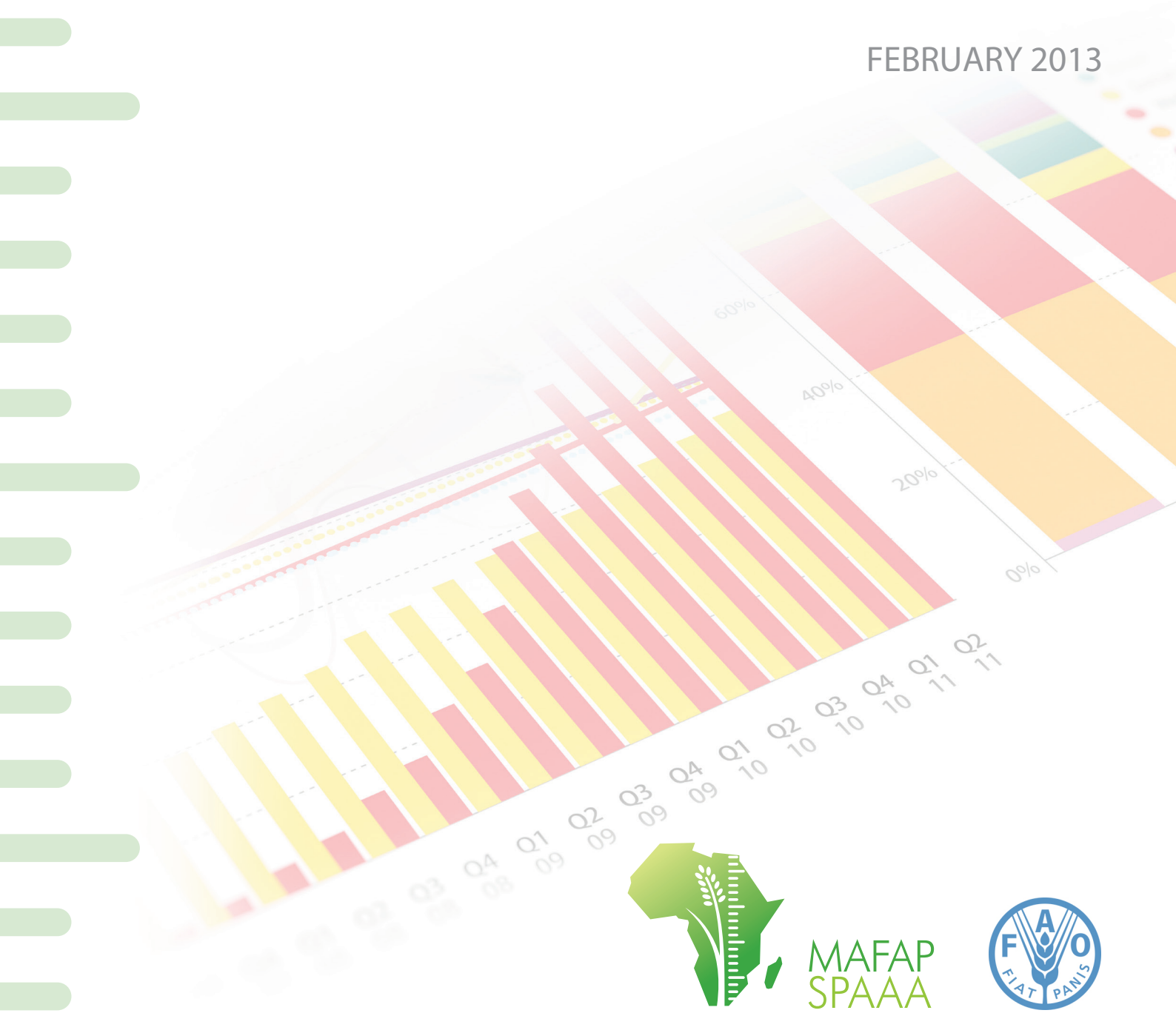
MONITORING AFRICAN FOOD AND AGRICULTURAL POLICIES (MAFAP)

REVIEW OF FOOD AND AGRICULTURAL POLICIES IN THE KENYA 2005-2011

COUNTRY REPORT

FEBRUARY 2013



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Monitoring African Food and Agricultural Policies

Food and Agriculture Organization of the Unided Nations

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Acronyms

ADB	African Development Bank
AEO	African Economic Outlook
AGOA	African Growth Opportunity Act (USA)
AEZ	Agro-Ecological Zones
APRM	African Peer Review Mechanism
ARS	Agriculture Recovery Strategy
ASAL	Arid and semiarid land
ASDS	Agriculture Sector Development Strategy
AU	African Union
AWM	Agricultural Water Management
CAADP	Comprehensive Africa Agriculture Development Program
CDF	Coffee Development Fund
CGD	Centre for Governance and Development
CIF	Cost, Insurance and Freight (import price)
CODA	Cotton Development Authority
COMESA	Common Market for Eastern and Southern Africa
DFL	Dominion Farms Ltd
DPI	Development and Performance Indicator
DPs	Development Partners
EABL	East African Breweries Ltd
EAC	East African Community
EIU	Economist Intelligence Unit
EPZA	Export Processing Zones Authority
ERS	Economic Recovery Strategy for Wealth and Employment Creation
FAO	United Nations Food and Agriculture Organization
FOB	Free On Board (export price)
GFRA	FAO Global Forest Resources Assessment
GIEWS	Global Information and Early Warning System (FAO)
GOK	Government of Kenya
GOT	Ginning Outturn (% lint from seed cotton)
GTA	Global Trade Atlas
ha	hectares
IFC	International Finance Corporation
IMAWESA	Improved Management of Agricultural Water in East & Southern Africa
ITCZ	Inter-Tropical Convergence Zone
IWMI	International Water Management Institute
KARI	Kenya Agricultural Research Institute
KDB	Kenya Dairy Board
KTDA	Kenya Tea Development Authority
KEPCO	Kenya Producers Coalition
KESGA	Kenya Sugar Growers Association
KESMA	Kenya Sugar Millers Association
KfW	German Development Bank
KIPPRA	Kenya Institute for Public Policy Research and Analysis

KLMC	Kenya Livestock Marketing Council
KMC	Kenya Meat Commission
KNBS	Kenya National Bureau of Statistics
KSB	Kenya Sugar Board
KSI	Kenya Sugar Industry
KSS	Kenya Soil Survey
KTDA	Kenya Tea Development Authority (until 2000); ... Agency Ltd. (since 2000)
LMD	Livestock Marketing Division (Ministry of Agriculture)
LTMS	Livestock Traders Marketing Society of Kenya
MAFAP	Monitoring African Food and Agricultural Policies
MDG	Market Development Gap
MLFD	Kenya Ministry of Livestock and Fisheries Development
MOA	Kenya Ministry of Agriculture
MOLD	Kenya Ministry of Livestock Development
MPND	Kenya Ministry of Planning and National Development
MRML	Mwea Rice Mills Ltd
MTIP	Medium Term Implementation Plan
MWI	Kenya Ministry of Water and Irrigation
NCCRS	National Climate Change Response Strategy
NCPB	National Cereals and Produce Board of Kenya
NEPAD	New Partnership for Africa's Development
NGO	Non-Governmental Organization
NIB	National Irrigation Board
NRP	Nominal Rate of Protection
NU	Nebraska University
ODA	Official Development Assistance
OECD	Organisation for Economic Co-operation and Development
PPP	Purchasing Power Parity
RATIN	Regional Agricultural Trade Intelligence Network
ROK	Republic of Kenya
RVF	Rift Valley Fever
SADC	Southern Africa Development Community
SDL	Sugar Development Levy
SIDA	Swedish International Development Cooperation Agency
SOMO	Centre for Research on Multinational Corporations
SPAAA	Suivi des Politiques Agricoles et Alimentaires en Afrique (MAFAP in French)
SRA	Strategy for Revitalizing Agriculture
SSA	Sub-Saharan Africa
SWAP	Sector-Wide Approach to Planning
TBK	Tea Board of Kenya
THVC	Traditional High-Value Crops (programme)
UNDESA	United Nations Department of Economic and Social Affairs
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization

USDA	United States Department of Agriculture
WHO	World Health Organization
WKRM	Western Kenya Rice Mills Ltd.

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All work for the MAFAP project in Kenya was completed in partnership with the Ministry of Agriculture (MOA), the Kenya Agricultural Research Institute (KARI), the Kenya Institute for Public Policy Research and Analysis (KIPPRA) and the Food and Agriculture Organization of the United Nations (FAO).

Analysis and technical support was provided by the country team, which includes Stella Makokha and Daniel Kilambya of KARI and Nancy Laibuni of KIPPRA. The country technical teams worked under the direction of Festus Murithi and Wellington Mulinge (KARI) and John Omiti (KIPPRA).

Yasaman Matinroshan (FAO), Luis Monroy (FAO) and Wellington Mulinge (KARI) wrote Part 1.

Megan Witwer (FAO), Luis Monroy (FAO), Stella Makokha (KARI) and Daniel Kilambya (KARI) wrote the sections on incentives and disincentives (Chapter 5) and policy coherence (Chapter 7) in Part 2, with contributions from Mohamed Ahmed (FAO) and Jesus Barreiro-Hurle (FAO).

Part 2 (Chapter 6) on public expenditure was prepared by Joanna Ilicic-Komorowska (OECD) and Nancy Laibuni (KIPPRA), with the assistance of Alban Mas Aparisi (FAO).

Luis Monroy (FAO) wrote Part 3, building on previous work from the Land and Water Division in FAO, with contributions from Wellington Mulinge (KARI).

Cameron Short (FAO), Jean Balié (FAO) and Keith Wiebe (FAO), as well as the PSE advisory group of OECD and the MAFAP review team in FAO, contributed to the report and the technical notes on which it is based.

EXECUTIVE SUMMARY

This report constitutes the first agricultural policy review undertaken by the MAFAP project in Kenya. The report reviews the main developments of the economy and the agricultural sector as well as the main policy decisions affecting this sector. However, its main contribution focuses on: a) an analysis of price incentives and disincentives faced by farmers and consumers for ten agricultural commodities, which cover a significant share of agricultural production, imports, exports and diet; and b) a detailed analysis of the composition and level of public expenditure in support of agriculture and rural development. The former analysis was made for the period 2005-2010, while the latter covers 2006 to 2011.

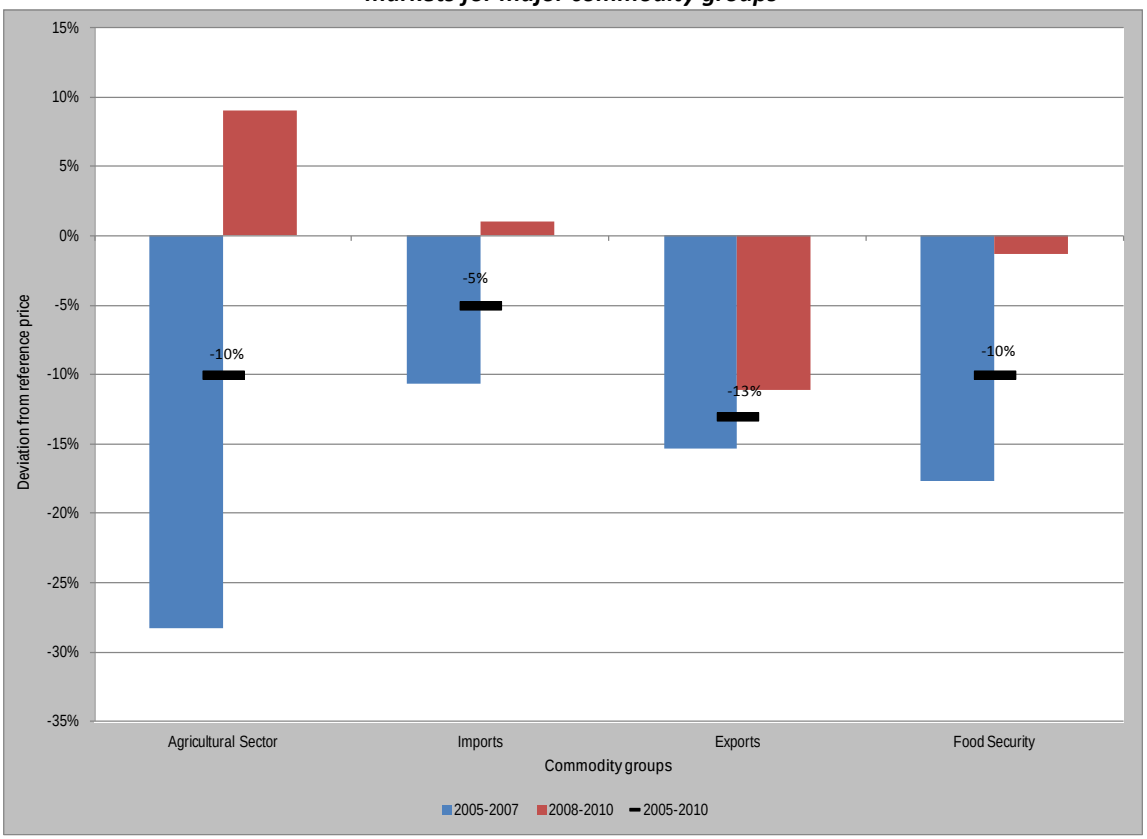
The commodity analysis is designed to identify how the current policy environment affects agriculture through its influence on commodity markets. It is based on well-known, simple indicators to measure the deviation of commodity prices received by various agents in domestic markets from an estimated ideal price in a distortion-free, competitive situation, referred to in this report as the reference price. The deviation is measured in monetary value per unit of marketed output (price gap) and in relative terms as a percentage of the reference price (nominal rate of protection). The reference price takes into account whether the commodity is an export, import or thinly traded product in world markets; the marketing costs currently incurred; and all taxes or levies. According to this indicator, when the domestic price is equal to the reference price, there are no distortions to farm incentives, indicating that the domestic prices are consistent with the comparative advantage of the country in producing the commodity. A domestic price above the reference price of the commodity suggests that producers are receiving transfers through the market or incentives due to existing policy or functioning of the value chain. On the other hand, producers are facing disincentives originating from policies or market factors when the domestic price is below the reference price.

The report offers results achieved with a rigorous methodology for measuring the effects of agricultural and food policies and of public spending in agriculture and rural development. The report provides a baseline to support the dialogue on agricultural and food policies in Kenya among key decision makers and with development partners.

KEY FINDINGS

- ***The level of price incentives for producers generally increased since 2005, though this trend was largely driven by high domestic prices during food shortages in 2008 and 2009. Therefore, it is uncertain whether this positive trend will be sustained in the long-term.*** Between 2005 and 2007, all commodity groups faced strong market price disincentives. Since 2008, there have effectively been price incentives for most commodity groups due to political instability following Kenya's 2007 election and a subsequent drought in 2009. These events resulted in significant food shortages and high domestic prices for producers. Exports (coffee and tea), on the other hand, continued to face disincentives, since cash crops were less affected by these events. Food security crops also faced minor disincentives between 2008 and 2010, though this trend was mainly driven by maize, for which import tariffs were waived during the food crisis.

Figure 1: Average percentage deviation of producers' price from the price *producers would receive in world markets for major commodity groups*



Note: The bars measure the percentage of deviation between the price domestic producers currently receive and what producers would receive in world markets (the latter is the reference price and is equivalent to 0%). Imports analyzed include maize, wheat, rice, sugar and cotton; Exports include coffee and tea; Commodities important for food security include maize, wheat and rice; and the Agricultural Sector includes all aforementioned crops in addition to thinly traded products (milk, cattle and sorghum).

Source: Authors' elaboration using data from commodity specific technical notes

- ***In general, staple food crops were least affected by inefficiencies in domestic markets, while milk cattle, sugar and smallholder coffee producers were most affected.*** For staple food crops, inefficiencies are mainly due to government taxes and fees, bribes and the delays at roadblocks and weighbridges. For milk, cattle, sugar and smallholder coffee producers, however, inefficiencies largely stem from structural issues such as the concentration of market power and profits among intermediaries, information asymmetry and poor regulation and organization among producers. These market distortions in commodity value chains translate into lower domestic prices and represent significant opportunity costs for producers.

- ***Import tariffs were effective in keeping prices for wheat, rice and sugar high for producers, but did not always affect prices for maize and sorghum.*** Wheat and rice are both routinely imported from world markets, and tariffs are effective in keeping domestic prices high for producers. Maize and sorghum, on the other hand, are typically imported duty-free from countries within the EAC and COMESA regions and are only imported from world markets under exceptional circumstances. Consequently, tariffs are not always effective in keeping maize and sorghum prices high for producers. Furthermore, trade policies established to

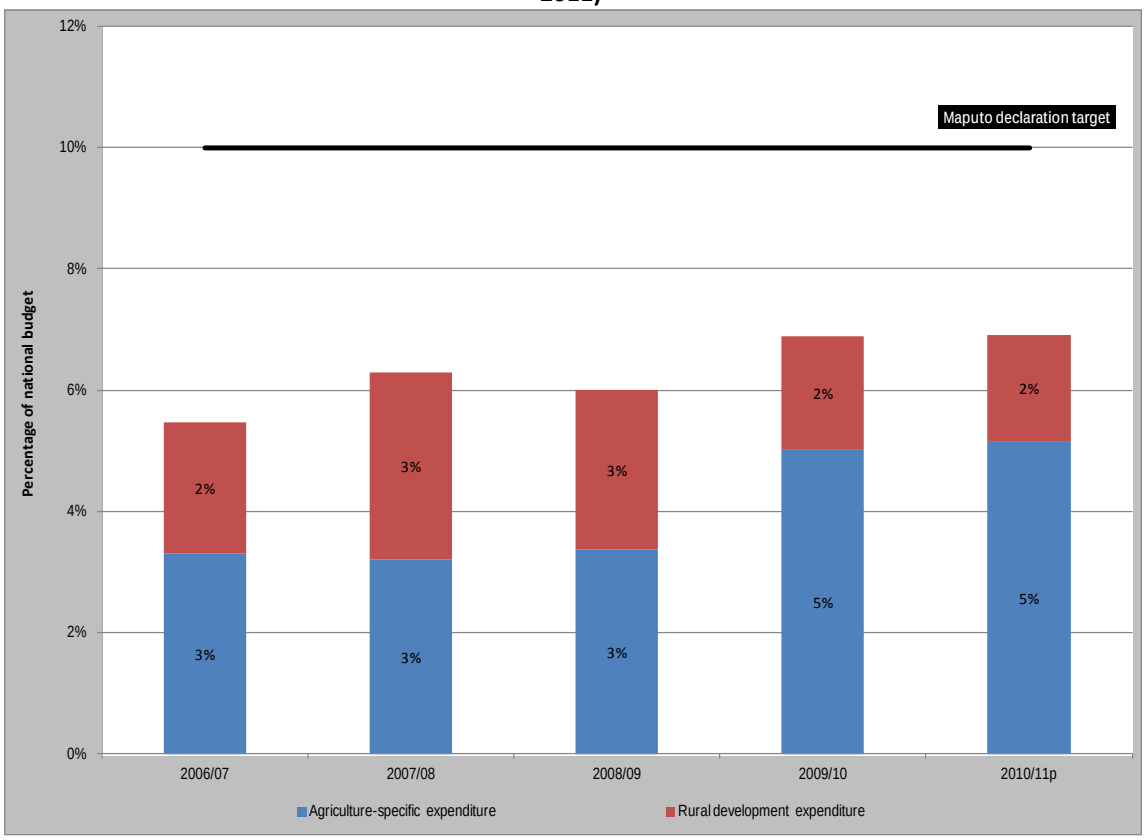
protect sugar producers are gradually being reduced and will likely be eliminated by 2014, though trends suggest that the quota on sugar imports is no longer binding.

- ***Consumers are adversely affected by tariffs on food imports, especially those on wheat and rice.*** Kenyans in urban areas spend nearly as large a share of their food budget on wheat and wheat products as on maize and maize products. With respect to rice, however, it seems likely that consumers most adversely affected are those in urban areas with moderate to high incomes, since many low-income consumers still cannot afford it.

- ***Government policy interventions in response to food shortages appear to be more reactive than proactive in nature.*** This was evidenced by the government's reaction to the food crisis in 2008 and 2009. In both years, the GOK either subsidized food imports or waived import tariffs on staple food crops (maize and sorghum) in order to protect consumers, as food stock inventories were not sufficient to cover the deficit. Given Kenya's high susceptibility to drought and other production shocks, the GOK may need to consider developing more preventative measures in order to stabilize market prices for consumers and producers, reduce risk and promote trade.

- ***The percentage of the government budget going to agriculture and rural development has increased by 12 percent since 2006, though it is still well below the Maputo target.*** The approved budget for all expenditures to support agriculture and rural development grew by 122 percent in nominal terms between 2006 and 2010, reaching 66.1 billion Kenya Shillings. Expenditures allocated directly to the agriculture sector more than doubled over the period analyzed, while spending allocated to rural development increased by about half. Extension services, research, infrastructure and input subsidies to producers (mainly for capital investments) make up the largest share of agriculture-specific expenditure. Rural development expenditure was almost equally distributed among rural education, health and infrastructure, with water and sanitation accounting for a much larger share than energy and roads.

Figure 2: Level and distribution of public expenditure in support ofthe agricultural sector in Kenya (2006-2011)



Source: Authors' elaboration using data from public expenditure technical note

- ***Further decomposition of agriculture-specific expenditure shows that most government funds are allocated to projects and programs in support of all commodities, while funds allocated to commodity groups constitute about a third and to individual commodities only a small proportion.*** Among expenditures in support of individual commodities, by far the largest share goes to fish, followed by maize, dairy, cotton, silk, coconut, coffee and tea. The largest share of expenditures on commodity groups goes to livestock and crops, followed by horticulture, sheep and goats, apiculture and apiculture and livestock.

CONCLUSIONS

- ***Government policies to promote commercial, market-oriented and profitable agriculture to raise incomes and increase food security in Kenya are supported through high levels of public expenditure. However, apparent imbalances across spending categories exist.*** The government's high level of investment in research and extension can bring benefits through improved agricultural productivity, and even contribute significantly to poverty reduction. Public spending on rural infrastructure, both on and off-farm, are essential for reducing transaction costs and improving farmers' access to markets. However, there has been no investment in the construction of markets, storage and public stockholding, and very little investment in improving inspection and marketing. Public spending should allocate adequate funds to further develop emerging or promising markets for agricultural products.

- ***Despite policy efforts and substantial investments in infrastructure, market inefficiencies are still constraining price incentives for agricultural producers in Kenya.*** It can be observed that all products are affected negatively by inefficiencies, whatever their trade status, and regardless of their status from the point of view of incentives and disincentives resulting

from the effects of explicit policies (trade policies, pricing policies, etc.). These distortions represent additional disincentives at the producer level stemming from implicit policies such as taxes and fees, or the absence of policies: lack of infrastructure, rigidities and information asymmetry. Inefficiencies highlight gains and cost savings that could be achieved if the necessary investments were made, notably in transport infrastructure and technology acquisition, and if adequate measures were taken, especially to eliminate or limit illegal taxes, bribes, excessive profits of intermediaries due to monopolistic behavior.

- ***Low diversification is hindering Kenya's export potential.*** The country is relying on a few export products and trade partners, which makes Kenyan exports highly vulnerable to external pressures. Among the exported products, tea accounts for more than 50 percent of the value of Kenyan agro-food exports, and more than 60 percent of tea exports go to only three consuming countries (Pakistan, Egypt and UK).

- ***Kenya is moving towards policy coherence, but there still are important constraints to be addressed.*** Agricultural sector policies have been gradually adapting to the country´s general policy and political changes towards market liberalization, privatization and commercialization of the agricultural sector. The consensual definition of development objectives and strategies has proven difficult, but progress has been made. This is being reflected in the downward coherence and continuity between national strategies, sector policies and policies related to other supportive sectors. Although there has been clear progress over the past 10 years towards coherence in the agricultural sector, it is still identified as a challenge in the current national development strategy of Kenya.

INTRODUCTION

The Monitoring African Food and Agricultural Policies (MAFAP) project seeks to provide African policy makers and their development partners with the best possible information on the impacts of policies and investments affecting agriculture and food security.

To do this, MAFAP works with national partners to build capacity and systematically analyze the impacts of food and agricultural policies and public expenditures on market incentives and disincentives faced by producers and other actors in key agricultural value chains. The resulting quantitative indicators are comparable across commodities, countries and over time, providing the basis for informed investment decisions and evidence-based policy dialogue at national, regional and international levels.

This report constitutes the first policy review of this project in Kenya. The core part of the report was drawn from ten technical notes that provide detailed and innovative analyses covering ten key products accounting for 59 percent of the average value of agricultural production in Kenya between 2005 and 2010. The respective technical notes for each commodity are standalone results of the MAFAP project, and are available in addition to the report. These notes were written by MAFAP's local team in Kenya, composed of policy analysts and a senior coordinator, assisted by FAO's Rome team. The authors also benefited from the help of several agricultural, public and private development stakeholders in Kenya. This report is thus based on a lot of input from Kenyan researchers themselves, in accordance with MAFAP's medium-term objective, which is the full internalization of its methodology within a national institution.

This review is to be updated periodically as part of a biennial country report identifying key developments in the sector.

The report offers concrete results achieved with the implementation of a rigorous methodology for measuring the effects of agricultural and food policies and of public expenditure in agriculture and rural development. The approach is novel as it has been used for the first time in Kenya. The report establishes a baseline to support the dialogue on agricultural and food policies in Kenya among key decision makers and with development partners. It is true that the MAFAP project seeks to inform discussion on policy reforms; however, the project is not intended to advocate particular reforms. Such changes must be endogenous, and if they take place must result from a dialogue on government policies among stakeholders in the country.

This report does not purport to be exhaustive. Therefore the political dialogue should also be supported by other inputs provided by various institutional players to arrive at a full perception of the situation of agricultural and food policies in Kenya.

The report is structured into three main parts:

The first part offers a description and analysis of the context of government policies in Kenya, a comparative list of development and performance indicators (DPI), and a description of the major decisions and government policies in the agricultural sector.

The second part is the heart of the report. The incentives and disincentives to production observed for the ten products are analyzed. The level, composition and effectiveness of public expenditure and aid are analyzed in detail, and the consistency of government policies is addressed and discussed. The general conclusion presents the key messages from the application of the methodology and analysis, and offers recommendations for an enhanced political dialogue, transparent and based on facts. Its concluding paragraph highlights the lessons learned from implementing the first phase of the MAFAP project in Kenya in terms of strengths, weaknesses, opportunities and challenges for the sustainability of such a periodic monitoring and analysis of agricultural and food policies.

The third part of the report deals with a subject of specific national interest and will be different for each edition of the report. This edition provides a brief analysis of investment in agricultural water management in Kenya.

PART 1. GEOGRAPHY, SOCIO-ECONOMIC CONDITIONS AND AGRICULTURAL POLICIES

This section summarizes the geography, economic and political developments since Independence, and socio-economic conditions of Kenya, and presents the Development and Performance Indicators (DPI) for Kenya.[1]

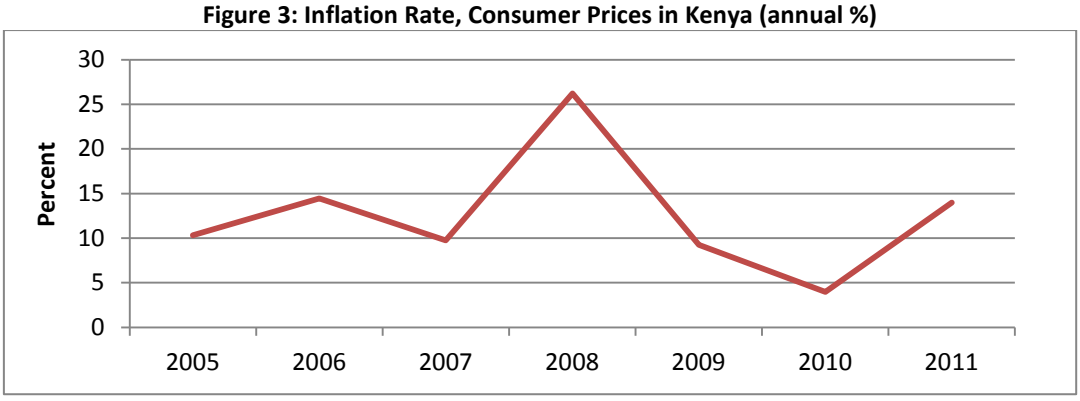
1. Kenya in brief

Over 80 percent of the Kenyan population lives in the rural areas. Agriculture remains the backbone of the economy in Kenya, contributing 25 percent of the total GDP and employing 75 percent of the national labour force. Given the importance of the sector, it is a key factor for the overall performance of the economy.

According to the World Bank, the agriculture sector GDP growth reached 5.6 percent in 2010, a strong recovery after two years of domestic shocks. This growth is mainly due to enhanced dissemination of agricultural technologies, provision of subsidized inputs to farmers and increase in the area under irrigation. The country also managed to produce three quarters of its food requirements; maize production increased to 3.2 million tonnes in 2010 from an average of 2.5 million tonnes in the previous three years.

Although the severe international economic shocks pushed up inflation (Figure 3) and restricted GDP growth, the country's macroeconomic performance proved rather strong.

Figure 3: Inflation Rate, Consumer Prices in Kenya (annual %)



Source: WB, 2012

At independence in 1963, Kenyan exports represented 40 percent of GDP, by the mid 1980s the export share had dropped to 20 percent, recovering to 27 percent in 2010. The export earnings for FY 2010/11 stood at USD 5,542 million, higher than FY 2009/10 USD 4,932 million (AEO, 2012). The reduction in quantity of exports in 2010 was mainly as a result of decreased demand in the volume of fruits and vegetables in the international markets occasioned by the global economic recession. The manufacturing sector is dominated by food processing and fast-moving consumer goods, motor

[1] The DPIs are common to all countries covered by the MAFAP project in order to facilitate comparison between countries. The data cited in this chapter and Table 3 are developed and referenced in the text of the report.

vehicles and farm implements. This sector accounting for 11 percent of the country's GDP, has dropped from second to fourth place in economic importance over a decade and is a great challenge for Kenya.

The East African Community (EAC) Countries –Kenya, Tanzania, Uganda, Rwanda and Burundi– entered an enforceable customs union on 1 January 2010, adopting a common external tariff (CET) with three bands: zero percent (raw materials and capital goods), 10 percent (intermediate goods) and 25 percent (finished goods). Tariffs of up to 100 percent are applicable to products that are deemed to be sensitive to member states. Members will continue to collect customs receipts separately until a revenue sharing mechanism can be agreed. Furthermore, the EAC Common Market Protocol came into force on 1 July 2010, potentially allowing for the free movement of goods, services, people and capital in a zone with a combined population of some 135 million people. Given the large amount of legislation that needs to be amended in all countries to comply with the protocol, the transition is proceeding slowly.

Finally, Kenya also experienced a tense political environment over the past five years; in particular the 2008 election caused post-election violence and subsequently brought into power a Grand Coalition Government. The coordination between the two political parties –the office of the President and the office of Prime Minister– brought several reforms. Among these is the adoption of a new Constitution (27 August 2010).

Development and performance indicators

Table 1 lists the Development and Performance Indicators for Kenya, compared with those for Africa and for the world.

Table 1: Development and Performance Indicators (DPI) for Kenya, Africa and the world

Domains	DPI #	Development and Performance Indicators (DPI)	Latest values, Kenya	Africa	World
1. Macroeconomic Performance	DPI 1	Share of agricultural value added/GDP (GOK)	25% (2010)	13.3% (2009) (sub-Saharan Africa)	2.8% (2009)
	DPI 2	Growth rate of agricultural GDP (EIU, 2012)	3% (2012)	4.35% (2010) (Sub-Saharan Africa)	2.74% (2010)
2. Performance of the rural and agricultural sector	DPI 3	Share of agricultural land use (WB, 2012)	48.1% (2009)		
	DPI 4	Value of agricultural exports/total exports (EIU, 2012)	18.9% (2010)	8.8% (2009)	7.6% (2009)
	DPI 5	Value of agricultural imports/exports (FAOSTAT)	24.4% (2010)	13.1% (2009)	7.7% (2009)
	DPI 6	Share of small farms - less than 5ha (ASDS, 2010-2020).	75% of total agricultural output		
3. Market inputs and constraints to development of industries	DPI 7	Fertilizer use, kg/ha of arable land (WB, 2012)	32.4 (2009)	10.5 (2009) (Sub-Saharan Africa)	122.1 (2009)
	DPI 8	Share of farms with a tractor (a tractor per 100 sq.km of arable land-WB, 2010)	25.2% (2009)		
	DPI 9	Average of Doing Business Index on the extent of credit information and legal rights index (IFC, 2013)	4 out of 6 credit index 10 out of 10 legal rights (2012)	2 for credit 6 for Legal rights (Sub-Saharan Africa)	5 for credit 7 for legal rights (OECD)
	DPI 10	Share of paved roads/total road network (WB, 2012)	14.3% (2009)	18.3% (2004) (Sub-Saharan Africa)	45.0% (2004)

4. Environment and agriculture	DPI 11	Share of grassland/total area (FAOSTAT)	37.4% (2009)	30.6% (2009)	25.8% (2009)
	DPI 12	Deforestation rates (FAO, 2010)	0.31% (2005-2010)	0.5% (2005-2010)	0.14% (2005-2010)
5. Population	DPI 13	Average growth rate of the population (FAOSTAT)	2.6% (2010)	2.5% (2006) (Sub-Saharan Africa) (WB, 2012)	1.15% (2006) (WB, 2012)
	DPI 14	Mortality rates and birth rates (WHO, 2011)	Mortality rate 9/1,000 (2009) birth rate 38/1,000 (2010)	Mortality rate 12.5/1,000 Birth rate 37.4/1,000 (2010)	Mortality rate 8.2/1,000 Birth rate 19.6/1,000 (2010)
	DPI 15	Fertility rate (WB, 2012)	4.7 births/woman (2011)	4.9 births / woman (2010)	2.5 births / woman (2010)
6. Poverty, inequality and employment	DPI 16	Share of population living below the poverty line - less than $ 1.25 PPP per day (UNDP, 2013)	45.9% (2005)	NA	NA
	DPI 17	GDP per capita in PPP (UNDP, 2013)	US$ 1,428 (2009)	US$ 1,966 (2011) (Sub-Saharan Africa)	US$ 10,082 (2011)
	DPI 18	Gini coefficient (UNDP, 2013)	47.7% (2005)		
	DPI 19	Unemployment rate (EIU, 2012)	12.7 (2006)		
7. Urbanization and migration dynamics	DPI 20	Share of rural population to the total population (WB, 2012)	76% (2009)	62.6% (2010) (Sub-Saharan Africa)	49.3% (2010)
	DPI 21	Growth of urban population (WB, 2012)	4% (2010)	3.9% (2010) (Sub-Saharan Africa)	2.0% (2010)
	DPI 22	Net Migration Rate (WBI)	-0.23/1000 (2012)	-0.7 (2005-2010)	NA

8. Food security and socio-sanitary conditions	DPI 23	Human Development Index (UNDP, 2013)	0.509 (2011)	0.463 (2011) (Sub-Saharan Africa)	0.682 (2011)
	DPI 24	Rates of child mortality (UNDP, 2013)	84/1000 births (2009)	129 (2009)	58 (2009)
	DPI 25	Rate of assisted births by Skilled Staff (WB, 2012)	44% (2009)	47.7% (2005-2009) (Sub-Saharan Africa)	76.4% (2005-2009)
	DPI 26	Prevalence of undernourishment	33% (2008)	23% (2006-2008)	13% (2006-2008)
9.Education and gender	DPI 27	Gross enrolment rate in primary school (WB, 2012)	113% (2009)	99.9% (2009) (Sub-Saharan Africa)	107.1% (2009)
	DPI 28	Adult literacy rate (WB, 2012)	87% (2006)	61.6% (2005–2010)	80.9% (2005–2010)
	DPI 29	Index of gender inequality (UNDP, 2013)	0.654 (2005)	0.610 (2011)	0.492 (2011)
	DPI 30	Economic activity rate of women (UNDP, 2013)	Woman: 74.7% (2010)	Woman: 62.9% Man: 81.2% (2009)	Woman: 51.5% Man: 78.0% (2009)

2. Geographical context

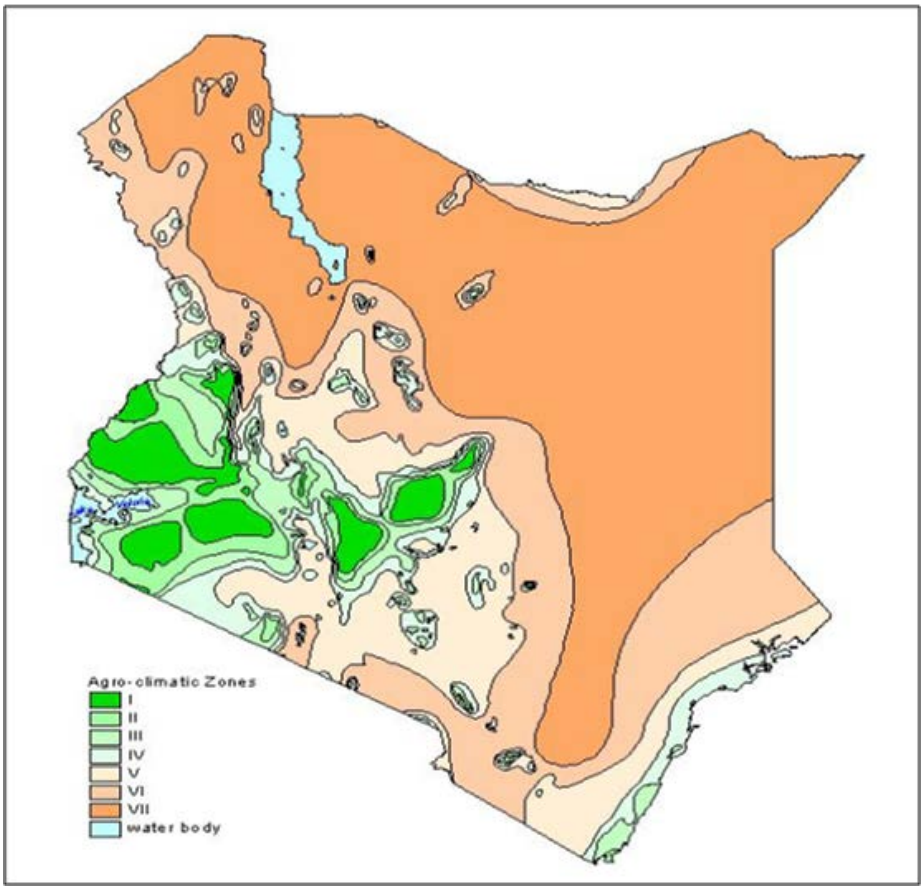
Kenya, the regional hub of trade and finance in Eastern Africa, is bordered by Ethiopia to the north, Somalia to the east, Tanzania to the south, Uganda to the west, and Sudan to the northwest, with the Indian Ocean along the southeast coast. Kenya lies approximately between latitudes 5º north and 5º south and between longitudes 34º and 42º east on the east coast of Africa. The equator bisects the country in almost equal parts. The altitude varies from sea level to about 5,000 m above sea level in the central highlands. It has a total area of 582,650 km^2, of which 13,400 km^2 is covered by water. About 17 percent of the total area is land with high to medium agricultural potential and supports about 80 percent of the country's population. The remaining 20 percent of the population live in the other 84 percent of the total area that is arid and semiarid land (ASAL).

The country's climate is influenced by nearness to the equator, topography, the Indian Ocean, and the Inter-Tropical Convergence Zone (ITCZ). The influence of the ITCZ is modified by the altitudinal differences, giving rise to varied climatic regimes. Annual rainfall in Kenya follows a strong bimodal seasonal pattern. Generally, the long rains occur in March – May, while the short rains occur in October – December.

Kenya is endowed with a variety of habitats and ecosystems, which include wildlife, forests, lakes and rivers, wetlands, farmlands, natural vegetation and marine life. Tourism mainly depends on wildlife, beaches and scenic features. The tourism sector is a major employer in Kenya and is second to tea in foreign exchange earnings.

Kenya has seven agro-ecological zones (Figure 4 and Table 2). Agro-ecological zone I (Alpine) is the high altitude mountainous zone that is least habitable and not available for agriculture. Agro-ecological zones II to IV are the well-watered humid and subhumid zones that support arable agriculture and have a high population density. Zones V to VII comprise the fragile ASALs of Kenya where rainfall is generally poor, evapotranspiration is high and soils are shallow and poorly endowed with organic matter. These areas support much of Kenya's wildlife; they host Kenya's terrestrial national parks and are the main livestock producing zones (IMAWESA, 2007).

Figure 4: Agro-ecological zones (AEZ) in Kenya



Source: Kenya Soil Survey (KSS)

Table 2: Areas of ASAL agro-ecological zones (AEZ)

Agro-ecological zone	R/EO*(%)	Area (km^2)	% of country
Zone IV, Subhumid	40 - 50	27,000	5
Zone V, Semiarid	25 - 40	87,000	15
Zone VI, Arid	15 - 20	126,000	22
Zone VII, Very Arid	< 15	226,000	46
Total		466,000	88

Source: MOA, 1982.

* Rainfall/evapotranspiration ratios

3. Socio-economic aspects

Population

Kenya is a mix of 42 tribes, the largest being the Kikuyu (21 percent), the Luhya (14 percent), the Luo (12 percent), the Kalenjin (12 percent) and the Kamba (11 percent). Other important groups include the Kisii (6 percent), the Meru (5 percent) and the Mijikenda (5 percent).

In 2012 the total population of Kenya was estimated at 43,013,341 inhabitants. The population is very young: 42.8 percent of the population is under 14 years of age and 54.6 percent aged 15 to 64 years.The median age of the Kenyan population is 18.5, compared to 29.2 years for the world (UNDP, 2013).The population growth of 2.6 percent in 2010 was due to a mortality rate of only 9/1,000 and a birth rate of 38/1,000 (WHO, 2011). The fertility rate was high, 4.9 children per woman in 2009, compared to the average fertility rate for the world, 2.59 in 2009 (OECD, 2012a). This figure is better understood when taking into account the excess mortality due to AIDS that can result in lower life expectancy, and the high infant mortality rate (61.8/1,000).

Poverty, inequality and employment

The main concern in Kenya is the dramatic increase in the number of people living below the poverty line of less than USD 1.25 PPP per day, in spite of the decline from 52.3 percent of the total population in 1997 to 45.9 percent in 2005 (UNDP, 2013), because of the population growth rate of 2.6 percent from 2000 to 2005 and 2.5 percent from 2005 to 2010. Poverty is mainly a rural phenomenon, with 68 percent of the poor living in the rural areas (50 percent of the rural population) and the remaining 32 percent in the cities (34 percent of the urban population) (MOA, 2009).

Inequality in household consumption is high. Many Kenyans have consumption levels just above the poverty line and spend a significant part of their budget on food, so there is a risk that significant numbers of Kenyans would fall below the threshold by cost of living increases without corresponding increases in wages and incomes and rising food prices. The gross national income (GNI) per capita, in purchasing power parity, has risen steadily over the past five years and reached USD 1,720 in 2011 from 1,350 in 2005 (WB, 2012). The Gini coefficient for Kenya was 47.7 percent in 2005 (WB, 2012), an indication of high inequality of income in the country.

The unemployment rate stood at 12.7 percent in 2009, the urban unemployment rate rose from 18.5 to 20.6 percent and the share of youth (15-29 years of age) among the unemployed rose markedly, from 60 to 72 percent of total unemployment in Kenya. In response, the Youth Enterprise Development Fund has distributed Kshs 5.96 billion to 157,538 youth enterprises (2006-2011) to organize trade fairs and start pre-financing youth training. The fund is expected to expand in the coming years to ensure increased employment (OECD, 2012).

According to the Government of Kenya (GOK), in the rural areas employment grew from 8.4 to 9.4 million –about 1.5 percent annually– although this was largely through small-scale subsistence farming and informal work. Female unemployment is significantly higher than male unemployment, in both absolute numbers and relative terms (14 versus 11 percent), and three quarters of unemployed women are less than 29 years old. There is also a large gender gap in wages, especially at lower levels of education (GOK, 2010).

Migration and urbanization

The net international and internal migration (number of emigrants minus number of immigrants) stands at -0.23/1,000 in 2012 (WB, 2012). The majority of migrants in Kenya are male and most of international as well as internal migrants are from 26 to 50 years of age. The largest share of international migrants is to OECD countries, especially to the UK and the United States, with a smaller number in EAC countries. Thirtynine percent of international migrants left the country for education while most of the internal migrants are looking for employment opportunities (WB, 2010a).

Almost one quarter of Kenya's population lives in urban areas, out of which 40 percent reside in slums. The rise in food and non-food prices during 2008, 2009 and 2011 has deepened food insecurity for the lower income quintiles and has pushed borderline quintiles to heightened levels of food insecurity in the urban areas. Many poor urban households have had to curtail non-food expenditures so as to provide some minimum levels of food for survival. The urban migration is unrelenting without any clear evidence that movement from rural areas translates into improved household food security. A significant proportion of male members migrating from rural areas are barely able to meet their own basic needs, underlining the inability to remit income to household members left behind in rural areas. Urgent interventions intended to mitigate food insecurity for urban households are critical because of high concentrations of food-poor populations and adverse consequences of deepening food insecurity (GOK, 2011).

Education and gender

Rising spending on education is helping to reverse the decline in educational standards. Total public expenditure on education rose from 5.3 percent of the GDP in 1999 to 6.7 percent in 2010. This is higher than the average expenditure in SSA of 6.1 for the same year. However, while resources to education have increased, the relative importance of education in the government's total public expenditure has declined from 25.8 percent in 2000 to 17.2 percent in 2010 (UNESCO, 2011).

As a consequence of the rising expenditure, the adult literacy rate in the country increased from 73 percent in 2000 to 87 percent in 2009 (WB, 2012), and the enrolment figures in primary school grew from 6 million children in 2002 to 8,2 million in 2007. The gross enrolment rate reached 113 percent in 2009 (WB, 2012), almost the top rate in Africa. This is also due to the fact that in January 2003 the government made primary school education free.

Although primary education receives by far the largest share in the education expenditure, the Kenyan government has shown a significant interest in investing in secondary and tertiary education as well. The share of education expenditure for the secondary level passed from 17.6 percent in 2000 to 22.8 percent in 2006, while the tertiary education share passed from 10 percent in 1999 to 15.7 percent in 2006 (UNESCO, 2011).

The range of education expenditure in Sub Saharan Africa is 11 to 28 percent of the total government expenditure; overall SSA countries tend to spend a large amount of their budget on education despite their relatively low GDP per capita (UNESCO, 2011). However, boosting secondary and tertiary education comes as another costly challenge. A government-appointed task-force has recommended that secondary-level education be "free and compulsory", but such a policy measure would cost a minimum of Kshs 20bn (USD 280m) per year, about double the current annual allocation for secondary schools and more than double the cost of free primary education (EIU,

2012). Considering that education already consumes one-third of government expenditure (UNESCO, 2011), this would represent a heavy weigh on the Treasury.

Female access to education has been improved by the free primary education policy. For secondary school education, there is a higher number of boys' enrollment: 52 percent in 2009, but the number of girls is rising, standing at 48 percent in the same year (WB, 2012). More generally, Kenya ratified in 1984 the Convention on the Elimination of all forms of Discrimination Against Women (CEDAW), guaranteeing equal status and protection under the law for men and women; also in 2006 the country enacted the Sexual Offences Act, providing women greater protection while outlawing violence against women. There is an increase in the number of women involved in politics, the number of women ministers rising from 2 in 2006–2007 to 7 in 2009–2010, and the number of women members of parliament rising from 18 to 22 over the same period (OECD, 2012). Furthermore, the new Constitution adopted in 2010 states that "not more than two-thirds of the members of any county assembly or county executive committee shall be of the same gender", and that "30 percent recruitment in all public offices should be reserved for women".

Food security and health

Between 2002 and 2007, food insecurity fell by 12 percent. However, poor or failed cropping seasons in 2007 resulted in sustained deterioration of national food security. The number of Kenyans requiring food assistance rose from 650,000 in late 2007 to almost 3.8 million in late 2009 and early 2010 (GOK, 2011).

In July 2011, Kenya faced one of the worst food insecurity conditions in many decades. An estimated 2.4 million persons required food and non-food aid (Kenya Food Security Steering Group, February 2011). Aid Agencies, the UN and the Government of Kenya indicated that more than 3.5 million of 43 million Kenyans faced starvation as the country struggled with what is believed to be its worst drought in 60 years (KIPPRA, 2011).

Urban food insecurity is also increasing. More than half of Kenya's 10 million urban population live in informal settlements lacking basic services; many are unable to meet their food needs without compromising non-food expenditures. The low purchasing power and economic vulnerability that underpin growing urban food insecurity suggest that increased food output alone would not significantly reduce food insecurity. There is a key recognition that weather is one of the main drivers of food insecurity in Kenya: extended periods of drought erode livelihood opportunities and community resilience. In order to increase food security, Kenya will have to translate opportunities in the agricultural sector into greater food and nutrition security for people. There is a general consensus that Kenya has the potential to feed its own population.

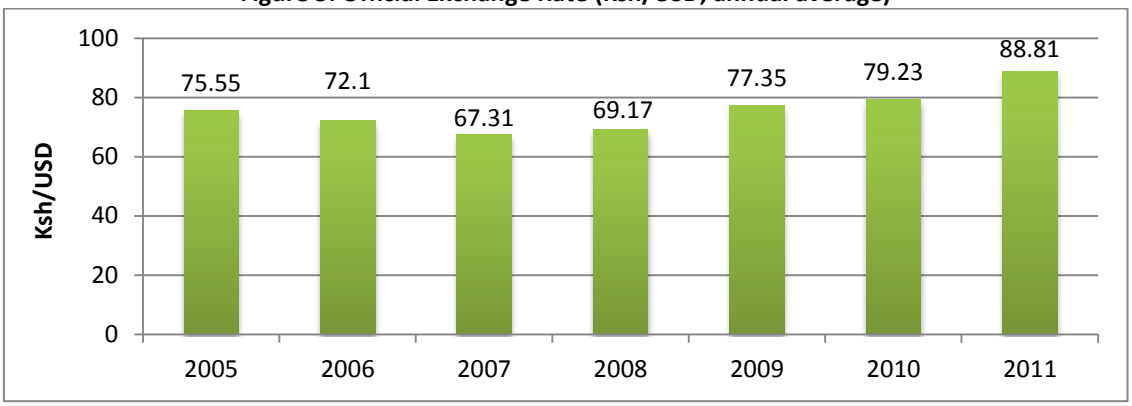
With regard to health, a major challenge in the country is to fight off malaria, which causes 27 percent of all registered deaths. This is followed by pneumonia (18 percent) and AIDS (11 percent) (OECD, 2012). The number of health facilities expanded by 5.3 percent from 4,912 in 2005 to 5,170 in 2006, while the registered medical personnel increased marginally from 65,914 in 2005 to 67,126 in 2006 (GOK, 2008a). The full immunization coverage of children less than one year improved from 63 percent recorded in 2005 to over 70 percent in 2006, following sustained national immunization campaigns. The average expenditure on health care from 2007/08 to 2010/11 in Kenya was only 4.7 percent of the total budget (OECD, 2012). The government has improved referral services by increasing the number of ambulances; however, the country has yet to meet its commitment made

in April 2001 under the Abuja Declaration to allocate 15 percent of the entire annual budget to health care.

