leaders merge</th>
<th>Exit of largest</th>
<th>Equal market shares</th>
<th>Perfect Competition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competition Policy</td>
<td>0.00</td>
<td>-0.66</td>
<td>0.19</td>
<td>1.02</td>
<td>-2.07</td>
<td>-3.94</td>
</tr>
<tr>
<td>Increase of 10% in:</td>
<td></td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>International Price</td>
<td>8.09</td>
<td>7.72</td>
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<td>8.59</td>
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<td>-1.04</td>
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<td>-0.35</td>
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<tr>
<td>Fixed Cost of Producing Cash Crop</td>
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<td>-0.48</td>
<td>0.34</td>
<td>-2.57</td>
<td>-3.94</td>
</tr>
<tr>
<td>Endowment</td>
<td>0.49</td>
<td>-0.24</td>
<td>0.79</td>
<td>1.63</td>
<td>-1.58</td>
<td>-3.94</td>
</tr>
<tr>
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<td>1.70</td>
<td>2.51</td>
<td>-0.79</td>
<td>-3.94</td>
</tr>
<tr>
<td>Cash Crop Price</td>
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<td>0.83</td>
<td>2.53</td>
<td>3.44</td>
<td>-0.33</td>
<td>-3.94</td>
</tr>
<tr>
<td>Marginal Cost of Producing Food Crop</td>
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<td>2.56</td>
<td>-0.68</td>
<td>-3.94</td>
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<tr>
<td>Transaction Costs on Crop Production</td>
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<td>3.32</td>
<td>3.36</td>
<td>3.69</td>
<td>2.59</td>
<td>2.56</td>
</tr>
<tr>
<td>Transaction Costs on Inputs</td>
<td>0.38</td>
<td>0.13</td>
<td>0.51</td>
<td>0.74</td>
<td>-0.20</td>
<td>-3.94</td>
</tr>
<tr>
<td>Non-Farmer demand</td>
<td>0.16</td>
<td>-0.54</td>
<td>0.38</td>
<td>1.21</td>
<td>-1.92</td>
<td>-3.94</td>
</tr>
</tbody>
</table>

Source: Simulation results from the model of supply chains
ACET is an economic policy institute supporting Africa’s long-term growth through transformation. Its mission is to promote policy and institutional reforms for sustained economic growth throughout Africa, so that African countries may drive their own growth and transformation agendas.