Macroeconomic performance

Since 2008, Kenya's economy has been going through a tough period while existing structural weaknesses have been compounded by short-term shocks. The most visible sign of Kenya's economic challenge is the depreciating Shilling (see Figure 5), which reached a a low of about 100 against the US Dollar in October 2011. The economy was hit in 2008 and 2009 by high international food and fuel prices, severe droughts and the conflict in the Horn of Africa (WB, 2010). These problems were compounded by the Euro crisis, widening fiscal and current account deficits, and major inefficiencies in Kenya's agriculture sector. All this has been undermining one of Kenya's main strengths over the last decade: the credibility and predictability of its macroeconomic policies.

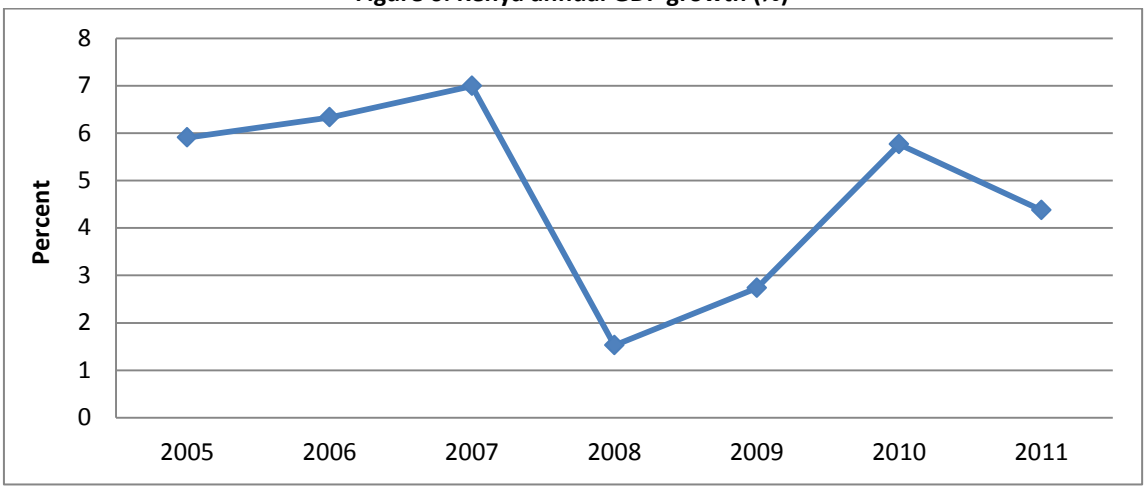
Figure 5: Official Exchange Rate (Ksh/USD, annual average)



Source: IMF statistics, 2012

In 2008 the GDP growth rate fell to 1.5 percent as a result of the food security crisis and weather conditions; in 2009 it was 2.6 percent and in 2010 the growth rate recovered to 5.6 percent (see Figure 6). This growth was driven by public and private sector investments and a healthier economic management. The private sector has attained greater importance in the development process, and currently accounts for two-thirds of GDP. Kenya relies heavily on agriculture for food and nutrition security, economic growth, employment creation, stimulation of growth in off-farm employment, and foreign exchange earnings.

Figure 6: Kenya annual GDP growth (%)

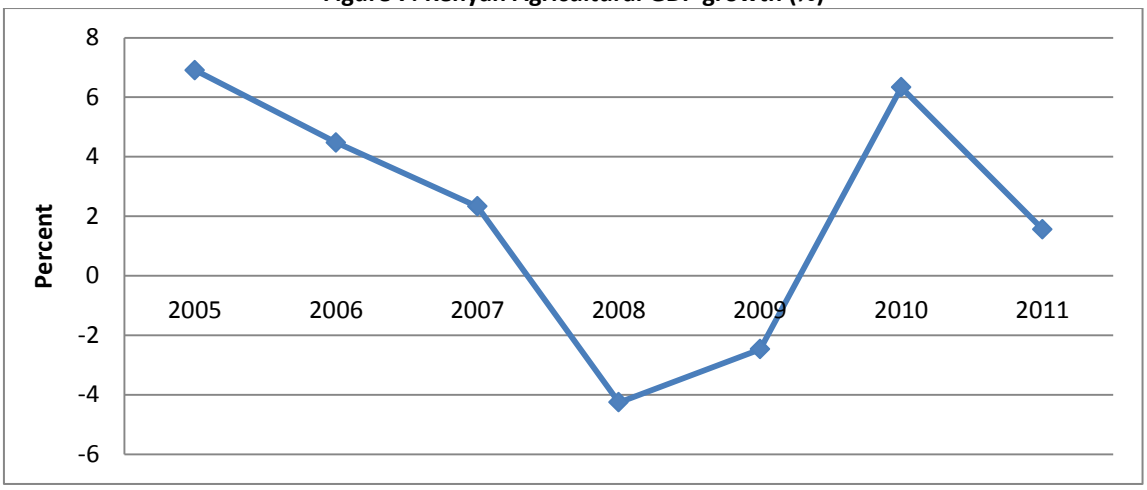


Source: WB, 2012

Performance of agricultural and rural development

The main objective of Kenya's agricultural sector strategy has been to increase agricultural growth, vital for higher rural incomes and the assurance of equitable wealth distribution. The sector registered a positive growth of 6.5 percent in 2010 (see Figure 7), after the negative -4.25 percent of 2008 and -2.4 percent in 2009 (WB, 2012). In 2009 the long rains of March to April were thinly spread and the short rains expected between October and December were generally erratic and uneven; prices of most agricultural commodities rose during the year because of supply constraints.

Figure 7: Kenyan Agricultural GDP growth (%)

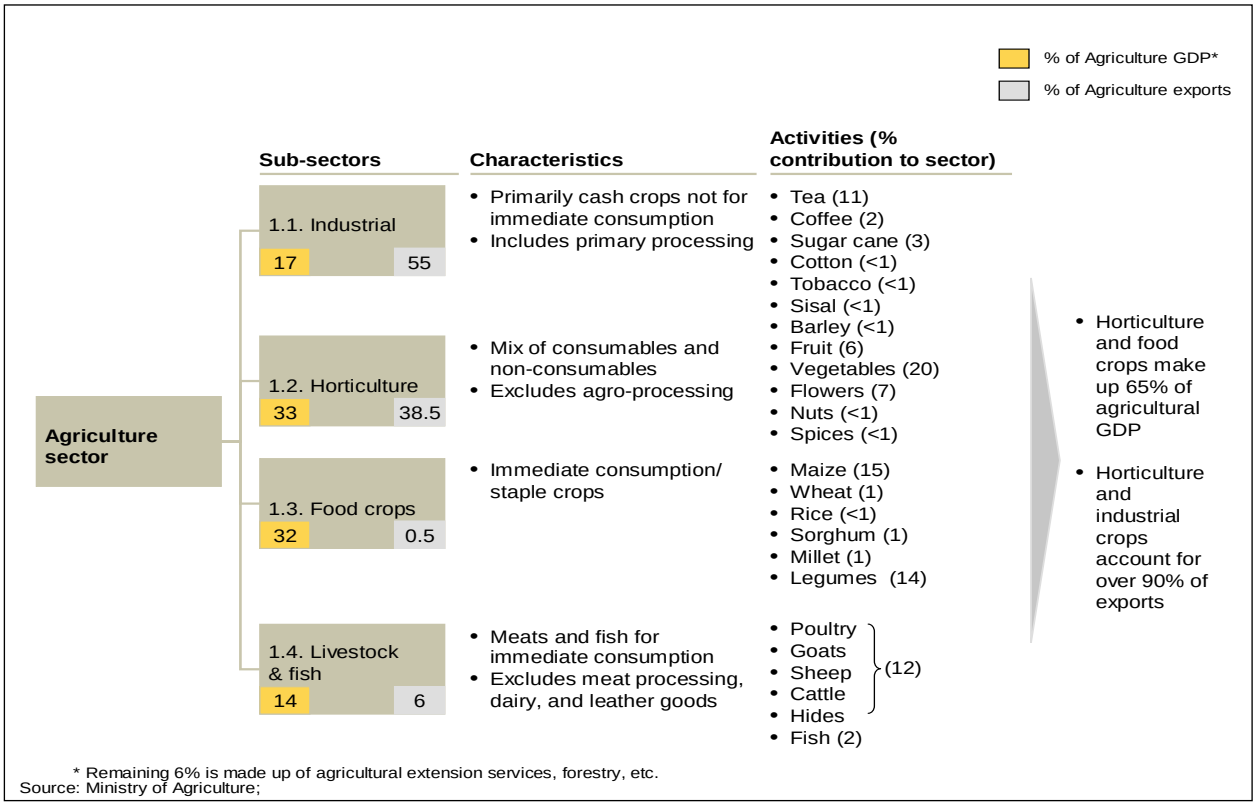


Source: WB, 2012

The sector comprises four major sub-sectors: industrial crops, food crops, horticulture, and livestock and fisheries. Industrial crops contribute 55 percent of agricultural exports and 17 percent of the total agricultural contribution to GDP (GOK, 2008). Similarly, horticulture has recorded significant export-driven growth in the past five years and is now the largest sub-sector in terms of contribution to agricultural GDP. Although the livestock and fisheries sub-sector is currently declining, it has high potential for growth: the development of such potential is one of the objectives of Vision 2030. Food crops make a significant contribution to Kenya's GDP (32 percent of Kenya's agricultural GDP) and are also the most relevant to ensure food security. The relative contributions of these sub-sectors in 2008 are shown in Figure 8.

Due to limited availability of high-potential land, increasing agricultural production will have to come from intensification of production through increased use of improved inputs, diversification – especially from low- to high-value crops–, commercialization of smallholder agriculture, and increased value addition through stronger links with other sectors.

Figure 8: Relative Contributions by Agricultural Sub-Sectors

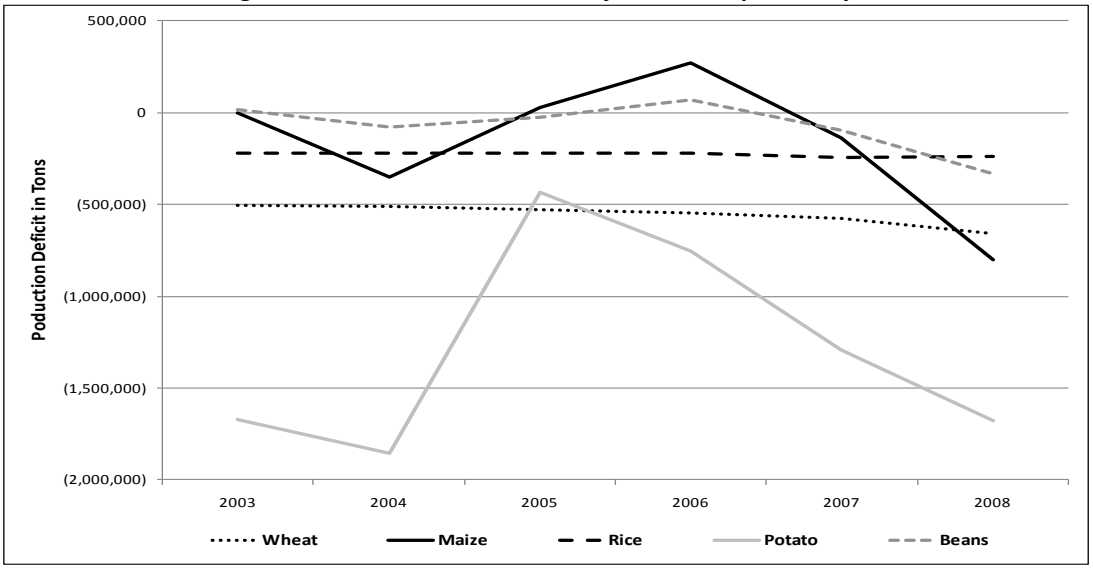


Source: GOK, 2008

The main agricultural products are: fruits, vegetables, flowers, sugarcane, pyrethrum, coffee, tea and livestock. Coffee and sugarcane production in particular have increased.

The national supply of staple foods in 2008 is as follows: maize 2.4 million metric tons (MT) against a national requirement of 3.1 million MT, wheat 360,000 MT against national requirement of 900,000 MT, rice 60,000 MT against national requirement of 280,000 MT (MOA, 2010). The country depends on imports to bridge the gap for these staple foods, especially wheat and rice and, when production falls below demand, for maize (see Figure 9).

Figure 9: Production Deficits of Major Food Crops in Kenya



Source: MOA, 2008a

Agricultural exports in Kenya rely heavily on few key products such as horticulture products, coffee and tea. For the FY 2010/11 the country's main exports were tea, 24.4 percent by value, horticulture 16.1 percent, manufactured goods 14.7 percent, raw materials 6.9 percent, coffee 4.7 percent and oil products 2.6 percent (OECD, 2012). A large percentage of agriculture-related exports consists of semi-processed, low-value products. The limited ability to add value to agricultural products and high production costs make it very difficult for Kenya to compete in the global market.

In FY 2010/11, 47 percent of all exports went to African countries and 53 percent to the rest of the world. The main destinations were Uganda (14.6%), United Kingdom (9.2%), Tanzania (8.0%), Netherlands (6.5%), USA (5.6%), Sudan (4.6%), Pakistan (4.2%), Egypt (4.1%) and United Arab Emirates (4.1%). Exports to the East African Community (EAC) accounted for 26.4 percent and exports to the Common Market for Eastern and Southern Africa (COMESA) region for 34.6 percent of total exports in FY 2010/11 (OECD, 2012).

In FY 2010/11 the share of imports that Kenya sourced from African countries accounted for 11.6 percent while 88.4 percent came from the rest of the world. Kenya is generally increasing its imports from Asia. In FY 2010/11, the main sources were the United Arab Emirates (13.0%), China (12.1%), India (11.6%), South Africa (5.8%), Japan (5.1%), United Kingdom (4.6%) and Singapore (4.0%). Imports from the EAC accounted for 2.2 percent and from the COMESA region for 3.9 percent of total imports in the year to June 2011 (OECD, 2012).

Input market and major constraints to production

Productivity levels for many crops in Kenya are below their potential. Major constraints to production include high cost of inputs (such as fertilizers and seeds), dependence on rainfed agriculture, inadequate market access, poor infrastructure, limited application of agricultural technology, and exploitation by middlemen creating distortions in the market.

Fertilizer use in Kenya is quite high compared to neighboring countries, but it is not uniform across regions. In 2009 fertilizer use stood at 32.4 kg/ha compared to the average of 10.4 kg/ha in the SSA region (WB, 2012). One of the reasons for the high use of fertilizer in Kenya is the government's decision of liberalizing the input market in the 1990s, which was followed by investment in wholesale and retail of fertilizer. In the following years the percentage of households using fertilizer for maize rose from 39 to 81 percent in 2007.

However, this positive trend was reversed by post-election violence in 2008 and an increase in the world price of fertilizers. In 2008 the National Cereal and Produce Board (NCPB) imported fertilizers but the input was delivered very late to farmers, which contributed to a low level of maize production. In 2009 the government imported a substantial amount again, and distributed it through NCPB and selected private retailers at price with 40 percent subsidy. In early 2010 the government announced the intention to import 1.5 million bags (750,000 MT) of fertilizer; around 30,000 MT were distributed through NGOs that year (Ariga & Jayne, 2011).

Poor infrastructure also remains among the main constraints for the agricultural sector, affecting the production and causing inadequate access to markets for producers and consumers. Poor roads – only 14.3 percent paved (WB, 2012) – markets and transport systems result in high transaction costs for farmers, reducing access to inputs and affecting exports. High transport costs are reflected in high prices and contribute to the poor market integration, and penalize producers.

The food imports and aid reduce domestic food prices, which acts as a disincentive to farmers, hence reduces food production. It also distorts the labour market, particularly in a country such as Kenya, that is dependent on agriculture for employment creation.

Environment and agriculture

As mentioned earlier, Kenya is over-reliant on rainfed agriculture because of limited high-potential agricultural land[2] and a large proportion of arid and semiarid land, not suitable for rainfed agriculture. Increasing agricultural production therefore will have to come from intensification of land use in the high- and medium-potential areas or increasing the extent of land under water management in the ASALs. The high reliance on rainfed agriculture makes the production vulnerable to weather variability leading to income fluctuations, especially in rural areas. The irrigation potential is only partly exploited, with less than 7 percent of the cropped land under irrigation (FAO, 2005). Poor rains always lead to poor agricultural performance and the subsequent famines have been affecting large sections of the population.

[2] About 17 percent of the country's land is high and medium potential agricultural land, where the most intensive crop and dairy production take place.

Kenya has also been affected by climate change in recent years. Changing climate conditions are already responsible for the decline of water levels in rivers, coral reef bleaching, loss of animal species, and melting of glaciers on Mount Kenya. The effects of climate change are likely to be more severe in the future since the Kenyan economy is dependent on climate-sensitive sectors such as agriculture and tourism.

There were serious droughts at least 12 times in the past 50 years. For example, the 1999/2000 La Niña droughts resulted in 4.7 million Kenyans facing starvation. Major rivers including the Tana, Athi, Sondu Miriu, Ewaso Ngiro and Mara had severely reduced discharges during droughts and many seasonal rivers completely dried up.

Deforestation is important in Kenya (see Table 3): 3.1 percent per year from 2005 to 2010, below the 6.7 percent rate in Eastern and Southern Africa for the same period.

Table 3: Deforestation in Kenya, percent per year

Period	1990-2000	2000-2005	2005-2010
Deforestation rate	3.5	3.4	3.1

Source: FAO, 2010

Kenya developed its first National Climate Change Response Strategy (NCCRS) in April 2010. Through this strategy Kenya is to enhance the participation in global climate change discussions. Kenya also made specific provisions for environmental protection in the new Constitution adopted in August 2010. The government continues to pursue environmental protection with emphasis currently fixed on the Mau Forest and cleaning of the Nairobi River Basin. The rehabilitation of the Mau Forest Complex is being undertaken in five phases, in line with the recommendation of the Mau Task Force report. The first two phases have been completed. During phase one, 4,530 ha of unoccupied forest land were repossessed. As part of phase two, an additional 19,000 ha were repossessed from illegal squatters by December 2009. Over 1,400 ha of forest have been replanted and plans are underway to rehabilitate an additional 5,000 ha during the rainy season of April-May 2012. It is expected that once the Mau rehabilitation is complete, protection efforts will focus on the remaining four principal "water towers".

4. Agricultural policy framework

The agricultural sector in Kenya is large and complex, with a multitude of public, parastatal, non-governmental and private actors. Because of its importance for the country's economic development, the policy and institutional framework governing the agricultural sector plays a vital role for the development of the whole economy.

Gitau et al. (2008), in concordance with other similar studies (Ronge et al., 2005; Alila & Atieno, 2006), identify three general periods in the recent agricultural policy history of Kenya: post-independence, liberalization, and stakeholder participatory approach periods.

During the **post-independence period** (1963-1980s), policy objectives were influenced by self-determination and economic growth (ROK, 1964 and 1965). The government impulse to agricultural production was mainly through the increase in productive land by promoting access to land for many smallholders (Ronge et al., 2005). This period was characterized by a conservative fiscal and monetary policy, supported by a fixed exchange rate system.

The agricultural policy was implemented by direct government intervention. The government set farm-gate and consumer prices for all basic agricultural commodities such as maize, maize meal, sugarcane, sugar, wheat grains, wheat flour, bread, milk and milk products. Government control over the sector was intensified by the creation of several production and marketing parastatals and boards, and by the promotion of farmer cooperatives. High public investment in productive infrastructure, such as large irrigation schemes and rural roads, was also common during this period. The main policy objective during this period was to achieve food self-sufficiency in the country. However, despite the growth achieved in the sector, the period was characterized by poor governance in parastatals, indebtedness and poor services to farmers, as well as monopolized market structures that led to price inefficiencies (Gitau et al., 2008).

The **liberalization period** starting in the mid 1980s was characterized by the implementation of the Structural Adjustment Programmes (SAPs) and "free market" policies, under the external influence of the International Monetary Fund and the World Bank (Ronge et al., 2005; Gitau et al., 2008). The actions enforced included the privatization and deregulation of the sector, reduction in trade barriers, exchange rate adjustments, and an increase in decentralization. This period resulted in the collapse of some government institutions created during the post-independence era, as they did not prove efficient in the liberalized market. In addition, the private sector did not have the capacity, nor the incentives, to take on the role that the government abandoned (Gitau et al., 2008). Liberalization suddenly exposed the un-capitalized farmers to market forces without support institutions, leading to poor performance of the sector. The general policy agenda during the mid 1980s showed a clear bias against the agriculture sector in favour of the industrial and financial sectors. In 1996 and 1997 the government prepared and implemented the paper on *Industrial Transformation to the Year 2020* and the eighth National Development Plan (1997-2001), both aiming at transforming the country "from an economy with agriculture as its backbone to a Newly Industrialized Country". The other sectors were supposed to play a complementary role towards this objective (Gitau et al., 2008). By 2000, prices of almost all commodities were liberalized, with some specific government interventions, mainly through international trade protection.

While secondary liberalization measures continued during the early 2000s, since then Kenya has been very dynamic in reforming and consolidating policies for a post-liberalization period. After the general economic crisis of the late 1990s–early 2000s, the country started to develop a national strategy for economic recovery (GOK, 2003), with a new emphasis on the use of a **Stakeholder Participatory Approach**. Although most of the support institutions had existed since independence, almost all of them, together with the respective commodity-specific and sector-wide policies, were to be reformed and adapted for stakeholder administration. Largely consultative processes resulted in a number of new or reformed policies, which conformed to the country´s recent strategies.

In 2001, the government published the Poverty Reduction Strategy Paper (PRSP), prepared with inputs from the public and private sectors and civil society under the supervision of the international financial institutions. The PRSP focused specifically on the consolidation of institutional, legislative and regulatory reforms (Gitau et al., 2008). Even though the implementation of the PRSP was never completed due to the change of government in 2002, it set a precedent about national policy development procedures (Alila et al., 2006).

In 2003, the new government embarked on a national economic recovery framework, the Economic Recovery Strategy for Wealth and Employment Creation (ERS) 2003-2007 (MPND, 2003). The new policy actions proposed for economic recovery were: maintaining macroeconomic stability, strengthening of institutions of governance, rehabilitation and expansion of physical infrastructure, and investment in human capital. Agriculture was identified as one of the three “movers” of the economy, together with trade and industry, and tourism. As the specific framework for the implementation of the ERS in the agriculture sector, the government launched the Strategy for Revitalizing Agriculture (SRA), 2004-2014 (MOA & MOLD, 2004). This is the policy framework that guided Kenya´s agricultural development during the time frame of this study (2005-2010). It also coincides with the time that Kenya joined the African Peer Review Mechanism in 2004 (APRM), one year after endorsing the Comprehensive Africa Agriculture Development Program (CAADP).

The SRA is different from Kenya´s past agricultural national strategies in two key ways: the primary development goal is no longer to achieve food self-sufficiency, as it was in the 1990s when the objective was to feed the rapidly growing population. The current overall objective is the creation of wealth and employment through a commercial, market-oriented and profitable agriculture, which in addition will ensure food security. The second difference is the government’s recognition of the importance of private and public sector partnership in the country and sectoral development. Therefore, only two major roles for the government are being considered in the SRA: providing a limited number of goods and services, and a reduced range of regulatory functions that cannot be enforced by private self-regulation (Alila et al., 2006). Apart from this, the strategy proposes the modernization and mechanization of farm structures, improvement of agricultural infrastructure, increase in agricultural services and improvement of access to domestic and foreign markets.

The implementation of the ERS and the SRA contributed to increasing the growth in the agricultural sector and the national GDP, as well as towards the achievement of the Millennium Development Goals for 2015. The sector growth jumped from -3 to 6.3 percent and GDP growth from 0.6 to 7 percent between 2003 and 2007 (MLFD, 2010). However, the 2007-2008 food and financial crisis had a significant negative impact on some of the advances made towards these goals.

In June 2008 Kenya adopted the Kenya Vision 2030 (GOK, 2008) as a new blueprint for the country's development, and to give continuity to the policy achievements of the ERS. The Vision 2030 is the road map for the Kenya's economic and social development in the next two decades and aims at consolidating the successes of the ERS. The Vision 2030 initiative aims at transforming Kenya into "*a newly industrializing, middle-income country providing a high quality of life to all its citizens in a clean and secure environment*". In the Vision, agriculture is identified as a key sector in achieving the envisaged annual economic growth rate. It endorses the view that this will be achieved through transformation of smallholder agriculture from subsistence to an innovative, commercially-oriented and modern agricultural sector.

Vision 2030 was followed by the revision of the Strategy for Revitalizing Agriculture, 2004-2014 (MOA & MOLD, 2004). This revision led to the development of the Agriculture Sector Development Strategy (ASDS) 2010-2020 (GOK, 2010), which foresees a food-secure and prosperous nation by 2020 and aims to consolidate the paradigm shift from agriculture as subsistence to agriculture as business. Its launch provided the basis for the government to formulate the ASDS and Medium Term Implementation Plan (MTIP) jointly with the CAADP compact.[3]

The ASDS has two additional thematic areas (six in total), namely, "the Legal, Regulatory and Institutional Reforms thematic area [that] endeavours to create an enabling environment for a competitive agricultural sector", and "an Agricultural Sector Reform Bill" that will consolidate and harmonize existing legislation in the sector (see Table 4).

Table 4: ASDS thematic areas and CAADP pillars

CAADP Pillars	Corresponding ASDS Thematic Areas
Pillar 1 Land & water management: extending the area under sustainable land management and water control systems	Sustainable land and natural resource management
Pillar 2 Market access: improving rural infrastructure and trade-related capacities for market access	Agribusiness, access to markets and value addition
Pillar 3 Food supply and hunger: increasing food supply and reducing hunger	Food and nutrition security
Pillar 4 Agricultural research, technology dissemination and adoption	Research and extension
	Inputs and financial services
	Legal, regulatory and institutional reforms

Source: ASDS Medium-Term Investment Plan, 2010–2015 (GOK 2010a)

[3] The ASDS and MTIP are done in a consultative manner and are aligned with CAADP principles.

In 2010, a new Constitution (Constitution Kenya 2010) was published by the Attorney General, with the signature of the President. It replaced the 1969 Constitution (which had replaced the 1963 Independence Constitution). The implementation of the new Constitution should have major consequences for policies and programmes. It requires the number of ministries to be reduced from the current 44 to a number between 14 and 22. This will entail substantial consolidation and reorganization of ministerial functions. Also, 131 pieces of legislation that are causing contradictions or are obsolete will need to be revised and consolidated into four laws. These draft laws, "Agriculture, Livestock and Food Authority bill" (ALFA), "Livestock and Fisheries bill", "Crops bill" and "Agricultural Research bill", are not yet endorsed. In addition to this massive change, the new Constitution also requires the devolution of Government powers to the 47 newly created Counties, which will have elected Governors and Assemblies as key executive and legislative bodies.

This aspect will enable the government to have considerable authority over national policy issues, capacity building, finance and technical assistance, while county governments will be responsible for priority setting, financial management, agricultural production and related extension services in their respective counties. This should allow a better alignment of government actions and projects to the objectives and priorities.

Recent policy decisions

In the face of the series of the food crisis and natural disasters in recent years, Government policies and interventions have focused on short-term emergency measures, such as safety net policies (food distribution, school feeding, food for work, etc.), short-term export bans or import tariff reductions, as well as input subsidies –also supported with cash transfer programmes by international development partners. It appears likely that the Government will continue to adapt its policies to deal with pressures confronting the country.

Many policy decisions lead to measures **supporting the consumers**. Some social protection measures already existed before the crisis, but these were scaled up, intensified and covered a broader range of beneficiaries during the emergency situation of 2008, 2009 and famine of 2011. Food Assistance is implemented through the School Feeding Program. Although the coverage and range of social policies are diverse from one county or district to another, these interventions were implemented over almost the whole country and targeted the most vulnerable part of the population. Another policy measure to mitigate the effects of food shortage was the price control bill to fix maximum retail and wholesale prices for essential goods.[4] Although the bill was passed in 2009 and repeatedly reinforced in 2010 and 2011, it has never been fully implemented. Following forecasts that the country would receive less rainfall, in 2010 Kenya tried to double the Grain Reserve, mainly of maize and wheat, from 360,000 to 720,000 MT as a buffer against any shortages the next year.

Agricultural price policies **supporting the producers** in recent years are characterized by a strong Government presence and control of produce and input prices. A prominent example of the policies is price stabilization and producer support prices for maize, through four main actions:

[4] For maize, maize flour, cooking fat or oil, sugar, paraffin, diesel and petrol.

- Increasing imports by the National Cereals and Produce Board (NCPB) for the strategic grain reserve (in 2008 the Board was authorized to import 270,000 MT of maize);
- supply of maize to millers at fixed prices (in 2008, the price was fixed at Kshs 21 per kg, equivalent to a 50 percent subsidy);
- fixing the purchasing price of maize, which in 2011 reached Ksh 33/kg, equivalent to double the market price; and
- input subsidies on a continuous basis, mainly for fertilizer, in the form of direct payment to farmers or free distribution.

The government also distributed seeds and fertilizers through cash vouchers. However, the implementation of these measures proved to be inefficient in many respects, notably in reaching and benefiting the targeted producers and particularly the poorest.

After social protection, government policy attention shifted to **trade measures**. Policies that affect imported staple food products are very sensitive due to the impact on food security of the country and the dilemma between supporting consumers or producers.The objective to increase national production has also been part of the government strategy, which is difficult in the actual policy context and even more in an international food crisis.

The positive shift of East African countries towards more regional cooperation that led to the East Africa Common Market Protocol for free movement of goods has been seriously affected by the recent food crises. During the food shortage, volatile prices, drought and natural disasters there were several attempts to protect national food security through export bans and reduction of import tariffs, mainly on maize, rice and sugar. However, these usually trigger similar measures by neighbouring countries, leading to a decline of trade flows.

Concerning **investment policies**, Kenya's budget allocation to the agriculture sector ministries has been rising in response to the commitment made at the 2003 Maputo Declaration of allocating 10 percent of the national budget to agriculture. The total allocation in nominal terms rose 122 percent from 2006 to 2011. However, relative to total government expenditure, the average share of agricultural expenditure was just 6.3 percent over that period. This share could increase in the coming years to meet the aspirations in the Kenya Vision 2030.

Commodity-specific policies

Maize

The major short- and medium-term policy objective for maize is maintaining availability at stable, affordable prices for Kenyan consumers. The National Cereals and Produce Board (NCPB) has been the main implementing agency. The Government has occasionally responded to low prices with higher tariffs, but market interventions have evidently focused on maintaining supplies, especially in the major deficit market of Nairobi. The longer-term policy focuses on increasing production through research, extension and other similar means.

The import tariff was waived in response to the 2008 international food crisis and millers and grain dealers were allowed to import maize directly. Kenya has also been increasing its strategic grains stockpile to buffer against shortages. In 2010 the government reinstated the 50 percent import tariff for countries other than Uganda and Tanzania and the activity of the NCPB declined. There is a

renewed interest in promoting domestic maize production via subsidized fertilizers provided through the NCPB, a new system of guarantees that allows farmers to store their maize in NCPB depots and sell it later in the year when prices are higher, and support for irrigation as part of an economic stimulus package.

Wheat

Marketing of wheat is liberalized in Kenya; the private sector is the importer and domestic marketing is no longer proscribed. As it does for maize, the NCPB purchases wheat for the strategic reserve and monitors its trade.

Traditionally, Kenya has protected domestic wheat producers with a 25 to 35 percent tariff. Under the Common Market for Eastern and Southern Africa (COMESA), Kenya's tariffs were harmonized with those of other members at 35 percent for wheat and 60 percent for wheat flour. Despite efforts to harmonize these rates in the East African Community (EAC) in its agreement on a common external tariff in 2004, members of COMESA and the EAC have agreed to a process to vary these rates as circumstances require. Thus, Kenya reduced its wheat tariff from 35 to 25 percent in response to the wheat price spike of 2007-2008. In 2010 Tanzania and Uganda lowered their tariffs on wheat to 10% and zero, respectively, in 2010. Kenya's tariff was also reduced further to 10 percent in 2010. This was done by a duty remission scheme in which importers initially paid the 35 percent tariff and then applied for remission. This measure was implemented despite the unpopularity of the reduction of the tariff among large-scale farmers in some parts of the country. In 2011, a continuation of the "tariff-abatement" policy was announced. Under the new scheme, registered millers are allowed to import wheat duty-free for one year beginning July 4, 2011.

Rice

Kenya has followed the same policy goals for rice as for maize and wheat. Kenya's long-term goal is self-sufficiency for all three staples. Policy decisions indicate that price stability is another important long-term objective, although the measures to achieve it need to vary with changes and shocks in production and trade. Trade policy has been a major means for achieving both objectives. Pakistan is Kenya's main rice supplier, but also Kenya's main tea buyer, so a preferential rate of 35 percent is set for rice imports from Pakistan. Imports from other countries are charged with a 70 percent import duty. Rice is routinely imported, so the high tariff rates are effective in keeping prices high for the domestic value chain.

The self-sufficiency goal for rice has also been pursued through various projects to maintain and expand irrigated production on a cost recovery basis. In 2008, the MOA released its long-term strategy to become self-sufficient in rice by 2030 (MOA 2008). The emphasis by the MOA on rice is based on its rising consumption: 12 percent per year, while wheat and maize consumption have only been growing at 4 percent and 1 percent respectively. The strategy is quite clear on the importance of extension, research and a strong seed dissemination system to achieve its objectives. This type of strategy requires donor support, and the World Bank, JICA and the Coalition for African Rice Development (CARD) have shown interest in rice production.

Sugar

The sugar industry in Kenya is closely linked to the government and is strongly influenced by domestic and international policies. After market liberalization in 1992, the government issued a set of temporary protective measures to ease the sugar industry's transition to full market liberalization.

Currently, raw sugar imports from non-COMESA countries are required to pay a 100 percent ad-valorem Common External Tariff (CET) and there are a number of non-tariff requirements for import (USDA, 2012).

For COMESA countries, an over-quota regime is applied. This system was set as a transitory measure towards free liberalization in 2008, but has been extended twice until 2014. The extension of these protective measures, granted in 2008/2009, was subject to certain conditions imposed by the COMESA Council and adopted by the GOK (KSI, 2009). These conditions, which have largely shaped the sector's development policy in recent years, include:

- Rising duty-free import quota in tandem with a declining import tariff
- Adoption of a privatization plan
- Implementation of a sugarcane payment system based on sucrose content instead of weight
- The adoption of a product diversification policy (e.g. co-generation and biofuel)
- Increasing funding for research and extension
- Increasing funding for road infrastructure.

In addition, the GOK is required to report to the COMESA Council twice a year on industry performance and efforts made to improve the sector's competitiveness (KSI, 2009).

Sugar is not classified as a basic food, so it is subject to a general 16 percent VAT (including imports). Additionally, the GOK established the Sugar Development Fund (SDF) in 1992, which is financed by a Sugar Development Levy (SDL) imposed on both domestic and imported sugar (GOK, 2007). The levy was initially set at 7 percent, but was reduced to 4 percent in November 2007 (USDA, 2008). The 4 percent SDL is distributed as follows (KSB, 2009):

- 0.71% - Factory Development Rehabilitation
- 0.94% - Research and Extension
- 0.66% - Sugarcane Development and Maintenance
- 0.29% - Industry Infrastructure
- 1.40% - Kenya Sugar Board Administration

The SDL is not a direct subsidy to producers but a loan that has to be refunded.

Cotton

Developing and expanding Kenya's cotton sector is a key agricultural strategy outlined in the Vision 2030, in order to promote development in the ASALs (CODA, 2008).

Rather than direct subsidy to cotton growing or price support for production, ginning or marketing, the government is providing targeted support to the smallholder farmers through provision of seeds and through extension services and research. It is also supporting rehabilitation of irrigation schemes to reinstate irrigated cotton production in the next 5 to 10 years. The government embarked on development of infrastructure that should support reliable testing of cotton through an instrument-based classification system to enable branding of Kenyan cotton (CODA, 2011).

No specific tariffs were applied to cotton lint or cottonseed during the period analyzed (WITS, 2012), and no export subsidies were identified. However, three incentive schemes are available to Kenyan companies to encourage export-oriented activities: the Export Processing Zones (EPZ) Scheme, the

Manufacturing under Bond Scheme (MUB), and the Duty Remission Scheme. Firms operating under these schemes are exempted from import duties and VAT for machinery, equipment and raw material (national or imported) (MOT, 2009). Some of the larger spinners and fabric manufacturers operate under these schemes (EPZA, 2005).

Yarn and fabrics (high up the value chain)) are protected by a 10 and 25 percent tariff for non-EAC countries. For yarn and fabrics from Uganda and Tanzania declining tariffs were applied during the period (10 to 0 percent in 2010).

A major policy change affecting the cotton sector in recent years was the promulgation of the 2006 Cotton (Amendment) Act, which created the Cotton Development Authority (CODA), with the mandate of promoting and regulating the cotton industry (ROK, 2006). CODA was established to replace the Cotton Board of Kenya, moving regulation authority from the government to industry stakeholders, including cotton growers, ginners and manufacturers (CGD, 2005).

Major challenges and constraints for CODA include a lack of sustainable financing mechanisms, inadequate management, low institutional capacity, debts from the past and a highly indebted industry (CODA, 2008). The government is supporting CODA through provisional fund transfers for staff placement, offices and operational costs.

The government and cotton stakeholders are engaged in several activities (CODA, 2011): establishment of a National Apex forum that comprises both public and private sector stakeholders; promoting access to input supply and credit through agreements with banking institutions; and creating a collaborative and appropiate seed production and management system. The Kenya Seed Company, the National Irrigation Board (NIB), the Kenya Agricultural Research Institute (KARI) and farmers are involved in the system. Its objective is to produce enough certified seed by 2015.

Tea

Although tea is now the most important export commodity of the country, during the studied period there was no specific government policy to support tea production. Support, extension, marketing and regulation are mainly in the hands of the private-sector stakeholders (small-scale producers, big plantations, traders, packers etc.). The government participates mainly through the Tea Board of Kenya (TBK), which has been created to increase national consumption and exploring international emerging markets for Kenyan tea.

The Kenya Tea Development Authority (KTDA) was established in 1963 by the government with the objective of providing services to smallholder tea farmers such as the provision of inputs, extension services, tea processing and marketing.

In the 1990s under the market liberalization process, a first attempt was made to liberalize the KTDA. However, it was overhauled because it did not fully benefit the interested smallholders, by then a powerful part of the tea sector. With strong support of the GOK, in 2000 the parastatal was transformed into the Kenya Tea Development Agency Ltd, a private company not answerable to the government, with shares exclusively purchased by the smallholders, and governed and managed by officials elected among all the Agency's stakeholders. Today the KTDA is owned by 150,000 small-scale tea farmer shareholders, and controls practically all the Kenya smallholders' tea production. It runs 63 tea-processing factories. The KTDA also imports production inputs at preferential prices and

provides extension services to all the smallholders. All the services are financed by fees and levies paid by the producers and other stakeholders.

There has been increasing interest and pressure, mainly from consumer countries, for the production of sustainable and fair-trade tea. Some Kenyan smallholder farms have been certified (Buch-Hansen, 2012), but general adoption of these standards by all smallholders seems difficult without support. Government expenditure on tea research and extension services represented only about 0.01 percent of the government budget in 2008 (Made et al., 2009). This is keeping Kenyan smallholders at a quality disadvantage to the large plantations, which are owned by the same companies promoting the certifications.

In February 2012, the Ministry of Agriculture introduced a levy of 1 percent over the auction-sale price on all Kenyan tea exports. The levy is intendeded to fund national tea regulators –the Tea Research Foundation of Kenya and the Tea Board of Kenya– and programmes to improve sector infrastructure (All Africa, 2012).

Coffee

Three main policy measures are affecting the production and sale of Kenyan coffee –a tight system of marketing regulations and fees; border measures affecting imports; and the Coffee Development Fund (CDF). In addition, there is a small amount of EU funding for equipment and training for the Coffee Research Foundation.

Regulations to verify quality and quantity are sometimes needed in agricultural markets to reduce disputes and other transaction costs when buyers and sellers are in different locations. However, this is only partially the case for Kenya coffee, where much of the regulation seems to be related to determining and verifying that fees and levies are correctly assessed –so they could be seen as an excise tax at the wholesale level on coffee production.

Kenya has a 25 percent tariff on imported coffee, with a special exemption for imported coffee sold at the Nairobi auctions and subsequently exported. Since Kenya is a coffee exporter and consumes a negligible amount, these measures have no impact on prices in Kenya.

The Coffee Development Fund (CDF) was established by the government in May 2006 as a financing vehicle for revitalizing the coffee sub-sector. Its mandate is to provide sustainable, affordable credit to coffee farmers for farm inputs, farming operations and income stabilization. Most of the loans go to smallholders organized in cooperatives. Currently, the CDF provides about USD 13 million in loans divided among about 61,000 coffee farmers. According to Patrick Nyaga, the CDF Managing Trustee, the sector needs about USD 125 million to meet the needs of coffee farmers. A 10 percent interest rate is charged on loans, while the average inflation rate between 2006 and 2010 was about 9%. Therefore the subsidy element of this program is relatively small, assuming reasonably good default rates. These loans appear to be available to growers over and above those available through the cooperative banks, which are assumed to be free of subsidy.

Milk

Before 1992, the dairy industry in Kenya was controlled by government, which gave policy guidelines, set prices, determined the players in the industry and set the market rules. The Kenya Co-operative Creameries (KCC) was a monopoly marketing and processing milk and dairy products. The

most critical step in the liberalization of Kenya's dairy industry was the deregulation of both producer and consumer prices of milk in May 1992, followed by an explicit policy statement that any party interested in going into dairy processing and marketing business could be licensed, provided that the business premises met the minimum standard hygiene requirements. Since then, many other processors have claimed a substantial share of the market, significantly reducing the dominance of KCC, now renamed as New KCC, still under government control but on the way to privatization.

The main regulatory body in the dairy industry is the Kenya Dairy Board (KDB), established under the Dairy Industry Act, Cap 336 of the Laws of Kenya. With the deregulation of milk prices, KDB's role in the dairy industry was re-evaluated to focus more on dairy regulation and development activities. The Board's main strategic objectives are to "improve the quality of Kenyan dairy produce, provide timely and accurate dairy information, stabilize milk production, promote milk production in non-traditional dairying areas and enhance consumption of milk and milk products" (Kenya Dairy e-Portal 2012).

Since 2003, the government has focused on revival of the milk industry with some positive results, such as the formal dairy sector almost tripling the amount of milk it handles, from about 144 million liters in 2002 to 423 million liters in 2007 (FAO, 2011b).

Live cattle

The government of Kenya has laid out strategies to improve livestock production and trade in two key policy documents – the Economic Recovery Strategy for Wealth Creation and Employment Creation (ERS) 2003-2007 (MPND, 2003) and the Agricultural Sector Development Strategy 2010-2020 (GOK, 2010). The ERS specifically focuses on developing Kenya's ASAL areas to improve the welfare of communities that rely on livestock production as a main source of income. Under this strategy, the government gives priority to strengthening livestock marketing and infrastructure in these areas and aims to encourage private-sector entrepreneurs to establish slaughterhouses and other channels for the export market.

According to Kenya's First Medium Term Plan 2008-2012 (GOK, 2008a), the Government has invested KShs 840 million in the rehabilitation of the Kenya Meat Commission (KMC)[5] and procurement of livestock from local producers in recent years. The revival of the KMC in June 2006 and the operationalization of the Landhies Road Depot in Nairobi and the Kibarani factory in Mombasa in 2007 have increased market outlets for many livestock producers. Efforts have been made to invest an additional KShs 170 million for the construction of satellite abattoirs in Isiolo and Garissa and the rehabilitation of a slaughterhouse in Wajir (GOK, 2008a). Kenya has also sought to expand livestock export markets by increasing beef cattle exports to the Middle East and Mauritius (GOK, 2008a).

There has also been progress in pest and disease control and in livestock branding. The former is being addressed through integrated extension services and enhanced surveillance in collaboration with other stakeholders. To address the latter, the government spent KShs 75 million in the 2006/07

[5] The KMC collapsed after liberalization in the 1990s.

FY on branding activities in pilot districts of the North Rift and Upper Eastern Provinces, where 1.4 million cattle were branded in order to improve traceability and promote livestock production. An additional KShs 120,770,040 was disbursed in the 2007/08 FY to complete the branding activities in the pilot districts and to expand branding activities to other cattle rustling-prone districts in the area (GOK, 2008a).

Sorghum

The ASDS classifies sorghum as one of Kenya's main food crops. It puts forth several broad based strategies for increasing sorghum production, productivity and marketability. Before the ASDS was developed, agricultural policies focused on cash crops rather than staple food crops, and even among those, more attention was paid to maize than other cereals. Despite the policy focus on staple food crops in recent years, sorghum and many others continue to face non-tariff trade barriers such as police roadblocks, multiple county cesses and levies, which hamper their competitiveness both domestically and regionally (Chemonics Inc., 2010).

In response to the increasing demand in the private sector for sorghum for beer production, KARI and Kenya's Ministry of Agriculture have been promoting the production of higher quality Gadam sorghum through bulking and distribution of seeds to farmers, under the Traditional High-Value Crops (THVC) program (MoA 2012a and 2012b). The THVC programme, which aims to increase production and consumption of drought-resistant crops in the ASAL areas, was initiated in the 2006/2007 financial year and is mainly implemented through government funding of Ksh 150 million per year. However, since the THVC program promotes the production and consumption of several alternative cereal and non-cereal crops, it is uncertain how much the government actually spent on bulking and distributing sorghum seeds each year and in which year or years these disbursements took place.

Although no tariffs are levied on food crops traded among EAC and COMESA countries, sorghum imports from Southern Africa Development Community (SADC) countries and the rest of the world are subject to a 25 percent tariff (Chemonics Inc., 2010).

PART 2. EFFECTS OF AGRICULTURAL AND FOOD POLICIES, PUBLIC EXPENDITURE AND AID

To achieve specific development objectives, governments use policies to change the rules governing the economy as a whole (macro-economic policy), or those governing a particular economic sector (sector policies), in order to guide and modify the behavior and decisions of agents operating in the economy. Governments can influence the economy by creating policies which regulate, incentivize or inform economic agents. This can be done by establishing a legal framework that agents must adhere to (e.g. food quality or safety norms, property rights) or run the risk of legal prosecution. Another approach is institutional reform or the provision of incentives or disincentives to certain types of behavior via price and trade policies, input and output marketing policies, social policies (e.g. income transfers, safety nets, social security schemes) and finance policies. Finally, governments can establish policies which increase agents' access to critical research, training and market information.

Public expenditure, on the other hand, can be used to make goods and services available to the food and agriculture sector, to support the implementation of government policies and to facilitate the achievement of development objectives. This expenditure may, for example, include the provision of public goods through public investment in infrastructure, or provide private benefits, such as subsidies or income transfers.

To monitor government actions and ensure that they adequately contribute to development objectives, it is essential that authorities are aware of the incentives or disincentives that the policies they implement may provide to the economy, as well as the consistency, efficacy and adequacy of the way in which public resources are spent.

Some of the key questions that governments need to consider include the following:

- Do policies in place provide incentives or disincentives for production, processing and marketing in key food and agricultural value chains?
- Who, in the most strategic value chains, benefits or loses from the policies in place? Producers, processors, traders or consumers?
- Which policies should be changed so that the incentive structure in the food and agriculture sector is more closely aligned with government objectives?
- Is public expenditure spent in a way that addresses the key issues faced by the food and agriculture sector? (e.g., what is the most efficient way to improve farmer incomes – an input subsidy or investment in a road?) Is public investment focusing on key investment needs?
- Are policy incentives and public expenditure consistent, or do they provide contradictory signals to the economy in some cases?
- Are public resources spent efficiently, or is an excessive share used for administrative costs?

5. Incentives, disincentives and market development gaps

Methodology highlights

MAFAP methodology seeks to measure market price incentives and disincentives to producers and other agents in commodity markets. The analysis is based on the comparison between observed domestic prices and reference prices. Reference prices are calculated using the price of the product in the international market, which is considered a benchmark price free of the influence from domestic policies and markets. Our methodology estimates two types of reference prices – observed and adjusted. Observed reference prices are those that would prevail in the presence of distortions from national policy measures (except tariffs and other trade measures) and deficiencies in the structure and functioning of domestic value chains, while adjusted reference prices are those that would prevail in the absence of these distortions.

This analysis is based on the law of one price, which is the economic theory that states there is only one prevailing price for each product in a perfectly competitive market. This law only applies in the case of homogeneous goods, if information is correct and free, and if transaction costs are zero. Thus, this analysis was conducted for goods that are either perfectly homogeneous or perfect substitutes in the local market in terms of quality, or, failing that, are simply comparable goods. Indicators calculated from reference and observed domestic prices will, therefore, reveal whether domestic prices represent support (incentives) or a tax (disincentives) to various agents in the value chain.

Observed domestic prices are compared to reference prices at two specific locations along commodity value chains – the farm gate and the point of competition, where domestic products compete with identical products at world market prices. The approach for comparing prices at each location is summarized below, using an imported commodity as an example. In this situation, the country is importing a commodity that arrives in the port at the benchmark price (usually the unit value CIF price at the port of entry). In the domestic market, we observe the price of the same commodity at the point of competition (usually the observed price at wholesale) and at the farm gate. We also have information on observed access costs, which are all the costs associated with bringing the commodity to market. These include marketing costs between the border and point of competition, as well as between the farm gate and point of competition.

The benchmark price is made comparable to the observed domestic price at the point of competition by adding the access costs between the border and the point of competition, resulting in the observed reference price at the point of competition. This takes into account all the costs an importer would need to bear in order to bring the commodity to market, which in effect, raises the price of the commodity. The reference price at the point of competition is further made comparable to the observed domestic price at the farm gate by deducting the access costs between the farm gate and the point of competition, resulting in the observed reference price at farm gate. This takes into account all the costs incurred by farmers and other agents in bringing the commodity from the farm to the wholesale market. Mathematically, the equations for calculating the observed reference prices at the point of competition (RP_{owh}) and farm gate $\left(RP_{ofg}\right)$ for an imported commodity are as follows:

$$RP_{owh} = P_b + AC_{owh}$$

$$RP_{ofg} = RP_{owh} - AC_{ofg}$$

where AC_{owh} are the observed access costs from the border to the point of competition, including handling costs at the border, transport costs from the border to the wholesale market, profit margins and all observed taxes and levies, except tariffs, and P_b is the benchmark price. AC_{ofg} are the observed access costs from the farm gate to the point of competition, including handling costs at the farm, transport costs from farm to wholesale market, processing, profit margins and all observed taxes and levies.

The same steps described above can be taken a second time using benchmark prices and access costs that have been adjusted to eliminate market distortions due to exchange rate misalignments, imperfect functioning and non-competitive pricing in international markets and inefficiencies along domestic value chains[6], where possible and relevant. The adjusted benchmark prices and access costs are then used to generate a second set of *adjusted* reference prices in addition to the first set of *observed* reference prices calculated.

For exported commodities, a slightly different approach is used. In this case, the border is generally considered the point of competition, and the unit value FOB price (free on board) for the commodity is normally taken as the benchmark price. Furthermore, observed and adjusted reference prices at the point of competition are obtained by subtracting, rather than adding, the access costs between the border and the point of competition. Mathematically, the equations for calculating the observed reference prices at the point of competition (RP_{owh}) and farm gate $\left(RP_{ofg}\right)$ for an exported commodity are as follows:

$$RP_{owh} = P_b - AC_{owh}$$

$$RP_{ofg} = RP_{owh} - AC_{ofg}$$

After observed and adjusted reference prices are calculated for the commodity, they are subtracted from the domestic prices at each point in the value chain to obtain the observed and adjusted price gaps at wholesale and farm gate. Observed price gaps capture the effect of trade policy measures directly influencing the price of the commodity in domestic markets (e.g. subsidies and tariffs) and actual market performance, while adjusted price gaps capture the effect of distortions resulting from market functioning in addition to the effect of government policy measures influencing domestic prices. Mathematically, the equations for calculating the observed price gaps at the point of competition (PG_{owh}) and farm gate $\left(PG_{ofg}\right)$ are as follows:

$$PG_{owh} = P_{fg} - RP_{ofg}$$

$$PG_{ofg} = P_{wh} - RP_{owh}$$

[6] Inefficiencies along domestic value chains may include government taxes and fees (excluding fees for services), high transportation and processing costs and high profit margins captured by various marketing agents.

where P_{fg} is the observed domestic price at farm gate, RP_{ofg} is the observed reference price at farm gate, P_{wh} is the observed domestic price at wholesale, and RP_{owh} is the observed reference price at wholesale.

A positive price gap, resulting when the observed domestic price exceeds the reference price, means that the policy environment and market functioning as a whole generate incentives (support) to producers or wholesalers. For an imported commodity this could be due to distortions such as the existence of a tariff or excessive access costs between the border and the point of competition. On the other hand, if the reference price exceeds the observed domestic price, resulting in a negative price gap, this means that the policy environment and market functioning as a whole generate disincentives (taxes) to producers or wholesalers. For an imported commodity this could be due to distortions such as subsidized sales by the government to keep domestic prices low.

In general, price gaps provide an absolute measure of the market price incentives (or disincentives) that producers and wholesalers face. Therefore, price gaps at wholesale and farm gate are divided by their corresponding reference price and expressed as a ratio, referred to as the ***Nominal Rate of Protection (NRP)***, which can be compared across commodities and countries.

The observed nominal rates of protection at the farm gate (NRP_{ofg}) and wholesale (NRP_{owh}) are defined by the following equations:

$$NRP_{ofg} = \frac{PG_{ofg}}{RP_{ofg}} \; ; \; NRP_{owh} = \frac{PG_{owh}}{RP_{owh}}$$

where PG_{ofg} is the observed price gap at farm gate, RP_{ofg} is the observed reference price at the farm gate, $PG_{owh}$is the observed price gap at wholesale and RP_{owh} is the observed reference price at wholesale.

Similarly, the **adjusted Nominal Rate of Protection** at the farm gate (NRP_{afg}) and wholesale (NRP_{awh}) are defined by the following equations:

$$NRP_{afg} = \frac{PG_{afg}}{RP_{afg}} \; ; \; NRP_{awh} = \frac{PG_{awh}}{RP_{awh}}$$

where PG_{afg} is the adjusted price gap at farm gate, RP_{afg} is the adjusted reference price at the farm gate, $PG_{awh}$is the adjusted price gap at wholesale and RP_{awh} is the adjusted reference price at wholesale.

If public expenditure allocated to any of the commodities analyzed is added to the price gaps at the farm gate when calculating the ratios, the ***Nominal Rate of Assistance (NRA)*** is generated. This indicator summarizes the incentives (or disincentives) due to policies, market performance and public expenditure.[7] Mathematically, the nominal rate of assistance is defined by the following equation:

[7] The NRA indicator was not calculated for any of the commodities analyzed because of insufficient data on public expenditure. However, it will be developed in the forthcoming reports, as the public expenditure analysis is improved and better data are made available.

$$NRA = \frac{PG_{afg} + PE_{csp}}{RF_{afg}}$$

where PE_{csp} is commodity-specific public expenditure that has been identified and measured as monetary units per tonne.

Finally, MAFAP methodology estimates the ***Market Development Gap (MDG),*** which is the portion of the price gap that can be attributed to "excessive" or inefficient access costs within a given value chain, exchange rate misalignments and imperfect functioning of international markets. "Excessive" access costs may result from factors such as poor infrastructure, high processing costs due to obsolete technology, government taxes and fees (excluding fees for services), high profit margins captured by various marketing agents, illegal bribes and other non-tariff barriers. Therefore, the total MDG at farm gate is comprised of three components – gaps due to "excessive" access costs, the exchange rate gap and the international market gap. When added together, these components are equivalent to the difference between the observed and adjusted price gaps at farm gate.

Similar to the price gaps calculated, the MDG is an absolute measure, which is also expressed as a ratio to allow for comparison across commodities and countries. This relative indicator of the total MDG affecting farmers is derived by calculating the ratio between the total MDG at farm gate and the adjusted reference price at farm gate as follows:

$$MDG_{fg} = \frac{(IMG+ERPG+ACG_{wh}+ACG_{fg})}{RP_{afg}}$$

where IMG is the international market gap, ERPG is the exchange rate gap, ACG_{wh} is the access cost gap at the point of competition defined as the difference between observed and adjusted access costs at the point of competition and ACG_{fg} is the access cost gap at the farm gate defined as the difference between observed and adjusted access costs at the farm gate.

MAFAP provides indicators (NRPs, NRAs and MDGs) at both the commodity-specific and aggregate level in order to provide a more general picture. Farmgate indicators for commodities are aggregated as a means of presenting the results for the agricultural sector as a whole or for product groups of different trade status or importance to food security. Aggregate indicators were calculated as a weighted average based on each commodity's relative contribution to the total value of the product group's production. The formula for constructing aggregate indicators for product groups is as follows:

$$NRP_g = \frac{\sum_{i=1}^{i=n} NRP_i * PROD_i * RP_{fgi}}{\sum_{i=1}^{i=n} PROD_i * RP_{fgi}}$$

where NRP_g is the aggregated NRP for a subset of n commodities, NRP_i is the NRP for the commodity, $PROD_i$ is the volume of production in tonnes (or any other unit) of the commodity and RP_{fgi} is the reference price of the commodity at the farm gate.[8]

[8] The same formula also applies for aggregated NRAs and MDGs, though NRP_i would be NRA_i and MDG_i, respectively.

A more detailed description of the methodology applied in this analysis is available on MAFAP's website at www.fao.org/mafap.

Commodity selection

Agricultural products for this analysis were selected according to the following criteria:

(a) Contribution to food security,
(b) Contribution to the food import bill,
(c) Contribution to export revenue, and
(d) Contribution to the value of agricultural production.

To ensure a set of indicators were developed that allow for cross-country comparison, agricultural products representing a significant share of the total agricultural production value within their respective region or within Africa as a whole were identified for analysis in each country. Where applicable, products with high potential for use in promising or emerging value chains were also taken into account. Finally, all commodities considered for selection represented at least 70% of the total value of agricultural production in the country.

The agricultural commodities identified based on the above criteria were classified according to their trade status (imported, exported or thinly traded). A commodity was considered exported or imported depending on whether the country is a net exporter or a net importer; however, if less than 2.5% of total production is traded internationally, the commodity was classified as thinly traded.

Sources used for the selection of agricultural commodities include the following:

- FAOSTAT Food Balance Sheets for food security data, using volume and equivalent kilocalories
- FAOSTAT for data on each commodity's contribution to the total value of agricultural production in 2005-2011 constant international dollars
- Kenya National Bureau of Statistics (KNBS) for international trade data.

Based on these criteria, the following commodities were considered for selection:

- **Imported:** maize, wheat, rice, sugar, cotton and peas
- **Essential for food security:** maize, wheat, beans, potatoes and rice
- **Exported:** tea, vegetables, coffee, pineapples, beans, fish and mangoes
- **Thinly traded:** cow milk, beef, bananas, cassava, sorghum and potatoes
- **African or region-wide:** cassava, rice, maize, peanuts, beef, bananas and cotton

Given the constraints of time and data availability, as well as the country´s priorities, the MAFAP team decided to exclude the following commodities from consideration or to postpone their analysis to a later phase of the project: bananas, cassava, potatoes, vegetables, pineapples, beans, fish, mangoes, peas, peanuts and beef. Live cattle were substituted for beef due to the lack of reliable data. Therefore, this analysis focused on the following ten commodities: ***maize, wheat, rice, sugar, cotton, coffee, tea, cow milk, live cattle and sorghum***.

Data inputs and sources used

This section provides a general summary of the data inputs and sources used in the market price incentives and disincentives analysis conducted for selected commodities. More detailed descriptions of data inputs and calculations are provided in the Technical Notes written for each commodity, which can be accessed on MAFAP's official website at www.fao.org/mafap.

Farm gate and point of competition

As mentioned previously, observed domestic and reference prices are compared at two specific locations along commodity value chains – the *farm gate* and the *point of competition*. The farm gate is the major production area for the commodity and the point where observed producer prices are obtained, while the point of competition is the location along the value chain where domestic products compete with identical products at world market prices. A detailed analysis of the value chain for each product was conducted to identify key production areas and the point of competition. For most products analyzed, major production areas are located in parts of western or central Kenya with relatively easy access to the Nairobi wholesale market.

For imported commodities, the main wholesale market for the commodity is normally considered the point of competition. In unique situations where no wholesale market exists, prices were compared at the factory gate, as in the case of cotton. For exports, the border is normally considered the point of competition. However, the commodity's main wholesale market or international auction was taken as the point of competition in this analysis. This was also the case for thinly traded commodities.

Benchmark prices

The most appropriate *benchmark price* for exported commodities is the unit value Free On Board (FOB) price[9], for imported commodities, it is the unit value Cost, Insurance and Freight (CIF) price.[10] These prices are computed as the total value divided by the total quantity exported or imported each year.

Data on the total quantity and value of exports/imports needed to calculate unit value FOB/CIF prices were obtained from the following sources:

- Kenya National Bureau of Statistics (KNBS)
- UN Food and Agriculture Organization FAOSTAT
- UN Comtrade
- Global Trade Atlas (GTA)

[9] FOB (Free on Board) is the cost of an export good at the exit point in the exporting country, when it is loaded in the ship or other means of transport in which it will be carried to the importing country.

[10] CIF (Cost, Insurance and Freight) is the landed cost of an import good on the dock or other entry point in the receiving country. It includes the cost of international freight and insurance and usually also the cost of unloading onto the dock. It excludes any charge after the import good touches the dock, such as port charges, handling and storage and agents' fees. It also excludes any domestic tariffs and other taxes or fees, duties or subsidies imposed by an importing country.

Domestic Prices

Observed domestic farmgate prices were obtained from various sources according to the product analyzed. The main sources used are as follows:

- Kenya National Bureau of Statistics (KNBS)
- Kenya Sugar Board (KSB)
- Kenya Tea Development Authority (KTDA)
- Ministry of Agriculture, Agribusiness Department
- Ministry of Agriculture, Economic Review of Agriculture, 2010 & 2012
- Ministry of Agriculture Economic Stimulus Project Report
- UN Food and Agriculture Organization FAOSTAT

Observed domestic prices at the point of competition (wholesale or ex-factory prices) were also obtained from various sources according to the product analyzed. The main sources used are as follows:

- Kenya Dairy e-Portal
- Kenya Cotton Development Authority (CODA)
- Kenya CountrySTAT
- Kenya National Bureau of Statistics (KNBS)
- Kenya Sugar Board (KSB)
- Kenya Tea Development Authority (KTDA)
- Ministry of Agriculture, Agribusiness Department
- TechnoServe
- FAOSTAT
- FAO Global Information and Early Warning System.

Access costs

Observed access costs between the farm gate and the point of competition reflect the actual cost of moving domestic products to market. They include all costs, such as processing, packaging, handling, transportation, marketing, taxes and fees (whether they are paid-for services or not). Most of these costs were gathered from various value chain analyses conducted for specific products. However, when value chain analyses were not available for the product analyzed, access costs from the World Bank's 2009 Eastern Africa Regional Maize Market and Marketing Costs study were used as a proxy, with appropriate volume adjustments made when necessary.

Observed access costs between the point of competition and the border. The border is considered the main point of origin for imports and destination for exports. Depending on the product analyzed, total access costs from the point of ingress or egress were used. These costs include all border clearance costs, port charges, handling and inland transportation to or from the point of competition, which was the main wholesale market in Nairobi for most commodities. The border points considered in this analysis are Mombasa and Busia.

Adjusted access costs reflect the cost of transporting the commodity from the farm gate to the point of competition and from the point of competition to the border in an efficient market. To determine access costs reflecting efficient value chains, the following adjustments were made:

- "excessive" profit margins were adjusted to reasonable profit margins equal to no more than 10% of full financial costs (purchase price plus all other access costs) borne by each economic agent along the value chain.
- "excessive" costs were identified and adjusted to more reasonable estimates when adequate information justified doing so.
- taxes, fees (excluding fees for services), bribes and costs of other non-tariff trade barriers were systematically deducted.

The difference between observed and adjusted access costs represents the component of the MDG that stems from excessive access costs along the commodity's value chain. Due to the lack of reliable data, certain observed access costs were left unadjusted, such as exorbitant processing costs due to high electricity costs or obsolete technology, losses incurred from delays in post-harvest collection, frequent breakdowns and other inefficiencies. Therefore, adjusted access costs tend to be overestimated: they are higher than they should be in a perfectly efficient market. It follows then that adjusted reference prices at the farm gate, which are calculated from adjusted access costs, are actually slightly lower than those that would prevail in an efficient, perfectly competitive market.

Caveats and limitations

Uncertainty about data quality is a limitation to the analytical work in this study. Every effort has been made to use data from country sources and to address data gaps by collecting information through trader interviews in order to minimize errors. Additional efforts have been made to ensure data quality and to support partners in advocating investment in reliable national price monitoring and statistical systems; such investment would provide great benefits for informed policy decision-making.

One important data quality issue affecting the analysis is that importers and exporters often report lower volumes than what they actually trade in order to pay less tax, particularly for heavily traded products. Certain products are often traded informally with neighbouring countries, which also results in underreporting of traded volumes. Therefore, customs data reliability is a major cause of uncertainty because it directly affects the magnitude of the estimated indicators. When there were obvious outliers or reported data seemed erroneous, alternative sources of data, such as UN Comtrade and Global Trade Atlas, were consulted.

Another important limitation is that our analysis is not entirely representative of market price incentives and disincentives affecting each sector studied. This is because the analysis focused only on the main production area and value chain for each product. For example, the analysis for rice only considered production from the National Irrigation Board's (NIB) Mwea Scheme. While the Mwea Scheme accounts for most of the country's rice production, there are several other NIB irrigation schemes producing rice in Kenya, which were not included in the analysis. There are two other types of rice value chains in addition to the NIB irrigation schemes, which were not analyzed. Producers and economic agents along these value chains may face circumstances that differ considerably from the value chain analyzed in terms of access costs or their connection to local markets, and therefore could yield different results. This limitation should be taken into account when interpreting MAFAP's indicators.

It is important to note the sensitivity of the adjusted indicators to the assumptions made in calculating the adjusted access costs. While the exclusion of direct taxes, fees (except fees for

services) and bribes to calculate the adjusted access costs is straightforward, as these represent some form of transfer from producers or other agents to the government, a normal profit margin of 10 percent of full finanacial costs is assumed in estimating adjusted access costs. This 10 percent is viewed as a reasonable level of profit for traders of the various commodities analyzed. Therefore, the validity of the adjusted nominal rates of protection and of the market development gaps depends on this assumption.

Lastly, since our methodology uses annual averages, it does not allow for the analysis of price variations within years due to seasonality of supply or quality during the production season.

MAFAP indicators

Introduction and dataset

This section summarizes the indicators (NRPs, MDGs) from market price incentive and disincentive analyses conducted for the ten selected commodities in two tables. The results are presented and discussed at the commodity-specific level and at the aggregate level in the following sections.

MAFAP's farmgate indicators (NRPs, MDGs) were aggregated into product categories as a means of presenting the results according to the trade status of the products analyzed and their importance to food security. As mentioned earlier, aggregate indicators were calculated as a weighted average based on each commodity's relative contribution to the aggregate's value of agricultural production. The aggregate categories and commodities included in each are listed in Table 5. As shown below, aggregate categories are not mutually exclusive. In this study the weighted average of indicators for the ten commodities analyzed –which account for about 59% of the total value of agricultural production between 2005 and 2010– is used as a proxy indicator for the agricultural sector.

Table 5: Aggregate categories and commodities included in each

Aggregate Category	Commodities
Agricultural sector (refers to the ten commodities analyzed)	maize, wheat, rice sugar, cotton, coffee, tea, cow milk, live cattle and sorghum
Imported products	maize, wheat, rice, sugar and cotton
Products essential to food security	maize, wheat and rice
Imported industrial products	sugar and cotton
Exported products	coffee and tea
Thinly traded products	cow milk, live cattle and sorghum

Commodity-specific and aggregate indicators are presented in Tables 6 and 7 on the next page.

Table 6: Commodity-specific indicators, 2005-2010 (percent)

Product	Indicator	Unit	2005	2006	2007	2008	2009	2010	Simple Average 2005-2010
Maize	Observed NRP at wholesale	%	-25%	-17%	-18%	7%	-15%	-25%	-15%
(large-scale)	Adjusted NRP at wholesale	%	-24%	-15%	-17%	9%	-14%	-24%	-14%
	Observed NRP at farm gate	%	-28%	-19%	-21%	9%	-17%	-29%	-18%
	Adjusted NRP at farm gate	%	-29%	-20%	-22%	8%	-17%	-30%	-18%
	MDG at farm gate	%	0%	0%	0%	0%	0%	0%	0%
Maize	Observed NRP at wholesale	%	-23%	-11%	-29%	-6%	4%	-14%	-13%
(smallholder)	Adjusted NRP at wholesale	%	-22%	-10%	-28%	-4%	5%	-12%	-12%
	Observed NRP at farm gate	%	-30%	-15%	-39%	-8%	5%	-19%	-18%
	Adjusted NRP at farm gate	%	-32%	-19%	-42%	-11%	1%	-23%	-21%
	MDG at farm gate	%	-3%	-4%	-4%	-4%	-3%	-5%	-4%
Wheat	Observed NRP at wholesale	%	23%	20%	18%	17%	14%	9%	17%
	Adjusted NRP at wholesale	%	26%	22%	20%	18%	16%	10%	19%
	Observed NRP at farm gate	%	31%	53%	57%	40%	66%	21%	45%
	Adjusted NRP at farm gate	%	31%	53%	57%	40%	66%	21%	45%
	MDG at farm gate	%	0%	0%	0%	0%	0%	0%	0%
Rice	Observed NRP at wholesale	%	83%	62%	76%	80%	84%	105%	82%
	Adjusted NRP at wholesale	%	92%	69%	84%	88%	93%	114%	90%
	Observed NRP at farm gate	%	135%	96%	128%	127%	141%	168%	132%
	Adjusted NRP at farm gate	%	122%	88%	117%	115%	128%	149%	120%
	MDG at farm gate	%	-5%	-4%	-5%	-5%	-5%	-7%	-5%

Sugar	Observed NRP at wholesale	%	29%	17%	15%	13%	19%	3%	16%
	Adjusted NRP at wholesale	%	29%	18%	16%	14%	20%	4%	17%
	Observed NRP at farm gate	%	83%	34%	25%	14%	38%	-6%	31%
	Adjusted NRP at farm gate	%	0%	-20%	-14%	7%	-12%	-28%	-11%
	MDG at farm gate	%	-45%	-40%	-32%	-6%	-36%	-23%	-30%
Cotton	Observed NRP at wholesale	%	11%	-13%	-17%	-32%	-19%	-26%	-16%
	Adjusted NRP at wholesale	%	14%	-11%	-16%	-31%	-18%	-25%	-15%
	Observed NRP at farm gate	%	-13%	-27%	-35%	-44%	-31%	-45%	-32%
	Adjusted NRP at farm gate	%	-12%	-26%	-35%	-43%	-30%	-45%	-32%
	MDG at farm gate	%	1%	1%	0%	0%	1%	1%	1%
Coffee	Observed NRP at wholesale	%	-4%	-4%	-4%	-4%	-4%	-4%	-4%
(estates)	Adjusted NRP at wholesale	%	-4%	-4%	-4%	-4%	-4%	-4%	-4%
	Observed NRP at farm gate	%	-5%	-4%	-5%	-4%	-5%	-5%	-5%
	Adjusted NRP at farm gate	%	-5%	-5%	-5%	-4%	-5%	-5%	-5%
	MDG at farm gate	%	0%	0%	0%	0%	0%	0%	0%
Coffee	Observed NRP at wholesale	%	-4%	-4%	-4%	-4%	-4%	-4%	-4%
(smallholder)	Adjusted NRP at wholesale	%	-4%	-4%	-4%	-4%	-4%	-4%	-4%
	Observed NRP at farm gate	%	-7%	-5%	-6%	-5%	-6%	-5%	-6%
	Adjusted NRP at farm gate	%	-28%	-20%	-21%	-17%	-21%	-15%	-20%
	MDG at farm gate	%	-23%	-16%	-16%	-13%	-16%	-10%	-16%
Tea	Observed NRP at wholesale	%	-12%	-31%	-15%	-15%	-15%	-14%	-17%
(smallholder)	Adjusted NRP at wholesale	%	-12%	-31%	-15%	-15%	-15%	-14%	-17%

	Observed NRP at farm gate	%	-15%	-40%	-19%	-17%	-18%	-17%	-21%
	Adjusted NRP at farm gate	%	-18%	-44%	-24%	-17%	-19%	-17%	-23%
	MDG at farm gate	%	-3%	-6%	-6%	0%	0%	0%	-3%
Cow Milk	Observed NRP at wholesale	%	-20%	-46%	1%	36%	-6%	33%	0%
	Adjusted NRP at wholesale	%	-20%	-46%	1%	36%	-6%	33%	0%
	Observed NRP at farm gate	%	-40%	-66%	1%	150%	-13%	116%	25%
	Adjusted NRP at farm gate	%	-51%	-69%	-29%	28%	-35%	17%	-23%
	MDG at farm gate	%	-18%	-9%	-29%	-49%	-25%	-46%	-29%
Live Cattle	Observed NRP at wholesale	%	-29%	-21%	-36%	-27%	-18%	-34%	-27%
	Adjusted NRP at wholesale	%	-39%	-34%	-27%	-38%	-31%	-44%	-35%
	Observed NRP at farm gate	%	-16%	-26%	-45%	-10%	5%	-17%	-18%
	Adjusted NRP at farm gate	%	-41%	-48%	-43%	-38%	-32%	-42%	-41%
	MDG at farm gate	%	-30%	-30%	4%	-31%	-35%	-31%	-26%
Sorghum	Observed NRP at wholesale	%	-22%	-16%	35%	20%	-14%	17%	3%
	Adjusted NRP at wholesale	%	-21%	-16%	37%	22%	-13%	19%	5%
	Observed NRP at farm gate	%	-19%	-34%	66%	38%	3%	22%	13%
	Adjusted NRP at farm gate	%	-20%	-35%	61%	35%	1%	20%	10%
	MDG at farm gate	%	-2%	-1%	-3%	-2%	-1%	-2%	-2%

Table 7: Aggregate indicators, 2005-2010 (percent)

Product	Indicator	Unit	2005	2006	2007	2008	2009	2010	Simple Average 2005-2010
Agricultural Sector	Average Observed NRP at farm gate	%	-22%	-43%	-20%	20%	-2%	9%	-10%
	Average Adjusted NRP at farm gate	%	-36%	-51%	-30%	-10%	-25%	-18%	-28%
	Average MDG at farm gate	%	-18%	-14%	-12%	-25%	-23%	-25%	-20%
Imports	Average Observed NRP at farm gate	%	-13%	-4%	-14%	6%	8%	-11%	-5%
	Average Adjusted NRP at farm gate	%	-20%	-14%	-22%	3%	-2%	-18%	-12%
	Average MDG at farm gate	%	-8%	-10%	-9%	-3%	-10%	-8%	-8%
Food Security	Average Observed NRP at farm gate	%	-22%	-10%	-21%	5%	3%	-12%	-10%
	Average Adjusted NRP at farm gate	%	-24%	-12%	-23%	2%	1%	-15%	-12%
	Average MDG at farm gate	%	-2%	-3%	-2%	-2%	-2%	-3%	-2%
Industrial Imports	Average Observed NRP at farm gate	%	75%	26%	18%	10%	35%	-8%	26%
	Average Adjusted NRP at farm gate	%	-1%	-20%	-16%	4%	-13%	-28%	-12%
	Average MDG at farm gate	%	-43%	-37%	-29%	-5%	-35%	-22%	-29%
Exports	Average Observed NRP at farm gate	%	-11%	-23%	-12%	-11%	-11%	-11%	-13%
	Average Adjusted NRP at farm gate	%	-18%	-28%	-18%	-14%	-16%	-13%	-18%
	Average MDG at farm gate	%	-7%	-7%	-7%	-3%	-5%	-3%	-5%
Thinly Traded	Average Observed NRP at farm gate	%	-28%	-55%	-23%	34%	-6%	26%	-9%
	Average Adjusted NRP at farm gate	%	-45%	-62%	-34%	-15%	-33%	-19%	-35%
	Average MDG at farm gate	%	-24%	-16%	-14%	-37%	-29%	-36%	-26%

Before discussing the indicators shown in Tables 6 and 7 in greater detail, it is important to emphasize two points. A significant part of the period analyzed (2005-2010) was particularly turbulent, with dramatic changes in price trends due to the global commodity price crisis in 2007 and 2008. This made the analysis and determining the causes of incentives and disincentives more challenging.

Secondly, the indicators referring to the agricultural sector as a whole actually refer only to the ten products analyzed, representing on average about 59% of the total value of agricultural production between 2005 and 2010, with each product accounting for the following share: maize 6%, wheat 4%, rice <1%, sugar 3%, cotton <1%, coffee 1%, tea 6%, cow milk 20%, live cattle 19% and sorghum <1%.[11]

Indicators and interpretation for individual commodities

Maize

Maize is by far the most important agricultural commodity in Kenya because it is the primary staple for Kenyans, accounting for 36% of all calories and 65% of staple food calories consumed. The integral role of maize in food security was underscored by the period of political unrest following the December 2007 election and a severe drought in 2009. These events resulted in a large spike in maize imports and prices and increased interest in policies to assure supplies. However, maize accounts for only about 6% of the total value of agricultural production, which is much lower than other commodities such as cattle and cow milk.

Production

Most maize is produced in western Kenya. Parts of the Rift Valley Province, particularly the Trans Nzoia and Uasin Gishu districts, produce a large surplus, mainly on medium- and large-scale farms. Most other regions are self-sufficient or face a maize deficit on an annual basis, though much of Kenya is semiarid and subject to significant production volatility. About 15% of total maize production is sold to the National Cereals and Produce Board (NCPB) or large millers, much of which comes from medium- and large-scale farms in the surplus region.

The events of 2008 and 2009 severely strained Kenya's ability to provide affordable maize and maize meal. Civil disturbances after the December 2007 election resulted in the destruction of 0.3 million tonnes of maize (African Centre for Open Governance) and a 20% reduction in the total area planted to maize during long rains in 2008 (World Bank, 2009). This was followed by drought conditions, which affected the next two harvests. As a result, total production fell 19% in 2008 and did not recover to normal levels until 2010, according to official estimates (see Table 8).

Sales to the NCPB and large millers fell even more dramatically, by 33% in 2008 and a further 44% in 2009. Smallholder producers retained a larger share of their harvest in the face of food shortages and steeply rising prices.

[11] Estimates are based on data from FAOSTAT.

Table 8 : Maize production and sales, 2005–2010

	Unit	2005	2006	2007	2008	2009	2010
Production	1,000 T	2,916	3,249	2,925	2,367	2,439	3,222
Sales to NCPB & Millers	1,000 T	416	471	509	341	191	295
Share of sales to NCPB & Millers	%	14	14	17	14	8	9
Other Maize Produced	1,000 T	2,500	2,778	2,416	2,027	2,248	2,927
Share of other Maize Produced	%	86%	86%	83%	86%	92%	91%

Sources: KNBS, 2011 (ES Table 8.9 & 8.11); KNBS, 2010 (SA Table 60); MOA, 2010 (Table 5.2)

Consumption and trade

Domestic maize production has increasingly lagged behind population growth, especially urban population growth, which is increasing at 4% per annum. Since 2000 it has become clear that Kenya has a structural deficit in maize production. This deficit has increased to about 10% of production since 2005 (see Table 9).

Table 9 shows Kenya's available maize supply and disposition for 2005 to 2010. It is estimated that if consumption would have been maintained at "normal" levels in 2008, maize inventories in 2008 would have been reduced by about 744,000 tonnes; this would imply a negative possible inventory – minus 402,000 T. Since this amount was not available, this indicates a large consumption shortfall.[12] The continued shortfall resulted in temporary policy changes, which allowed millers and wholesalers to import maize duty-free from world markets in 2009. The consequent spike in imports helped replenish inventories that were carried into 2010. KNBS estimates that inventories increased by 545,000 tonnes in 2010. High prices, however, kept per capita consumption below average throughout 2008-2010.

[12] Some of the gap may have been met with other staple substitutes and some by people going hungry, i.e. consuming less.

Table 9: Kenya maize production, trade, supply and disposition, 2005–2010

	Unit	2005	2006	2007	2008	2009	2010
Production	1,000 T	2,916	3,249	2,925	2,367	2,439	3,222
Imports	1,000 T	252	275	254	288	1,600	349
Exports	1,000 T	11	15	43	18	102	1
Available supply	1,000 T	3,157	3,509	3,136	2,637	3,937	3,570
Normal consumption	1,000 T	3,044	3,152	3,265	3,381	3,501	3,626
Surplus/shortage	1,000 T	114	357	-128	-744	436	-56
Possible inventory	1,000 T	114	470	342	-402	34	-23
Import dependency ratio	%	8	8	8	11	41	10

Sources: GTA; RATIN; WB, 2009

Most of Kenya's structural deficit is met through official and unofficial imports from Uganda and Tanzania. Both countries are generally regarded as having lower costs of production than Kenya and competitive access costs to some of Kenya's population centres. Kenya is normally able to import sufficient maize to meet its needs from the two countries at prices below those in world markets. However, Uganda and Tanzania were not able to respond to the shortfall in production in 2008 and 2009, so Kenya resorted to imports from the international market (South Africa) at world market prices.

There are several reasons why Uganda and Tanzania were not able to respond. Kenya required imports over five times its normal import level in 2008 and 2009, and this additional volume was simply not available from Uganda and Tanzania. In fact, Tanzania closed its borders to maize exports in order to protect its own consumers. Moreover, production in Uganda and Tanzania is likely to have been affected by the same drought conditions as in Kenya in 2009.

As members of the EAC, all three countries normally apply a 50% tariff on maize imports from other parts of the world, but various fees are limited to 2.75% on trade with each other. However, Tanzania has frequently implemented export bans, while Kenya has often been forced to waive tariffs in situations of supply shortfall.

In 2008, the NCPB imported nearly 150,000 tonnes of maize from South Africa through Mombasa at a CIF price of over USD 400/tonne. This high import price is a result of the surge in world prices that affected global markets in 2007 and 2008. NCPB imports from South Africa occurred in the second half of the year, after world prices had declined from their peak. However, prices paid on deliveries from South Africa were high, perhaps relating to the timing of orders and deliveries, as well as the uncertainties in world markets at that time. A 50% tariff, port charges and transportation costs to Nairobi would have raised the parity price to over USD 600/tonne, but the NCPB sold it at well below the USD 400/tonne CIF price.

Kenya's maize tariff was waived in 2009, and millers and wholesalers were able to import maize directly at an average price below USD 300/tonne. This measure resulted in massive imports, amounting to 1,599,617 tonnes, or about half of normal annual production. Throughout 2009, wholesale prices in Nairobi closely approximated the import parity, indicating that Nairobi was clearly integrated with the global market, but prices remained high and above the more usual prices of 2006 and 2007.

Value chain

The origin of maize supply is either large or small farms. According to Chemonics Inc. (2010), "Medium- to large-scale producers sell virtually all their harvested produce, except for very small quantities (less than 1%) for home consumption, animal feed and seeds in some instances." Medium and large farms sell their maize either to the NCPB or directly to large millers.

The NCPB buys from large-scale farmers and from smallholders in a few major surplus zones, such as Trans Nzoia and Uasin Gishu (Kirimi et al., 2011). It increases its purchases in a good production season and reduces its purchases in a poor production season to stabilize maize prices (Jayne, Myers, and Nyoro, 2008).

Kirimi et al. (2011) found that only 3% of the 1,275 smalholders in the Tegemeo Rural Surveys sold maize to the NCPB. While some smallholder producers may sell directly to consumers in local markets, most sell their maize to local traders, who then sell it to larger wholesalers. At wholesale, the maize may go on to the retail market, the NCPB or large millers.

Indicators

Medium and large farms were analyzed separately from smallholder farms, since the value chains differ considerably for each producer group. The average price paid by the NCPB and large millers in Nairobi was taken as the wholesale price for medium and large farms, while the average wholesale price in Nairobi was used for smallholder farms.

At the wholesale level, NRPs were highly variable throughout the period analyzed, mainly due to changes in trade patterns and domestic policies in response to the events of 2008 and 2009. Observed NRPs averaged -15% for medium and large farms and -13% for smallholder farms. Adjusted NRPs at the wholesale level for both producer groups were slightly higher (or less negative) than observed NRPs in each year, averaging -14% for medium and large farms and -12% for smallholder farms.

Figures 10 and 11 show that both groups of producers faced strong market price disincentives in 2005, 2006, 2007 and 2010, when Kenya had relatively normal levels of production and imported maize duty-free from the region. These results are difficult to reconcile, especially given the liberalized market and the absence of international trade barriers. A result that shows low protection rates close to zero percent (either positive or negative), something like that seen in 2008, is what might be expected in these years.

One plausible explanation for such strong disincentives in these years is that the activities of the NCPB are keeping prices down for millers. Another plausible explanation is that the Nairobi maize market may be weakly integrated with other sub-national and international maize markets, possibly

because arbitrage is only profitable for very short periods of time due to low prices and high access costs.

The results suggest that under exceptional circumstances, different sub-national markets do interact, but only for brief periods. Major events, such as political unrest in 2007/2008 and a subsequent drought in 2009, resulted in maize shortages, high prices and an increase in imports. Sub-national markets became much more integrated, and prices were determined more by international prices than by prices in the various regional markets. Consequently, these events generated quite different results from those in other years, and the impacts on smallholder farmers were slightly different from those on medium- and large-scale farmers.

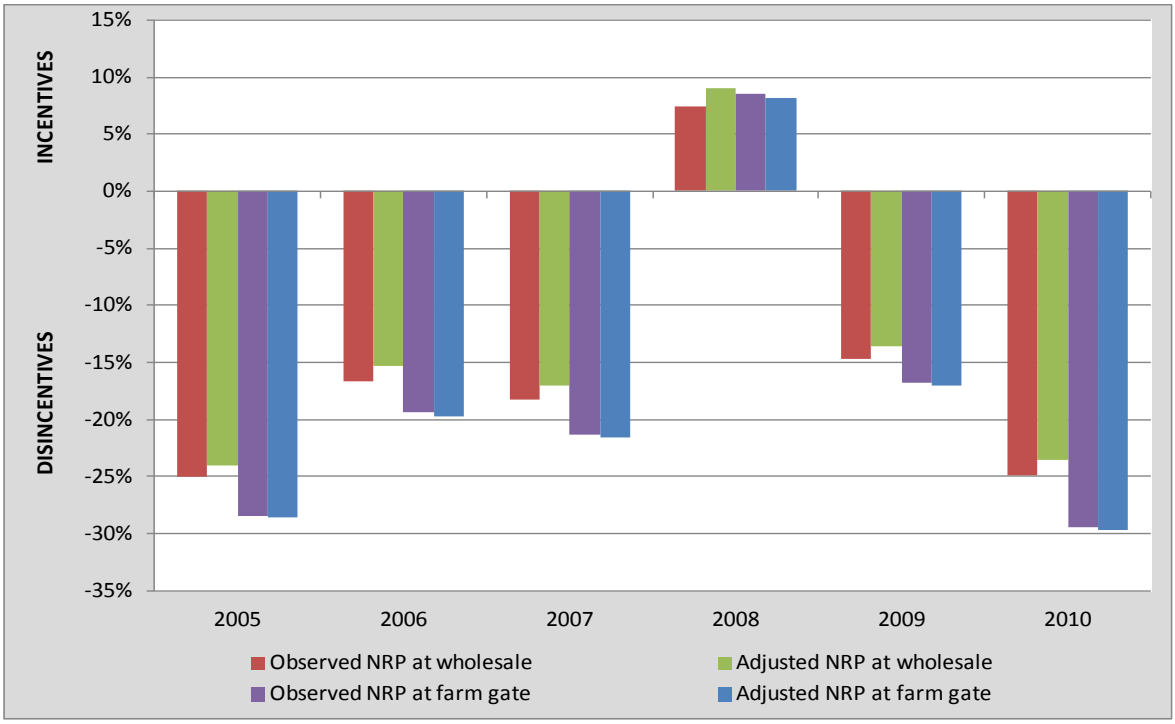
In 2008, imports from South Africa were limited and heavily subsidized by the NCPB. Additionally, Tanzania imposed a ban on exports in the face of the situation in Kenya, but maize markets remained linked to those in Uganda. The benchmark price for maize imports in 2008 was about 25% higher than before the global commodity price crisis of 2007 and 2008. Prices in Nairobi also increased substantially in response to scarce domestic supply, resulting in an observed NRP at the wholesale level of 7% for medium and large farms and -6% for smallholder farms. These results imply that subsidized imports from South Africa were relatively ineffective in reducing prices for consumers in Nairobi.

In 2009, Kenya waived its tariff on imports from outside the EAC, allowing millers and wholesalers to import maize duty-free from world markets. This resulted in a Nairobi wholesale price that was very close to the import parity price throughout the year, according to RATIN data. Therefore, the observed NRP at wholesale averaged about 4% for smallholders throughout the period analyzed. However, the average price paid by the NCPB and millers was slightly below the Nairobi wholesale price, resulting in an observed NRP at the wholesale level of -15% for medium and large farms.

Farmgate results closely follow those at wholesale by construction. Since reliable farmgate prices were not available, it was necessary to estimate them by subtracting market access costs to the farm gate from observed wholesale prices in each respective year. The absolute price gaps between domestic and reference prices, therefore, are identical at wholesale and farm gate in all years; however, the rates of protection are more extreme (higher if positive, or more negative) at the farm gate because the base of the ratio (the reference price) is much lower than at wholesale level.

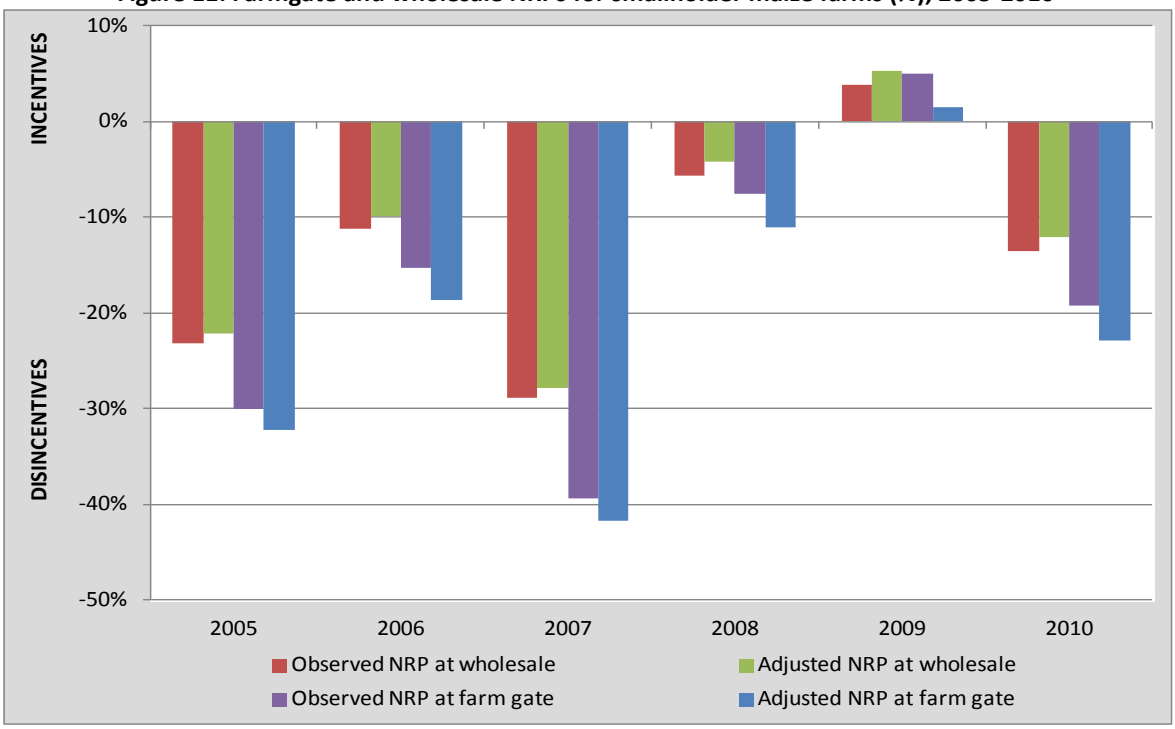
Observed NRPs at the farm gate averaged about -18% for both producer groups. As shown in Figures 10 and 11, adjusted NRPs at the farm gate were only slightly lower (or more negative) than observed NRPs in each year, indicating that market inefficiencies along maize value chains represent marginal opportunity costs for producers. On average these costs amounted to an MDG equal to 4% of the adjusted reference price at farm gate for smallholder producers and less than 1% of the adjusted reference price at farm gate for medium- and large-scale producers. These inefficiencies are mainly due to government taxes, fees and illegal bribes. If these distortions were eliminated and the market functioned more efficiently, producers, particularly smallholders, would be slightly better off than under existing market conditions.

Figure 10: Farmgate and wholesale NRPs for medium and large maize farms (%), 2005-2010



Source: MAFAP

Figure 11: Farmgate and wholesale NRPs for smallholder maize farms (%), 2005-2010



Source: MAFAP

Main message

Kenya has had to cope with tremendous instability in its maize market since 2005. This instability was driven by domestic factors, such as shocks to production caused by political unrest in 2007/2008 and a subsequent drought in 2009. These extraordinary events resulted in a large maize deficit, an

increase in duty-free imports and high domestic prices. During this period, the Nairobi maize market seemed to be much more integrated with sub-national and international markets than in other years. Consequently, domestic maize prices were close to the import parity in 2008 and 2009, resulting in very low rates of protection (positive or negative) for both groups of producers.

This analysis shows that in normal years (2005-2007 and 2010), Kenya was able to meet its import requirements from Uganda and Tanzania at prices well below those on world markets. Since there were no significant import tariffs or non-tariff trade measures directly affecting domestic prices in these years, low rates of protection (either positive or negative) were expected. However, the analysis shows that both groups of maize farmers actually faced strong market price disincentives. While these strong disincentives cannot be explained by domestic policies, they can, to some extent, be explained by the weak and highly variable integration of Kenya's regional maize markets with other sub-national and international markets.

Certainly there are linkages among the major regional markets in Kenya and with those in Uganda and Tanzania. Some of this is due to the crucial role maize plays in production, consumption and food security in all regions of Kenya. However, these linkages are ephemeral in nature rather than easily predictable or at least seasonal. This on-again, off-again connection to world and regional markets is most likely a risk factor, which contributes to the high marketing margins seen in Kenya, as well as the variability in estimated rates of protection.

Another factor potentially contributing to the variability in protection is the NCPB's activities in stabilizing prices for consumers and lowering prices for millers. However, price trends suggest the NCPB's impact on domestic maize prices is limited. Some argue that the NCPB would need to be much more active than it appears to be and would probably need much higher levels of support from the Treasury for effective price stabilization.

Finally, the MDGs that could be identified were relatively small and seemed to have a marginal impact on the overall level of incentives (or disincentives) received by farmers. It is likely, however, that large MDGs are in fact present; otherwise there would have been evidence that sub-national markets are better integrated. With better yields and more specialized transportation facilities, the region could perhaps compete in global markets.

Wheat

Wheat is an important cereal crop in Kenya and is integral to food security. Muyanga et al. (2005) found that in 2003, Nairobi consumers spent 34% more on wheat products than they did on maize and more than twice as much as they spent on rice. Wheat consumption is associated with urbanization and higher incomes and has been an increasing component in Kenyans' diets. Furthermore, wheat has a convenience factor because bread and other wheat products can be prepared and distributed in a form that is easily consumed with little additional preparation.

Wheat has a unique policy context, not only because of its role in food security, but also because it is a major import. In fact, Kenya now imports about five times as much wheat as it produces. In contrast to other food security commodities such as maize and sorghum, wheat must be imported from world markets at world market prices rather than from countries within the East Africa region.

Production

Wheat production in Kenya is dominated by a small number of medium and large farms using capital-intensive technology. Nyangito, Ikiara and Ronge (2002) indicate that in 2002, large-scale farmers accounted for 75% of the area planted to wheat and 83% of production. Chemonics Inc. (2010)reported that there were 2,000 small-scale (<5 ha) and only 20 large-scale (>40 ha) wheat farmers under the Cereal Growers Association[13], with the large-scale farmers accounting for 80% of total output.

The main wheat producing regions are the areas above 1,500 m in the Nakuru, Uasin Gishu, Trans Nzoia and Laikipia districts of western Kenya. The fragmentation of some of the large farms in these districts resulted in a switch to maize production or a combination in which wheat is grown as a cash crop and maize is produced for subsistence consumption. However, new wheat growing areas have developed on land leased from Masai pastoralists in Narok. Makanda and Oehmke (undated) report that the GOK estimates up to 500,000 ha could be planted to wheat in Narok.

Long-term trends indicate that the total area planted to wheat has increased very little since independence and has remained at about 120,000 ha for the last decade. Trends also indicate that yields increased at an annual rate of about 1.5% between 1960 and 1985. Since that period, however, they have trended downward at an average annual rate of about -0.7%. The regional shift from the large farm area in western Kenya to Narok and a greater share of production coming from small-scale farmers likely explain this decline in yields. The shift towards more liberalized markets in the 1990s may also be a factor.

Table 10 shows Kenya wheat production and disposition over the period 2005-2010. Production averaged about 348,000 tonnes, with about 3% of this being retained for seed. Exports were negligible, while imports averaged about 668,000 tonnes, contributing to an average supply of just over one million tonnes. Table 10 also shows the variability in supply during this period; production varied from a low of 219,000 tonnes in 2009 to 512,000 tonnes in 2010. The low level of production in 2009 is likely related to the drought following post-election instability in 2007/2008. Imports appear to have been somewhat pro-cyclical, with the highest levels occurring in the same year as highest production.

[13] In comparison, there are an estimated three million maize farmers in Kenya.

Table 10: Kenya wheat production, trade, supply and disposition, 2005-2010

	Unit	2005	2006	2007	2008	2009	2010
Production	1,000 T	369	329	322	337	219	512
Sales to marketing boards	1,000 T	123	99	108	82	123	190
Retention for seed	1,000 T	12	8	10	10	10	10
Imports	1,000 T	622	650	564	539	782	848
Available supply	1,000 T	991	980	887	875	1,001	1,360
Normal consumption	1,000 T	927	960	994	1,030	1,067	1,105
Surplus/shortage	1,000 T	64	19	-108	-155	-66	256
Import dependency ratio	%	63	66	64	62	78	62

Sources: FAOSTAT for production and seed retention; KNBS SA Table 60 and ES Tables 8.11 & 8.12 for sales to marketing boards; imports from SA Table 46, ES Table 7.5.

Consumption and trade

Between 1960 and 2011, apparent consumption increased steadily at an average annual rate of over 4% and shows no sign of slowing. With production largely stagnant, the gap has been met by the elimination of exports in the early 1960s and a continuous increase in imports.

The average annual per capita wheat intake over the period 2005-2010 was slightly more than 28 kg, compared to 91 kg for maize. The estimates for normal consumption shown in Table 10 were calculated by multiplying this average per capita intake by the estimated population in each year. Shortages and surpluses were then found by subtracting normal consumption from the available supply. The results in Table 10 show large shortages in 2007 and 2008, resulting from a significant drop in imports, which may have occurred in response to the higher price for wheat in world markets during the global commodity price crisis.

As mentioned previously, Kenya meets much of its demand for wheat through imports. Between 2006 and 2010, more than half of Kenya's wheat imports came from Russia and Ukraine, with Argentina and the United States being the third and fourth most important suppliers, respectively.

Under COMESA, Kenya's import tariffs were harmonized with those of other member countries at 35% for wheat and 60% for wheat flour. The EAC adopted these rates in its agreement on a common external tariff in 2004. However, members of COMESA and the EAC have agreed to a process that allows EAC member countries to vary these rates as circumstances require. Therefore, in response to climbing global prices, Kenya reduced its wheat tariff from 35% to 25% in 2007–2009.

In 2010, Kenya's tariff was reduced further to 10%. This was done by a duty remission scheme in which importers initially paid the 35% tariff and then applied for remission. This approach may have been used as a means of limiting the quantity eligible for the lower tariff. The decision to reduce the tariff was made despite protests by large-scale farmers in Narok.

Value chain

Small-scale wheat farmers in Kenya sell to the NCPB, while medium- and large-scale farmers sell either to the NCPB or directly to millers. Farmers deliver their wheat to millers in Nairobi or to NCPB depots located near production areas. Wheat purchased by the NCPB is then sold to millers, sometimes at a reduced price. After processing, wheat flour is packaged and sold either to Kenya's bakery industry or to wholesalers for distribution to retailers and consumers. Additionally, by-products of the milling industry are often used as inputs for the animal feed industry.

Government involvement in the value chain currently entails providing support to farmers in the form of research and extension, regulating and promoting trade, and in the form of the NCPB, which is responsible for maintaining a food reserve as well as monitoring and stabilizing market prices.

Farmer and miller organizations also play a role in the value chain. Farmers are represented by the Cereal Growers Association, which is centred on large-scale farms in western Kenya, and the Narok Wheat Farmers Association. The millers are represented by the Cereal Millers Association.

Indicators

In this analysis, the average price paid by the NCPB was taken as the farmgate price for wheat. Presumably, farmers receive a price that compensates them for the additional costs they must bear in trucking wheat from the farm to NCPB depots. Since reliable wholesale prices were not available, the wholesale price was inferred from the border price by adding a margin for the costs of clearing the port and transporting the wheat to Nairobi. Appropriate adjustments were made to account for quality differences between domestic and imported wheat.

Between 2005 and 2010, the average observed and adjusted NRPs at wholesale were 17% and 19%, respectively. At the farm gatethe farm gate, adjusted and observed NRPs were nearly equivalent in all years, both averaging 45% (see Figure 12). These high rates of protection indicate that wholesalers and producers faced strong market price incentives, which were largely due to the tariffs levied on wheat imports throughout the period analyzed. As mentioned previously, tariff rates were reduced as circumstances required, from 35% in years 2005-2006 to 25% in years 2007-2009 and finally to 10% in 2010.

Figure 12 shows that observed NRPs at wholesale remained below the effective tariff rate in each respective year, declining steadily from about 23% in 2005 to 8.5% in 2010. It also shows that observed NRPs at the farm gate were not only substantially higher than those at wholesale, but were also equal to or greater than the effective tariff rate in each respective year. This is mainly due to the fact that the observed price gap at the farm gate was larger than the absolute value of the tariff in all years, especially in years 2007-2009. The surge in global prices in 2007 and 2008 may have been a factor in securing these high prices for wheat farmers. However, in 2009, domestic prices remained high due to widespread drought that caused a drop in production. In this particular year, the price gap at farm gate was nearly three times the absolute value of the tariff, which suggests that farmers were being overpaid because they were receiving a price that includes the tariff and much more.

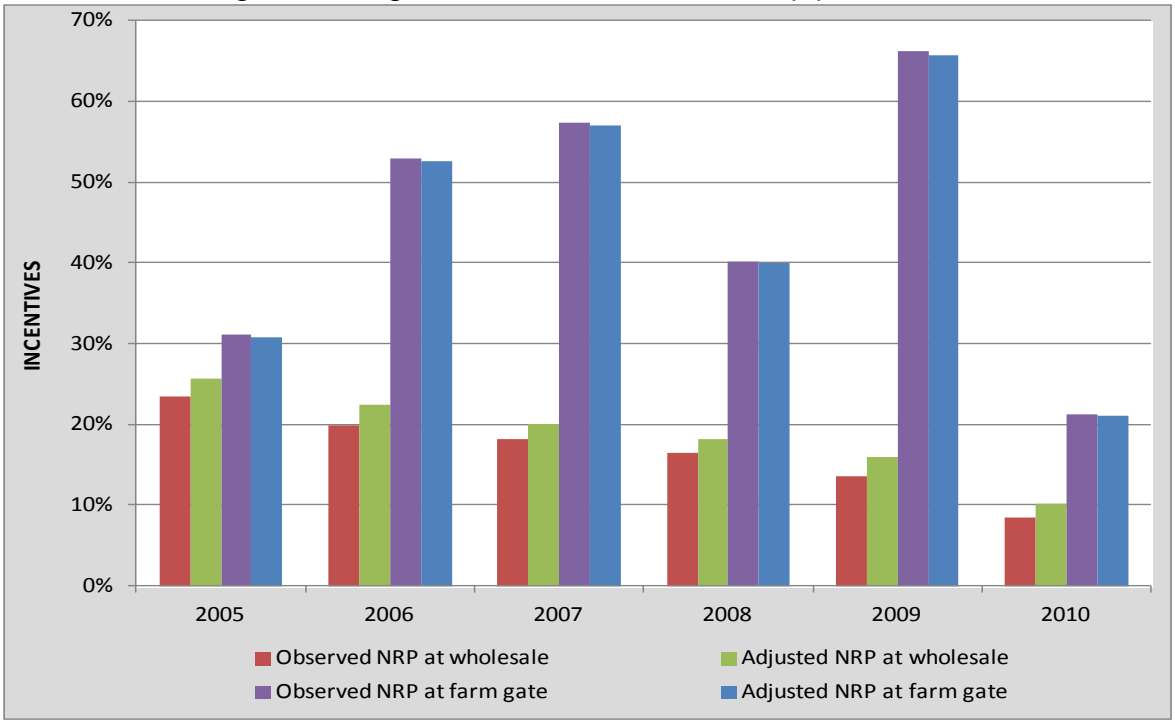
One potential reason why farmers may be overpaid is that large-scale wheat farmers have significant market power and are able to determine the price paid by the NCPB. According to one observer, Kenya wheat producers insist on:

"Using the import parity pricing of hard wheat from Australia or Argentina, yet hard wheat and soft wheat are two separate products. Even the quality level of imported soft wheat is higher than that of the locally produced soft wheat. Furthermore, local producers rarely meet the recommended moisture content of 13% that allows easy separation of the germ from the endosperm." (Nyangito, Ikiara, and Ronge, 2002)

During the period analyzed, wheat was primarily imported from Russia and Ukraine at prices considerably below those of Australia hard, white wheat. If the price paid to farmers is in fact based on the import parity for Australia hard, white wheat, this might explain the large difference seen in the price gaps.

Another potential reason why farmers may be overpaid is that the NCPB may simply overestimate the opportunity cost prices that millers would need to pay and, as a result, are establishing prices higher than necessary.

Figure 12: Farmgate and wholesale NRPs for wheat (%), 2005-2010



Source: MAFAP

Main message

The results of this analysis show that wheat farmers are highly protected and that a large share of this protection is attributable to Kenya's tariff on wheat imports. For more than 50 years, Kenya has provided protection to wheat producers, even though many of them are large-scale commercial farms. While government protection of wheat farmers could perhaps have been justified in the past because most wheat was consumed by high-income households, recent trends indicate that low-income Kenyans in Nairobi are spending 10.7% of their total food expenditure on wheat and wheat products, compared to 11.5% for maize. Even in other urban areas, Kenyans are spending nearly as large a share of their food budget on wheat and wheat products as they do on maize and maize products – 9.7% versus 13.5%. Thus, a tariff on wheat is a tariff on poor consumers and, as this analysis has shown, it affects prices.

In addition to import tariffs, this analysis indicates that a significant share of market price incentives for wheat farmers can also be explained by the fact that farmers are likely overpaid by the NCPB. Our findings suggest that this may occur for two potential reasons –large, commercial wheat farmers have considerable market power, which allows them to demand a more favourable price for their wheat based on a higher quality wheat than what they actually produce; and the NCPB overestimates the opportunity cost prices that millers would need to pay and, as a result, are establishing prices higher than necessary.

Rice

Rice is the fourth most important staple food in Kenya after maize, wheat and beans. Rice is mainly produced by smallholder famers on irrigation schemes managed by the National Irrigation Board (NIB) and is traditionally considered a cash crop sold to urban consumers with moderate to high incomes. Since the 1960s, growth in rice consumption has outpaced production, resulting in an annual deficit, which Kenya continues to meet through imports from the Far East.

Kenya has established similar policy goals for rice as it has for maize and wheat. Kenya's long-term goal is self-sufficiency, while its short-term goal is to stabilize prices, though the latter objective has been less formally enunciated than the former. Protective trade measures have been the government's primary means of achieving these objectives. Unlike maize, rice and wheat are imported from the world market on a routine basis, so tariffs have been effective in keeping prices high for producers. However, this protection comes at a high cost to consumers.

Production

The two most often cited estimates for rice production, area and yield in Kenya are those of the MOA and those of the NIB for rice produced on its irrigation schemes (see Table 11).[14] Chemonics Inc. (2010) and Gitau et al. (2011) claim that about 95% of total rice production comes from NIB irrigation schemes. This has likely been the case in the past, but the data Table 11 indicate that on average only 78% of total production came from the schemes between 2005 and 2010.

MOA estimates for total production and area should be larger than NIB estimates in all years because they include non-NIB irrigated production and production on lowland and highland rainfed rice fields. Non-NIB irrigated production includes private rice irrigation enterprises and small-scale irrigation schemes established by other agencies, such as the Lake Basin Development Authority. It also includes production from Dominion Farms Limited (DFL), a large-scale, vertically integrated farm, with nearly 7,000 ha of irrigable land in the Yala Swamp Region near Lake Victoria.[15]

There are obvious inconsistencies between these two data sources in 2008 and 2010. Extremely low production in calendar year 2008 could be masked in the NIB production data, which are reported by crop year for the schemes. MOA (2008) itself gives a much higher 2008 estimate for total production

[14] NIB production estimates were converted at a rate of five tonnes of milled rice from eight tonnes of paddy rice (rough or unmilled rice).

[15] This is equivalent to 60% of the average amount of irrigated land on the NIB schemes between 2005 and 2010. However, it's likely that only about 1,000 ha were developed for irrigation by 2010. The DFL value chain is substantially different from that on the NIB schemes.

in its *National Rice Development Strategy* (2008-2018), while the 2010 estimate for total production may be revised up to 50,000 tonnes, according to the *FAO* (2011a) *Rice Market Monitor*.

Faced with this type of inconsistency about production and likely major differences in the value chains for different groups of producers, this analysis focused solely on production from the NIB rice schemes.

Table 11: Kenya milled rice production, area and yield, 2005-2010

	Unit	2005	2006	2007	2008	2009	2010
Total							
Production	T	57,942	64,840	47,256	21,881	42,202	44,468
Area	ha	15,940	23,106	16,457	16,734	21,829	n.a.
Yield	T/ha	3.6	2.8	2.9	1.3	1.9	n.a.
NIB Schemes		2004/05	2005/06	2006/07	2007/08	2008/09	2009/10
Production	T	39,173	39,366	33,196	25,041	23,249	45,313
Area	ha	10,832	12,501	9,626	9,092	10,072	17,611
Yield	T/ha	3.6	3.1	3.4	2.8	2.3	2.6

Source: Total production data are from MOA, 2010 (Table 5.7 for 2005-2009) and 2010 total production data are from FAO Countrystat; NIB schemes data are from KNBS (SA Table 67 and ES Table 8.18).

Four NIB schemes currently produce rice in Kenya. Mwea in central Kenya is by far the largest, accounting for 78% of the irrigated area, 88% of production and 98% of the gross value of output between 2005 and 2010, according to NIB data. The other three rice producing schemes – Ahero, Bunyala and West Kano – are located in western Kenya.

Long-term trends indicate that there was little change in rice production and yield between 1985 and 1998, despite the implementation of a large Japanese supported project, which improved rice production on the Mwea scheme throughout most of this period. However, both yield and production increased between 1999 and 2010, albeit with two major down cycles between 1999 and 2002 and between 2007 and 2009.

The first dip in production and yields was due to a rebellion on the part of plot holders on the Mwea Irrigation Scheme in 1998, followed by a widespread drought in 2000/01. The second dip stemmed from several factors, including the spike in world commodity prices in 2007/08, which may have affected the cost and availability of fertilizers needed to maintain rice yields, as well as civil disturbances that followed the December 2007 election, and a subsequent drought in 2009.

With the exception of these down cycles, overall growth in yield and production since 1999 was likely related to the liberalization of production controls, reduced market access costs for producers and better milled rice prices further up the value chain.[16]

Consumption and trade

Several sources have noted Kenyans' preference for aromatic basmati rice produced on the Mwea scheme, which is relatively high-value rice. The Consumer Price Index (CPI) expenditure weights for rice indicate its relative importance for different consumer groups. For low-income consumers in Nairobi, rice accounts for 3.9% of food expenditure compared to 11.5% and 10.7% for maize and wheat, respectively. In other urban areas, rice accounts for 4.8% of food expenditure compared to 13.5% and 9.7% for maize and wheat, respectively.

Table 12 shows the available supply (i.e. apparent consumption) for milled rice throughout the period 2005-2010. Rice consumption has been growing much more rapidly than production at an average rate of 11% per year since 1960. As a result, imports have increased rapidly, and the import dependency ratio has climbed higher in most decades, averaging 23% in the 1960s, 15% in the 1970s, 53% in the 1980s and 88% in the 1990s. Growth in consumption appears to have slowed to only 3% per year between 2005 and 2010, but the import dependency ratio for the decade remained at about 88%.

Table 12: Kenya milled rice production, trade and supply, 2005-2010

	Unit	2005	2006	2007	2008	2009	2010
Production	T	57,942	64,840	47,256	21,881	42,202	44,468
Imports	T	228,206	232,305	261,712	299,070	308,158	284,368
Exports	T	n.a.	801	597	1,481	2,310	1,640
Available supply	T	279,800	296,344	308,371	319,470	348,050	327,196
Import dependency ratio	%	80	78	85	93	87	86

Sources: Production data for 2005-2009 and consumption data for 2005 from MOA-ERA, 2010; 2010 production data from CountryStat; export data for 2005 from KNBS (SA Table 46 for 2005); import and export data for 2006-2010 from Global Trade Atlas.

Kenya imports most of its rice from Pakistan, which accounted for 74% of total rice imports throughout the period 2006-2010.[17] Vietnam is the next largest source of rice imports, accounting for 9%, while Thailand, India and Egypt each accounted for 4% of total imports during this time period.

[16] Before 1999, the NIB specified nearly all production practices, provided land preparation, seed, fertilizer and pesticides and farmers were required to deliver their crop for milling to the NIB mills. Farmers had to bear the cost of delays in land preparation and seeding and inefficiencies in milling and marketing (see Kabutha and Mutero, 2001 and Ruigu, 1988).

[17] Data on imports are from the Global Trade Atlas (GTA). The earliest data available from GTA are for 2006.

The dominance of Pakistan in all years between 2006 and 2010 is the result of Kenya's tariff structure. Under the EAC Common External Tariff Agreement, Kenya was to increase its external tariff to a 75% ad valorem duty or USD 200/tonne, whichever is greater. However, Kenya obtained an exemption for rice imports from Pakistan throughout the period and was able to reduce the tariff to only 35%, while rice imports from other countries were still subject to the agreed EAC tariff, forcing them to compete at a 40% tariff differential.

Value chain

Three main rice marketing chains can be identified within the Kenyan rice sector – the vertically integrated chain of the Dominion Farms Ltd. (DFL), the traditional value chain of non-NIB irrigation schemes and rainfed producers and the highly concentrated value chain of NIB irrigation schemes, particularly Mwea. These chains differ considerably in terms of the types of rice they produce and how the rice is marketed.

The NIB and the Mwea Rice Farmer's Cooperative Society jointly own Mwea Rice Mills Ltd. (MRML), which has four mills on the Mwea irrigation settlement. Milled rice from MRML is sold to supermarkets and the NCPB under their Nafaka brand. There is a similar arrangement in western Kenya where Western Kenya Rice Mills Ltd. (WKRM) is jointly owned by the NIB and farmers of the Ahero, Bunyala and West Kano schemes through their respective cooperative societies.

Farmers on the NIB irrigation schemes are now free to market their own rice, and there are a large number of traders and small-scale rice millers that form a local wholesale market. According to Gitau et al. (2011), the introduction of diesel powered mills has increased the number of options in the milling industry. This rice may be sold as generic rice or find its way into a branded product line. Chemonics Inc. (2010) indicates that a large share of Mwea rice is milled by Capwell Rice Millers, a large-scale private sector miller in Thika, which markets rice under its Pearl Rice brand.

DFL farms, mills and markets its rice under its own *Prime Harvest* brand. Other non-NIB irrigated rice and rainfed rice is likely marketed through traders and small-scale millers as generic rice.[18]

Indicators

As mentioned previously, this analysis focused solely on production from the NIB rice irrigation schemes. The average wholesale price for milled rice in Nairobi was taken as the price at the point of competition, while the national average price for paddy rice was taken as the farm gate price. Appropriate adjustments were made to account for quantity differences between milled and paddy rice throughout the value chain. It is important to note that while the NIB schemes account for most rice production in Kenya, the results of this analysis are not fully representative of all value chains in the sector.

Between 2005 and 2010, the observed NRP at wholesale ranged from 62 to 105% and averaged 82%, while observed NRPs at farm gate ranged from 96 to 168% and averaged 132%. These high rates of

[18] Low-income consumers in rural areas might be more likely to consume generic rather than branded rice, but the prevalence of branded rice products is likely connected to the growth of the supermarket industry. This may be an important development for Kenya's rice value chains, especially if they are reaching low-income consumers in urban areas.

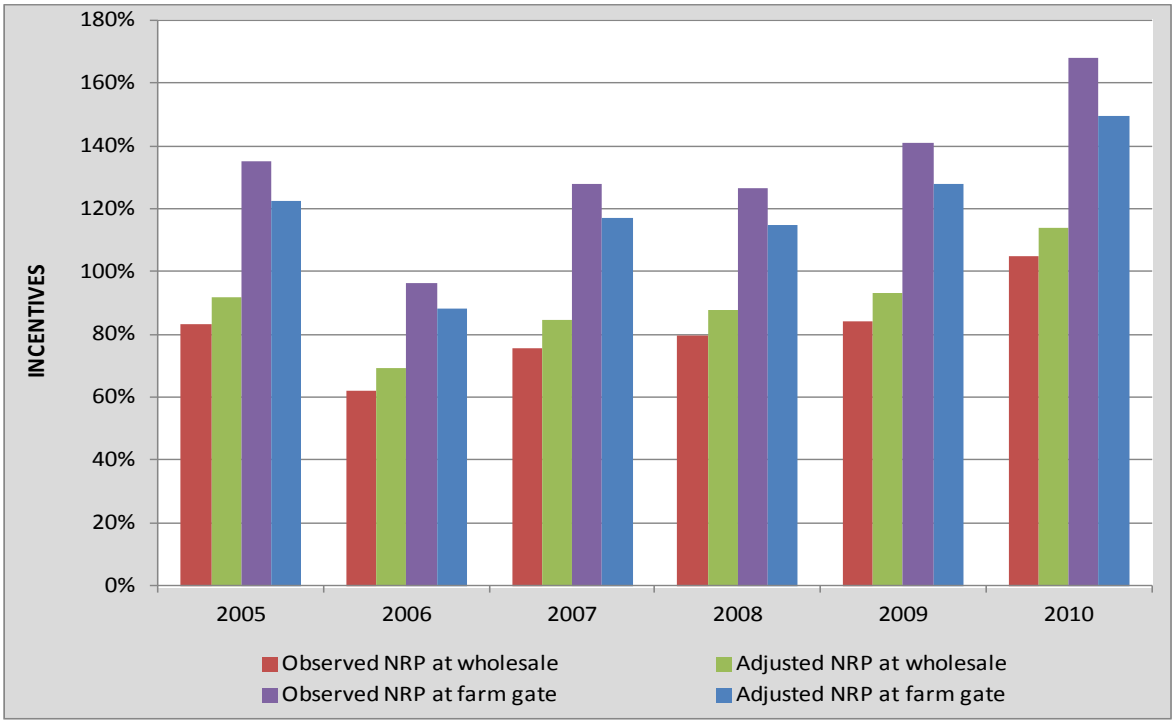
protection indicate that wholesalers and producers faced strong market price incentives, which were a direct result of the 35% tariff levied on imports from Pakistan and the 75% tariff, or USD 200/tonne tax (whichever was greater), levied on imports from all other non-EAC countries throughout the period analyzed.

Figure 13 shows that the rates of protection at wholesale and farm gate exceeded Kenya's highest tariff rate of 75% in all years, except at the wholesale level in 2006, which suggests there may be additional factors influencing the level of protection. It is likely that the relatively low rates of protection in 2006 resulted from the spike in rice production and imports that year. Higher national supply would have presumably depressed domestic prices, thereby generating lower NRPs than those seen in other years.

As shown in Figure 13, adjusted NRPs at farm gate were lower than observed NRPs in all years, averaging 120% throughout the period under review. This indicates that market inefficiencies along the rice value chain analyzed represent significant opportunity costs for producers. On average these costs amounted to an MDG equal to about 5% of the adjusted reference price at farm gate. These inefficiencies are mainly due to government taxes and fees, as well as traders' excessive profit margins.[19] If these distortions were eliminated and the market functioned more efficiently, producers would be better off than they are under existing market conditions.

[19] Excessive profit margins are defined as margins exceeding 10% of the agent's full financial costs (crop purchase plus access costs). It was estimated that rice traders typically realize a profit equal to about 15% of their full financial costs based on data reported by Gitau et al. (2010).

Figure 13: Farmgate and wholesale NRPs for rice (%), 2005-2010



Source: MAFAP

Main message

Rice farmers are highly protected under Kenya's tariff regime. Despite the lower and more favourable tariff rate of 35% levied on imports from Pakistan, prices in Kenya appear to be largely determined by the 75% tariff, or USD 200/tonne tax (whichever is greater), levied on imports from all other non-EAC countries.

Producers benefiting from Kenya's tariffs on rice imports are relatively low-income farmers with a small land base of less than two hectares. However, it is important to note that while Kenya's policy protects producers, it does so at the expense of consumers by raising domestic rice prices. It seems likely that most consumers affected are those in urban areas with moderate to high income, since many low-income consumers still cannot afford to purchase rice.

Sugar

The sugar industry plays a significant role in Kenya's economy, contributing about 15% to the country's agricultural GDP (KSI, 2009). The sector is dominated by smallholder farmers, who supply over 92% of the sugarcane processed by sugar companies, while the remainder is supplied by factory-owned nucleus estates (KSI, 2009; KSB, 2010).

The government supports the sugar industry through direct investment in sugar mills. However, the industry continues to operate below capacity and is unable to meet Kenya's national demand for sugar or compete with more efficient producers in the international market. For this reason, Kenya's sugar sector remains protected, often at the expense of local consumers.

In recent years, Kenya's sugar industry has faced several key challenges, including trade liberalization under the COMESA and WTO protocols, high costs of production compared to other sugar producing countries in the region, the dilapidated state of some factories, poor governance and management,

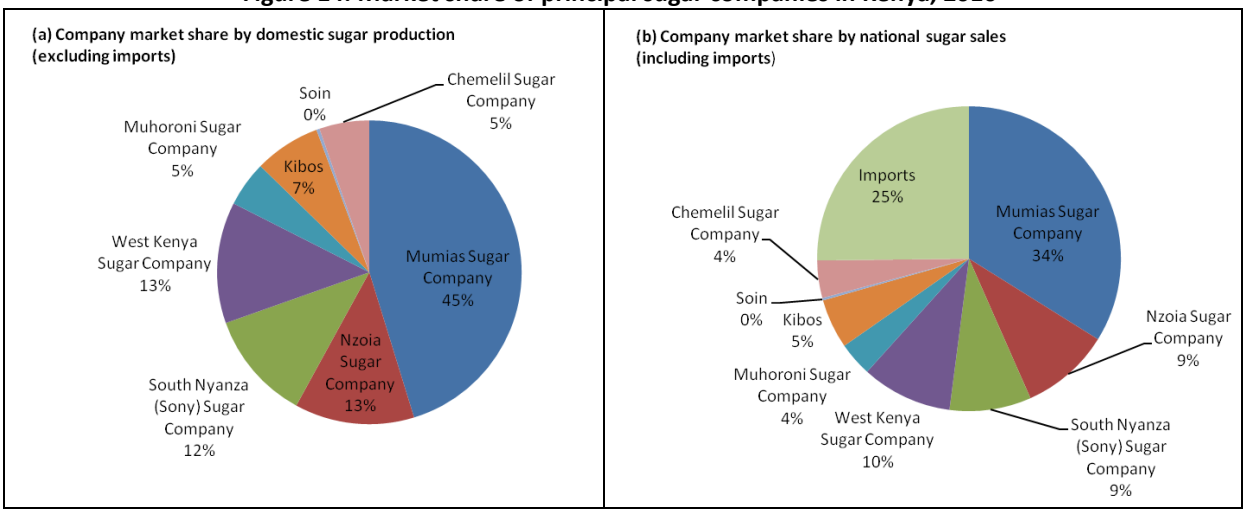
insufficient funding and inadequate research and extension services (KSI, 2009). These challenges have led to the development of a new national strategy for the sector, which focuses on industry privatization, improved access to credit, sector research and diversification (USDA, 2011; USDA, 2012).

Production

Average annual growth in sugarcane production increased from about 1% in the 1980s to about 4% over the past decade. Historical trends indicate that growth in production in recent years has been more correlated with increases in total land planted to sugarcane rather than increases in yield (KSI, 2009). In fact, the average yield declined from about 100 t/ha in the 1980s to 87 and 84 t/ha in the 1990s and 2000s, respectively. Potential reasons for this reduction in productivity include the widespread use of low-quality sugarcane varieties, poor agricultural and land management practices and delayed harvesting of mature sugarcane (KSB, 2010).

Figures 14a and 14b show the market share of principal sugar companies operating in Kenya. Data on market share by domestic sugar production in 2010 shows a concentrated structure, where the largest four companies produced 83% of the country's raw sugar, with Mumias Sugar Company accounting for almost half of total domestic production. As illustrated in Figure 14b, Mumias Sugar Company also accounted for the largest share of national raw sugar sales (34%) in 2010, followed by importers, who accounted for about 25% of national sales (KIPPRA, 2010). However, according to KIPPRA (2010), there is no clear dominant player in the national sugar market.

Figure 14: Market share of principal sugar companies in Kenya, 2010



Source: KSB, 2010 & KIPPRA, 2010

Consumption and trade

Over the past three decades, sugar consumption in Kenya has grown steadily, outpacing domestic production. Kenya relies on raw sugar imports to cover its national deficit. Between 2005 and 2010, Kenya's average import dependency ratio for raw sugar was around 27% (see Table 13).

Table 13: Raw sugar production, trade and supply, 2005-2010

	Unit	2005	2006	2007	2008	2009	2010
Production	T	488,100	517,000	520,404	511,900	547,999	523,652
Imports	T	149,664	166,326	230,013	220,176	184,537	195,000
Exports	T	11,978	14,519	22,267	45,096	2,136	2
Available supply	T	625,786	668,807	728,150	686,980	730,400	718,650
Import dependency ratio	%	24	25	32	32	25	27

Source: FAOSTAT

Almost all of Kenya's raw sugar imports are from COMESA countries. Egypt and Swaziland are Kenya's top import partners, accounting for 87% of the total volume imported throughout the period 2005-2010 (GTA, 2012).

Over the past 25 years, the government has made substantial investments in the sugar sector, particularly in sugar mills. Despite government support, Kenya's sugar industry continues to suffer from the highest production costs in the region, as shown in Table 14. These costs not only limit the industry's capacity to meet the national demand for sugar, but they also hinder its ability to compete with more efficient producers in the international market.

Table 14: Sugar production costs in selected COMESA countries, 2009

	Unit	Kenya	Sudan	Egypt	Swaziland	Zambia	Malawi	Uganda	Tanzania
Cost	USD/T	415-500	250-340	250-300	250-300	230-260	200-230	140-180	180-190

Source: KSI, 2009

Due to high production costs, Kenya's sugar industry has remained under threat from cheap imports (KIPPRA, 2010). As a result, Kenya restricts access to its domestic market through tariff and non-tariff barriers. Non-COMESA countries are required to pay a 100% ad-valorem Common External Tariff, apply for permission from the Kenya Sugar Board (KSB), pay a 16% VAT and a Sugar Development Levy and submit extensive quarterly and annual records (USDA, 2012).

On the other hand, COMESA countries fall under an over-quota tariff regime, which limits raw sugar imports to a set amount each year and applies an ad-valorem tariff to imports exceeding that amount (see Table 15). Although these safeguards expired in February 2008, they were extended to February 2012 by the COMESA Council under the condition that the GOK make a concerted effort to improve the competitiveness of its sugar industry and gradually remove all trade barriers (KIPPRA, 2010). By 2012, a free trade regime was supposed to be in full operation between COMESA countries. However, in 2011, the GOK petitioned to renew the extension of Kenya's COMESA safeguards until 2014 (USDA, 2012). The petition was granted, maintaining the 2012 quota and tariff conditions until 2014.

Table 15: Protective trade measures applied to raw sugar imports from COMESA countries

	Unit	Before 2008	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15
Quota	1,000 T	200	220	260	300	340	340	340	0
Over-Quota Tariff Rate	%	100	100	70	40	10	10	10	0

Source: KSI, 2009 & USDA, 2012

Value chain

Most sugarcane is grown by smallholder outgrowers, who have low technical capacity, limited capital and typically produce sugarcane under rainfed conditions. The processing component of the value chain consists of 11 sugar factories, six of which are privately owned, while the others are public or mixed-owned (Pem Consult A/S and Particip GMBH, 2012).

Outgrowers sell their outputs directly to factories. Prices paid to outgrowers are set each season by the Cane Pricing Committee, which is comprised of representatives from the KSB, Kenya Sugarcane Growers Association (KESGA) and Kenya Sugar Millers Association (KESMA). The 2001 Sugar Act requires that sugarcane prices are determined based on sucrose content rather than weight (KSB, 2009). The objective of this pricing system is to encourage farmers to deliver high sucrose sugarcane and millers to improve their sugar recovery ratio, thereby boosting the industry's overall productivity (KSI, 2009).

Harvesting and transportation account for 45% of total sugarcane production costs (KSB, 2010). These two activities are often considered jointly because the cane must be transported to processing facilities within hours of harvesting to avoid spoiling. Sugarcane harvesting is extremely labour intensive, requiring an average of 71 man-days/ha (KSB, 2010). Additionally, sugarcane is a bulky crop, which makes it expensive to transport (KSI, 2009). These costs are assumed by outgrowers, as they are deducted from the producer price paid at farm gate (KSB, 2010).

Every sugar factory in Kenya has its traditional supply zones, where it works together with outgrowers to obtain inputs. Factories coordinate with private transportation companies or provide their own transportation for sugarcane collection, scheduling it according to their quantity requirements. However, due to frequent breakdowns from maintenance problems, factory demand for sugarcane is often inconsistent and unpredictable. Although outgrowers assume the full cost of transportation, they have no real control over transportation companies or the sugarcane collection schedule. In fact, outgrowers continually report costly delays of 6 and up to 12 months in the mature cane harvest due to inconsistent collection schedules and inefficiencies in factory operations (KSI, 2009).

Kenya's sugar factories have the combined installed capacity to process more than 24,000 tonnes of cane per day. If this capacity were fully exploited, the industry could meet the national demand for sugar. However, factories continue to operate at a capacity utilization of only 55 to 60% due to significant technical and management limitations (KSI, 2009; KSB, 2010).

One indicator of a sugar factory's production efficiency is its conversion ratio (also known as the sugar recovery ratio), which is the amount of sugarcane needed to produce one unit of raw sugar.

When comparing the conversion ratios of Kenya's sugar factories, there is a significant difference between private and government-owned companies. For example, in 2008, the conversion ratio for the privately owned Mumias Company was 9.65, while the conversion ratio for the publicly owned Muhoroni Company was 12.67 (KSB, 2010). This means that Muhoroni required three more tonnes of sugarcane than Mumias to produce one tonne of raw sugar.[20]

Even though a factory's conversion ratio largely depends on the technology used and the quality of sugarcane supplied by producers, sugar loss by delay between harvest and processing, factory management and processing time also affect production efficiency. In 2008, the overall time efficiency for Mumias was 83%, while the time efficiency for Muhoroni was only 63% (KSB, 2010).

Processed sugar is sold to the local food industry and households through an integrated network of private wholesalers, retailers and distributors. The ex-factory price paid by wholesalers incorporates the cost of the sugarcane, milling, processing, packaging, factory operations, the factory's profit margin, and government levies, which include a 16% Value Added Tax (VAT) and a Sugar Development Levy imposed by the KSB (KSB, 2010).

According to the KSB's 2010 sugar value chain analysis, the main factor hindering sugar marketing is the high cost of transportation due to long distances travelled, poor road conditions and a distribution system controlled by few players, as well as inadequate packaging and branding.

Indicators

In this analysis, NRPs were measured at the farm gate and at the factory gate so that market price incentives for sugar factories could be compared to those for farmers. Consequently, the average ex-factory price for raw sugar was taken as the price at the point of competition, while the average price that factories paid to farmers for sugarcane inputs was taken as the farm gate price. Appropriate adjustments were made to account for quantity differences between raw sugar and sugarcane throughout the value chain.

Between 2005 and 2010, the average observed NRPs for factories and farmers were 16% and 31%, respectively. Figure 15 shows that observed NRPs at the factory gate and farm gate were generally positive, indicating that both groups of producers were protected. Figure 15 also shows that observed NRPs at the farm gatethe farm gate were higher than those at the factory gate level in most years, but that observed NRPs at both levels declined gradually throughout the period analyzed. This decreasing trend is consistent with the gradual liberalization of Kenya's national sugar market. Since raw sugar imports remained below or close to the import quota, it is reasonable to assume that domestic prices and NRPs were more influenced by the import quota than by the over-quota tariff.

The effect of a binding import quota is similar to the effect of a tariff in that it raises domestic prices. However, the main difference between quota and a tariff is that the government does not receive revenues from the quota. Instead, those parties with a license to import raw sugar receive quota rents, or profits from purchasing cheap sugar in the international market and selling it at a higher

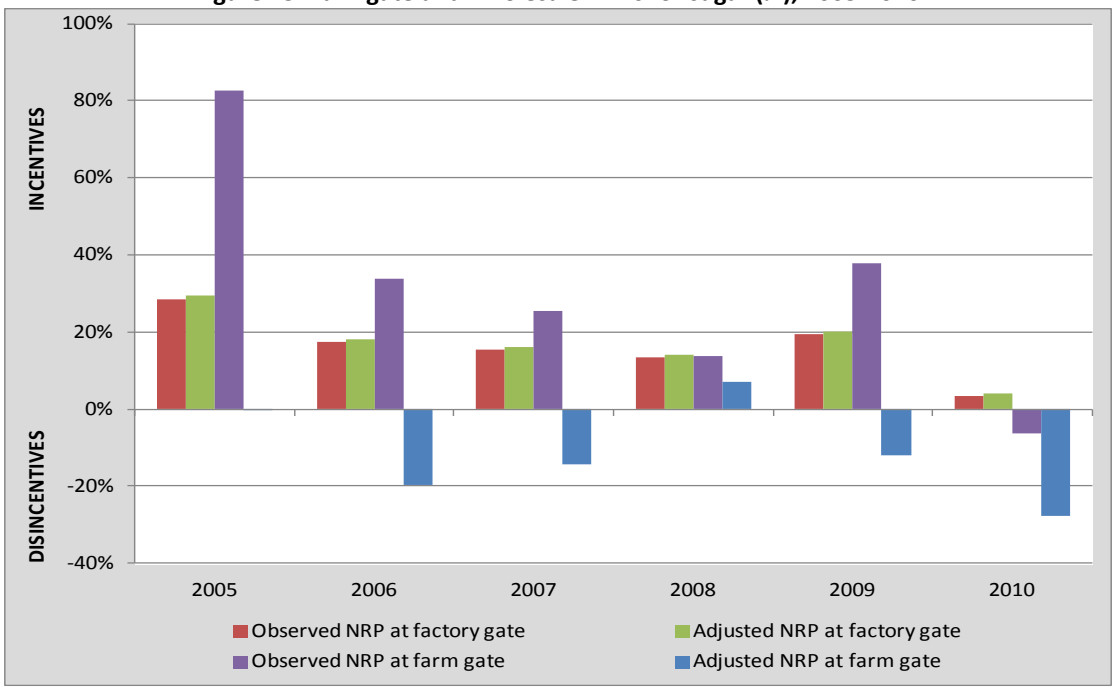
[20] This is mainly an issue of technology, which can be examined further by comparing the opportunity cost of lost sugar to the cost of upgrading machines.

price in Kenya. Thus, the quota rent is equivalent to the difference between the domestic price for raw sugar (demand price) and the international price (supply price) at the quota limit.

In this case, the price gaps at the factory gate and farm gate reflect the value of the quota rent per tonne. The results in Figure 15 show that as the quota gradually increased between 2005 and 2010, the effect of the quota weakened, thereby reducing the quota rent (price gap). In 2010, observed NRPs at the farm level were negative, indicating that the quota rent was also negative. This implies that the quota may have been non-binding that year, possibly because it exceeded the quantity demanded at the market equilibrium.

Adjusted NRPs shown in Figure 15 capture the effect of MDGs. As illustrated, adjusted NRPs at the farm gate were substantially lower than observed NRPs and were generally negative, averaging -11% throughout the period analyzed. This indicates that market inefficiencies along the sugar value chain represent very high opportunity costs for farmers, amounting to an average MDG equal to 30% of the adjusted reference price at farm gate. Most of this large MDG can be attributed to factories' excessive profit margins.[21] It is estimated that if profits were distributed more equitably between farmers and factories, farmers could potentially receive a price up to 36% higher than the price they currently receive.

Figure 15: Farmgate and wholesale NRPs for sugar (%), 2005-2010



Source: MAFAP

[21] Excessive profit margins are defined as margins exceeding 10% of the agent's full financial costs (crop purchase plus access costs). It was estimated that the profit margins of sugar factories averaged about 31% of their full financial costs throughout the period analyzed. This estimate was based on data reported by KSB (2010).

Main message

Sugarcane farmers generally received market price incentives under Kenya's protective trade policies, but these incentives decreased as the quota limit was raised and the over-quota tariff on raw sugar imports from COMESA countries was reduced throughout the period analyzed. In 2010, when the quota limit was raised to the point where it was no longer binding, the results demonstrate that sugarcane farmers actually faced market price disincentives.

Results from this analysis also show that market price disincentives resulting from sugar factories' high profit margins generally outweighed the incentives that farmers received from Kenya's protective trade measures. As trade restrictions were gradually lifted and domestic sugar prices decreased, factories lowered the price paid to farmers in order to maintain their profit margin. Therefore, it is clear that the market power of sugar factories hinders sugarcane outgrowers. Under these conditions, factory margins represent high opportunity costs for farmers. If factories continue to control the market, then farmers will likely face increasing price disincentives in future years, as international trade restrictions are further reduced and Kenya moves toward full market liberalization.

Cotton

Even though cotton no longer stands among Kenya's leading cash crops such as tea, sugarcane and coffee, it was once an important source of income for rural communities, as well as an important source of raw material for a thriving national textile industry. Despite the sector's decline in recent years, cotton is still considered one of the few cash crops with real potential for increasing household incomes and employment opportunities in Kenya's ASAL regions (CODA, 2008). Consequently, revitalization of the cotton sector is a key development and industrialization initiative to be implemented under Kenya's *Vision 2030* strategic plan and *Medium Term Plan, 2008-2012* (GOK, 2008).

Contrary to the situation in neighbouring cotton producing countries, Kenya is endowed with a well-developed textile industry that requires a constant supply of cotton lint. However, this industry has been operating below capacity, partly due to the insufficient supply of domestic inputs. In 2000, a preferential trade agreement under the African Growth Opportunity Act (AGOA) was signed with the U.S. Government, which eliminated all duties and quotas on Kenyan textile exports to the U.S. market. As a result, Kenya's textile exports to the U.S. have increased significantly over the past decade, peaking at 300 million USD in 2004 (U.S. DoC & ITC, 2012). Despite this growth in exports, very few benefits have been realized by local cotton producers, as the textile industry imports most of its factory inputs from neighbouring countries.

Since market liberalization in 1991, the cotton-to-garment value chain in Kenya has lacked the structure and institutional dynamics required to compete with global players like China, or even with regional competitors, and is far from realizing its true potential. In an effort to revitalize the country's cotton sector, the MOA passed the Cotton (Amendment) Act in 2006, which provided the legal framework to re-organize the sector, allowing stakeholders to regulate the industry through the Cotton Development Authority (CODA), under the supervision of the MOA (CGD, 2005).

Production

Kenya's cotton sector is characterized by a large number of smallholder farmers, with an average growing area of one ha and low yields.[22] Over the past three decades, seed cotton production averaged about 25,000 tonnes per year and remained fairly stable. Historical trends indicate that production levels in the 1980s were sustained mainly through area expansion rather than increases in productivity. However, in the late 1980s and early 1990s, the total area planted to seed cotton plummeted as a result of market liberalization, but this decline was largely offset by significant increases in yield, which have maintained production levels at a little below the historical average.

Table 16 provides estimates for seed cotton production throughout the period analyzed. In 2005, production was relatively low at 20,000 tonnes due to volatile producer prices, farmers' lack of access to credit and a poorly organized marketing system. However, production increased in 2006 and 2007 as a result of increased government support to smallholders in the form of seeds, chemicals and training, as well as the promulgation of the 2006 Cotton Act, which raised farmers' expectations for a more efficient and organized marketing system (CODA, 2011). In 2008, however, production fell to 15,093 tonnes due to poor rains, lack of continuity in government support, inadequate access to inputs and insufficient quantities of certified seed available for planting. In the following years, production continued to slope downwards as a result of the global financial crisis, which reduced world garment imports by an average of 4.5%, as well as poor weather conditions in 2010 (COMESA, 2009).

Table 16: Seed cotton production, area and yield, 2005-2010

	Unit	2005	2006	2007	2008	2009	2010
Production	T	20,000	34,500	38,300	15,093	14,886	11,822
Area harvested	ha	45,000	78,400	87,000	43,035	39,963	24,553
Yield	T/ha	0.44	0.44	0.44	0.35	0.37	0.48

Source: FAOSTAT

Utilization and trade

Seed cotton is consumed exclusively by local ginners that separate the fiber from the seed to produce cotton lint. The lint then goes to the local textile industry, mainly through the spinners that transform the fiber into yarn, while the seed is typically used for replanting (10%) or for oil and animal feed production.

Twenty-two operative ginneries are dispersed throughout Kenya's major cotton producing provinces (CODA, 2011).[23] Collectively, these ginneries have the capacity to produce 140,000 bales[24] of cotton

[22] Kenya's average seed cotton yield (.42 t/ha) is lower than the regional average (.66 t/ha) for Eastern Africa. It is also the lowest among other cotton producing countries, such as Malawi, Mozambique, Uganda and Tanzania (FAOSTAT, 2012).

[23] The number of ginneries by province is: Eastern 5, Central 1, Coast 5, Western 5, Nyanza 5 and Rift valley 1 (CODA, 2011).

lint per year; however, they are not operating at their full capacity due to the low supply of domestic seed cotton[25] (CODA, 2012). According to COMESA's 2009 Regional Strategy for the Cotton-to-Clothing Value Chain, the utilization rate of ginneries in Kenya is only 13%, which is the lowest among all COMESA countries, followed by Uganda (20%), Madagascar (20%) and Tanzania (26%).

Kenya's low supply of domestic seed cotton/cotton lint also affects local spinners and textile mills, which rely on imports to cover their large, unmet demand. According to CODA (2011), spinners and textile mills import about 80% of their cotton lint inputs. Furthermore, it is expected that the utilization rate of Kenya's textile industry will remain low at about 53%, unless local seed cotton and lint production increase (CODA, 2011).

Kenya is relatively self-sufficient in cottonseed, but cottonseed remains underutilized in oil and animal feed production. Domestic vegetable oil production covers less than a third of the country's national supply, making it the second most imported commodity after petroleum (FAOSTAT). Despite the high demand for vegetable oil in Kenya, cottonseed oil accounts for only 3% of national vegetable oil production (FAOSTAT). Moreover, Kenya also imports large quantities of cottonseed cake for animal feed, since domestic production falls short of national demand. Thus, both the oil and animal feed industry represent important market opportunities for cottonseed that can be further exploited to expand and develop the cottonseed subsector.

As stated previously, domestic seed cotton supply is insufficient to meet the needs of Kenya's growing textile industry. Consequently, spinners and textile mills import a large share of their cotton lint inputs from neighbouring countries. Between 2005 and 2010, Uganda and Tanzania were Kenya's main import partners, accounting for 63% and 35% of total cotton lint imports, respectively (UN Comtrade).

Table 17 shows that Kenya was a net importer of cotton lint throughout the period 2005-2010, with an average import dependency ratio of about 24%. Imports dipped in 2006 and 2007 due to the increase in national seed cotton/cotton lint production following the promulgation of the 2006 Cotton Act.

[24] In Uganda and Tanzania, one bale is equivalent to about 182 kilograms (www.cotlook.com). Therefore, 140,000 bales is equivalent to about 25,480 tonnes of cotton lint.

[25] For the ginneries to meet their full production capacity of roughly 25,480 tonnes of cotton lint, about 77,212 tonnes of seed cotton (25,480/33% GOT) are needed, but domestic seed cotton production in 2010 was only 11,822 tonnes.

Table 17: Cotton lint production and trade, 2005-2010

	Unit	2005	2006	2007	2008	2009	2010
Production	T	6,600	11,385	12,639	5,000	4,900	3,840
Imports	T	2,196	1,786	1,867	2,243	2,546	1,452
Exports	T	317	82	91	0	8	111
Available supply	T	8,479	13,089	14,415	7,243	7,438	5,181
Import dependency ratio	%	26	14	13	31	34	28

Source: FAOSTAT & UN Comtrade

Table 18 shows that Kenya was also a net importer of cottonseed between 2005 and 2010. During this period, Uganda and Tanzania accounted for 55% and 45% of total cottonseed imports, respectively (UN Comtrade).

Although the trade situation for cottonseed in Kenya is similar to that of lint, it differs slightly in that the country shows a constant decline in imports throughout the period analyzed, reaching self-sufficiency in 2010 (see Table 18). However, this does not mean that the national demand for cottonseed sub-products is domestically fulfilled, just that many of these products are imported already processed, as in the case of vegetable oil and cottonseed cake.

Table 18: Cottonseed production and trade, 2005-2010

	Unit	2005	2006	2007	2008	2009	2010
Production	T	13,000	22,492	24,993	9,820	9,720	7,690
Imports	T	2,462	1,531	400	590	967	15
Exports	T	2	-	-	-	-	-
Available supply	T	15,460	24,023	25,393	10,410	10,687	7,705
Import dependency ratio	%	16	6	2	6	9	0

Source: FAOSTAT and Global Trade Atlas

Value chain

Liberalization of the cotton industry in 1991 allowed cotton growers for the first time to negotiate prices directly with buyers. Though this was first seen as an advantage to farmers, the lack of supportive market and governmental institutions, coupled with stiff competition in an unregulated market, led to a general decline in the prices received by producers (Cotton to Garment APEX Committee, 2006).

Since there is no secondary market for seed cotton, ginneries are the only market and, therefore, have significant power to dictate prices paid to local producers. Cotton growers have made some

attempts to organize as a way of increasing their market power, but have had little success (Ikiara & Ndirangu, 2003). On the other hand, ginneries are also extremely dependent on local seed cotton supply, so the market relationship is one based on symbiosis that has not been fully potentiated in Kenya.

In response to the institutional vacuum that developed in the primary marketing and production of cotton after liberalization, and taking into account that the link between cotton farmers and ginners is perhaps the most critical link in the entire cotton-to-garment supply chain (Cotton to Garment APEX Committee, 2006), Kenya's MOA established CODA under the 2006 Cotton Act. CODA's objective is to facilitate activities between cotton growers and ginners and to coordinate sector decisions, including setting floor prices for seed cotton paid by the ginneries (CGD, 2005).

Every ginnery has its traditional cotton supply zones, but most of the time the supply is not enough. This often forces ginneries to expand their zones and compete with other ginneries, which can increase their transport costs to almost 10% of the farm gate price (RATES, 2003). Since the creation of CODA in 2005, the establishment of more than 250 authorized buying centers has been prioritized in an effort to reduce access costs for both ginners and farmers.

The cost of seed cotton represents a large share (86%) of ginners' total production costs. At the same time, many ginners also receive low prices for their lint, partly due to the poor quality of seed cotton inputs available to them. Furthermore, the insufficient supply of seed cotton in Kenya has caused many ginneries to operate well below capacity, which often discourages investment in ginneries (Ikiara & Ndirangu, 2003). However, cotton growers complain that seed returned by ginneries for replanting is mainly a second quality seed, which is often mixed with different varieties and untreated, resulting in low yields and low quality outputs (RATES, 2003; World Bank, 2005).

The ginner's main objective is to produce cotton lint without reducing its fiber spinning quality. This requires communication with lint buyers and textile mills and knowledge of the latest ginning technology (Ikiara & Ndirangu, 2003; RATES, 2003). Most ginners in Kenya use technology that has been available since 1935. Even though it is appropriate for the usual type of fiber characteristics found in Kenyan seed cotton, the ginning outturn (GOT) of cotton lint[26] is only 33%, which is well below the 40-42% GOT potential of the cotton varieties grown in Kenya as well as the regional GOT average of about 36-40% (RATES, 2003; World Bank, 2005).

Following the ginning phase, the separated lint and cottonseed go through a secondary transformation. The cotton lint is sold to spinners and textile mills for transformation into yarn and fabric, while the cottonseed is either used for replanting or is sold to seed processors for transformation into raw oil and seed cake used for animal feed production.

Most of the country's spinning and textile mills are large-scale, and a few are even integrated with local ginneries. In cases where spinners are integrated with ginners, they have the power to dictate low lint prices paid to ginneries, which are then transmitted back to cotton farmers (RATES, 2003; World Bank, 2005).

[26] Weight of cotton lint output produced per unit weight of seed cotton input (percent).

Seed processing for oil and animal feed production is often a complementary industry in countries where cotton is produced. The key players of the seed processing industry in Kenya include oilseed processors, which crush the seed to extract the oil and use the remnants for producing cottonseed cake, and oil refineries, which convert raw cottonseed oil into edible oil for human consumption. Due to the high national demand for vegetable oil, Kenya has considerable seed processing capacity, equipped with more than 20 oilseed processors and refineries nationwide (EPZA, 2005).

Indicators

This analysis focused on the primary processing, or pre-spinning, stage of the Kenya's cotton value chain to measure the market process incentives for farmers and ginners.

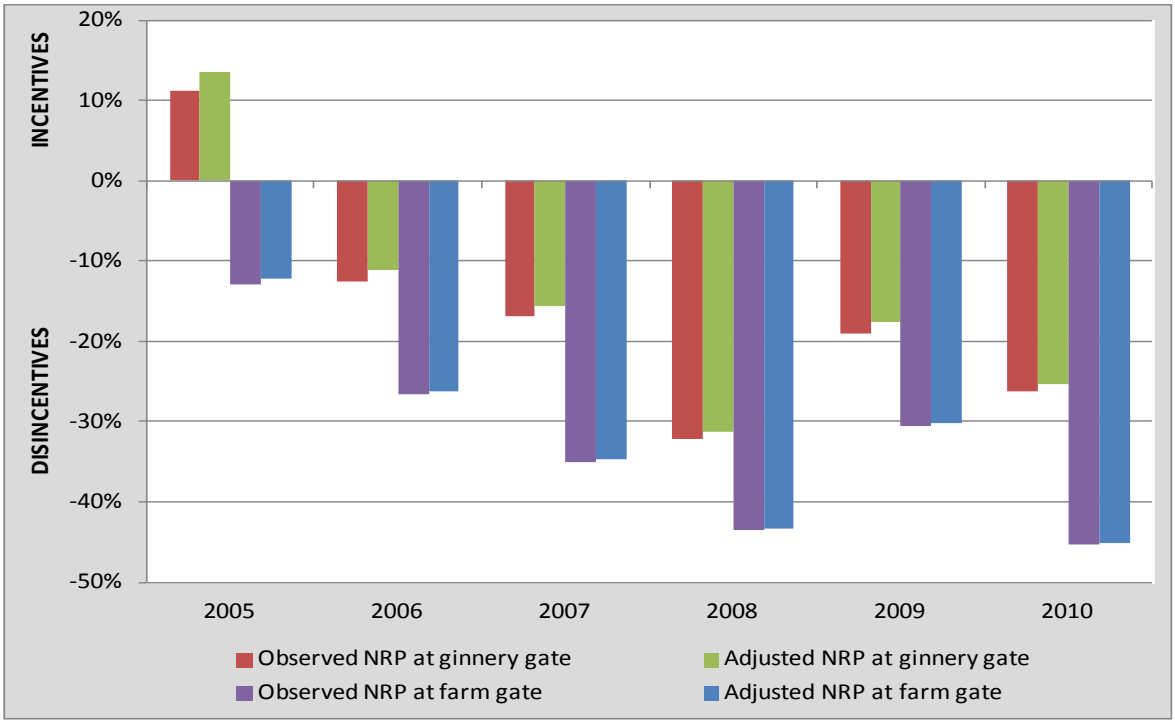
Although cottonseed is only a by-product of lint production, it has several marketable uses, which raises the value of seed cotton. Therefore, since this analysis of price incentives was undertaken from the perspective of farmers and ginners, it was imperative that the value and costs for both lint and seed were taken into account. Without including the value of seed in the evaluation of prices, domestic and international prices for cotton would have been underestimated, giving rise to inaccurate measures of incentives or disincentives received by producers.

For the purpose of this analysis, the ginnery gate was taken as the point of competition, where domestic cotton lint and cottonseed compete with imported cotton lint and cottonseed. As a result, ex-ginnery prices for both products were used to construct a seed cotton-equivalent price at the point of competition. This was done by taking a weighted average of the ex-ginnery prices for both products in each year based on Kenya's conversion rates (GOT) of 33% for lint and 67% for cottonseed. This approach was also applied to construct a seed cotton-equivalent benchmark price using the unit value CIF prices for both products, while observed producer prices for seed cotton reported by the KNBS were taken as the farmgate prices.

The results in Figure 16 show that, with the exception of ginners in 2005, both cotton farmers and ginners faced strong market price disincentives in all years. Between 2005 and 2010, the average observed and adjusted NRPs at the ginnery gate were -16% and -15%, respectively. At the farm gate, observed and adjusted NRPs were nearly equivalent in all years, both averaging -32%. It is important to note that throughout the period analyzed, farmers faced about twice the disincentives that ginners faced.

As illustrated in Figure 16, the rates of protection at the ginnery and farm level were highest (or least negative) in 2005 due to a low benchmark price that year. After 2005, increasing benchmark prices, combined with relatively stable ex-ginnery and farmgate prices, caused the NRPs to gradually decline. However, in 2009, a significant decrease in the benchmark price occurred, which did not proportionally affect local prices, causing the NRP to rise. This trend indicates that domestic prices remained relatively stable throughout the period analyzed, despite significant fluctuations in the international price. Thus, NRPs increased when the benchmark price went down and decreased when the benchmark price went up. One plausible explanation for this could be the floor prices for seed cotton that are established at the beginning of each growing season under the auspices of CODA, as well as the control that spinners and textile mills have over prices in the value chain.

Figure 16: Farmgate and wholesale NRPs for cotton (%), 2005-2010



Source: MAFAP

Main message

Since the cotton market in Kenya is completely liberalized and there were no trade policies directly affecting domestic cotton lint and cottonseed prices in Kenya during the period analyzed, an NRP close to zero was expected at the ginnery level and farm level in all years. However, this analysis shows that both producer groups generally faced market price disincentives, though the disincentives for farmers were significantly higher than those for ginners. While these disincentives cannot be explained by domestic policies, a large share can be explained by the considerable market power that spinners and textile mills have over ginners and consequently over farmers. Under these market conditions, losses borne by primary level producers are gains for secondary level producers, as spinners and millers seem to have better access to market information and control over prices.

Additional factors contributing to market price disincentives for both groups of producers include critical, interrelated issues affecting the value (price) of their outputs. The first, and perhaps the most important issue, is the poor quality seeds produced by ginners and provided to farmers for replanting. The use of poor quality seeds results in low yields and poor quality seed cotton that, in turn, adversely affect the volume and quality of cotton lint outputs produced by ginners. Another problem is the out-dated equipment used in many ginneries, which not only reduces the GOT, but may also reduce the spinning quality of the lint produced. Lastly, the inconsistent quality and supply of dometic seed cotton, partly due to the poor quality seeds used for replanting, causes many ginneries to operate well below capacity. This shortage of inputs raises the risk of investment in ginneries, thereby limiting opportunities for capital improvement, such as upgrading ginning equipment.

Based on this analysis, it is clear that Kenya's cotton sector has significant potential to increase incomes for farmers in ASAL regions due to the presence of a thriving textile industry and the industry's preferential trade agreement with the United States, which has expanded the export

market for Kenyan textiles. Nevertheless, the current market structure and strong price disincentives for primary cotton producers constrain the sector's ability to reach its potential. Consequently, primary producers have not been able to take full advantage of Kenya's large, unmet demand for cotton lint inputs, leaving the textile industry highly dependent on imports from the region.

Coffee

Coffee was for a long time Kenya's most important agricultural export, accounting for as much as 40% of the total value of exports in some years (Mitchell, 2011). This situation has changed dramatically since coffee production peaked in 1988. In recent years, coffee accounted for only about 6% of agricultural exports, while horticulture and tea exports have increased substantially, accounting for 34% and 32% of agricultural exports, respectively. Despite the decline in exports, coffee is still a major cash crop in many parts of the central highlands and western Kenya.

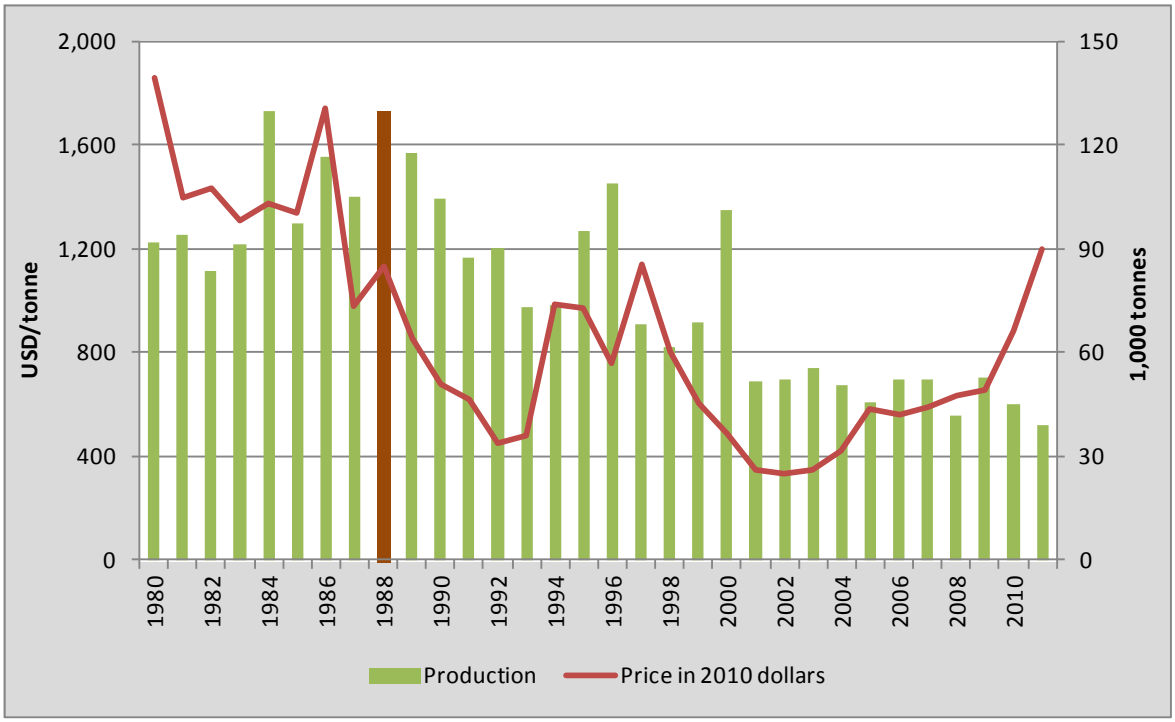
Production

Kenya produces high quality, mild Arabica coffees that are known for their intense flavor, full body and pleasant aroma. The sector consists of about 3,300 large-scale coffee estates and over 600,000 smallholder producers organized into about 550 cooperatives. Smallholders account for 75% of the land planted to coffee, but only slightly over half of total production. Yields are much higher on the estates because of the more intensive use of fertilizers, pesticides, herbicides and fungicides, as well as irrigation. Smallholder farmers use fewer purchased inputs and practices, such as mulching, for water conservation and weed control.

Coffee production in Kenya increased at an average annual rate of 6.6% between independence and 1988, when production peaked. However, production declined 62% between 1989 and 2008-10. Yields followed the same trend, increasing at an average annual rate of 0.9% per year between 1963/64 and 1987/88, but declined at a rate of 5.5% per year between 1988/89 and 2009/10.

There are a number of possible reasons for the decline in coffee production. Clearly, an important factor was the decline in world coffee prices between 1986 and 1992, as shown in Figure 17**.** Prices recovered partially between 1993 and 1997, but declined again between 1998 and 2002 to a level of less than 25% of their peak level over the 31-year period.

Figure 17: Kenya coffee production and price, 1980-2011



Sources: Production data are from USDA, as reported on http://www.indexmundi.com/agriculture. Prices are the New York cash prices for "other mild Arabicas" of the International Coffee Organization obtained from the IMF commodities database. These were converted to 2010 USD/T using the US consumer price index.

The price decline only partly explains the problem because production in other countries has increased since 1992. Global coffee production resumed its long-term growth rate of about 1.35% per year after 1992. According to Gilbert (2005), the International Coffee Agreement (ICA) system, which operated from 1962-1989, imposed restrictions in production that favoured African Arabicas. Its dissolution resulted in a period of adjustment and a reduced African share of global coffee production, while Brazil and Vietnam increased their share in world markets based on a cost advantage for their value chains.

Another possible reason may have to do with productivity. Kenyan producers pay a Coffee Cess of 1% on coffee sales to fund coffee research. In contrast, most other agricultural commodities are funded by the government and by the international community because research for these commodities is seen as a public good. This method of financing coffee research may have something to do with the decline in coffee exports. Arguably, this results in underfunding for coffee research and discriminates against a potential income-generating activity for smallholder farmers.

Most coffee in Kenya is still produced with two cultivars developed in the 1950s. A third cultivar developed before 1960 is used on lower altitudes. All three cultivars are susceptible to Coffee Leaf Rust and Coffee Berry Disease, which necessitates the use of fungicides. The development of new, resistant varieties of coffee is extremely important for increasing production, but may be inherently difficult. Producers may have hoped for a greater return on their investment with regard to the performance of past varieties.

Finally, there is the issue of the operation of cooperatives themselves. Until 2002, all small-scale growers had to market their coffee through cooperatives. Cooperatives are authorized to process

and sell smallholder coffee at the Nairobi Coffee Auction. While smallholders have a choice in which cooperatives they belong to, private coffee buyers are proscribed. There are eight licensed marketing agents, who represent growers at the auctions, and about 50 licensed dealers, who buy coffee at the auctions and sell it to overseas customers. The efficiency of the cooperatives is critical to the competitiveness of Kenyan coffee production, and there is some reason to believe, as shown in Figure 17, that considerable improvements could be made.

Consumption and trade

After coffee is sold to licensed dealers at auction, it is distributed for sale on the domestic market or exported to a foreign buyer. However, less than 4% of coffee is sold for consumption in Kenya (KCTA, 2012). Despite producing some of the world's finest coffee, Kenyans generally prefer tea, so almost all coffee is exported.

Kenyan coffee over the last five years has been exported to 70 different destinations. The top three destinations, accounting for 48% of the total value of coffee exports, are Germany, the United States and Sweden, with shares of 19%, 16% and 13%, respectively.

The International Coffee Organization (ICO) regularly publishes prices for four main types of coffee – *Columbian milds*, *other milds*, *Brazilian naturals* and *Robustas*. The first three are Arabicas, with *Columbian milds* enjoying a premium of about 10% over *other milds*. Columbia has established the Columbia country-of-origin as an effective brand signifying high quality. Kenyan Arabicas are considered in the *other milds* category, which enjoys a slight premium over Brazilian naturals. *Robustas* currently sell for less than half the price for *other milds*.

An article in the African Executive in 2004 underscored the lack of a Kenya brand in international markets compared to Ethiopia, where coffee farmer groups have established Sidamo and Yirgacheffe as brand names. Additionally, until 2006, all coffee sales had to go through the Nairobi Coffee Exchange, where it is purchased by the licensed coffee dealers through competitive bidding. Since then, a direct sales mechanism has been established, and the Coffee Board of Kenya has implemented a coffee brand initiative.

Direct sales allow a grower to negotiate a sale directly with a buyer outside Kenya, but the procedure for direct sales is similar to that followed for auctions with regard to the role of marketing agents, permits, certificates, inspections and fees. The grower must negotiate a three-party contract that includes the buyer and one of the eight licensed coffee marketing agents.

For all sale transactions, whether direct or auction sales, agents must pay a levy of 1% to the Coffee Board of Kenya, 2% to the Coffee Research Foundation and a 1% Coffee Cess, which is divided among the Kenya Roads Board and local authorities. In addition, fees are charged for registering the sales contract, as well as for each permit and certificate required.

The new direct sales system has led to the emergence of *terroir* growers that produce a high quality coffee for connoisseur consumers at a premium price. However, this is such a niche market that for most small-scale growers, it is likely that the system is effectively the same as it was before the 2006 reform.

Value chain

Coffee estates in Kenya are vertically integrated operations that farm, process and market coffee through the wholesale coffee auctions in Nairobi. This means that there is no separate farmgate and wholesale price, since market access costs are internal to the farm business. The same is true for smallholder coffee producers, since they market through a cooperative, which undertakes primary processing and contracts secondary processing and marketing through to the coffee auction on their behalf. Smallholders also legally retain ownership of their coffee until it is sold at auction. They are responsible for all processing and marketing costs incurred in their name, and these costs are deducted from the proceeds at auction.

After harvest, smallholder farmers deliver their coffee to cooperatives for primary processing. Cooperatives use the same wet processing method as estates, which involves separating the beans based on quality, removing the outer skin using pulping machines and soaking or (fermenting) to remove the fruity mucilage layer that clings to the coffee parchment layer. The beans are then dried on special tables and regularly turned to obtain the colour for which Kenya coffee is known.

It is only after drying that the coffee from different growers is merged and bagged. The cooperative then decides when and how often to deliver it to one of the seven licensed commercial coffee mills or several private mills. The whole process with the cooperative can take up to three months.

Processing by the miller can take as long as two months. The parchment layer surrounding each bean is removed at the mills followed by further mechanical grading into seven separate grades according to size, weight and shape of the bean. When milling is complete, the bagged coffee is shipped to a Nairobi warehouse adjacent to the auction house. There, samples are drawn by three commercial operators, who act as marketers, and are sent to the 50 or so licensed dealers of the Nairobi exchange.

The three commercial operators, established under the Coffee Act, include the Kenya Producers Coffee Union (KPCU), Socfinaf and Thika Coffee Mills. Their responsibilities are to prepare, warehouse and warrant coffee in preparation for auction. This involves making samples available for dealers prior to auction, representing growers during auction and collecting and distributing proceeds following final sales. If a dealer doubts the accuracy of any of the 500 plus samples received in a given week, he can go to the warehouse to resample. The marketers receive a flat fee of USD 50/tonne for their services, but clearly selecting a miller is also a selection of the marketer associated with each miller. Up to four months can pass between delivery to the miller and sale at auction.

Passing the proceeds back to the grower can take a considerable amount of time once payments are made to the bank representing the cooperative. The payments may sit there for as long as four months before they are credited to the cooperative net of any loan repayments for individual members of the cooperative. The cooperative then pays individual growers in one to four weeks.

One of the problems in Kenya is that cooperative bank fees and interest charges on loans to growers can result in high effective interest rates. Cooperative banks and cooperatives have also been known to make some dubious investments on behalf of growers.[27]

Indicators

Coffee estates were analyzed separately from smallholder farms, since the value chains differ considerably for each producer group. The average annual auction price reported by the KNBS was taken as the observed wholesale price for both producer groups, while farmgate prices were calculated residually by deducting market access costs from observed wholesale prices.

As shown in Figure 18, the average observed NRP at wholesale for coffee estates was -4% throughout the period analyzed, indicating that the sector faces price disincentives. This was entirely due to the various statutory levies on coffee, which represent 4% of the auction price. The price of coffee increased sharply over the period 2005-2010, so the absolute amount of these levies increased proportionally with observed auction prices.

The effect of statutory charges at the farm level for coffee estates was greater than at the wholesale level because the levies represent a larger share of farm-gate prices. Farm-gate prices for coffee estates were about 80% of auction prices in 2005, so the 4% levies translate into a -5% NRP at farm level. Both coffee prices and access costs from farm gate to wholesale market increased sharply between 2005 and 2010, but coffee prices increased more rapidly, amounting to 90% of the auction prices in 2010. As a result, the observed level of disincentives at farm gate fell to -4.5% (see Figure 18).

Adjusted farmgate and wholesale NRPs for coffee estates were nearly equivalent to observed NRPs throughout the period analyzed. This means that the vertically integrated value chain for coffee estates in Kenya is relatively efficient. The only inefficiencies identified include the minor effect of levies and unofficial charges on transportation margins. These MDGs represent very marginal opportunity costs for coffee estates, amounting to less than 1% of the adjusted reference price at farm gate.

While the story for estate farmers is not ideal, it is significantly less positive for smallholder coffee farmers. The observed NRPs for smallholder farmers at the wholesale level were the same as those for the estates, since the two value chains merge at the wholesale auction. Therefore, the average observed NRP at wholesale for smallholder farmers was also -4% due to the statutory levies on coffee (see Figure 19).

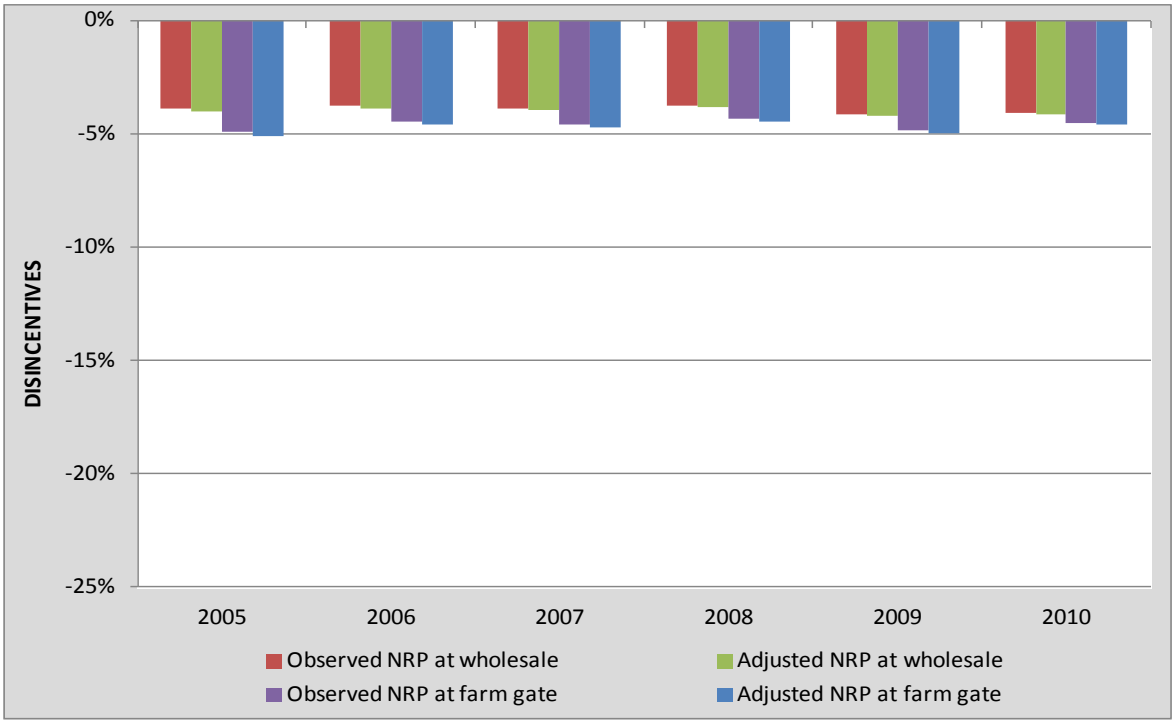
At the farm gate, levies had a greater impact in relative terms on smallholders, as shown by the observed NRPs in Figure 19. In 2005, the observed NRP at farm gate was -7%, almost double the levy rate. However, there is a small offset for smallholder farmers in the form of the Coffee Development Fund (CDF), which was established by the government in May 2006 as a financing vehicle for revitalizing the coffee sub-sector. The CDF's mandate is to provide sustainable, affordable credit to coffee farmers for farm inputs, farming operations and income stabilization. Most of the loans go to

[27] See articles by Kennedy (2005) and Mitchell (2011) for descriptions of management problems with some Kenyan coffee cooperatives.

smallholders organized in cooperatives. The CDF benefit amounted to about 2%-3% of the farmgate price between 2006 and 2010.

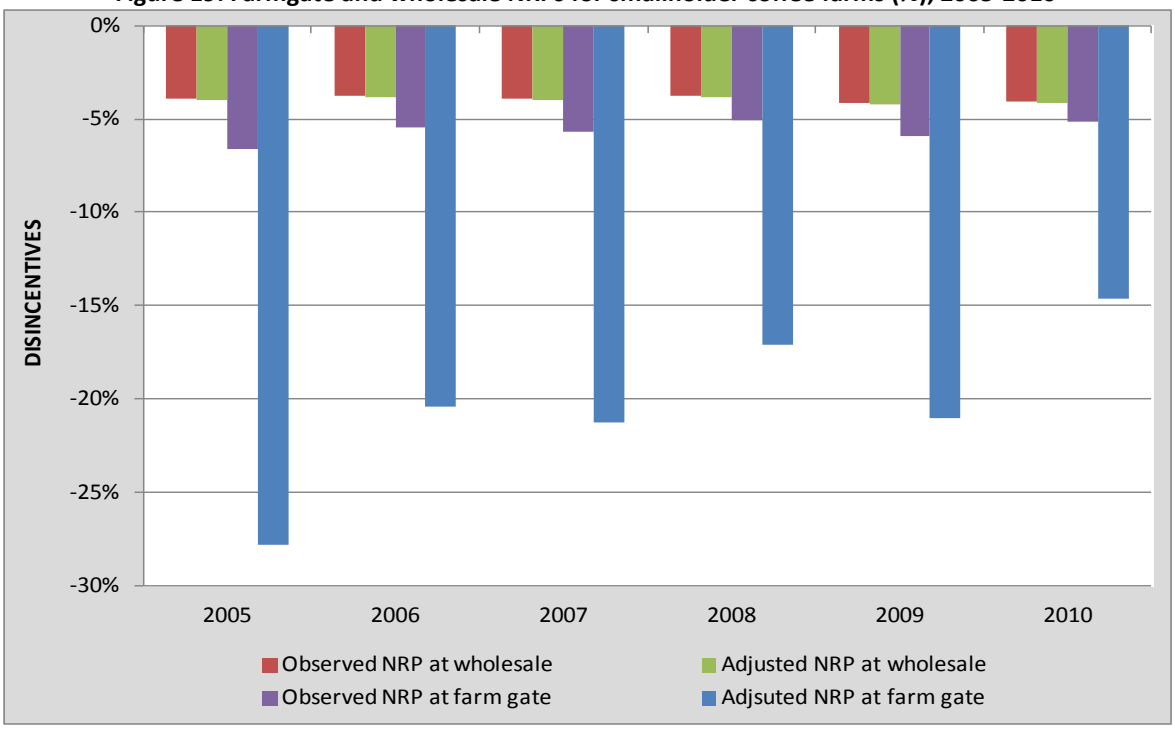
Adjusted NRPs for smallholders were nearly equivalent to observed NRPs at the wholesale level. At the farm gate, however, adjusted NRPs were significantly lower, averaging -20% throughout the period analyzed. This means that market inefficiencies along the smallholder value chain represent significant opportunity costs for farmers, amounting to about 16% of the adjusted reference price at farm gate. MDGs are much larger for smallholders than for estates because they include very high primary processing costs in addition to the effect of levies and unofficial charges on transportation margins. These processing costs are a direct consequence of the highly regulated system for marketing smallholder coffee in Kenya, which often leads to abuse and provides few real options for farmers.

Figure 18: Farmgate and wholesale NRPs for coffee estates (%), 2005-2010



Source: MAFAP

Figure 19: Farmgate and wholesale NRPs for smallholder coffee farms (%), 2005-2010



Source: MAFAP

Main message

The results of this analysis indicate that both estate farmers and smallholder coffee farmers faced market price disincentives throughout the period analyzed due to statutory levies on coffee. However, disincentives were much stronger for smallholder farmers as a result of high processing costs stemming from issues related to market structure in the smallholder value chain.

The levies on production are all for functions and services normally provided by government. The World Trade Organization allows countries to classify research, market promotion and infrastructure as green box support and does not count it in its aggregate measure of support. Similarly, the OECD monitoring and evaluation database would classify these expenditures as part of its General Services Support Estimate and not part of their Producer Support Estimate. Such fees are only rarely charged in developed countries. Eliminating them would eliminate a disincentive affecting both smallholder and estate farmers. The size of this levy (4%) is deceptive. At the farm level, it is an effective output tax of 5-7%. For many agricultural commodities, 5-7% could be 25-50% of their profit margin.

The dual structure of production split among cooperatives serving smallholder farmers and large-scale estates results in significantly different on-farm cost structures. The estates have better access to capital and inputs, use more fertilizer, pesticides and irrigation, and obtain much higher yields. The estates also manage their own primary processing and are able to control processing costs.

Smallholder farmers, in contrast, rely on one or more local cooperatives for primary processing. The limited choice in processing for smallholder farmers means that there is little market pressure on cooperative managers to control costs and improve efficiency. The long time period between delivery of cherry (coffee berries) and payment for green coffee beans sold at auction also creates a lack of transparency and a disincentive for smallholder farmers. Individual growers have no way of knowing whether their payment reflects the quality of the coffee they delivered.

Many of these factors are linked. For instance, the levies for research, marketing boards and rural infrastructure seem to require a centralized and regulated marketing system to ensure payment. However, the delays in payment to farmers also seem to be related to this system, in which farmers must retain ownership until their coffee is sold at auction.

Although Kenya's coffee sector was liberalized to some extent in 2006, allowing for direct marketing by farmers, all direct sales must take place within the existing regulatory framework. Consequently, this liberalization is not reflected in the indicators generated. Thus, it is evident that while the current marketing system may have been established in the 1960s as a means of protecting smallholder farmers, it is actually having the opposite impact on farmers. Unless the sector undergoes reform, it is likely that smallholders will continue to face strong price disincentives as a result of high processing costs from the lack of marketing options and competitive structures, as well as levies from which they may only receive marginal benefits.

Tea

English settlers introduced tea to Kenya in 1903. Under the colonial government, the cultivation of major cash crops, such as tea and coffee, was restricted to large-scale settler estates and multinationals (KHRC, 2008 and CPDA, 2008). However, after independence in 1963, the production of tea was opened to local farmers, who started buying small plots of land from tea plantations (KHRC, 2008). Since then, the total land planted to tea and tea production has grown remarkably,

increasing from 21,500 hectares and 18,000 tonnes in 1963 to 120,000 hectares and almost 300,000 tonnes by the end of the century (FAOSTAT). Today, Kenya is the third largest tea producer after China and India, making the Kenyan tea industry one of the major private sector employers and contributors to the country's national income.

Production

Kenya's tea sector is divided in two production systems or value chains – smallholder farmers and large-scale plantations. Since independence, smallholders have exceeded plantations in terms of total output, accounting for about 60% of domestic production and 65% of the total area harvested during the period 2005-2010.

Tea production in Kenya has increased steadily over the past decade mainly because of the constant growth in harvested area, primarily among smallholders. However, two distinct dips in production occurred in 2006 and 2009 due to significant decreases in yield (see Table 19). In 2009, this decline in productivity was a direct result of a widespread drought that affected the region.

Table 19: Tea production, area harvested and yield, 2005-2010

	Unit	2005	2006	2007	2008	2009	2010
Production	T	328,500	310,580	369,600	345,800	314,100	399,000
Total Area Harvested	ha	141,300	147,080	149,190	157,700	158,400	171,900
Yield	T/ha	2.3	2.1	2.5	2.2	2.0	2.3

Source: Tea Board of Kenya

Consumption and trade

Almost 60% of the tea produced in the world is consumed locally. China and India are the world's top tea producers, but consume 73% and 81% of their total production, respectively (Van der Wal, 2008). On the contrary, Kenya only consumes around 5% of its production and exports the rest. For this reason, even though Kenya is the third largest tea producer after China and India, it is the number one exporter of tea, accounting for 20% of world exports.

Although Kenya is not a major consumer of tea, local consumption has been growing at an average rate of 3% per annum over the last five years (TBK, 2011). This growth may be related to several initiatives implemented by the government and other organizations to encourage local consumption of Kenyan tea, including the establishment of a private blending company for local marketing.[28] The Tea Board of Kenya (TBK) is also carrying out an intensive promotional campaign, supporting brand marketing by local tea packers and increasing factory gate sales (TBK, 2011). Despite these initiatives, the share of Kenyan tea production consumed locally remains marginal relative to the share that is exported.

[28] Tea Packers of Kenya Ltd, a private blending company owned primarily by the Kenya Tea Development Authority (KTDA) and some plantations, such as Brooke Bond Kenya Ltd. (Unilever Tea). The company currently controls around the 85% of the locally consumed product (GDS, 2004).

Tea is Kenya's leading agricultural export, accounting for 25% of the country's agricultural foreign exchange earnings in 2010 (Agritrade, 2011). Table 20 provides Kenya's trade balance for tea throughout the period analyzed. The tea exports and trade balance were lowest in 2006 and 2009, the years when production fell due to low productivity.

Table 20: Tea production and trade in Kenya, 2005-2010

	Unit	2005	2006	2007	2008	2009	2010
Production	T	328,500	310,580	369,600	345,800	314,100	399,000
Imports (M)	T	11,172	12,082	8,643	3,918	4,092	13,582
Exports (X)	T	342,335	322,861	374,256	389,915	331,235	416,412
Trade Balance (X-M)	T	331,163	310,779	365,612	385,997	327,143	402,830

Source: FAOSTAT & UN Comtrade

Kenya's tea market is directly affected by the high concentration of buyers within the international tea market. Only seven companies control 85% of the tea output consumed in the world (van der Wal, 2008; Agritrade, 2011). Most of these companies are highly integrated multinationals, with their own plantations and factories in tea producing countries. Moreover, blending and packaging, two important value addition activities that represent up to 80% of the retail price, are mainly undertaken in their own processing plants located in consumer countries (Agritrade, 2011).

According to FAO (2005), the gap between value-added export prices and auction prices has been increasing, which means "growers are not fully benefiting from the consumer's rising demand for value-added products". Furthermore, world export destinations for tea are concentrated in only seven countries, which are by order of importance: Russian Federation, UK, Pakistan, USA, Egypt, Iraq and the United Arab Emirates (van der Wal, 2008).

The main buyers of Kenyan tea are Pakistan, Egypt and the UK, accounting for more than 65% of national tea exports. Pakistan alone accounts for 25% of Kenya's total exports. Over-reliance on a few export partners, coupled with low domestic consumption, was identified as one of the major challenges for Kenya's tea industry (Amde et al., 2009). This issue was particularly problematic when Pakistan began to seek out other tea suppliers, reducing Kenyan tea imports from 91,000 tonnes in 2005 to 65,000 tonnes in 2006 (UN Comtrade).

Value chain

Kenya's tealeaf-to-cup value chain is vertically integrated with direct links between manufacturers and producers. The main tea packers have influence throughout the chain, from the farm input supply to the tea-bag retail. This is different from other commodities, such as coffee, in which companies only operate in specific parts of the production chain (van der Wal, 2008).

Tea production is labour-intensive, with planting, maintenance and harvesting done by hand. In Kenya, tea can be picked year-round. The leaves are plucked and taken to a main collection point, where they are weighed and then rapidly transported to a nearby factory for processing.

The plucked green leaves must be processed within 12 hours after harvesting. Primary processing is largely mechanized and accounts for about 10% of total employment in the tea sector. The processed tea (referred to as "made tea") is sold either loose or in packets.

Tea production in Kenya is divided between large-scale plantations and the Kenya Tea Development Authority (KTDA), which by law controls all of Kenya's smallholder tea production. Formerly a government parastatal, the KTDA was privatized in June of 2000 and is now owned by 150,000 small-scale tea farmers (Buch-Hansen, 2012). It is the leading source of tea in the country and the largest single exporter of processed tea in the world (Bowfield and Dolan, 2010).

Today, there are around 450,000 smallholders producing tea in Kenya, usually with plots between four and eight hectares. Most smallholder plots are not entirely designated to tea, but are mixed with other staple crops as a risk management practice. Although smallholders account for the majority of tea produced in Kenya, their average output of about 2 tonnes per hectare is much lower than the 2.7 tonnes per hectare produced by plantations. This is largely because plantations benefit from economies of scale and make better use of technologies and inputs than smallholders.

Smallholder tea farmers in Kenya own their own factories, which are managed by the KTDA. Farmers are grouped by their corresponding factory and are able to elect their factory manager. Each farmer receives an initial payment for their product from the KTDA, which is agreed in advance for all factories. The KTDA is responsible for marketing tea produced by smallholders at the Mombasa Tea Auction and pays each factory according to their respective selling price at auction. The factories then calculate a second payment to farmers, deducting all loan payments, commissions and future investments. Depending on the farmers' profit margins, the board of the factory determines the dividends to be paid to each factory shareholder.

Traditionally, tea out of KTDA factories is known for its high quality, so producers are often able to obtain higher prices than the auction average. According to a KTDA analysis of prices paid to farmers in other tea-producing countries for the production year 2010/2011, Kenyan farmers obtained the highest rates. In fact, Kenyan smallholders received 130% more than the world average paid to tea farmers (48.4 vs. 20.9 Ksh/tonne for green leaf tea).

Although smallholder farmers receive high prices for their tea, they face several critical issues, most of which are related to KTDA management of the smallholder value chain. One of the main problems is the lack of influence that most smallholders have over the decisions that directly affect them. For example, there was a factory building program carried out by the KTDA on behalf of the farmers before 2007, which involved a great deal of investment, but most farmers were left out of the decision-making process even though they had to carry the burden of the loan payment (CPDA, 2008). Since not all smallholder tea producers are shareholders of the KTDA, there is also the constant threat of a potential bias towards shareholders in KTDA decision-making, especially with respect to company expenditures and dividend sharing.

Other key issues that smallholders face include the slow flow of information throughout the value chain; the KTDA's inefficiency and alleged corruption; the lack of farmer representation in the main regulating boards; the high cost of production and inputs; the lack of extension services, particularly from the KTDA; poor transparency in the legal ownership and decision-making process of the KTDA;

global overproduction of tea affecting the prices of Kenyan tea; and the low value addition of Kenya's tea sector.

Contrary to the smallholder value chain, large-scale tea plantations in Kenya are owned and operated by multinational companies. These companies not only control the most profitable activities in the tea value chain (blending and packing), but they control the entire global market (Bowfield and Dolan, 2010). This means that some have direct control over the full tealeaf-to-cup value chain through the ownership and management of tea plantations, freight companies, trading companies, processing, blending and packaging companies and retail marketing subsidiaries. Currently, there are 39 private tea factories operating in Kenya, but their value addition ends after the first transformation from green leaf to made tea. Virtually all tea sold by plantations is bulked made tea, which is purchased and transported to factories in consumer countries for blending and packaging.

Even though plantations have better management, organization and processing quality standards, the tea they produce is usually of lower quality than the tea produced by smallholders. This is mainly because a large part of tea quality depends on the collection process (the plucking technique), and the plantations have difficulty controlling the technique used by the temporary workers in the fields because they pay by weight (CPDA, 2008). However, quality is becoming less of an issue for plantations, since many companies are now deliberately reducing tea quality through the blending of different varieties and qualities in order to expand their international market share (van der Wal, 2008).

Around 85% of Kenyan tea produced by smallholders and plantations is marketed through the Mombasa Tea Auction, the second largest tea auction in the world (Kariuki, 2007). The auction system brings buyers and sellers together to determine the price through interactive competitive bidding based on prior assessment of tea quality.

Usually in the world tea market, auction sales are controlled by a small number of buyers. New buyers are discriminated against, and their bids are not easily accepted. Smaller buyers often have difficulties competing with larger buyers, who also have stakes in blending and packaging. In Mombasa, only six multinational companies account for two-thirds of the tea traded through the auction (van der Wal, 2008). With this buying power, large tea companies strongly influence both price movements and the demand for certain qualities of tea. This high concentration of power offers ample opportunities for the manipulation of prices and functioning of the Kenyan tea market (SOMO, 2006).

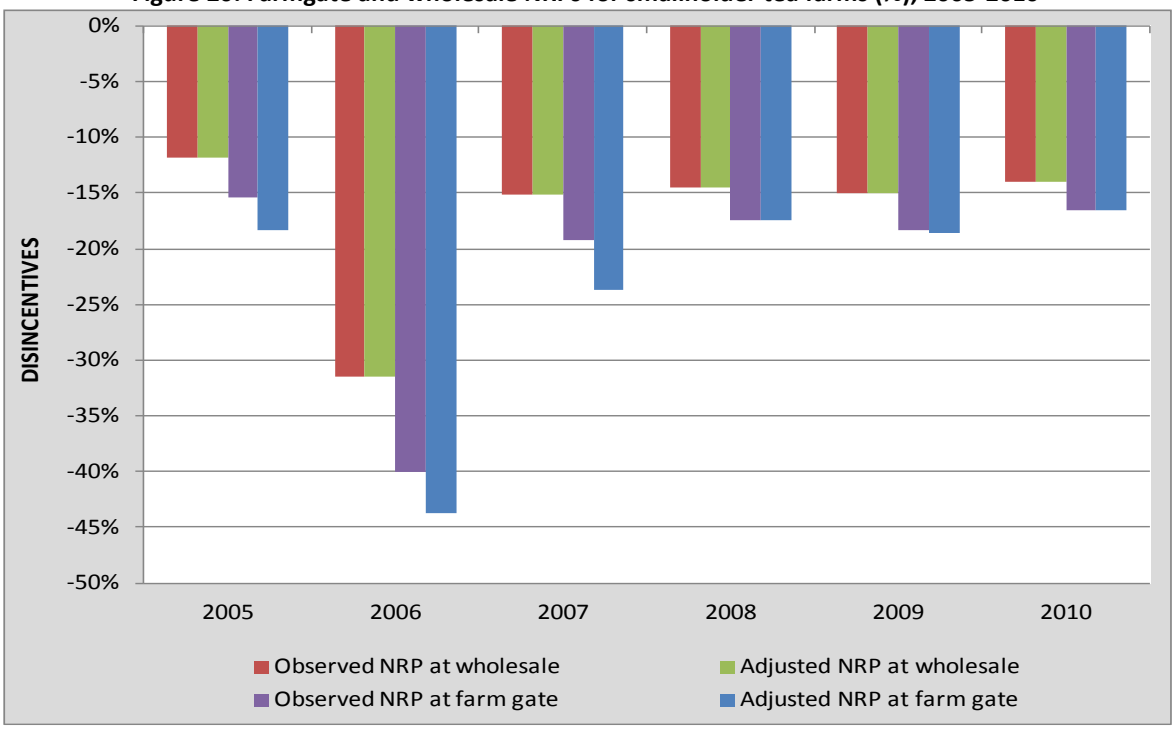
Indicators

Due to the lack of complete data for tea plantations, this analysis focused solely on the KTDA value chain for smallholder farmers. The wholesale market at the Mombasa Tea Auction was taken as the point of competition, where domestic tea production competes in the international market. Therefore, the average annual auction price for KTDA black tea was used as the wholesale price, while the average annual price paid to KTDA farmers for green leaf tea was used as the farmgate price. Appropriate adjustments were made to account for differences in quantity and quality throughout the value chain.

The average observed NRP at wholesale was -17% throughout the period under review, while the average observed NRP at the farm gate was -21%. As shown in Figure 20, observed NRPs were negative in all years, but generally decreased between 2005 and 2010 due to a steady increase in tea prices at the auction and at the farm gate. The strong relationship between the auction price and the price paid to KTDA farmers throughout the period analyzed likely stems from the dual payment system employed by the KTDA in which farmers are given an initial payment for their tea, followed by a second payment after their tea is sold at auction. However, the rate of protection at the farm gate was lower (or more negative) than the rate of protection at the auction level in all years. Part of this bias could potentially stem from shareholders of the KTDA capturing more of the profits than other smallholder producers.

Adjusted NRPs were nearly equivalent to observed NRPs at the wholesale level. At the farm gate, however, adjusted NRPs were lower than the observed, averaging -23% throughout the period analyzed. This indicates that market inefficiencies represent opportunity costs for farmers, amounting to an MDG equal to about 3% of the adjusted reference price at farm gate. Inefficiencies along the value chain were due to the excessive profit margins of the KTDA in certain years, which reflect the potential bias toward KTDA shareholders. These high profit margins are considered market distortions that inflate access costs between the farm gate and the wholesale market.

Figure 20: Farmgate and wholesale NRPs for smallholder tea farms (%), 2005-2010



Source: MAFAP

Main message

The results of this analysis show that even though KTDA smallholders in Kenya receive higher prices than tea producers in many other countries, they face strong market price disincentives due to the concentrated structure of the international tea market and the power that multinational companies have over production, processing and prices. This market power allows large companies to control the blending and packing process, which is the most profitable activity in the tea value chain. Almost all of Kenya's high-quality bulk tea is purchased by large multinationals that export it to their own

factories in consumer countries for blending and packing. Consequently, Kenyan tea farmers are not able to benefit fully from higher prices for value-added tea products. Although several initiatives have been carried out to develop the value addition component of Kenya's tea value chain, multinational companies are hesitant to move their operations to Kenya. The KTDA has invested in value addition by establishing a local blending and packing company, but it is not yet clear whether this will yield real benefits for smallholder tea farmers.

Another factor that may contribute to the disincentives for farmers is the common practice by large-scale multinational tea companies of blending their own lower quality teas with higher quality teas such as KTDA's black tea, in order to expand their international market share. This practice may depress prices for Kenyan tea, as it may influence consumer preferences and demand for higher quality brands.

The last factor contributing to the market price disincentives received by smallholder farmers is the inherent bias in the institutional structure and management of the KTDA. Only one third of the country's smallholders are legal shareholders of the company, even though all smallholders are required by law to market their output through the KTDA. This bias may result in the unbalanced distribution of profits between shareholders and non-shareholders of the company, which could be the reason for the KTDA's high profit margins in certain years. These profits represent significant opportunity costs for the majority of smallholder farmers.

Cow milk

Milk production and marketing are a significant part of Kenya's agricultural economy. Milk production provides smallholder farmers more regular cash income than other farm and non-farm enterprises. It also provides growth linkages to input service providers, milk traders, and processors. According to FAO (2011b), dairy products (excluding live animals) contribute 30% of livestock GDP and more than 22% of livestock gross marketed products.

Production

Kenya is largely self-sufficient in milk production. Currently, Kenya produces about 3.1 billion litres per annum. Milk production is mainly based on dairy cattle. The average milk yield is estimated at 564 to 1,000 kg per cow per year (Karuga, 2009).

Smallholder dairy farmers dominate the industry at the production level. There are more than one million smallholder dairy farmers, contributing more than 70% of gross marketed production from farms (FAO, 2011b). In general, smallholders have about two to five head of cattle, yielding about five kilograms of milk per cow per day. Milk sales are low at less than ten kg per day. The use of inputs is also low, but varies depending on community traditions and the level of market orientation.

During the period analyzed, dairy production generally increased, but was greatly affected by the post-election instability in 2007/2008. According to a survey conducted by Land O'Lakes, 36% of the Rift Valley and 31% of the South Valley population was displaced, about 10% of cows were lost or stolen and milk distribution was severely disrupted (Land O'Lakes, 2008; TechnoServe, 2008). Milk processors and cooling plants were unable to collect milk, a number of informal traders and milk bars were displaced or destroyed, and access to animal feed and other inputs was severely disrupted. Total loss to the dairy industry, including loss to consumers, was estimated at 7.1 billion

Ksh (Land O'Lakes, 2008; TechnoServe, 2008). Once political unrest subsided, production increased, but did not recover until 2010 due to drought conditions in 2009.

Consumption and trade

Milk consumption levels in Kenya are among the highest in the developing world, averaging 100 kg per capita per year. Milk plays a useful role in enhancing food security for communities living in the ASAL regions. According to FAO (2011b), about 45% of the milk produced is used for home consumption. Almost all dairy consumption is in the form of liquid milk. Districts with high per capita milk production also have high per capita home milk consumption, and the quantity of milk consumed generally increases as incomes increase.

Milk production has been seen more as a subsistence activity than as a source of income. According to FAO (2011b), about 55% of the milk produced in Kenya enters the market, of which more than 75% is marketed through informal, unregulated channels. Public health risks are a concern owing to the large amount of milk that is marketed unprocessed and to weak monitoring of the market. The main public health concerns are the potential risk of diseases, such as brucellosis and tuberculosis, and drug residues. However, it has been noted that virtually all consumers boil the milk before consumption, so the risks of infection from bacterial health hazards are relatively low.

Kenya exports substantial quantities of milk and milk products to the region, especially to Zambia, Tanzania, Uganda, Democratic Republic of Congo, Rwanda, Burundi and Saudi Arabia. The main products exported are long-life milk and milk powder. Cow milk imports have gone down over time as Kenya becomes increasingly more self-sufficient in milk and milk products. Kenya does, however, import specialized milk products from New Zealand and the E.U. (Dairy E-Portal**,** 2012).

Value chain

An efficient dairy value chain is crucial for obtaining high-quality milk for processing, and therefore higher profit margins. However, Kenya's value chain is very fragmented and uncoordinated, and quality standards are not always met.

There are two distinct value chains for dairy marketing in Kenya – the formal and informal. The informal market has one main advantage over the formal: it is a cash-based market, in which producers are paid immediately for their deliveries. Within the formal chain, farmers may wait up to a month to receive payment for their milk. Since many smallholder farmers face immediate cash flow needs, the informal market provides an advantage (TechnoServe, 2008).

According to FAO (2011b), Kenya's dairy value chains suffer from several issues at the farm and marketing levels. At the farm level, long-standing issues include the poor quality and high cost of inputs and services, poor terms of trade and hence low prices for milk, and poor access to information and markets. At the market level, challenges include the quality and safety of milk, owing to the high proportion of raw milk channeled through the informal market; the high cost of milk collection, transportation and distribution due to poor infrastructure; and the under-utilization of processorcapacity, owing to the higher demand for liquid milk than for high-added-value products.

Another critical issue is the lack of an adequate policy framework for the dairy sector, which is a problem that existed well before market liberalization in the 1990s (MOLD, 2010). This problem has

not been solved despite the years and capital invested in developing these regulatory instruments and the government's declared commitment to reforming the sector (FAO, 2011b). The GOK recently introduced a zero tax rate on inputs used in milk processing and various tax exemptions to incentivize investment in rural processing facilities (MoLD, 2010).

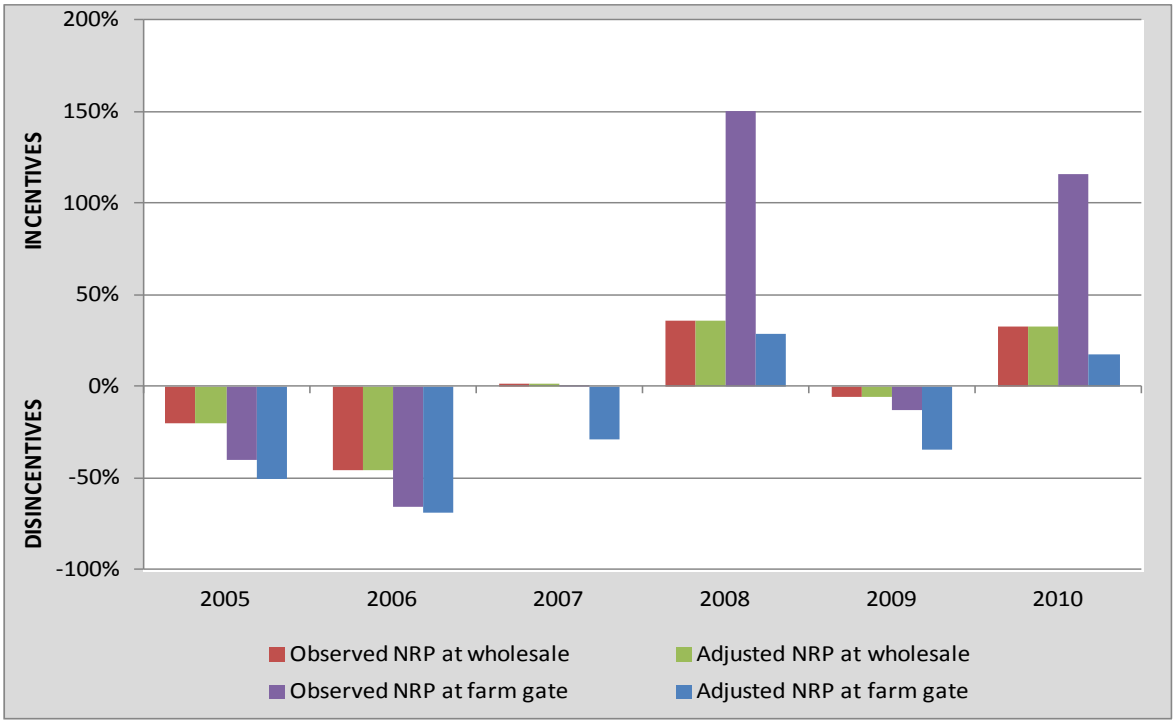
Indicators

This analysis treats cow milk as an exported commodity and focuses only on the formal value chain. Market price incentives and disincentives were measured at the factory gate and at the farm gate. Therefore, the ex-factory price was taken as the price at the point of competition, while the average annual producer price was taken as the farmgate price. Both price sets were obtained from the Brookside Dairy Plant.

At the wholesale level, the observed and adjusted NRPs were equivalent, averaging less than 1% throughout the period analyzed. At the farm gate, the average observed and adjusted NRPs were -25% and -23%, respectively. Figure 21 shows that NRPs varied significantly throughout the period analyzed. The trend in observed NRPs indicates that factories and farmers faced market price disincentives in all years, except 2008 and 2010. Extremely high NRPs in 2008 were linked to a decrease in the international (benchmark) price for milk as well as scarcity in domestic milk supply. As mentioned earlier, post-election instability in 2007/2008 reduced local milk supply significantly, resulting in higher domestic prices. In 2010, the high observed NRP was mainly caused by a significant decline in the international (benchmark) price for milk.

Adjusted NRPs capture the effect of market inefficiencies along the value chain. As shown in Figure 21, adjusted NRPs at the factory gate were equivalent to observed NRPs in all years. At the farm gate, however, adjusted NRPs were lower than observed NRPs in all years, particularly in 2008 and 2010, indicating that market inefficiencies represent significant opportunity costs for farmers. These costs mainly stem from the fragmented value chain and highly concentrated processing sector, which has resulted in excessive profits for factories and lower prices for farmers. For years 2008 and 2010, adjusted NRPs show that while farmers seemed to face stronger price incentives than factories, they actually faced weaker price incentives due to factories' high profit margins. On average, these opportunity costs amount to about 29% of the adjusted reference price at farm gate.

Figure 21: Farm and wholesale level NRPs for cow milk (%), 2005-2010



Source: MAFAP

Main message

Since the dairy market in Kenya is liberalized and there are no trade policies directly affecting domestic prices, an NRP close to zero was expected at the farmgate and wholesale levels in all years. However, throughout the period analyzed, market price incentives and disincentives varied significantly. Major fluctuations in the rate of protection were primarily driven by domestic shortages in milk supply and downward shifts in international prices, which resulted in price incentives for farmers in 2008 and 2010. In more stable production years, however, farmers generally faced market price disincentives. A large share of these disincentives can be explained by inefficiencies along the value chain, namely the high profit margins of factories due to the concentration of market power among dairy processors. This was particularly noticable in 2008 and 2010, when the adjusted NRPs indicate that farmers actually received lower market price incentives than factories, even though they should have received much higher incentives, as reflected in the observed NRPs at farm gate.

Although there has been substantial private and public investment in the dairy sector, dairy production is still considered a subsistence activity rather than a business. The lack of a clear and specific policy framework and of reliable information about the state and dynamics of the sector will continue to result in price disincentives for producers if these issues remain unaddressed.

Despite the problems hindering the dairy industry, FAO (2011b) concludes that it remains one of the economic subsectors with high potential for increasing income and creating employment in rural areas. Milk production can be increased through better management without necessarily increasing the dairy herd size (FAO, 2011b). With a more efficient value chain and a stable raw milk supply, the Kenyan dairy industry could be in a position to take advantage of the high unmet demand for milk in the COMESA and EAC regions, which is now largely met through imports from the USA and Europe.

Live cattle

The livestock sector contributes about 7% of the national GDP and 17% of the national agricultural GDP (ASDS, 2010-2020). Cattle are an integral component of this sector, "supplying by value 80% of the nation's ruminant offtake for slaughter" (Behnke & Muthami, 2011). Cattle are also a major source of income for pastoralists in ASAL regions, where most animals are raised for meat production (Kiptarus, 2005). According to the 2009 national livestock census, 70% of the country's cattle stocks are located in the ASALs, with arid regions accounting for 36% and semiarid regions accounting for 34% of the total population (Behnke & Muthami, 2011).

Production

Kenya's cattle stocks increased from about 14 million head in 1990 to 18 million head in 2010, with significant variability between years due to reoccurring drought and disease outbreak (FAOSTAT, 2012; FAO countrystat, 2012). Severe droughts in 2000/01 and 2004-06, coupled with outbreaks of the Rift Valley Fever (RVF) in 1997/98 and 2006/07, caused the body condition of many cattle to deteriorate, eventually killing off a portion of the country's cattle supply (Munyua et al., 2010; Deloitte, 2006). These events also prompted cattle producers to sell their stocks for slaughter prematurely out of fear that their cattle may contract disease or depreciate in value.

It is important to note that in 2009, Kenya conducted a comprehensive national livestock census for the first time in 40 years. According to Behnke and Muthami (2011), cattle population estimates over the previous decade were about three quarters of the 2009 census estimate. This suggests that population figures for cattle may have been significantly underestimated in past years and should be treated with caution.

Consumption and trade

Red meat represents 80% of domestic meat consumption in Kenya, and cattle are Kenya's main source of red meat (EPZA, 2005). In fact, beef accounted for 73% of the total meat consumed by Kenyans in 2009 (FAOSTAT Food Balance Sheet, 2012). Furthermore, total domestic beef consumption more than doubled over the past two decades, increasing steadily from about 200,000 tonnes in 1990 to almost 500,000 tonnes in 2009 (FAOSTAT Food Balance Sheet, 2012). Statistics indicate that beef consumption is highest in Mombasa and Nairobi, where annual per capita consumption is estimated at 15 and 18.25 kg, respectively, while annual per capita consumption in rural areas is estimated at only 3.25 kg (Deloitte, 2006).

Kenya was a net exporter of live cattle from 2005 to 2010, with the exception of 2007 (UN Comtrade, 2010). The high number of imports in 2007 may have resulted from domestic cattle losses caused by the 2004-2006 drought and the 2006/07 RVF outbreak. Except in 2007, traded volumes were low throughout the period analyzed, suggesting that Kenya is generally self-sufficient in cattle production and is only a minor exporter of live cattle.

Contrary to official trade statistics, some data sources suggest that while Kenya is self-sufficient in most livestock products, it is not self-sufficient in red meat production and consistently meets its shortfall through inflows of on-the-hoof animals trekked across its porous borders from neighbouring countries (Aklilu et al., 2008; Deloitte, 2006). It has been estimated that Kenya imports about 25-30% of its beef through unofficial movement of cattle across its borders, and about two million beef cattle enter the country annually, making the national herd highly variable (Deloitte,

2006). However, the lack of information on informal, cross-border trade of live cattle makes it impossible to estimate how many cattle are actually imported and exported each year. Therefore this analysis relied solely on official trade figures.

According to official trade statistics, Kenya exports most of its live cattle to Uganda and Mauritius, which accounted for 62% and 34% of the numbers exported between 2005 and 2010, respectively. Kenya imports most of its live cattle from Tanzania and the Netherlands, which accounted for 76% and 24% of the numbers imported between 2005 and 2010, respectively.

Value chain

Before liberalization of Kenya's livestock sector in 1987, cattle marketing was regulated by the Kenya Meat Commission (KMC), a monopolistic meat processing organization supplying major urban areas, and the Livestock Marketing Division (LMD), which carried out activities to facilitate organized livestock marketing in Kenya. With the support of the LMD, the KMC established several stock routes, holding grounds and quarantine areas to divide the country into disease prone and Disease-Free Zones. Additionally, meat and livestock prices were controlled, and other slaughterhouses were prohibited from entering major urban areas until 1977. Although the KMC collapsed shortly after market liberalization, some of its stock routes are still functioning today, despite their dilapidated state (Deloitte, 2006).

During the LMD's period of operation, 31 stock routes were developed throughout Kenya, but only 14 of these are still in use (Deloitte, 2006). Kenya's existing stock routes generally consist of primary, secondary and terminal markets (EPZA, 2005). Cattle traded along these routes typically change hands once or twice and in very few cases three times (EPZA, 2005). Cattle are usually trekked from remote pastoral areas to primary and secondary markets and then trucked from secondary markets to the main terminal markets in Nairobi and Mombasa (Deloitte, 2006). In some cases, trekking is also the main system of transport from secondary to terminal markets, especially along the Garissa–Tana River–Mombasa route (Deloitte, 2006). Trekkers along this route allow their cattle to graze and put on weight during the journey. Some trekkers even rent ranches to fatten their cattle for several months before selling them for export or slaughter (EPZA, 2005).

Kenya's stock routes are heavily reliant on livestock from ASAL areas, and animals traded in these value chains are not only from Kenya, but are also from neighbouring countries. This cross-border trade flow introduces the risk of transboundary animal diseases and has heightened the need for Disease-Free Zones, especially if the country's export trade is to be developed (Deloitte, 2006).

Since liberalization, an increasing number of private agents, including traders, butchers and slaughterhouses, have entered Kenya's livestock market. Additionally, much of Kenya's livestock marketing infrastructure (i.e. holding grounds, quarantine stations and stock routes) has broken down and movement permits are not strictly adhered to, despite veterinary requirements. These factors have had an adverse effect on the country's former Disease-Free Zones (Deloitte, 2006).

Today, Kenya's beef exports remain low due to high local demand, the prevalence of disease and its inability to meet stringent sanitary and phytosanitary requirements in importing countries. Furthermore, livestock producers have remained largely unorganized, leading to their exploitation by traders and middlemen. The formation of District Pastoralist Associations, such as the Kenya Livestock Marketing Council (KLMC) and the Livestock Traders Marketing Society of Kenya (LTMS-K),

may help to ameliorate this exploitation by passing critical market information to producers (Deloitte, 2006).

Indicators

For the purpose of this analysis, Kenya was considered a net exporter of live cattle in all years, except 2007. Kenya's Garissa–TanaRiver–Lamu–Mombasa stock route was selected for analysis, as this route accounts for 25% of the total animals supplied to the terminal market in Mombasa. The average wholesale price for Grade 2 cattle in Kenya's Coast Province was taken as the price at the point of competition, while the average producer price for Grade 2 cattle in Garissa was taken as the farmgate price in this analysis.

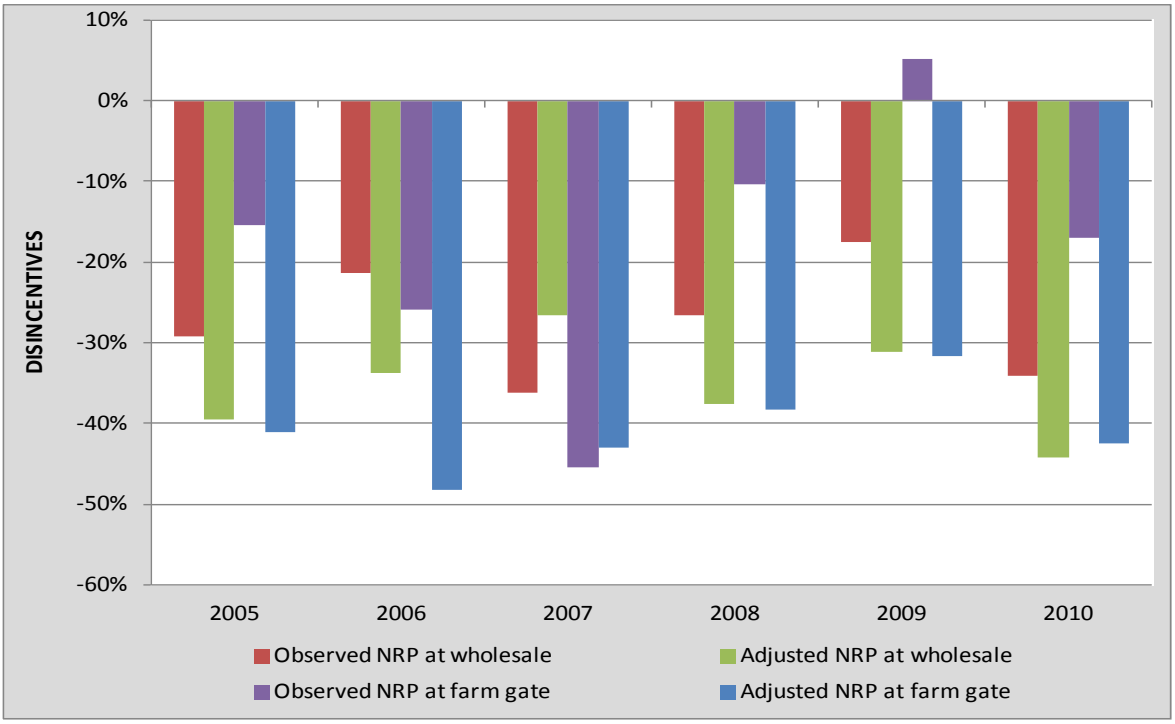
At the wholesale level, the average observed and adjusted NRPs were -27% and -35%, respectively, while at the farm gate, they were -18% and -41%, respectively. As shown in Figure 22, NRPs were highest in 2009 (though still negative at the wholesale level), when there was a notable increase in domestic prices following the drought and RVF outbreak, which had depressed prices between 2004 and 2007 by reducing the quality and increasing sales of cattle stocks.

Adjusted NRPs capture the effect of market ineffiencies along the value chain. Figure 22 shows that in years when Kenya was an exporter of live cattle, adjusted NRPs at wholesale and the farm gates were substantially lower (or more negative) than observed NRPs, indicating that inefficiencies along the value chain represent significant opportunity costs for wholesalers and producers. Figure22 also shows that this situation was reversed in 2007, when Kenya's trade status changed to an importer. In this case, adjusted NRPs at wholesale and farmgate were less negative than observed NRPs, indicating that inefficiencies represented net gains for producers and wholesalers rather than opportunity costs in this particular case. This is largely because inefficiencies actually inflate domestic prices by raising the cost of bringing imports from their point of entry to the domestic market and, therefore, act as natural protection, though this protection is at the expense of consumers purchasing cattle. For this reason, it cannot be interpreted as an overall benefit per se. On average, however, inefficiencies represented net costs for producers, amounting to about 26% of the adjusted reference price at farm gate during the period analyzed.

Market inefficiencies contributing to the total MDG for cattle resulted entirely from excessive access costs. Access cost gaps were substantial in all years analyzed, though they were slightly higher between the border and wholesale than between the farm gate and wholesale. These large gaps are mainly due to high profit margins realized by traders.[29] Profit margins for trekkers and truckers moving cattle from the farm gate to wholesale were estimated at 23% and 34% of their full financial costs, respectively, while profit margins for exporters/importers were estimated at 33% of their full financial costs (Deloitte, 2006). Government taxes and fees imposed on traders also contributed to the access costs gaps. The analysis indicates that trekkers moving cattle from the farm gate to wholesale are subject to government taxes and fees equal to 14% of their total transport costs, while cattle truckers and exporters/importers are subject to very few taxes and fees, if any.

[29] Excessive profit margins are defined as margins exceeding 10% of the agent's full financial costs (crop purchase plus access costs).

Figure 22: Farmgate and wholesale NRPs for live cattle (%), 2005-2010



Source: MAFAP

Main message

Since the cattle market in Kenya is liberalized and there are no trade policies directly affecting domestic prices, an NRP close to zero would be expected at the farm gate and wholesale in all years. However, this analysis shows that wholesalers and producers generally received negative protection, or market price disincentives. The results indicate that while these disincentives cannot be explained by national trade policies, a large share can be explained by issues related to market structure, namely traders' high profit margins due to rent-seeking behaviour, the lack of organization among producers and information asymmetry along the value chain. Government taxes and fees imposed on cattle trekkers also contribute to disincentives, though these costs were marginal relative to traders' profits.

Other important factors influencing the level of (incentives or) disincentives for cattle producers and wholesalers are reoccurring drought and disease outbreaks. As previously explained, these events may, in some cases, depress domestic cattle prices by reducing quality and increasing sales. Thus, lower domestic prices during such events may result in lower market incentives (NRPs).

Based on this analysis, it is evident that the current market structure, as well as severe droughts and disease outbreaks, hinder cattle producers and wholesalers. Information asymmetry and the lack of organization among producers allow traders to capture a larger share of the profits from cattle sales. Furthermore, government taxes and fees imposed on trekkers may reduce the prices that trekkers are willing to pay producers for their cattle, or even deter the movement of cattle from remote pastoral areas to markets. Lastly, if animal disease outbreaks are not properly contained and water sources are not provided during periods of severe drought, these events can reduce domestic prices and market incentives in certain years. Unless these issues are addressed, they will continue to serve

as major barriers to Kenya's stated goal of expanding its cattle export market as a strategy for poverty alleviation in ASAL regions.

Sorghum

As the only cereal species indigenous to Kenya, sorghum is produced throughout much of the country, including areas with low agricultural potential. Sorghum is a drought-resistant food crop typically grown by small-scale, resource-poor farmers. The increased use of improved varieties such as gadam in beer production has spurred renewed interest in the commercial production of sorghum. In recent years, the GOK has started to promote sorghum production as a strategy for increasing food security and income generation in ASAL regions.

Production

Sorghum production has been fairly volatile in recent years, dipping steeply in 2004 and again in 2008. The first dip in production was mainly due to a reduction in yield, while the second was strongly correlated with a reduction in both yield and total land planted to sorghum, resulting from post-election instability in 2007/2008 (Chemonics Inc., 2010). Between 2008 and 2010, however, production tripled, increasing by almost 110,000 tonnes. Most of this growth was driven by expansion in the total area planted to sorghum, which was largely due to the promotion of sorghum as a drought-resistant crop in Kenya's ASALs, as well as attractive prices from increased consumption (MOA, 2011).

Sorghum yields in Kenya have shown little consistent improvement over the past two decades, varying significantly between years. The average yield between 1990 and 2010 was only 0.8 T/ha (FAOSTAT, 2012), despite the development of new seed varieties with the potential to yield 2–5 T/ha.

Consumption and trade

Total sorghum consumption in Kenya increased from 128,250 tonnes in 2005 to 139,637 tonnes in 2007, but decreased to only 33,000 tonnes in 2008 due to post-election instability and a concomitant decline in sorghum production. Since 2008, total sorghum consumption in Kenya has increased once again, leveling off at about 81,000 tonnes in 2009 and 2010 (MOA, 2010; MOA, 2011).

Most sorghum in Kenya is consumed within producing households and is typically ground into flour at home or in rural hammer mills for making thin or thick porridge, known as *ugali*. Some sorghum is also processed into flour by larger commercial mills and then packaged for sale in urban markets. The by-products from sorghum processing are typically used for animal feed production (Chemonics Inc., 2010).

Based on FAOSTAT's Commodity Balance Sheet for years 2005-2009, it was estimated that on average 53% of domestic sorghum supply is used for food (grain and flour) and 24% is used for industrial processing, while 11% goes to waste, 10% to animal feed and 2% to seed for planting.

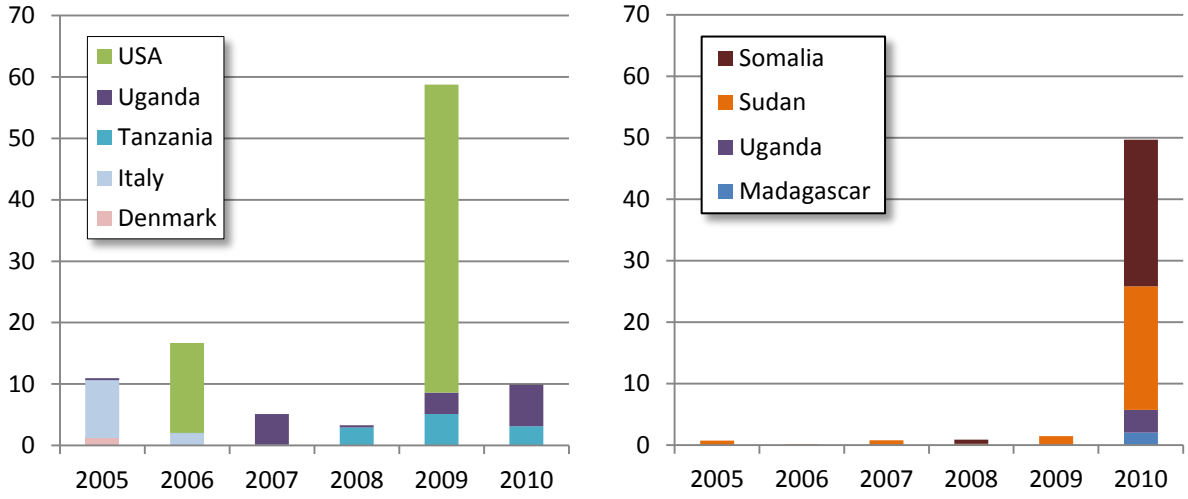
Sorghum is thinly traded in Kenya due to low production volumes and poor marketing channels. Most farmers produce enough sorghum to meet their domestic requirements, with little surplus to

sell (Ochieng, 2011). It has been estimated that only 30% of domestic sorghum production is actually marketed (NU, 2006).

Figure 23 below shows that the total volume of sorghum internationally traded remained low until 2009 and 2010. It also shows that sorghum imports exceeded exports in all years, with the exception of 2010. In that year, Kenya exported 49,709 tonnes of sorghum mainly to Somalia (23,852 tonnes) and Sudan (20,133 tonnes), since both countries faced severe drought conditions that necessitated food imports. However, Kenya's unusually high volume of imports in 2009, primarily from the United States, suggests that most exports in 2010 were actually food aid shipments received in 2009 for redistribution to neighbouring countries in crisis.

Figure 23 also indicates that with the exception of irregular imports from the United States and Europe, Kenya generally imports sorghum from countries within the region such as Uganda and Tanzania. A 25% tariff is levied on sorghum imports from outside COMESA and EAC regions.

Figure 23: Sorghum imports (left) and exports (right) by trade partner (1,000 tonnes), 2005-2010



Source: UN Comtrade, 2011

Though sorghum trade is limited in Kenya, the situation is likely to change in the near future. Due to increased health concerns and awareness, the use of sorghum products has seen a gradual increase, as reflected by the quantity and range of processed sorghum products sold in local supermarkets. Sorghum flour is in great demand and is likely to be the future for the sorghum industry (Chemonics Inc., 2010). With proper packaging, the sorghum flour market could be expanded to larger retail outlets and export markets (Chemonics Inc., 2010). Furthermore, KARI in collaboration with East African Breweries Ltd (EABL) is promoting the use of sorghum to supplement barley in beer production (MOA, 2011). This recent development has spurred renewed interest in the commercial production of sorghum, as it offers farmers prospects for higher returns.

Value chain

Sorghum is generally traded and consumed locally or sold to middlemen and small traders for wider distribution (Chemonics Inc., 2010; Ochieng, 2011). Traders and middlemen generally bulk sorghum at local markets and transport it to wholesalers. Wholesalers then sell directly to retailers, grain

millers and exporters. The main markets for sorghum are Nyamakima and Gikomba in Nairobi (Chemonics Inc., 2010).

While sorghum is typically processed at small hammer mills in Gikomba, some is also processed in large mills and packaged for sale in large-scale outlets. Large mills produce sorghum flour as well as by-products for the animal feed industry. Once processed, sorghum flour is sometimes mixed with cassava flour to enrich the flour product before it is sold, especially in urban areas (Chemonics, 2010).

Sorghum trading from production to retail is generally undertaken by individuals who work independently rather than in organized groups. Traders at the Nyamakima and Gikomba markets have indicated that they would like to be organized as a group, which could lobby the City Council for their interests. Traders in both markets are primarily concerned with the high council cess, harassment by the council, bribes during transport and poor access to credit and market information. They also indicated that storage facilities, sale areas and loading/unloading facilities are inadequate and that there is a need for a larger staple foods market (Chemonics Inc., 2010).

The brewing industry has recently started to play a key role in the value chain for sorghum. This is due to the increased use of higher-quality sorghum varieties such as gadam for beer production, which has opened new marketing opportunities for producers. In response to this demand, the Ministry of Agriculture is promoting the production of gadam sorghum through the bulking and distribution of seeds to farmers under the Traditional High Value Crops (THVC) programme (MOA, 2011; MOA, 2012). Most of the sorghum produced by farmers receiving these seeds is sold directly to the EABL (MoA, 2011).

Indicators

For the purpose of this analysis, Kenya was taken as a net importer of sorghum in all years. The average wholesale price in Nairobi was taken as the price at the point of competition. Since producer prices were not available, the average wholesale price in five primary markets within major production areas in western Kenya was taken as the farmgate price.

At the wholesale level, observed and adjusted NRPs averaged about 3% and 5%, respectively. As shown in Figure 24, NRPs at wholesale were negative in years 2005, 2006, and 2009, when Kenya imported sorghum from Europe and/or the United States and were positive in years 2007, 2008 and 2010, when Kenya imported sorghum from the region. This is partly because benchmark prices were higher in years when sorghum was imported from world markets rather than regional markets. Wholesalers received the highest rates of protection in 2007 and 2008, possibly due to post-election instability, which reduced domestic supplies and presumably raised wholesale prices.

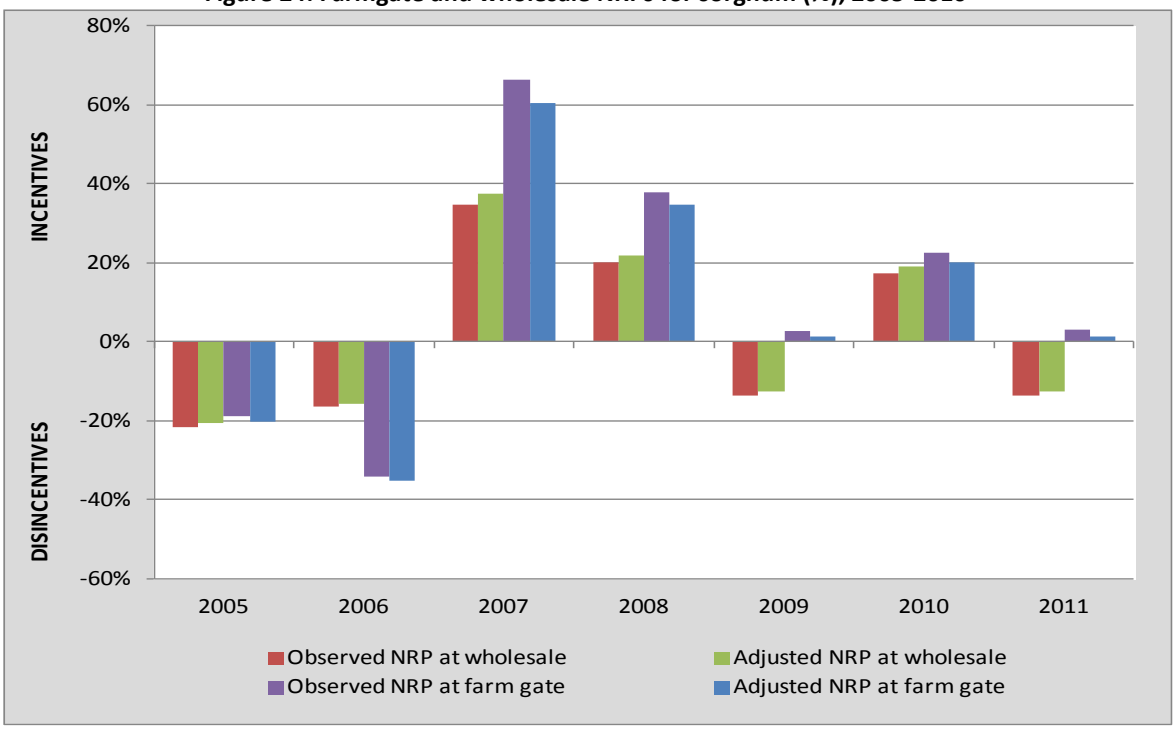
At the farm gate level, observed and adjusted NRPs averaged about 13% and 10% throughout the period analyzed, respectively. As shown in Figure 24, NRPs at farm gate followed a trend similar to those at wholesale. In 2009, however, NRPs at farm gate were higher than the NRPs at wholesale and were close to zero percent, indicating that producers received neither price incentives, nor disincentives.

Given the unusual price and trade patterns that occurred in 2009 and 2010 as a result of the regional drought and food shortage, NRPs in these years are considered special cases that do not necessarily

reflect typical market conditions or realities confronted by sorghum farmers. In fact, trade trends indicate that a large share of the imports in 2009 may have actually been food aid shipments sent to Kenya for redistribution to neighboring countries in crisis. Even if most of the imports were re-exported, some of the food aid may have remained in the country and could have even been subsidized for consumers. If this was in fact the case, it may explain why the farm gate price was nearly equivalent to the reference price, while the wholesale price was low relative to the reference price.

Adjusted NRPs capture the effect of market inefficiencies along the value chain. As shown in Figure 24, adjusted NRPs at wholesale were higher (or less negative) than the observed, whereas adjusted NRPs at the farm gate were lower (or more negative) than the observed. This means that inefficiencies represent opportunity costs for farmers, but not for wholesalers. On average, the net MDG amounted to about 2% of the adjusted reference price at farm gate, which is the price that farmers should receive in an efficient market (i.e. in the absence of distortions caused by government policy measures and market functioning). Inefficiencies along the value chain were entirely due to excessive access costs such as government taxes, illegal bribes and delays at roadblocks and weighbridges. If these distortions were eliminated and the market functioned more efficiently, farmers would be slightly better off than under existing market conditions.

Figure 24: Farmgate and wholesale NRPs for sorghum (%), 2005-2010



Source: MAFAP

Main message

Although a 25% tariff is applied to sorghum imports from outside EAC and COMESA member countries, the results suggest that this has had little effect on domestic prices, since producers received an average NRP of about -15% in years when sorghum was mainly imported from Europe and the United States. One potential explanation for the disincentives, particularly in 2005 and 2006, is that the tariff on sorghum imports may have been waived due to food shortages during periods of

severe drought. Furthermore, low farmgate prices relative to the high price of imports in 2005 and 2006 suggest that there was weak price transmission between wholesale and farmgate in these years.

Since there are no tariffs levied on sorghum imports from EAC countries, an NRP of zero was expected in years when Kenya mainly imported sorghum from Uganda and Tanzania. However, the results indicate that producers actually received an average NRP of about 48%. These incentives were largely due to high domestic prices relative to regional import prices, which may have resulted from a decline in domestic sorghum production during post-election instability in 2007/2008, as well as a regional drought and food crisis in 2009/2010.

Overall, the results indicate that NRPs varied considerably throughout the period analyzed and that market inefficiencies also played a role in disincentives for producers. The data suggests that most of this variability was due to shifts in trade patterns and the removal of import tariffs in certain years. Thus, the volatility of government intervention creates uncertainty in the sorghum market, which not only hinders domestic trade, but also increases the risk borne by farmers and deters long-term investments in sorghum production. Additionally, poor price transmission between farmgate and wholesale in some years suggests production by individual farmers is often too small to make tradable volumes, so a large share of domestic sorghum is still sold and consumed locally rather than in major wholesale markets. Weak trade linkages between local and urban wholesale markets may result in significant opportunity costs for producers, especially in years when high-cost imports increase wholesale prices. Furthermore, market inefficiencies such as taxes, bribes and other non-tariff barriers also represent opportunity costs for farmers, which reduce price incentives at the farm gate.

Traditionally, sorghum is an inexpensive staple food crop that offers low returns for producers. For this reason, sorghum in Kenya is generally considered a non-tradable or is primarily traded locally. However, domestic sorghum consumption has steadily increased and new marketing channels have opened up in recent years that could potentially offer higher returns for farmers. These channels include the brewing industry, which is contracting farmers to grow higher quality gadam sorghum for alcohol production. Additionally, consumer demand for sorghum flour has risen, especially in urban areas. While domestic sorghum production has increased in response to this growing demand, it continues to fall short, resulting in the need for imports to fill the gap. Without attractive incentives for sorghum farmers, production may continue to fall short of demand and farmers may not be willing or able to take advantage of these new marketing outlets.

Aggregate farmgate indicators and interpretation

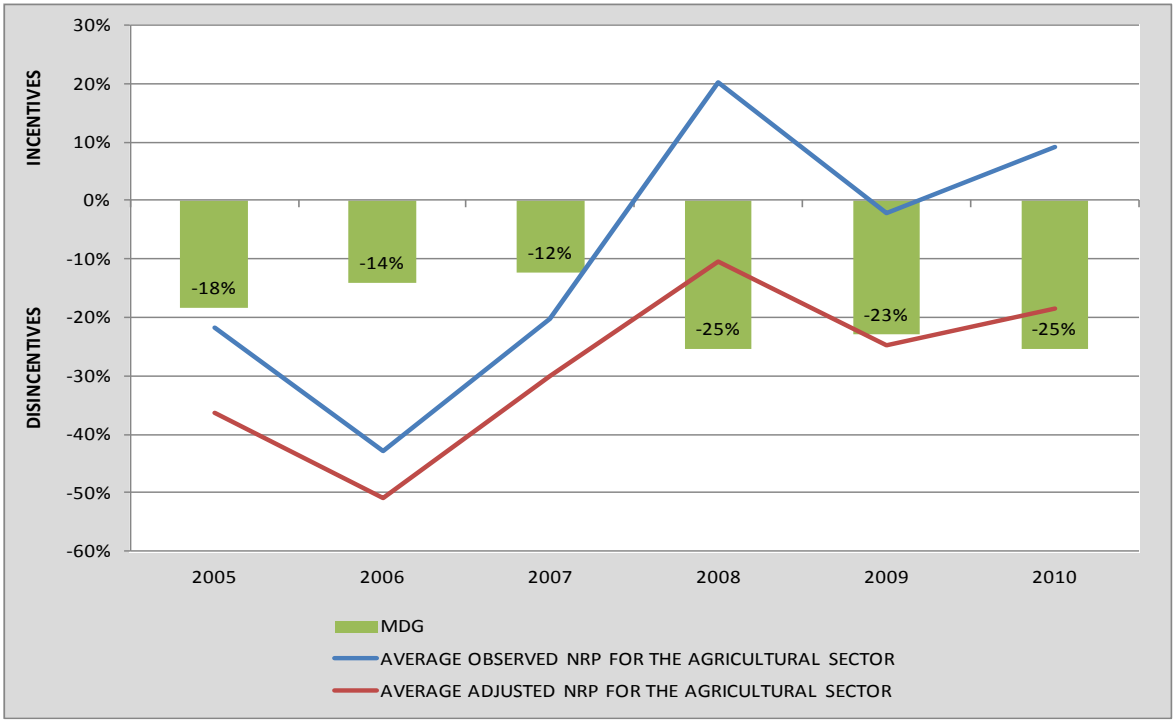
Figure 25 shows the aggregate indicators at the farm gate for *the agricultural sector.*[30] The average observed and adjusted NRPs throughout the period analyzed were -10% and -28%, respectively. Figure 25 indicates that producers generally faced market price disincentives, though a positive trend is observed. It seems that producers only faced price incentives in years when there were major shocks to production, such as political instability following Kenya's December 2007 election

[30] The agricultural sector refers only to the ten commodities analyzed, which account for about 59% of the value of agricultural production in Kenya.

and a subsequent drought in 2009. These extraordinary events seemed to have a larger impact on food crops than on cash crops, resulting in shortages, increased imports and high domestic prices.

Adjusted NRPs in Figure 25 capture the effect of market inefficiencies (MDGs) on producers. As illustrated, adjusted NRPs were negative in all years and were lower than observed NRPs throughout the period analyzed. This indicates that producers received lower prices than they would have in the absence of market distortions caused by government policy interventions and inefficiencies along commodity value chains. Therefore, inefficiencies represent significant opportunity costs for producers in Kenya. Figure 25 illustrates that these costs, reflected in the MDG (green bar), were highest in years 2008-2010, when domestic prices rose in response to supply shortages. This suggests that the benefits from higher domestic prices in these years were not fully transmitted to the farmer, as traders and intermediaries may have captured a larger share of the profits. On average the MDG affecting producers amounted to 20% of the adjusted reference price at farm gate.

Figure 25: Farmgate NRPs and MDGs for the agricultural sector, 2005-2010

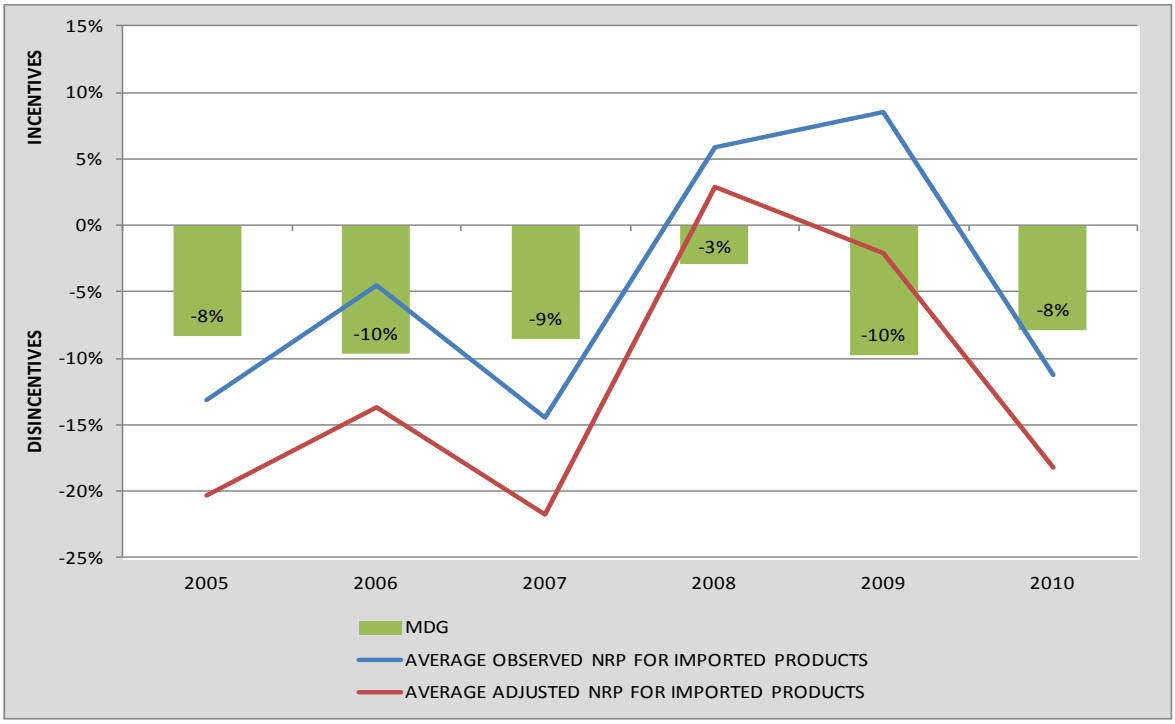


Source: MAFAP

Imported products

Figure 26 shows the aggregate indicators at the farm gate for imported products, which include maize, wheat, rice, sugar and cotton. The average observed and adjusted NRPs for imports throughout the period under review were -5% and -12%, respectively, while the average MDG was equal to about 8% of the adjusted reference price at farm gate. As illustrated, producers faced market price disincentives in all years, except in 2008 and 2009, when there were significant shocks to production, which presumably resulted in higher prices for farmers.

Figure 26: Farmgate NRPs and MDGs for imported products, 2005-2010



Source: MAFAP

The trends for imported products are much easier to interpret when they are separated into two distinct subgroups – imported products essential for food security and imported industrial products.[31] The aggregate indicators for each of these subgroups are presented in Figures 27 and 28 below.

Imported products essential for food security

Figure 27 shows the aggregate farmgate indicators for products essential for food security, which include maize, wheat and rice. Collectively, these account for almost 11% of the total value of agricultural production. Maize, accounting for about 6%, is the main commodity driving the trend in NRPs and MDGs shown in Figure 27.

The average observed NRP for food security products was -10% throughout the period under review, while the average adjusted NRP was -12%. Trends in observed NRPs were generally negative. It seems that producers only faced minor price incentives in 2008 and 2009. The low, but positive protection in these two years was a direct result of major shocks to the production caused by political unrest in 2007/2008 and a subsequent drought in 2009. Food scarcity during these turbulent years resulted in high domestic prices, thereby raising the NRP for producers.

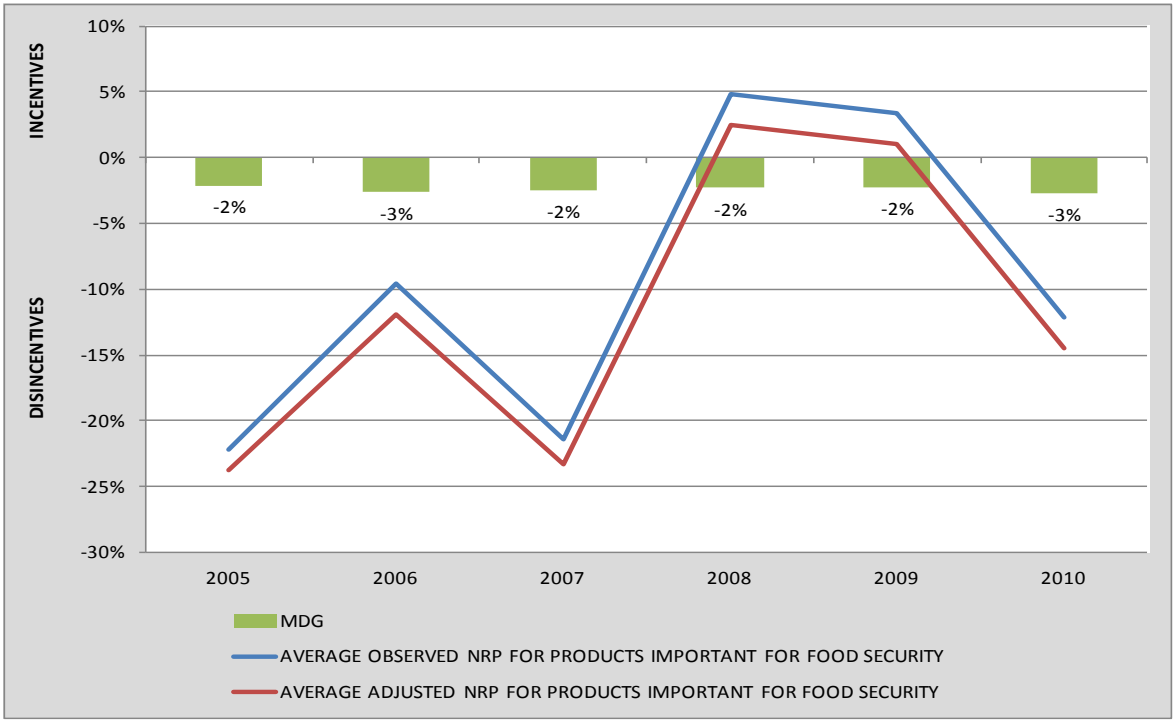
The market price disincentives received by producers throughout most of the period analyzed is an interesting finding, given that food security crops are protected under Kenya's trade policy. Maize, wheat and rice imports from outside the EAC and COMESA regions are subject to tariffs. Wheat and

[31] The latter subgroup refers to agricultural products mainly imported for industrial purposes. This includes raw sugar, which is often imported for food processing, and seed cotton, which is imported by spinners and textile mills to produce yarn and fabric for Kenya's garment industry.

rice are both routinely imported from world markets, so tariffs are effective in keeping domestic prices high for producers. Maize, on the other hand, is typically imported duty-free from neighboring countries within the EAC and is only imported from world markets under exceptional circumstances. However, maize imports are often subsidized or protective tariffs are waived in times of crisis, as they were in 2008 and 2009. Since maize is the main commodity driving the trend in Figure 27, the lack of effective protection from tariff measures throughout the period analyzed is evidenced by the low or negative observed NRPs.

Adjusted NRPs in Figure 27 capture the effect of market inefficiencies (MDGs) on producers. Adjusted NRPs were slightly lower than observed NRPs in all years analyzed, indicating that MDGs represent marginal opportunity costs for producers. On average these costs were about 2% of the adjusted reference price at farm gate. This means that if the markets were functioning efficiently, producers would be slightly better off than under existing market conditions.

Figure 27: Farmgate NRPs and MDGs for imports essential for food security, 2005-2010



Source: MAFAP

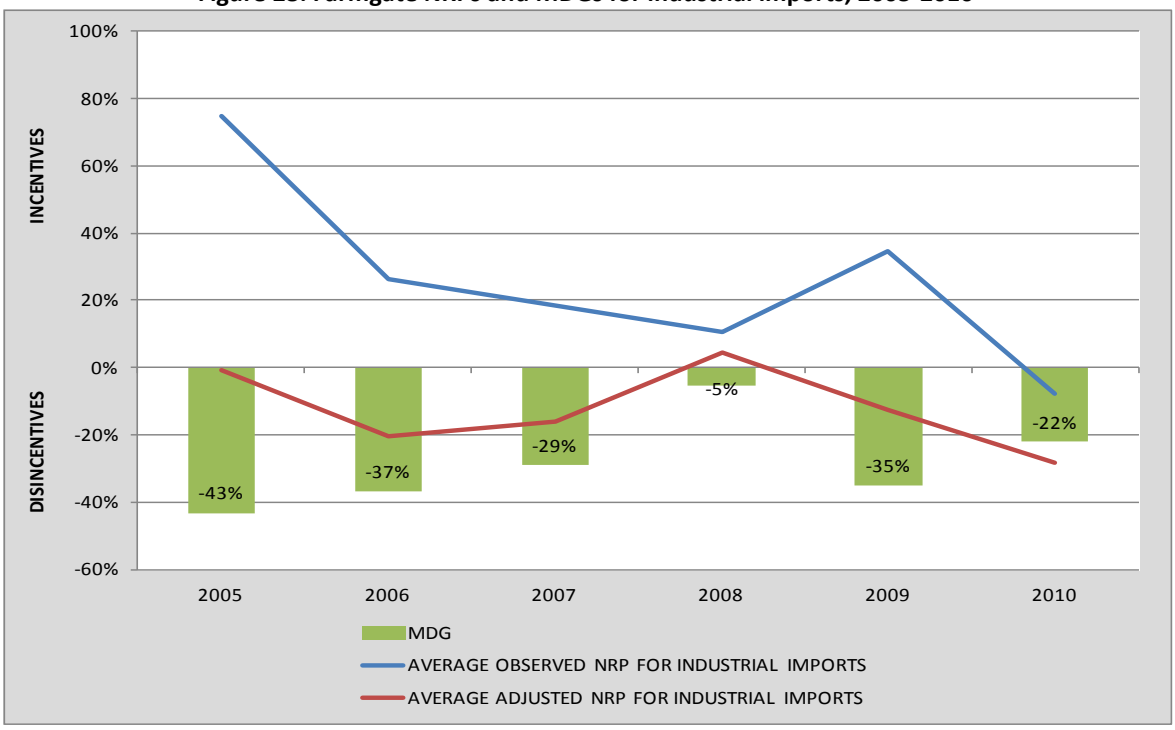
Imported industrial products

Figure 28 shows the aggregate farmgate indicators for industrial imports, which include sugarcane and seed cotton. These commodities account for less than 4% of the total value of agricultural production. The average observed and adjusted NRPs for industrial imports throughout the period under review were 26% and -12%, respectively. Trends in observed NRPs indicate that producers faced market price incentives in almost all years, but that these incentives generally decreased between 2005 and 2010. This was largely due to the government's gradual withdrawal of protective trade measures and liberalization of the sugar industry. The spike in protection in 2009 was probably a result of the widespread drought that year, which may have raised farmgate prices for

sugarcane.[32] It may also be linked to a decrease in the benchmark price for seed cotton in 2009, which did not proportionally affect local prices, thereby reducing market price disincentives for producers.

Adjusted NRPs in Figure 28 capture the effect of market inefficiencies (MDGs) on producers. Adjusted NRPs were substantially lower than observed NRPs in almost all years analyzed, indicating that MDGs represent significant opportunity costs for producers. This was mainly due to the high profit margins of sugar factories, which accounted for most of the excessive access costs between the farm gate and factory gate. The average MDG throughout the period analyzed represented about 29% of the adjusted reference price at farm gate. Therefore producers would be much better off if the market were functioning more efficiently and profit margins were more equitably distributed than under existing market conditions.

Figure 28: Farmgate NRPs and MDGs for industrial imports, 2005-2010



Source: MAFAP

Exported products

Figure 29 shows the aggregate indicators at the farm gate for exported products, which include coffee and tea. Given that tea represents about 6% of the value of agricultural production and coffee only 1%, tea is the main commodity driving the trend pictured below.

The average observed NRP was -13% throughout the period analyzed, indicating that farmers of exported products faced market price disincentives. In the case of coffee, disincentives largely stem from various levies on coffee exports, the revenues of which are used for coffee research and infrastructure development. Tea, on the other hand, is mainly affected by the concentration of

[32] Industrial import products did not appear to be significantly affected by post-election instability in 2007/2008.

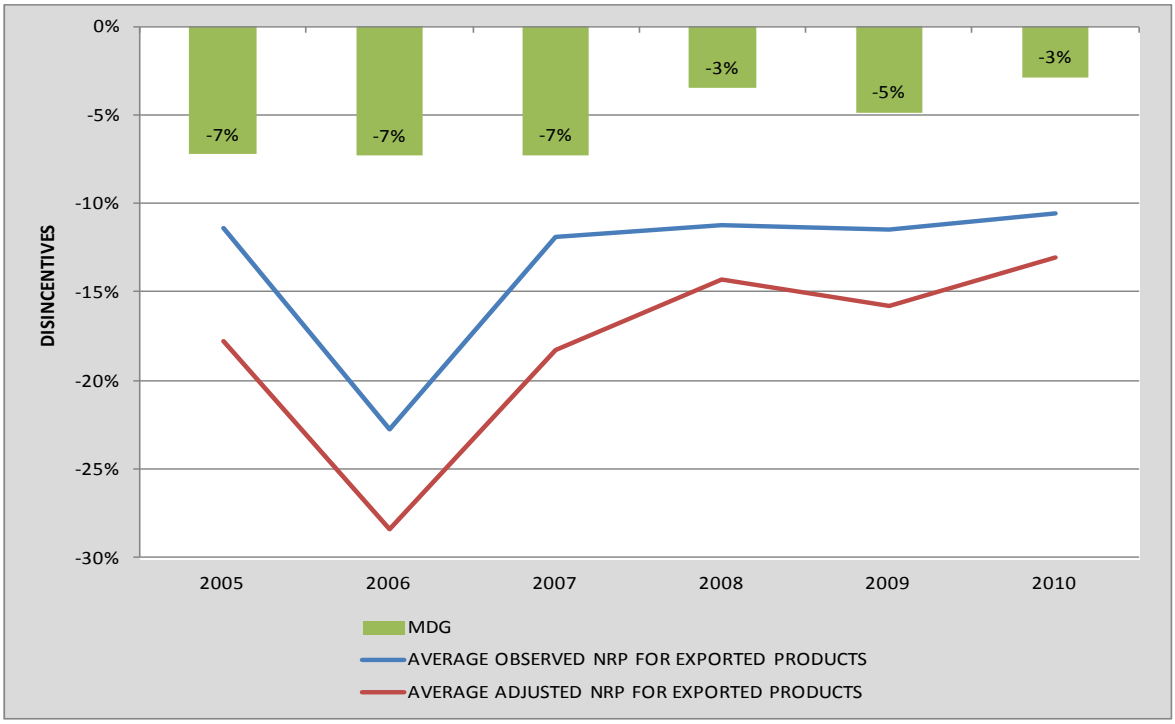
buying power among a small number of multinational corporations, which control the global tea market and influence prices. Therefore, disincentives for tea are more related to the functioning and structure of the international market than to government policies directly affecting prices, as in the case of coffee.

As illustrated in Figure 29, adjusted NRPs were lower (or more negative) than observed NRPs in all years, averaging -18% throughout the period analyzed. This means that farmers faced even stronger disincentives due to inefficiencies along export value chains. Both the coffee and tea sectors are characterized by highly centralized and regulated value chains, especially for smallholders. All coffee smallholders are required to sell their outputs to cooperatives that arrange for processing and marketing on their behalf. This system has proven inefficient and costly for producers, as there are very few options for processing. The lack of competition has discouraged cooperatives and processors from reducing their costs, which are borne by farmers. Therefore, these inefficiencies have resulted in major opportunity costs for smallholders, which have contributed to the MDG shown in Figure 29.

Similarly, all smallholder tea producers are required by law to market their outputs through the Kenya Tea Development Authority (KTDA), a private company owned by shareholders representing only one third of smallholder tea farmers in Kenya. The inherent bias in the organization and management of the KTDA has resulted in high margins for the KTDA and its shareholders in certain years and lower prices for non-shareholder producers. These high margins constitute significant opportunity costs for the majority of smallholders, contributing to the overall MDG.

On average, the MDG for exported products amounted to about 5% of the adjusted reference price at farm gate, which is the price that farmers should receive in the absence of distortions caused by government policy interventions and deficiencies in the structure and funtioning of value chains.

Figure 29: Farmgate NRPs and MDGs for exported products, 2005-2010



Source: MAFAP

Thinly traded products

Figure 30 shows the aggregate farmgate indicators for thinly traded products, which include cow milk, live cattle and sorghum. Given that cow milk and cattle each represent roughly 20% of the value of agricultural production and sorghum represents less than 1%, they are the main commodities driving the trend pictured below.

The observed NRP averaged about -9% throughout the period analyzed, indicating that producers of thinly traded products generally faced market price disincentives. Since these products are not heavily traded, disincentives represent opportunity costs for producers in years when they could have potentially received a higher price by trading domestically or exporting to the world market.

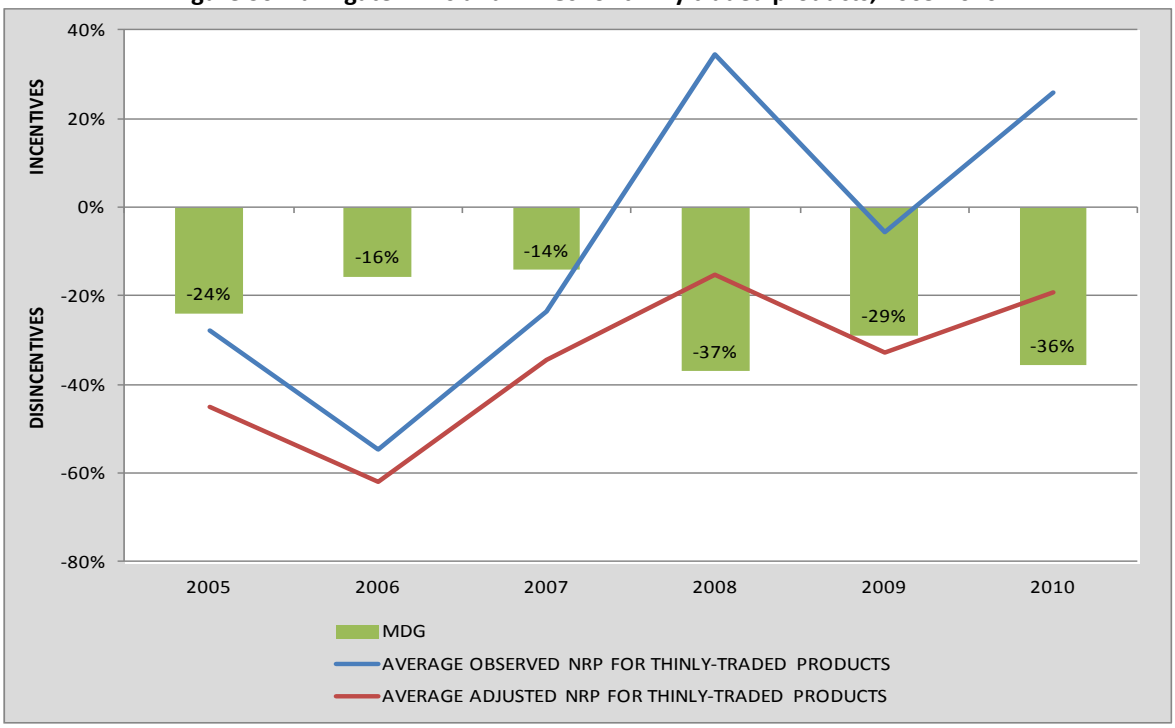
As reflected in the trend below, disincentives generally decreased over time. In the case of cow milk, political instability in 2007/2008 resulted in scarce supplies, which drove up local milk prices. Favourable domestic prices, coupled with a decrease in the export price for milk, resulted in strong price incentives for producers in 2008. A second decrease in the export price for milk also generated incentives for producers in 2010.

Cattle followed a similar trend; however, disincentives generally declined as the effects from drought conditions in 2004-2007 and the disease outbreak in 2007 subsided. These events reduced the quality of cattle stocks and increased cattle sales, which put downward pressure on domestic prices. Lower domestic prices generated market price disincentives for cattle producers in all years except 2009.

As illustrated in Figure 30, adjusted NRPs were lower (or more negative) than observed NRPs in all years, averaging -35% throughout the period analyzed. This means that farmers actually faced

market price disincentives in all years, when accounting for inefficiencies along commodity value chains. Inefficiences in the dairy and livestock sectors arise from issues related to market structure. Both sectors suffer from highly fragmented value chains characterized by a lack of organization among producers, a weak policy and institutional framework, poorly enforced health standards and the concentration of market power among certain groups of marketing agents. In the case of cow milk, market power is mainly concentrated among factories, which allows them to capture a significant share of the profits. Within the cattle value chain, market power is primarily concentrated among exporters and middlemen, who have better access to information and are able to secure much higher profits than pastoralists. High profit margins obtained by the various agents in both sectors constitute significant opportunity costs for producers, which contribute to the overall MDG. On average, the MDG for thinly traded products amounted to about 26% of the adjusted reference price at farm gate.

Figure 30: Farmgate NRPs and MDGs for thinly traded products, 2005-2010

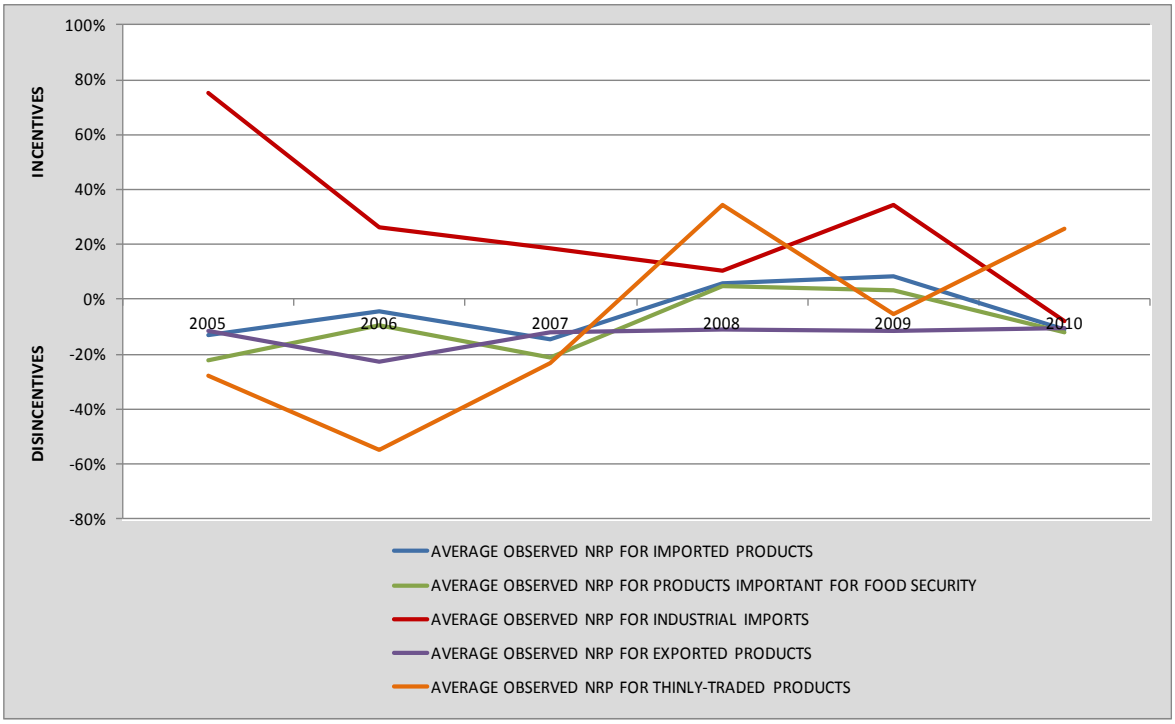


Source: MAFAP

Comparison across product categories

Average observed NRPs in Figure 31 show that market price disincentives generally decreased for all product categories throughout the period analyzed, except for exported products and industrial imports. This pattern is largely due to major shocks to production, such as post-election instability in 2007/2008 and drought conditions in 2009, which resulted in more favourable prices for producers. Exported crops (coffee and tea) did not appear to be significantly affected by these events. In contrast, the high level of incentives captured by producers of thinly traded products in 2008 suggests that the milk sector was most affected by post-election instability. This is not surprising given the major losses in the dairy sector, which were reported in surveys conducted by Land O'Lakes (Land O'Lakes, 2008).

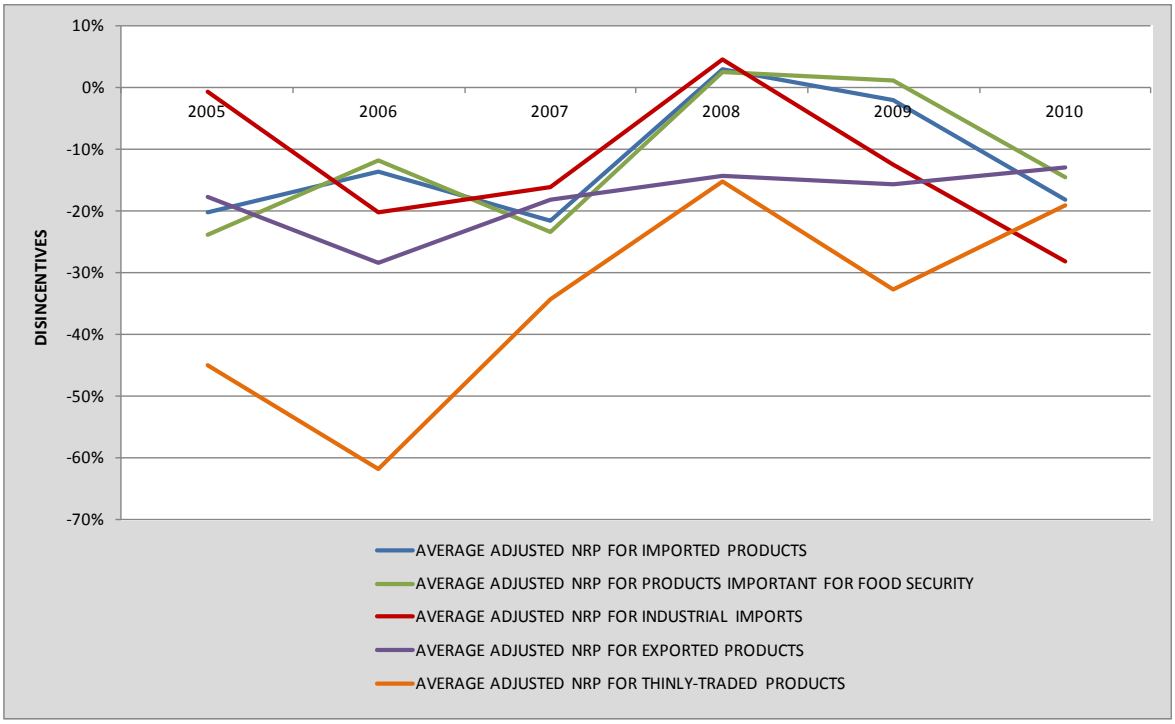
Figure 31: Observed NRPs at farm gate by product category, 2005-2010



Source: MAFAP

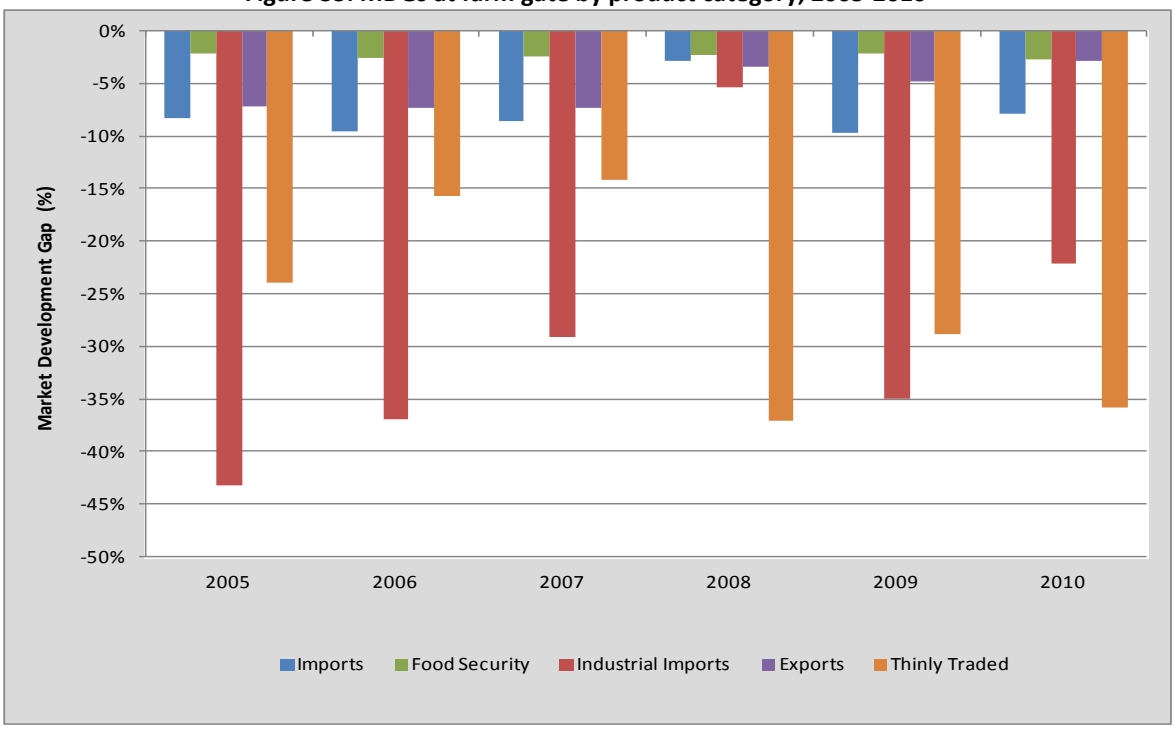
Average adjusted NRPs for all product categories in Figure 32 show that producers faced lower market price incentives or disincentives, when accounting for inefficiencies along commodity value chains. This means that producers generally received a lower price than they would have in the absence of market distortions caused by government policy measures and deficiencies in the structure and functioning of domestic markets. Adjusted NRPs for thinly traded products were the lowest compared to all other product categories. Furthermore, adjusted NRPs for industrial imports were negative in all years, except in 2008. As shown in Figure 33, both product catergories appear to be the most affected by market inefficiencies, while food security crops appear to be the least affected.

Figure 32: Adjusted NRPs at farm gate by product category, 2005-2010



Source: MAFAP

Figure 33: MDGs at farm gate by product category, 2005-2010



Source: MAFAP

Conclusions

This analysis shows that producers in Kenya generally faced market price disincentives throughout the period 2005-2010. Indicators for the agricultural sector as a whole show that these disincentives decreased throughout the period analyzed, though this trend was linked to production shocks, such as political instability following Kenya's December 2007 election and a severe drought in 2009, which resulted in more favourable prices for producers. Therefore, it is uncertain whether this positive trend will be sustained in the long-term, as it is largely driven by the price volatility of food crops, which appear more vulnerable to production shocks than cash crops.

Food security products are least affected by inefficiencies in domestic markets, while thinly traded products and industrial imports are most affected. For the former product category, MDGs are mainly due to government taxes and fees, bribes and the delays at roadblocks and weighbridges. For latter product categories, however, MDGs largely stem from structural issues such as the market power of intermediaries, information asymmetry and poor regulation and organization among producers within commodity value chains.

Import tariffs are levied on maize, wheat, rice, sugar and sorghum. Wheat and rice are both routinely imported from world markets, and tariffs are effective in keeping domestic prices high for producers. Maize and sorghum, on the other hand, is typically imported duty-free from countries within the EAC and COMESA regions and are only imported from world markets under exceptional circumstances. Consequently, tariffs are not always effective in keeping maize prices high for producers. Furthermore, policies established to protect the sugar industry are gradually being reduced and will likely be eliminated by 2014, though trends suggest that the quota on sugar imports is no longer binding.

Consumers are adversely affected by tariffs on food imports, especially those on wheat and rice. Kenyans in urban areas spend nearly as large a share of their food budget on wheat and wheat products as on maize and maize products. With respect to rice, however, it seems likely that consumers most adversely affected are those in urban areas with moderate to high incomes, since many low-income consumers still cannot afford it.

Finally, the results of this analysis highlight the fact that government policy interventions in response to food shortages appear to be more reactive than proactive in nature. This was evidenced by the government's reaction to the food crisis in 2008 and 2009. In both years, the GOK either subsidized food imports or waived import tariffs on these crops in order to protect consumers, as food stock inventories were not sufficient to cover the deficit. Given Kenya's high susceptibility to drought and other production shocks, the GOK may need to consider developing more preventative measures in order to stabilize market prices for consumers and producers, reduce risk and promote trade.

6. Public expenditure and aid

Introduction

Kenya is a largely agriculture-based economy and public expenditures are an important policy instrument in Kenya's agricultural sector development. Despite implementation of a number of reforms, the resource allocation to agriculture remains low, while the composition of expenditures in support of agriculture may not be optimal. The utilization of budgeted allocations is unsatisfactory. The analysis is based on partial data coverage; therefore any figures, statements and conclusions drawn on their basis should be considered preliminary.

The agriculture and rural development sector in Kenya is under political oversight by the following ministries: Agriculture, Livestock and Fisheries Development and Cooperatives and Marketing Development. Other sector-related ministries include: Water and Irrigation, Natural Resources and Environment, Forestry and Wildlife, Ministry of Regional Development Authorities, and Ministry of Lands. Expenditures by these ministries are normally considered when measuring support to agriculture and rural development in Kenya.

Much expenditure that supports development of the agricultural sector occurs outside these key agricultural sector ministries and institutions. In Kenya, the supportive ministries include: Ministry of State for Development of Northern Kenya and Other Arid Lands, Ministry of Health (rural health), Ministry of Education (rural education), Ministry of Special Programmes, and Ministry of Roads (rural roads).

Following MAFAP methodology, the expenditures on projects and programmes of all these ministries were examined; all relevant expenditures financed from the national resources have been included in the analysis. However, the project had difficulties in obtaining data for all relevant expenditures on donor-financed projects. The data available only cover several major projects operating under the four key agricultural ministries. Data on overall donor contribution to the agriculture sector budget for 2006/07 (as measured traditionally in Kenya, hence excluding Ministry of State for Development of Northern Kenya and Other Arid Lands and Ministries of Health, Education, Special Programmes, and Roads) indicate that less than a third of donor expenditures is covered in our database (see KEPCO, 2010 for 2006/07 donor data). The project was also unable to complete collection of the data on actual spending. As a result, the analysis is limited to the budgetary expenditures. Annex 1 provides a detailed list of projects and programmes covered in the analysis.

It is important to note that the limited coverage of the donor data and the missing actual spending figures do not allow a fully-fledged analysis of public expenditures in support of the food and agriculture sector in Kenya, as conducted for other countries participating in the MAFAP project. A partial analysis is presented therefore and incompleteness of the results is noted throughout the text, where appropriate. Any figures, statements and conclusions drawn on their basis should be considered as preliminary and will be subject to further revisions when the missing data will be collected.

The following analysis uses concepts and definitions described in the MAFAP methodology for measuring public expenditures in support of food and agriculture sector development and its terminology. Readers not familiar with the methodology are invited to refer to the MAFAP concept

paper available at: www.fao.org/mafap. A few main definitions are provided in Box 1; Annex 2 provides a summary of main concepts.

Box 1: Main definitions

The main definitions are provided below. Annex 2 summarizes main concepts behind measurement of public expenditures in support of food and agriculture sector development in the MAFAP projects.

Public expenditures in support of food and agriculture sector development: all public expenditures undertaken in support of food and agriculture sector development, financed from the national budget, either central or regional government, regardless of the ministry that implements the policy, and external aid, provided either through local governments or specific projects conducted by international organisations or NGOs. They are composed of agriculture-specifc expenditures and agriculture-supportive expenditures.

Agriculture-specific expenditures: all public expenditure measures that generate monetary transfers to agricultural agents (producers, consumers, input suppliers, traders, processors and transporters) or the sector as a whole (in form of research, extension services etc.)

Agriculture-supportive expenditures: public expenditure measures that are not strictly specific to the agriculture sector, but that have strong influence on agricultural sector development, such as rural education, rural health or rural infrastructure (energy, water and sanitation, roads etc.)

Support to individual commodities: public expenditures that directly target specific individual commodities such as rice or cotton.

Support to groups of commodities: public expenditures that directly target specific groups of commodities such as crops or livestock.

Trends in public expenditure in support of agriculture

The approved budget for all expenditures in support of food and agriculture sector development covered in this analysis[33] grew by 122% in nominal terms from 2006/07 to 2010/2011, reaching 66.1 billion Ksh (Table 21). In relative terms, however, the share of identified agricultural expenditures in total government budgeted expenditures grew by only 12%: from 5.5% in 2006/07 to 6.9% in 2010/2011 (see Figure 34).

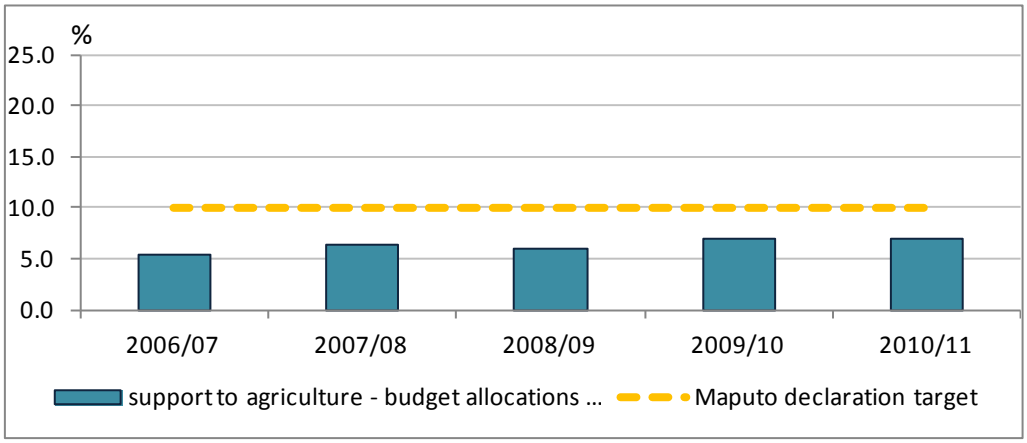
[33] The expenditures include both policy transfers in support of food and agriculture and policy administration costs. They include funding from national resources and from foreign aid.

Table 21 : Total agricultural expenditures in Kenya: budget allocations

	2006/07	2007/08	2008/09	2009/10	2010/11	% change 2006/07-2010/11
	billion Ksh					
budget allocation	29.8	43.6	43.5	56.7	66.1	122

Source: GOK

Figure 34 : Share of measured support to agriculture in the total government expenditures in Kenya



Source: GOK

These results suggest that the allocation to agriculture and rural development (including national resources and aid) falls short of the 10% CAADP recommendation expressed in the 2003 Maputo declaration. Even if all donor expenditures were covered in the analysis, probably the total approved sector budget would still not reach the recommended target.

Composition of public expenditures in support of the food and agriculture sector

Categories of spending

The data collected allow for a good disaggregation of expenditures. All national expenditures in support of food and agriculture sector development for the 2006/07 to 2010/11 period were covered; only a few donor-funded projects could be included. Overall, 200 projects and programmes were identified (see Annex 1 for the full list) and classified into the MAFAP classification as outlined in the project methodology (MAFAP, 2010). Normally the composition analysis should be based on the actual spending data. Budget allocations are used instead because the project could not collect the actual spending data in time for drafting this report. The results are shown in Table 22.

Table 22: Public expenditures in support of food and agriculture sector in Kenya (budget allocations)

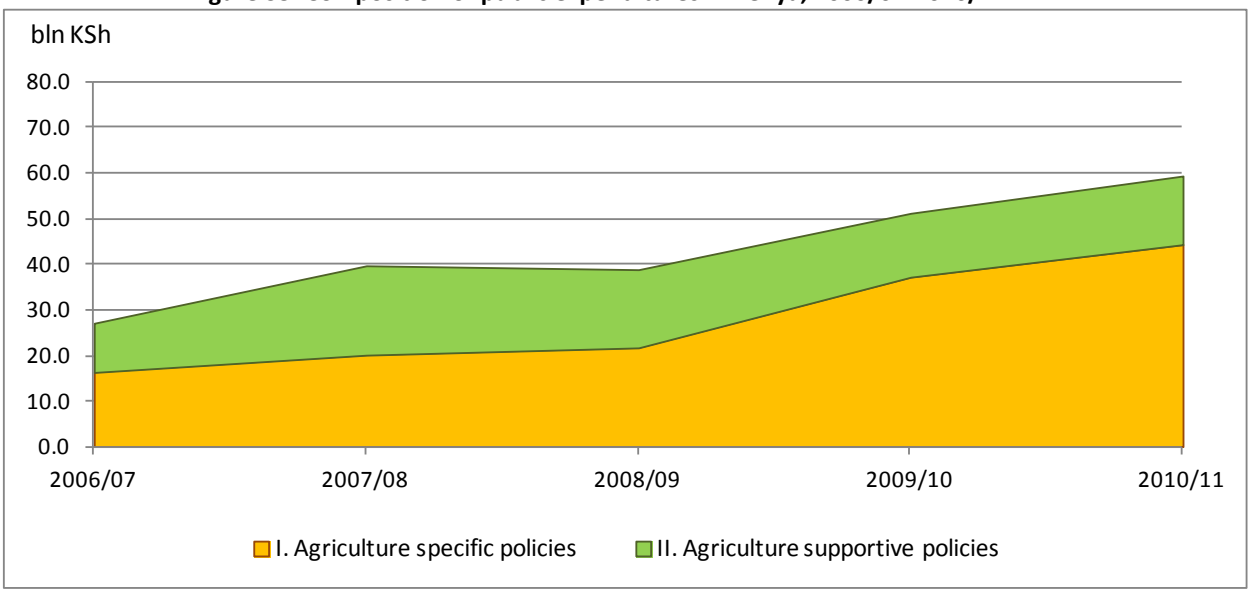
billion KSh					
	2006/07	2007/08	2008/09	2009/10	2010/11
I. Agriculture-specific policies	16.4	20.2	21.8	37.2	44.3
I.1. Payments to agents in the agro-food sector	4.4	5.8	5.9	17.9	15.9
I.1.1. Payments to producers	4.2	5.6	5.3	17.3	15.2
A. Payments based on output	0.0	0.0	0.0	0.0	0.0
B. Input subsidies	4.2	5.6	5.3	17.3	15.2
B1. variable inputs	0.2	0.4	0.8	6.6	2.2
B2. capital	2.9	3.5	2.9	6.9	9.3
B3. on-farm services	1.1	1.7	1.7	3.8	3.7
C. Income support	0.0	0.0	0.0	0.0	0.0
D. Other	0.0	0.0	0.0	0.0	0.0
I.1.2. Payments to consumers	0.2	0.2	0.6	0.6	0.7
E. Food aid	0.0	0.0	0.0	0.0	0.0
F. Cash transfers	0.0	0.0	0.0	0.0	0.0
G. School feeding programmes	0.2	0.2	0.6	0.6	0.6
H. Other	0.0	0.0	0.0	0.0	0.0
I.1.3. Payments to input suppliers	0.0	0.0	0.0	0.0	0.0
I.1.4. Payments to processors	0.0	0.0	0.0	0.0	0.0
I.1.5. Payments to traders	0.0	0.0	0.0	0.0	0.0
I.1.6. Payments to transporters	0.0	0.0	0.0	0.0	0.0
I.2. General sector support	12.0	14.4	15.8	19.3	28.4
I. Agricultural research	3.6	4.7	4.2	5.3	4.8
J. Technical assistance	0.2	0.2	0.2	0.6	1.0
K. Training	1.4	1.5	1.5	1.8	3.7
L. Extension	3.6	4.0	4.8	3.1	8.4
M. Inspection (veterinary/plant)	0.3	1.0	0.9	1.1	1.7
N. Infrastructure	1.7	1.3	2.3	4.5	5.2
roads	0.0	0.0	0.0	0.0	0.0
irrigation	0.7	0.8	1.8	3.0	3.7
others	1.0	0.5	0.5	1.5	1.4
O. Storage/public stockholding	0.0	0.0	0.0	0.0	0.0
P. Marketing	0.4	0.9	0.9	1.4	3.3
R. Other	0.7	0.9	1.1	1.6	0.4
II. Agriculture-supportive policies	10.8	19.5	17.1	14.0	15.0
S. Rural education	2.9	3.0	2.3	1.9	0.0
T. Rural health	0.8	4.9	1.5	4.0	4.1
U. Rural infrastructure	1.8	4.0	5.0	5.2	6.3
roads	0.4	0.5	0.3	0.6	0.4
water and sanitation	1.2	3.0	3.2	3.0	3.2
energy	0.1	0.6	1.4	1.6	2.6
other	0.0	0.0	0.0	0.0	0.0
V. Other	5.2	7.6	8.2	2.9	4.6
III. Total expenditures in support of food and agriculture sector (policy transfers)	27.1	39.7	38.8	51.2	59.3

Source: GOK

Among the expenditures captured in the analysis, agriculture-specific expenditures accounted on average for almost 63% of expenditures in support of food and agriculture sector development,

growing from about 60% in 2006/07 to 75% in 2010/11. Agriculture-specific expenditures more than doubled over the analysed period; agriculture-supportive expenditures increased only by half (Figure 35).

Figure 35: Composition of public expenditures in Kenya, 2006/07-2010/11

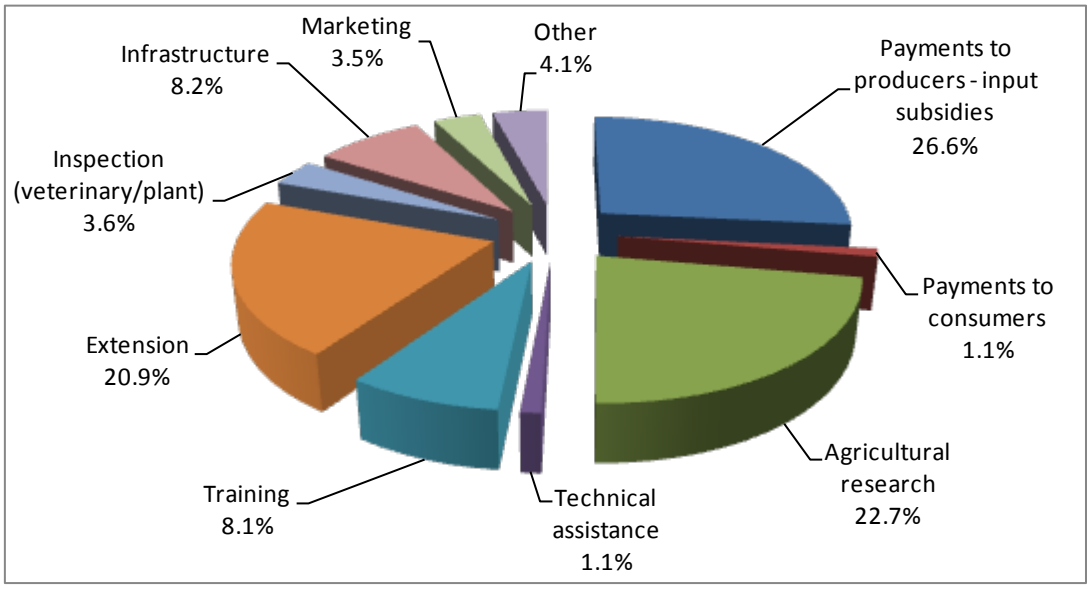


Source: GOK

Of the agriculture-specific expenditures captured in the analysis, 67% on average are in general sector support. In the first part of the analysed period, 2006/07-2007/08, the largest shares were for agriculture research and extension (see Figure 36). Infrastructure and training accounted for a smaller share of agriculture-specific spending. Still less is spent on inspection, marketing (including related infrastructure) and technical assistance. In the second part, 2008/09-2010/11, the composition of general sector support was slightly different (see Figure 37). Extension services and research were still the largest, but much lower than in the previous period, in favour of an increased share for infrastructure. Marketing, inspection and technical assistance shares increased slightly, while the share of training slightly decreased.

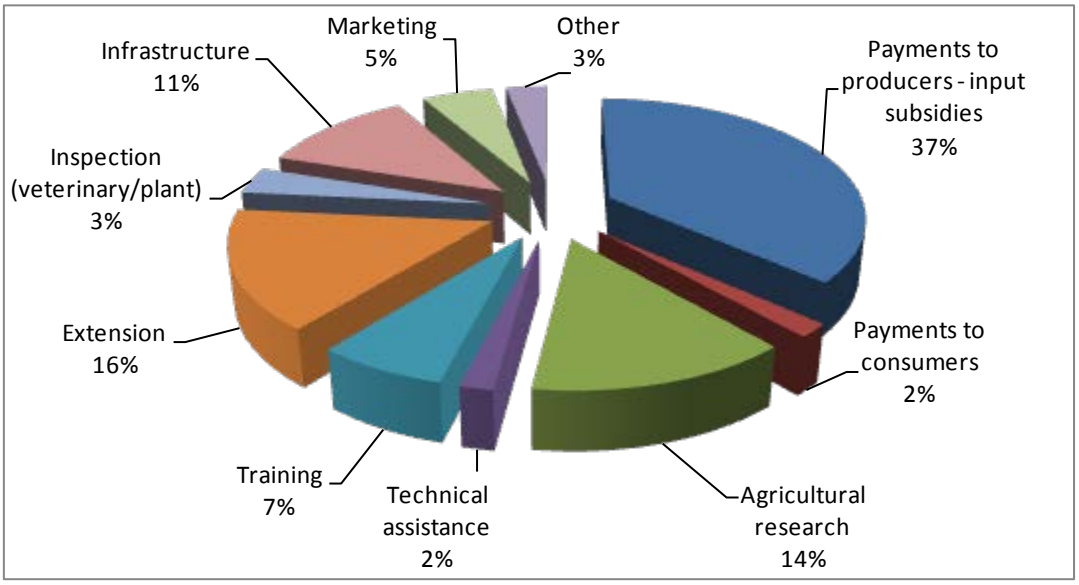
Payments to agents in the agro-food sector accounted for the remaining 33% of agriculture-specific spending (see Figures 36 and 37). Within this category, almost all expenditures were input subsidies to producers. Mostly were subsidies to capital, in particular investments in on-farm irrigation and livestock breeding programmes, but also to on-farm services, in particular veterinary services, and to variable inputs. Their importance increased over time. There were also some payments to consumers, particularly on school feeding programmes, rising from around 1 to 2% of total agriculture-specific spending in the analysed period. There were no payments to processors, traders, transporters and inputs suppliers.

Figure 36: Composition of agriculture-specific expenditures in Kenya, average 2006/07-2007/08



Source: GOK

Figure 37: Composition of agriculture-specific expenditures in Kenya, average 2008/09-2010/11

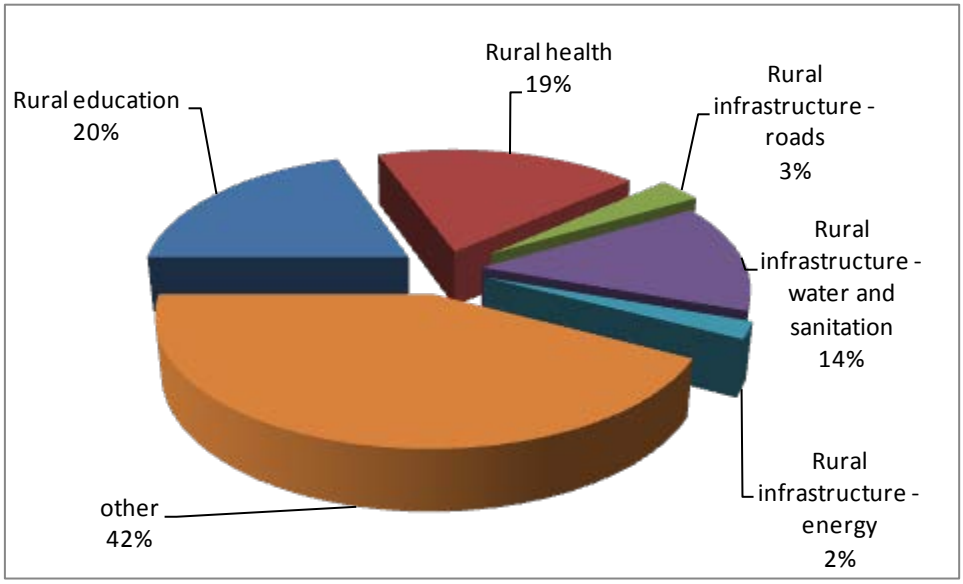


Source: GOK

The complementary agriculture-supportive expenditures account on average for 37% of the identified expenditures in support of food and agriculture sector in Kenya. In 2006/07-2007/08, almost half are in category "Other," comprising agriculture-supportive expenditures with insufficient information to identify their specific category (see Figure 38). The rest of the agriculture-supportive expenditures were almost equally distributed among rural education, rural health and rural infrastructure. The most important infrastructure investments were in rural water and sanitation, much more than in rural energy or rural roads. In 2008/09-2010/11 the category "other" still dominated, but accounted for about a third of agriculture supportive expenditures (see Figure 39). The share of rural education decreased by half, while the share of rural health remained almost

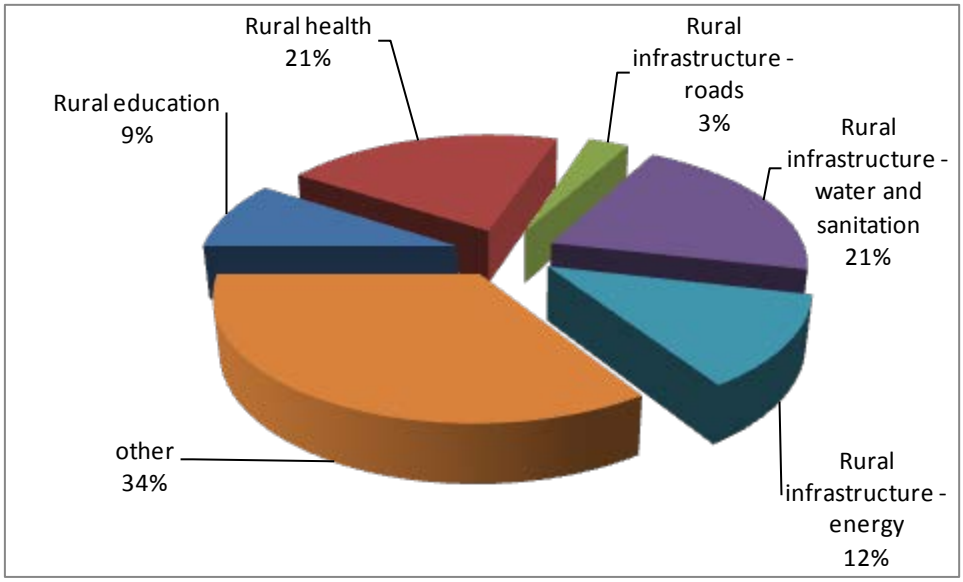
unchanged. The share of rural infrastructure increased, particularly in rural water and sanitation, and energy.

Figure 38: Composition of agriculture supportive expenditures in Kenya, 2006/07-2007/08



Source: GOK

Figure 39: Composition of agriculture supportive expenditures in Kenya, 2008/09-2010/11



Source: GOK

Most of the identified public expenditures in support of the agriculture sector are aimed at provision of public services and investments, particularly in agricultural research, extension, and rural infrastructure. There is also significant support to producers in form of input subsidies, particularly to build the capital used in the production process. It should be noted, however, that these conclusions could change significantly if all expenditures placed in the category “Other” would be reallocated into the appropriate spending categories. The conclusions on the composition of expenditures might also be very different if all data on donor-funded expenditures could be included

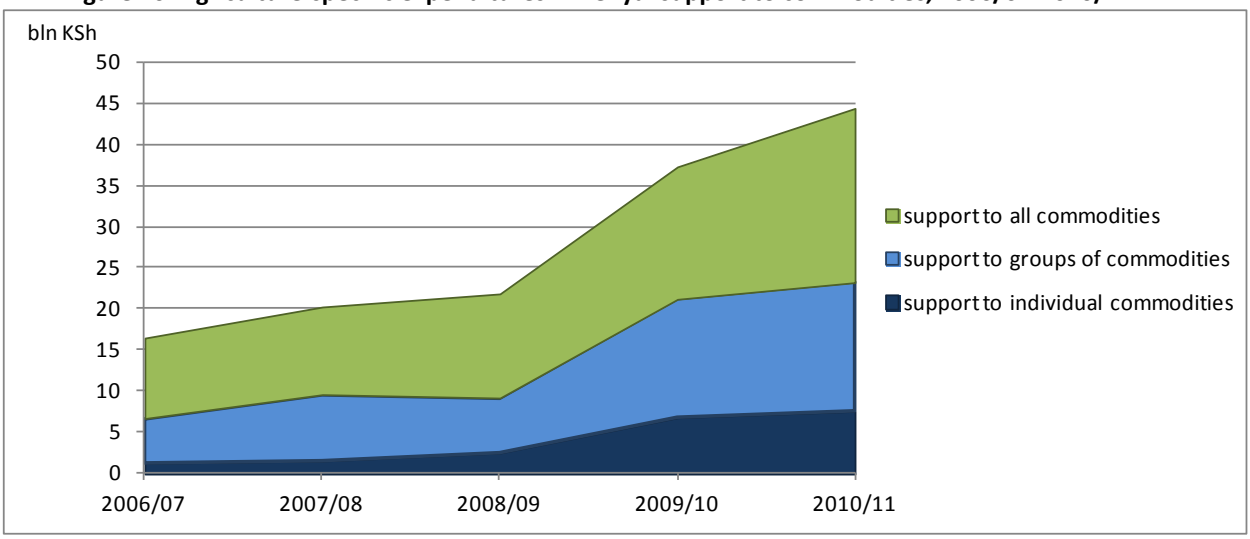
in the analysis – particularly the for the general sector support and agriculture-supportive categories, because these are typically supported by donors.[34]

Spending by commodity

Agriculture-specific expenditures can be also decomposed by commodities. Each expenditure measure within this category has been attributed to an individual commodity (e.g. dairy for the Smallholder Dairy Commercialisation Programme), a commodity group (e.g. livestock for Livestock Breeding and Laboratory Services) or all commodities (e.g. National Agriculture and Livestock Extension Programme, NALEP).

Generally, these expenditures support a large number of commodities such as coconut, coffee, tea, fish, dairy, maize, silk, livestock, forestry products. Expenditures in support of all commodities are the most important throughout the analysed period and represent more than half of agriculture-specific spending (see Figure 40). Expenditures in support of groups of commodities constitute about a third and support to individual commodities only a small proportion.

Figure 40: Agriculture-specific expenditures in Kenya: support to commodities, 2006/07-2010/11

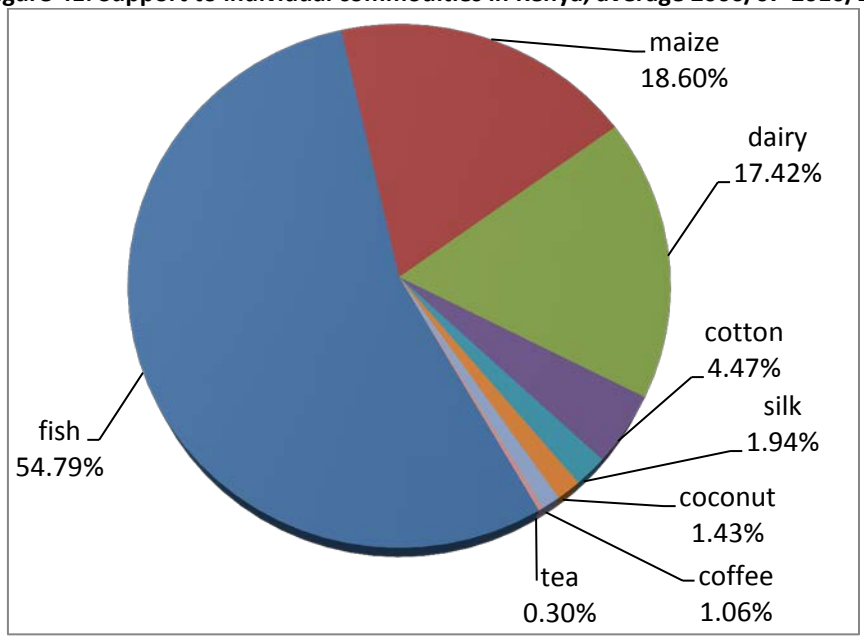


Source: GOK

Among expenditures in support of individual commodities, by far the largest share goes to fish, followed by maize, dairy, cotton, silk, coconut, coffee and tea (see Figure 41). The largest share of expenditures on commodity groups go to livestock and crops, then horticulture, forestry, crops and horticulture, sheep and goats, apiculture and apiculture and livestock (see Figure 42).

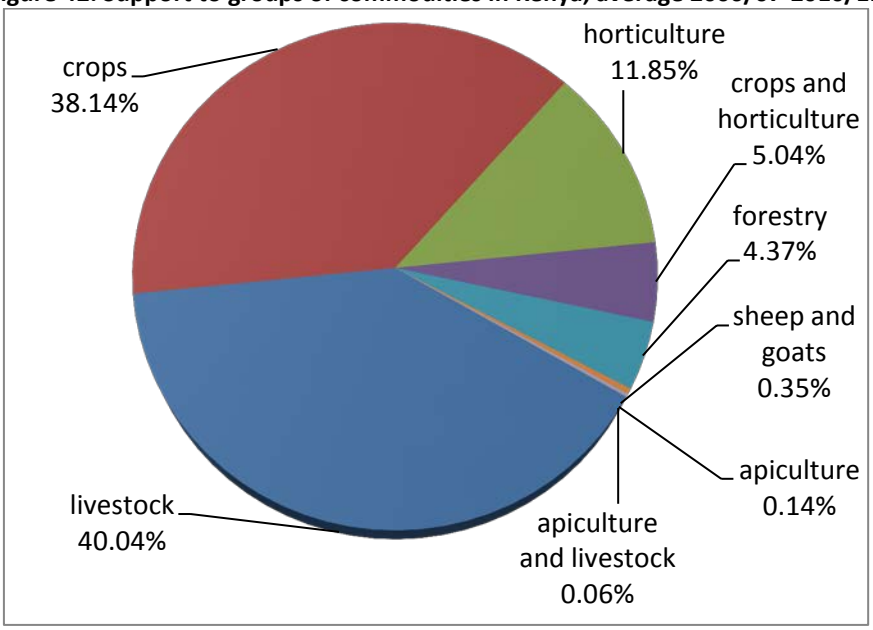
[34] This conclusion is based on ongoing public expenditure analyses in other East African countries under the MAFAP project.

Figure 41: Support to individual commodities in Kenya, average 2006/07-2010/11



Source: GOK

Figure 42: Support to groups of commodities in Kenya, average 2006/07-2010/11



Source: GOK

Actual versus budgeted spending

Actual spending may vary significantly from the budgeted amounts, particularly since budgets significantly depend on donor disbursements,[35] and Kenya operates a cash budget system. Data

35 Although the relative importance of external aid in the budget in Kenya is lower than in other East African countries, it still accounts for more than 20% of overall spending in support of agriculture sector (KEPCO, 2010).

collected on public expenditure in support of the agriculture sector do not allow for the reporting of actual spending figures and showing the difference from budget allocations. Several recent studies on the performance of public expenditure in Kenya's agriculture sector (KEPCO, 2010 and Ongaro, 2011) found that many of the agriculture sector ministries are unable to spend their entire budget allocations, particularly development allocations, for several reasons:

- Delays in the disbursements of allocated funds;
- Scattered allocations of funds across agriculture-sector ministries;
- Slow procurement processes;
- Lack of an effective monitoring and evaluation system;
- Insufficient human capacity to implement projects and programmes, particularly weak understanding of the budget process;
- Low morale of staff due to poor terms of service, poor flow of information and inadequate office and laboratory accommodation.

Table 23 presents the budget absorption rates reported in Ongaro (2012). The absorption rates have varied over time, but generally are higher for the recurrent budget than for the development budget, indicating greater efficiency in disbursing funds allocated to the recurrent budget. The absorption rates of the development budget are quite low, particularly for the beginning of the analysed period. Although there has been some improvement over time, a large portion of funds remains unspent every fiscal year.

Table 23: Average budget absorption rates for the key agricultural ministries in Kenya (%)

Fiscal year	Absorption rate	
	Recurrent budget	Development budget
2006/07	101	67
2007/08	95	82
2008/09	93	71
2009/10	94	82
2010/2011	95	88

Source: Ongaro, 2011

Administrative costs versus policy transfer

Table 24 shows the share of policy administration costs in the total agricultural budget for key agricultural ministries. The results show a rather balanced proportion between policy transfers and their administrative costs in the total expenditures. However, most of the administration costs are dedicated to wages, while a much smaller proportion to operational costs. This may constrain significantly the effectiveness of certain expenditures. For example, extension services or training can be provided effectively only if extension or training officers have sufficient resources for travelling to communities where services are provided (KEPCO, 2010 and Ongaro, 2011).

Table 24: Share of policy transfers and policy administration costs in total expenditures of key agricultural ministries in Kenya (%)

	2006/07	2007/08	2008/09	2009/10	2010/11
Policy transfers	91	91	89	90	90
Administration costs	9	9	11	10	10
Total agricultural budget	100	100	100	100	100

Source: GOK

Role of aid

Because the collected data are insufficient for a complete analysis of donors' contributions to supporting food and agriculture sector development, the project has collected and analyzed secondary data for several donor-supported projects in Kenya. This section summarises the main findings.

There are many donor-supported projects in Kenya dealing with technological innovation, expanding natural resource use, improved marketing infrastructure, institutional capacity development, policy and institutional reforms, and multifunctional investments. The main intervention areas include:

- Food security and nutrition programmes
- Safety nets
- Improving access to farm inputs
- Agricultural advisory services
- Agri-business development
- Improving natural resources management
- Institutional support (capacity building)

In terms of MAFAP classification, most of these donor-funded programmes would fall into the following categories: payments to producers in form of input subsidies (variables inputs, capital and on-farm services); payments to consumers (school feeding programmes and general sector support); agricultural research; training; extension services; technical assistance; and marketing. Some of the projects would be considered policy administration costs, as they support policy formulation at the ministry level. Overall, the categories of spending supported by donors are in line with those funded from national resources.

Conclusions

The level of expenditures on agriculture falls well below the 10% target of total government spending recommended by CAADP. Even if all donor contributions to agriculture and rural development were included, the budget level still would not reach the target. However, even these scarce resources would contribute significantly more to sector performance if budget allocations would be fully used.

The composition of public expenditures in support of food and agriculture sector development could still be improved. The composition of public expenditures is just as important, if not more, than the total level. There may be tradeoffs between spending in different categories (e.g. investment in rural

infrastructure versus subsidies for seed and fertilizer), and there may be complementarities (for example, between spending on extension services and the development of infrastructure enabling farmers to get their outputs to markets). Although the majority of public expenditures aim at provision of public services and investment, there is an apparent imbalance between particular categories of spending. The high investments in research, extension services and training can bring benefits through improved agricultural productivity, and in the longer term contribute significantly to poverty reduction. Investments in agricultural infrastructure, both on and off-farm, are a key element in reducing transaction costs and improving farmers' access to markets. However, there are no investments in construction of markets, and there is no support to storage development and very little support to marketing. There is also very little support to credit for poor farmers that would make such lending more attractive. The low support to rural development may impede growth of off-farm employment opportunities.

Addressing these issues will be crucial in improving performance of expenditures on food and agriculture sector development. However, whether addressing these issues will be reflected in improved agricultural growth will also depend on other factors that cannot be fully derived from public spending.

Because of underestimates of expenditures due to incomplete data on donor-funded projects and programs, and potential overestimates by use of budget allocations rather than actual spending data, the conclusions in this chapter should be improved in a future edition of this report when more complete donor and actual spending data is made available.

7. Coherence between government policies, incentives and public expenditure

Introduction

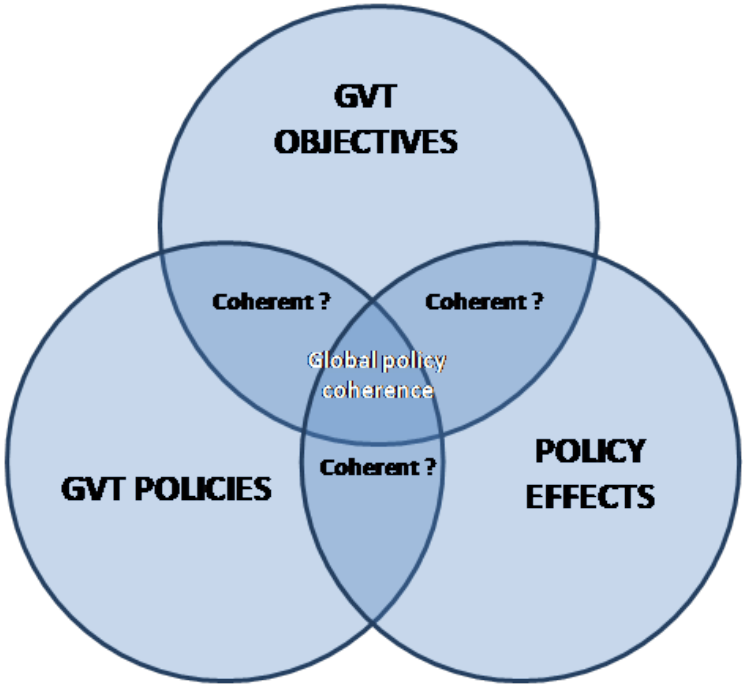
The results of the MAFAP analysis on the rural and agricultural sector can be put into perspective with the government's objectives in terms of agricultural policies. These objectives are set within large policy frameworks. Agricultural policies are considered here as being a series of decisions and policy measures aimed at being consistent with the overall objectives.

A study on agricultural policy coherence of the Global Donors Platform for Agricultural and Rural Development (Wiggins et al., 2011) showed that the real risk of inconsistency lies in the proliferation of policies, projects and programs that are subsequently cancelled and are not prioritized.

Therefore, the main questions in addressing the issue of policy coherence are:

- What are the main strategies determined by the government?
- What are the major policy decisions and measures (main programs/projects, taxes/exemptions)? Are these decisions consistent with the stated objectives?
- Have the adopted measures and policy decisions really had an impact/achieved expected effects, and have they met the outlined objectives?

Figure 43 : Logical framework for the analysis of policy coherence



Source: MAFAP

In Kenya, there has been a considerable effort by authorities and other sectors stakeholders to give coherence to the country's policy for agriculture development -within all the sector policies, policies related to other sectors and the national development strategy-. The implementation of sector wide reforms had proved to be complex in nature due to the number of commodities and stakeholders involved, as well as the number of reforms needed in other supporting sectors. To enhance the

mechanisms of harmonization, the Agricultural Sector Coordinating Unit (ASCU) was created in 2005. The ASCU is an inter-ministerial coordination committee with the mandate of guiding and facilitating the implementation of the national agricultural development strategy.

Although there is clear progress over the past ten years towards coherence in the agricultural sector, it is still identified as a challenge in the country's current national development strategy.

Two documents define the country's general policy framework specific for the period analyzed in this report:

- The Economic Recovery Strategy for Wealth and Employment Creation (ERS) from 2003 to 2007.
- The Kenya Vision 2030 since October 2007.

Each one of them has its corresponding strategic framework specific to the agricultural sector:

- The Strategy for Revitalization of Agriculture (known as SRA and launched in 2004).
- The Agricultural Sector Development Strategy (known as ASDS and launched in 2010).

In all these documents, the general and specific objectives and strategies regarding the development of agricultural sector are stated. This section builds on these strategic frameworks and other commodity specific documents.

Although a more extensive analysis of all the documents that define agricultural and rural sector policies in Kenya is recommended, it is nevertheless possible to identify clues as to the coherence between public expenditure, decisions and measures implemented by policies, and incentives and disincentives observed by the MAFAP project[36]. Our intention is to identify situations where policies complement each other and those where, on the contrary, they seem to contradict or compete with each other. In such cases, this can result in inconsistent messages, difficult to read and adapt to by operators, especially for producers. MAFAP's intention is to see if beyond government declarations, there is real support for all or at least some producers, by combining support prices and government spending in favor of producers.

Assessing the effects of major decisions and policy measures based on the results of the MAFAP project

This section builts on the analysis from Chapters 5 and 6 of this report, and aims to contrast its findings with the objectives and strategies found in the SRA and in the Vision 2030 for agricultural development. The summary of this exercise is presented at the end of this section in form of a matrix that follows the structure of Chapter 5 (Agricultural sector first, sub-goups of commodities next and individual commodities at the end).

[36] Due to the nature of MAFAP analysis, it is not possible to cover government objectives and measures for all areas of the agricultural sector. The methodology is not straight forward, for example, to assess policy coherence with objectives such as improved plant protection, animal health, supporting livestock through improved animal genetics and animal health, mobilization of water resources, or even job creation.

In Kenya, supporting the agricultural sector for its development is set as one of the main pillars for the country's economic development in both national strategies, the ERS and the Vision 2030. For this, the present agricultural development goals and strategies have shifted from those of self-sufficiency in food to that of achieving food security through wealth and employment creation (MoLD, 2010). Therefore, the vision for the agricultural sector stated in the SRA is that of transforming *"Kenya's agriculture into a profitable, commercially oriented and internationally and regionally competitive economic activity*", with the general objectives of raising household incomes, employment creation and ensuring food security.

To achieve this, the SRA identified six strategies (fast track interventions):

1. Review and harmonize regulatory, legal and institutional framework.
2. Improve the delivery of research, extension and advisory services.
3. Restructure and privatize non-core functions of parastatals and ministries in favor of efficiency, accountability and effectiveness.
4. Increase access to quality farm inputs and financial services.
5. Improve access to both domestic and external markets, as well as rationalize taxation in the agricultural sector.
6. Formulate the Food and Nutrition Policy and programs.

Two supportive strategies are identified: rural infrastructure development (roads and electricity) and development of the ASALs.

The ERS was a 5-year plan that expired in 2007 and was succeeded by the Vision 2030, which incorporating the previous approach stated that the objective is an "*innovative, commercially-oriented, competitive and modern agricultural sector*". For achieving this, the Vision added two specific strategies: developing more irrigable areas in the ASALs and increase value adding before agricultural products reach local, regional and international markets. Although self-sufficiency does not appear anymore as the country's main objective, it still appears as an objective in some specific commodities policy papers.

According to MAFAP's public expenditure analysis, the government increased agricultural expenditure more than a 120 percent from 2006 to 2011. However, the considerable increase was not coherent with the importance given to the agricultural sector by the country's development strategies. The Maputo Declaration goal of ten percent of the annual budget dedicated to agriculture was not achieved (only the half). This has been reflected in reduced human resources and service delivery by Government institutions (ASDS, 2010).

Review and harmonize regulatory, legal and institutional framework

The government has indeed moved forward in harmonizing the sector and commodities' policies and documents with the national policy framework. Almost all the new and reformed policies reviewed through this report state the ERS and/or the Vision 2030 as guiding documents to set their objectives.

A participatory and Sector-Wide Approach to Planning (SWAP) guides policy development in Kenya. This somehow makes more difficult the implementation of new policies, due to its own complex nature and because it requires significantly more institutional capacity, which resulted in cases of

slow policy development and adoption. However, during the period analyzed, over 15 policies and pieces of legislation were developed and implemented. Among these are the Seed Policy, the Food Security and Nutrition Policy, the National Agricultural Extension Policy, the National Dairy Development Policy, the Cotton Act 2006 and the Cooperatives Policy.

This change was important as for mayor commodities such as dairy and live cattle, no specific or clear policies were identified before this period. In other cases, like for cotton, the policy meant an institutional change in the regulatory and apex board, which, if correctly implemented, should have an impact on the disincentives faced by producers. Cotton is an example of an intervention when pursuing the objective of revitalizing the sector; they first reformed the legal and institutional framework.

Addressing market structure problems: Although tea is the primary export in Kenya, the sector is functioning with minimum government intervention. Our analysis showed that the main cause of market price disincentives is the domestic and international market structure.

Improve the delivery of research, extension and advisory services

As seen in the PE analysis, the government is in fact increasing the resources allocated to agricultural research. At the same time it is moving towards concentrating its research and extension services in the Kenya Agricultural Research Institute (KARI), this should increase coordination and effectiveness in research, but not necessary assure the linkage between research and farmers. However, a significant budgetary effort has been made to increase the government technical assistance and extention services during the studied years.

This objective corresponds with budgetary allocation. Extension, training and technical support was targeted with an average of 26 percent of the public expenditure specific to agricultural policies during the period analyzed, while research by itself was targeted with 16 percent. However, the ASDS recognize that efficiency in delivery of knowledge to the farmers, especially in the ASALs, remains a big challenge.

Furthermore, we could see that research is aligned with the support of development of the ASALs research in irrigation, cottonseed and drought resistant crops, especially sorghum.

Restructure and privatize non-core functions of parastatals and ministries in favor of efficiency, accountability and effectiveness

The government has taken clear measures towards the objective of achieving efficiency through privatization. A Privatization Commission started operations on 2008, under the Privatization Act of 2005. The objective was to formulate, manage and implement Kenya's Privatization Program. In this subject, sometimes the importance is not the "what" rather than the "how". In the case of sugar, the transition towards full privatization was taking place during the period analyzed and mainly as a response to the imminent market liberalization in the upcoming years and the unsustainable position of government investments in the sugar factories. However, as our analysis showed, this has not been reflected on the incentives faced by the farmers as structural problems of the industry are yet to be addressed. On the other side, the privatization of the tea smallholders sector in the early 2000s seems to be a model of successful transfer of a government-controlled industry to the stakeholders. The government seems to be pushing towards this model in the cotton and coffee sectors. However, strong investment should come with these strategies.

On the other hand, it seems strange that under this strategy, the Government has been allocating resources to revive some institutions and public enterprises. The ASDS states this as a success of the ERS implementation. Reinforcement of regulatory commissions (Kenya Meat Commission) and supportive bodies for research and extension (Cotton Development Authority), for example, seems coherent with the governmental strategy. Nevertheless, reinvestment in public companies like the Kenya Cooperative Creameries and some sugar factories in the middle of a privatization strategy seems strange. The strategy of reviving agricultural institutions by the government affected the dairy and live cattle sectors, specifically by the revival of the Kenya Meat commission and the Kenya Cooperative Creameries, the latter accused of distorting the market to the detriment of private competitors without benefiting the farmers. This seems contradictory with the general objective of privatizing public companies.

The cotton sector has been privatized and fully liberalized since the early 1990s, facing competition from duty free lint imports. The government strategy goes through the institutional strengthening of the sector, by approving the Cotton (amendment) Bill in 2006 which gave place to the institutionalization of the Cotton development Authority (currently receiving provisional public founding). One of the main objectives of CODA is to enforce price agreements between the industry stakeholders. Cotton is individually targeted by 0.65 percent of the expenditure specific to agriculture.

By increasing competition, farmers might obtain better prices; however, the results have shown the opposite. Our analysis showed that farmers' protection decreased significantly at the same time the measures were being implemented. There is no specific measure to prepare farmers for market liberalization.

Increase access to quality farm inputs and financial services

Aligned with its fourth strategy, Kenya allocated an estimated 34 percent of its agriculture specific expenditure to input subsidies, being the highest single item in budget allocation for the studied period. However, in the incentives/disincentives analysis we couldn't find a specific strategy apart from the provision of subsidized fertilizer and seed. It was difficult to distinguish targeted crops or farmer groups in the public expenditure analysis. However, what the public expenditure analysis did showed was the effort of investing in capital inputs rather than in variable inputs, which is someow coherent with what is stated in the SRA.

It is remarkable to note that in accordance to the privatization strategy, development of rural infrastructure, provision of inputs and research and extension service, had been delegated to the specific regulatory boards or apex organization, either private or de-concentrated, financed by the levy payments, as the case of sugar, or by selling commissions, as the case of tea.

Improve access to both domestic and external markets, as well as rationalize taxation in the agricultural sector

High market access costs is a major issue hindering access to domestic and external markets for virtually all commodities analyzed. These costs mainly stem from high fuel costs, poor infrastructure (e.g. storage facilities and roads) in rural areas and non-tariff trade barriers, such bribes and costly delays at roadblocks and weighbridges. These costs also stem from high processing costs and excessive profit margins of economic agents along each product's value chain. Excessive profit

margins are an issue related to market structure, while high processing costs may be related to market structure as well as the high cost and unreliable supply of electricity in Kenya.

Another factor hindering market access is the inability to effectively meet and enforce quality and safety standards. This issue directly affects products with the potential of becoming important exports, such as live cattle and dairy.

To address quality issues, the government is spending about 5% and 3% on marketing and inspection, respectively, which doesn't correspond to the level of disincentives this issues represent according to the MAFAP findings. The government is also spending on infrastructure (rural roads and energy) in order to reduce market access costs. During the whole PE analysis, an unbalance trend in investing towards increasing production and productivity over increasing market access and reducing costs, was identified.

In order to reduce high profit margins and increase competition within sectors, the government has effectively been moving towards market and trade liberalization by gradually moving away from setting prices, imposing controls and subsidizing parastatals. Despite these efforts, most sectors are still facing market disincentives. Therefore, while policies appear to be coherent, it may take several years before positive results are reflected in market price incentives for each sector.

Formulate the Food and Nutrition Policy and programs

The new Kenyan Constitution (2010) established the assurance of food security for every Kenyan as a Government responsibility. In 2008 a Food Security and Nutrition Strategy (FSNS) was drafted in accordance with the working draft of the National Food and Nutrition Security Policy published in 2011. The FSNS stated as one of its main goals "to ensure that all Kenyans have the means to access affordable, nutritious and personally acceptable foods".

In addition to the objective of ensuring food security, our analysis elucidates two more objectives aimed by the government measures, which might sometimes be conflicting: (1) become a net exporter of food in the long term and (2) maintaining food supply at stable and affordable prices for consumers in the short and medium term.

The food security policy documents are aligned with the ERS, SRA and Vision 2030, defining specific interventions to increase productivity and value addition. Besides, they promote the liberalization of food trade as a mean for ensuring food security, while defining a list of "sensitive" products.

As a result, the Government measures regarding food security crops had been moving between the two objectives stated before: protection to farmers and consumers. Mainly forced by external shocks to production during the timeframe of MAFAP analysis, our results were able to identify the dynamics and effects of government interventions in this matter.

The food security crops analyzed (maize, wheat and rice) are generally protected by import tariffs. However, when the production shocks and the increase of international food prices hited the country, the government reacted with a series of measures to protect consumers, mainly by waving the import tariff for maize (the most important staple crop), food procurement through the NCPB and price controls, moving out from the main objective of achieving a commercial and innovative agriculture. However, we weren´t able to capture its real effect as the years 2008 and 2009 were the

only ones when food security crops faced positive Nominal Rates of Protection, mainly due to the relative higher increase in domestic prices.

Development of rural infrastructure

One of the main issues that restrain market price incentives to production are the excessive access costs faced by farmers and processors (which in the case of a concentrated market structure, the bulk of the costs generally are transferred to the farmers). If Kenya aims to have a regionally and internationally competitive agriculture it is coherent to focus in improving its rural infrastructure, in order to reduce its production, processing and transport costs.

Analyzing the expenditure for agricultural supportive policies for the studied period, we found that the government is focusing an average of 18 percent to water and sanitation, eight percent to rural energy and only three percent on rural roads.

Development of the ASALs

Representing more than 85 percent of its territory, the development of the ASALs is not a new strategy in the country. A set of complementary strategies seems to be placed in order…

Although effective linkage between research development and implementation is still missing, the research agenda seems to be aligned with the general objective of development of these areas: development of drought resistant crops like sorghum and effective techniques in agricultural water management.

The investment in irrigation development is taking place mainly in these areas, especially in the Tana River basin. Also, the implementation of disease free zones in order to boost the livestock sector and increase exports, which face important non-tariff barriers due to its deficient sanitary control system.

One important initiative is the Traditional High Value Crops (THVC) programme initiated by the Ministry of Agriculture in 2006/2007 financial year to promote production and consumption of alternative cereal and non cereal crops. These crops include; open pollinated maize, beans, pigeon peas, green grams, cow peas, dolichos, sorghums, millets, sweet potatoes and cassava. They are drought tolerant and adaptive to harsh weather conditions. Programme mainly implemented through government funding of Ksh.150million per year to support basic seed production, bulking, distribution. In accordance with the general objective of developing the ASALs

In order to fully develop these areas, spetian attention should be put in assuring that any increase in productivity is accompanied by an increase in market access.

Increase value addition

It is clear that the idea behind the country's objective is to have more outputs for export in order to increase foreign exchange and that way create employment. In general, we can appreciate that the Government strategy towards the export sector is coherent with the country's general vision and strategies of liberalization and privatization, with promotion and enforcement of smallholders' organization. However, we could not identify a specific strategy to boost agricultural exports.

Two other objectives are increasing value addition of exported products that now for the case of tea and coffee are majorly exported in bulk. The second objective is international and local market

diversification. Increase local consumption and wide the range of commercial partners. These two strategies are in coherence with our findings.

The government attaches importance to the dairy subsector and has developed a policy aimed at: improving the productivity and competitiveness of dairy products, increasing domestic consumption of milk and milk products, transforming the dairy industry into a net exporter to the regional and global markets and re-orienting milk processing towards long life dairy products.

Conclusions

In general, except for the external shocks for the years 2008 and 2009, of which the sector is still recovering[37], the implementation of the SRA is perceived as a success. By 2007, agricultural growth had surpassed the SRA target (3.1 percent): it grew at an average of 5.2 per cent, reaching a high of 6.4 per cent in 2006. It is also held responsible of increasing productivity of key commodities such as tea, maize, sugar, horticulture, milk and meat each by an average of over six per cent per annum from 2003 to 2007; and the revival of most agricultural institutions (ASDS).

Although negative, the trend in our analysis of price incentives seems also to have a positive trend. The general policy structure is pointing towards coherence and moving to same objectives and aligned with the country's general vision. However, apart from the natural dynamic and processes, due to the sector's normal (or implicit) complexities sometimes the government acts or takes measures that in the short-term seem to go against long-term objectives.

Some policy changes are not expected to have an immediate impact on the incentives faced by the producers, but at least the aimed prove to be more or less pointed towards addressing some of the core problems identified in the MAFAP analysis. Others are missing, basically the ones referring to the concentrated market structures (national and international) that are affecting some commodities, like cotton, sugar, tea and coffee.

[37] Post-election violence, global food price crises, escalating fuel prices, drought and the global financial meltdown.

Table 25: The driving factors for market incentives and disincentives in Kenya (and associated policy measures and public expenditures)

Product or product group	*What are the price incentives/ disincentives for producers? What are the costs/gains that market inefficiencies represent for producers?*	*What are the key factors or issues driving price incentives/disincentives for producers?*	*What policy measures and objectives are related to these driving factors?*	*How much of public spending is allocated to the issue/commodity?*
ALL PRODUCTS	Average Observed NRP: -10% Average Adjusted NRP: -28% MDG: -20%	• High domestic prices in certain years due to major shocks to production: (1) Post-election instability in 2007/2008 (2) Widespread drought in 2009 • High access costs due to: (1) High fuel costs (2) Poor infrastructure, especially in rural areas (3) Non-tariff barriers – illicit bribes, and delays at roadblocks and weighbridges (4) Costly and unreliable electricity, resulting in high production and processing costs (5) High concentration of market power and profits among intermediaries in commodity value chains (6) Multiple and duplicate local taxes and fees • Weak price transmission to producers due to the poor access to information and markets	• Main Objective: "Transform Kenya's agriculture into a profitable, commercially oriented and internationally and regionally competitive economic activity". • Strategies/goals: (1) Review and harmonize regulatory, legal and institutional framework. (2) Improve the delivery of research, extension and advisory services. (3) Restructure and privatize non-core functions of parastatals and ministries in favor of efficiency, accountability and effectiveness. (4) Increase access to quality farm inputs and financial services. (5) Improve access to both domestic and external markets, as well as rationalize taxation in the agricultural sector. (6) Formulate the Food and Nutrition Policy and programs. (7) Supportive: Developing rural infrastructure (roads and electricity) and developing the ASALs. • Vision 2030 additional strategies: (8) More irrigation in the ASALs and increase value adding before agricultural products reach local,	• Increase in agricultural expenditure from 2006-2011: 122% • Average share agricultural expenditure in the total government expenditure for the period: 6.3% • Increase of funding to research and extension. • Average composition of expenditure in agricultural specific policies: (1) 34% on input subsidies (2) 26% on extension, training and technical assistance (3) 16% on research (4) 7% on irrigation (5) 5% on marketing (6) 3% on inspection (7) 2% on school feeding programmes • Average composition of expenditure in agricultural supportive policies: (1) 20% on rural health (2) 18% on water and sanitation (3) 13% on rural education (4) 8% on rural energy

			regional and international markets.	(5) 3% on rural roads
IMPORTS	Average Observed NRP: -5% Average Adjusted NRP: -12%	• Domestic prices were highly affected by shocks to production in 2007/2008 (post-election instability) and 2009 (drought), though this applies more to food crops, especially maize, than to cash crops (sugar and cotton). • High prices due to protective trade policies for food crops (wheat, rice and sugar)	• Become a net exporter of food as a long term objective. • Maintain supply at stable and affordable prices for consumers as a short and medium-term objective. • Measures:` (1) Since 2005, EAC Common External Tariff (CET): 0% on raw material imports; 10% on intermediate	• Expenditure identified for crops accounted for 13.5% of the ag.-specific expenditure. • Subsidized inputs: fertilizer and seed.

	MDG: -8%		goods imports and 25% on finished imports CIF, for goods produced outside the community. (2) Approval of the Price Controls (Essential Goods) Bill 2009. (3) Price control to fix maximum retail, wholesale price for essential goods (not fully implemented). (4) Decreasing trend on import tariffs, waved in certain years for certain products. (5) Increase the Strategic Grain Reserve as a price buffer (6) Government emergency procurement of imported food. (7) Provision of subsidized fertilizer and seeds.	
Maize	Average Observed NRP (Large-scale): -18% Average Adjusted NRP (Large-scale): -18% MDG (Large-scale): 0% Average Observed NRP (Smallholder): -18% Average Adjusted NRP (Smallholder): -21% MDG (Smallholder): -4%	• Weak integration among sub-national markets and with international markets due to high access costs and volatile prices, which increase risk for traders and producers. • Activities of the NCPB in reducing prices for millers and stabilizing domestic market prices (though some argue that the NCPB may have little overall impact on prices) • High access costs due to government taxes, illicit bribes and delays at roadblocks and weighbridges, particularly for smallholders	• Measures: (1) Government procurement and increasing imports by the NCPB (2) Increasing national food stocks (3) Price control: fixed selling price for millers and fixed purchase price for producers by the NCPB (4) General 50 percent import tariff for countries outside the EAC (5) Import tariff waived and reduced in 2008 and 2009 (6) Temporary export bans (7) Provision of subsidized fertilizer and lending of storage facilities by the NCPB. (8) Direct payment in form of free inputs to farmers for 5600 ha of	• Maize is individually targeted by 2.6% of ag.-specific exp.

			maize in 2009.	
Wheat	Average Observed NRP: 45% Average Adjusted NRP: 45% MDG: 0%	• High domestic prices relative to import (CIF) prices in all years due to tariffs on imports from world markets • Farmers are likely significantly overpaid by the NCPB for two potential reasons: (1) Large commercial farmers enjoy considerable market power, which allows them to set a favourable price for their wheat based on a higher quality wheat than what they actually produce (2) The NCPB overestimates the opportunity cost prices that millers would need to pay and, as a result, are establishing prices higher than necessary	• Measures: (1) Increasing imports by the NCPB (2) Increasing national food stocks (3) General import tariff between 25 and 35 percent for wheat and 60 percent for wheat flour (4) Temporary reduction of import tariff to ten percent during 2008 (5) Provision of subsidized fertilizer and lending of storage facilities by the NCPB (6) Sales tax removed for bread.	
Rice	Average Observed NRP: 132% Average Adjusted NRP: 120% MDG: -5%	• High domestic prices relative to import (CIF) prices in all years due to tariffs on imports from world markets • High access costs due to government taxes and fees and traders' excessive profit margins	• Expand irrigated production and area. • Measures: (1) Preferential trade agreement with Pakistan (35 percent import duty). High import tariff for other countries (75 percent import duty) (2) General reduction of import duty to 35 percent in 2010 (3) Seed dissemination system (4) Direct payment in form of free inputs to farmers for 8400 ha of rice in 2009 (5) Sales tax removed during 2008.	• Among the crops benefited by irrigation expenditure.
Sugar		• High domestic prices relative to import (CIF) prices due to quota restrictions and	• Become a net exporter of sugar in the medium-term.	• Among the crops benefited by

	Average Observed NRP: 31% Average Adjusted NRP: -11% MDG: -30%	tariffs on imports from world and regional markets, though protection decreased as the GOK gradually withdrew these measures throughout the period analyzed • High loss of sucrose content in sugarcane due to delayed harvesting, resulting from inconsistent/ unreliable collection by factories and rain-fed cropping system (low quality sugarcane reduces prices paid by factories) • Companies' high debt and lack of investment in maintenance and machinery to improve efficiency, causing regular breakdowns and delays in sugarcane collection • Excessive profit margins captured by factories, resulting in lower farm gate prices and high opportunity costs for farmers	• Full privatization in the short-term. • Increase economic profits from process by-products. • Measures: (1) Temporary protective measures (import tariff and quotas) aiming for the gradual full market liberalization (2) Decrease of the Sugar Development Levy form 7 to 4 percent, starting from 2007 (3) Implementation of a sugarcane payment system based on sucrose content	irrigation expenditure.
Cotton	Average Observed NRP: -32% Average Adjusted NRP: -32% MDG: 1%	• Market power and control of secondary producers (spinners and textile mills) over prices paid to primary producers (farmers and ginners) in the value chain • Poor quality seed produced by ginners and sold to farmers, resulting in low yields and poor quality outputs, which in-turn also adversely impact the quantity and quality of ginners' outputs. • Outdated equipment used by ginners results in a low ginning outturn (33%) and may even reduce the quality of lint outputs in some cases • Inconsistent quality and quantity of seed cotton supply to ginners raises the risk of investment in ginneries, thereby limiting	• Liberalized trade policy to ensure cheap inputs for upstream textile and garment industry. • Liberalized trade policy, i.e. duty-free lint and seed imports to ensure cheap inputs fro upstream textile and garment industry • Recovering of the cotton sector is one of the key strategies of the agricultural policy. • Promulgation of the Cotton (amendment) Act 2006. • Creation of the Cotton Development Authority (CODA). • Measures: (1) Targeted support by the provision	• Cotton is individually targeted by 0.63% of ag.-specific exp. • Among the crops benefited by irrigation expenditure. • Cotton Development Programme- marketing activities and research KARI center focuses on cotton (not included in research expenditure). • Government temporarily covering the operative expenses of the CODA.

		opportunities for capital improvement, such as upgrading ginning equipment	of planting seeds, extension and research (2) Rehabilitation of irrigation schemes (3) Establishment of reference producer and ex-ginnery prices based on international markets (4) No tariffs for imported cotton lint or cottonseed	
EXPORTS	Average Observed NRP: -13% Average Adjusted NRP: -18% MDG: -5%	• Dependency on a few export partners • International markets controlled by a small number of multinational corporations (MNCs) • Dual production systems: vertically integrated plantations and smallholder producers • Escalating tariff structure in importing countries if value is added to products, which discourages value addition	• The trade policy aims at transforming the country into a more open, competitive and export-led economy. • Fully liberalization and privatization of the sector. • Promotion and enforcement of smallholder's organization. • International and local market diversification. • Increase value-added of the exported products. • Value chains are highly regulated and centralized; all outputs must be marketed through international auctions	• Expenditure identified for crops accounted for 13.5% of the ag.-specific expenditure. • Subsidized inputs: fertilizer and seed.
Coffee	Average Observed NRP (Estates): -5% Average Adjusted NRP (Estates): -5% MDG (Estates): 0% Average Observed NRP (Smallholder): -6% Average Adjusted NRP (Smallholder): -20%	• Estates have better access to capital and inputs and manage their own primary processing, which allows them to control processing costs • Smallholders must process and market their outputs through cooperatives and retain ownership until auction sale, resulting in: (1) Delayed payments by cooperatives (2) High processing costs due to the lack of marketing options and competitive	• Creation of the Coffee Development Fund in 2006 to provide affordable credit to coffee farmers. • All coffee producers are subject to a 4% statutory levy, which is used to fund research, market promotion and rural infrastructure development	• Coffee is individually targeted by 0.15% of ag.-specific exp.

	MDG (Smallholder): -16%	structures • Lower prices received by estates and smallholders due to an export tax		
Tea	Average Observed NRP (Smallholder): -21% Average Adjusted NRP (Smallholder): -23% MDG (Smallholder): -3%	• Concentration of market power among a few MNCs, which have significant control over tea production, processing and prices • Depressed auction prices due to the lack of branding and the common practice by large-scale tea companies of blending their own lower quality tea with higher quality tea, such as the KTDA's black tea, in order to increase their market share • Losses in value addition, since MNCs typically export Kenya tea to their own factories in consumer countries for blending and packing, the most profitable activities in the tea value chain • High profits captured by the KTDA (likely KTDA's shareholders) represent significant opportunity costs for the vast majority of smallholders, who are not shareholders of the company, but are required by law to market their outputs through the KTDA	• Complete privatization of the smallholder sector. • By law, all smallholder tea farmers are required to market their outputs through the KTDA	• Tea is individually targeted by 0.05% of ag.-specific exp.
THINLY TRADED	Average Observed NRP: -9% Average Adjusted NRP: -35% MDG: -26%	• Highly fragmented value chains and disintegrated markets • Lack of organization among producers, leading to information asymmetry and the concentration of profits among intermediaries in value chains • Production is generally too low to make tradable volumes • Weak institutional framework, regulation of markets and enforcement of health/quality standards		

Dairy	Average Observed NRP: 25% Average Adjusted NRP: -23% MDG: -29%	• Concentration of market power among dairy processors, allowing them to capture a larger share of the profits, which constitute significant opportunity costs for producers • A large share of milk is marketed through informal channels without processing due to inefficiencies within the formal value chain (e.g. delays in payments to farmers), resulting in increased health risks • Poor quality and high cost inputs result in poor quality (lower value) outputs • High cost of milk collection and distribution due to poor infrastructure	• Intensive privatization policy for practically all the dairy chain. • Revitalize the export market. • Development of a sector policy framework. • Inclusion of the informal market in the policy framework. • Rescue of the Kenya Co-operative Creameries.	• Expenditure identified for livestock (excluding fish) accounted for 6.4% of the ag.-specific expenditure.
Live Cattle	Average Observed NRP: -18% Average Adjusted NRP: -41% MDG: -26%	• Market structure and inefficiencies in the value chain, which represent opportunity costs for producers: (1) Traders' high profit margins due to rent seeking behavior, the lack of organization among producers and information asymmetry (2) Government taxes and fees mainly imposed on cattle trekkers moving cattle from the farm gate to the wholesale market (though these taxes and fees are marginal relative to traders' profits) • Reoccurring drought and disease outbreak often depress domestic prices by reducing the overall quality of cattle and increasing cattle sales.	• Revitalize the export market. • Strengthening marketing and infrastructure in the ASALs. • Encourage private sector investment in the exporting channel. • Rehabilitation of the Kenya Meat Commission. • Pest and disease control, as well as livestock branding. • Establishment of the Livestock Restocking and Enterprises Development Fund to provide grants and loans to livestock producers.	• Expenditure identified for livestock (excluding fish) accounted for 6.4% of the ag.-specific expenditure. • Dairy is individually targeted by 2.4% of ag.-specific exp.
Sorghum	Average Observed NRP: 17% Average Adjusted NRP: 12%	• Low domestic prices relative to import (CIF) prices in years when sorghum was imported from Europe and/or the United States indicates that protective tariffs	• Increase the production and consumption of drought resistant crops like sorghum (Traditional High Value Crops program).	• Research in drought resistant varieties. • Traditional High Value Crop

	MDG: -4%	were waived during food shortages and most imports may have been food aid shipments • Weak price transmission between farm gate and wholesale in certain years for two potential reasons: (1) Production by individual farmers may be too small to make tradable volumes (2) Volatility of government intervention in the sorghum market (e.g. food aid and the temporary removal of tariffs) creates risk, which may deter production and trade • High domestic prices relative to import (CIF) prices in years when sorghum was imported duty-free from the region, possibly due to: (1) Low sorghum production during post-election instability in 2007/2008 and a subsequent drought in 2009, which presumably raised domestic prices	• Increase in the production support measures for staple crops. • Measures: (1) Temporary removal of 25% tariff on imports from outside EAC and COMESA member countries during food crises and periods of severe drought (2) Research on higher quality sorghum fitted for the brewing industry (3) Bulking and distribution of seeds. (4) Provision of subsidized fertilizer and seeds.	Program.

8. General conclusions

Kenya is looking to transform its agriculture from subsistence and self-sufficiency-driven into a "profitable, commercially oriented and internationally and regionally competitive economic activity". For this to become reality, farmers must receive stronger incentives they they currently receive today.

The level of price incentives for producers generally increased since 2005, though this trend was largely driven by high domestic prices during food shortages in 2008 and 2009. Therefore, it is uncertain whether this positive trend will be sustained in the long-term. Producers in Kenya generally faced market price disincentives throughout the period 2005-2010. Indicators for the agricultural sector as a whole show that these disincentives decreased throughout the period analyzed, though this trend was linked to production shocks, such as political instability following Kenya's December 2007 election and a severe drought in 2009, which resulted in more favourable prices for producers. Therefore, it is uncertain whether this positive trend will be sustained in the long-term, as it is largely driven by the price volatility of food crops, which appear more vulnerable to production shocks than cash crops.

Imports. Producers of imported products (maize, wheat, rice, sugar and cotton) faced disincentives in all years, except in 2008 and 2009, when there were major shocks to production. Imports were further disaggregated and analyzed as two distinct categories – products essential for food security and industrial imports – which are discussed below.

Products essential for food security. The trend for food security crops (maize, wheat and rice) was similar to that of imported products and was largely driven by maize, the principal food crop in Kenya. The analysis shows that tariffs were not always effective in keeping maize prices high for producers due to weak market integration and duty-free free imports from the region in normal production years and the waiving of trade tariffs on imports from world markets in years when there were national and regional shortages. The case of maize shows that government interventions were largely unpredictable, erratic and reactive to production shocks from factors such as drought and political instability. Furthermore, it is not clear that the NCPB has a real impact on the market or risk management throughout the value chain.

It is important to note that while tariffs on maize imports were largely ineffective throughout the period analyzed, commodity-specific indicators in this analysis show that import tariffs levied on other staple foods such as wheat and rice, were effective in keeping prices high. These tariffs hinder consumers of staple foods, but this is perhaps more of an issue with respect to wheat, since it is consumed by a large and growing number of poor households. Rice, on the other hand, is still primarily consumed by medium to high-income households and is largely a cash crop for poor rural farmers. Nevertheless, tariffs hurt consumers across the board.

Industrial imports. Industrial imports (sugar and cotton) refer to products mainly imported for use in domestic industries. Indicators for this product category showed positive, but declining incentives. This trend is linked to the gradual withdrawl of protective measures and liberalization of Kenya's sugar sector. However, when taking into account the structure of the value chains and adjustments made to correct for inefficiencies, producers actually faced market price disincentives in all years, except in 2008. The unbalanced market structure – the market power of factories within the value

chain and the quasi-public private nature of the sugar industry – is reflected in the high profits of the sugar factories and the low lint prices paid to cotton ginners by spinners, who control the cotton industry. Deficiencies in technical and market efficiency and output quantity and quality cause the country to rely on imports to fulfil national demand. Liberalization of the sugar sector may force industries to become more efficient.

Exports. Producers of Kenya's major agricultural exports (tea and coffee) faced disincentives in all years, showing no sign of improvement throughout the period under review. This is mainly due to the concentration of market power among a few major buyers in the international market, which constrains price incentives for producers. The results also indicate that price disincentives are even further reduced by market inefficiencies, mainly due to the highly regulated and centralized structure of Kenya's tea and coffee sectors.

Because of the international market structure, smallholders tea producers do not receive prices that correspond to the high quality of their outputs. Furthermore, high profits captured by the KTDA (most likely by KTDA shareholders) represent significant opportunity costs for smallholders who are not legal shareholders of the company, but are required by law to market their products through the KTDA. Coffee farmers (both large and small) are hindered by export levies. The coffee cooperative system is inefficient, resulting in high costs for farmers due to lack of marketing options and competitive structures.

Constraints to adding value to exports include insufficient local demand relative to production volume, the control that multinational corporations have over processing (mainly in the case of tea) and higher tariffs imposed by trade partner countries, except for bulk products.

Thinly traded products. Producers of thinly traded products (milk, cattle and sorghum) were the most penalized compared to other commodity groups. Producers generally faced disincentives, though these disincentives decreased during the period analyzed. However, this trend was largely due to post-election instability in 2008, which devastated the dairy sector and resulted in a scarce supply of milk, thereby generating higher prices for producers.

The results also show that producers actually faced strong disincentives in all years when taking into account inefficiencies along the value chains. Most inefficiencies arise from the lack of integration along commodity value chains, which forces farmers to compete with several marketing agents for profits and adversely affects the quality of outputs.

Overcoming constraints faced by producers of thinly traded products is essential if strategic government objectives to develop the ASALs (sorghum and live cattle) and boost exports (milk and live cattle) are to be achieved.

Although the lack of trade taxes and subsidies for thinly traded commodities should have resulted in a near-zero NRP, market price disincentives were observed as a result of issues related to market structure. As in the case of international market concentration for tea and coffee, or the monopsonistic structure in the cotton industry. Live cattle and milk generally faced disincentives due to highly fragmented value chains and the concentration of power among marketing agents (processors and traders).

Large Market Development Gaps (MDGs) are strongly constraining market price incentives for producers throughout commodity value chains in Kenya. It can be observed that all products are affected negatively by market development gaps, whatever their trade status, and regardless of their status from the point of view of incentives and disincentives resulting from the effects of explicit policies (trade policies, pricing policies, etc.). An average MDG of -20 percent is observed for the period. This represents the average additional disincentives at the producer level stemming from implicit policies or market functioning. It should be noted that industrial imports (sugar and cotton) and thinly traded products (sorghum, milk and live cattle) reveal very significant average market development gaps of -29 and -26 percent, respectively. MDGs show gains and cost savings that could be achieved if the necessary investments were made, notably in transport infrastructure and technology acquisition, and if adequate measures were taken to eliminate or limit market inefficiencies, such as illegal taxes, bribes, excessive profits and monopolistic behavior. This opens a huge window of opportunity to increase incentives and overcome the challenging context (market liberalization and price volatility) and to achieve the specific objectives establilshed for the agricultural sector (boost exports and commercial profitability).

Depending on the segment of the value chain and the trade status of the commodity, MDGs could act as natural protection for traders and producers. Inefficienices along the value chain raise the cost of bringing imported products from their point of entry to market and, therefore, raise market prices. In soem cases, this may affect the willingness to reduce inefficiencies.

Low diversification is hindering Kenya's export potential. The country is relying on a few export products and trade partners, which makes Kenyan exports highly vulnerable to external pressures. Among the exported products, tea accounts for more than 50 percent of the value of Kenyan agro-food exports, and more than 60 percent of tea exports go to only three consuming countries (Pakistan, Egypt and UK).

Level and quality of public expenditure not yet fully consistent, but moving towards alignment with national objectives. The expenditure level still is well below the targeted 10 percent of total government spending recommended by CAADP, which does not reflect the strategic importance given to agriculture in the national development policy. The composition of expenditure could also be significantly improved, although it does show correlation with the country's priority strategies.

There may be tradeoffs between spending in different categories (for example spending on rural infrastructure versus subsidies for seed and fertilizer) as well as complementarities (for example between spending on extension services and the development of infrastructure enabling farmers to get their output to the market). Although most public expenditures are aimed at provision of public services and investment, there is an apparent imbalance between particular categories of spending. The high investments in research, extension services and training can bring benefits via improved agricultural productivity, and in the longer term contribute significantly to poverty reduction. Investments in agricultural infrastructure, both on- and off-farm, are a key element in reducing transaction costs and improving farmers' access to markets; however, there is no support to storage development and very little support to marketing. The focus appears to be on increasing production and productivity, with little evidence so far of a policy and investment strategy to provide market access to new production.

Kenya is moving towards policy coherence, but there still are important constraints to be addressed. Agricultural sector policies have been gradually adapting to the country´s general policy and political changes towards market liberalization, privatization and commercialization of the agricultural sector. The consensual definition of development objectives and strategies has proved to be difficult in nature, but progress has been made. This is being reflected in the downward coherence and continuity between national strategies, sector policies and policies related to other supportive sectors. Although there has been clear progress over the past 10 years towards coherence in the agricultural sector, it is still identified as a challenge in the current national development strategy of Kenya.

PART 3.TOPIC OF NATIONAL INTEREST RELATED TO POLICY

9. Investment in agricultural water management in Kenya

Introduction

"Any attempt to justify more irrigation would sensibly do so on the basis of the demands of farmers and those to whom they sell instead of the wishes of those that see political or other advantage in the supply of more infrastructure" (FAO, 2006).

Since the 1990s, investment in agricultural water development in Sub-Saharan Africa (SSA) has declined. This could be explained mainly by past experiences of poor returns on investment and an unsustainable approach used for the supply of water for agriculture with high economic, social and environmental costs (FAO, 2006). Very few public funding schemes for Agricultural Water Management (AWM) have been performing as designed and many small-scale irrigation schemes have been poorly organized and provided inefficient service.

Today, with increasing weather variability, there appears to be increased confidence in the capacity of AWM to buffer production shortfalls and develop unproductive areas. However, the agricultural sector in SSA still faces important structural problems that need to be jointly addressed, such as a mis-match between production systems and the character of national and regional demand; high transport and marketing costs; and very low value added in processing.

Rainfed agriculture in Kenya represents more than 95 percent of total cultivated area (FAO, 2005), with highly volatile yields and producers who are vulnerable to weather and market fluctuations. Kenya has limited water resources – 20 billion m^3/year, 647 m^3/year per capita, expected to fall to 235 m^3/year by 2025 due to population increase, depletion of the resource, and lack of adequate water storage capacity (Ministry of Water Development, 1992; GOK, 2011a). Kenya therefore is classified as a water-scarce country, comparing unfavorably with neighbouring Uganda and Tanzania, which have 2,940 and 2,696 m^3/year per capita respectively.

At present, only one percent of the country's high-potential cropping land is under irrigation, while more than 85 percent of the country comprises arid or semi-arid land not very suitable for rainfed production, making Kenya highly vulnerable to climate change. Kenya has identified the importance of investment in AWM as a main component of its national development strategy, Vision 2030, to reach two objectives: increase agricultural production and develop the Arid and Semi-Arid Lands (ASALs). Vision 2030 (GOK, 2008) aims to put an additional 600,000 – 1.2 million ha under irrigation by 2030.

Investment in AWM should not be understood just as a technical solution to increase crop productivity, but as a variety of interventions in a strategy for change in a complex environment. The range of effects and appropriateness of AWM depend on a set of local conditions including natural resource endowments, levels of producer and market sophistication, and realistic opportunities for adding value. Other important dimensions to consider in AWM are the scale and management of water supply systems, the institutional environment, and payment for the water services and

infrastructure (IWMI, 2007). Therefore, it is necessary not only to assess the effect on productivity of the increase in water supply, but also to identify constraints and opportunities for a successful, economically and environmentally sustainable investment in AWM – private, public or combined.

In the context of the Vision 2030 objectives and strategies, the chapters in this Part of the MAFAP Country Report on Kenya provide a general perspective on investment in AWM in Kenya to raise awareness of its complexity, with a particular focus on the important link between investment in AWM for commercial purposes and the market structure and economic incentives faced by producers.

The next sections present:

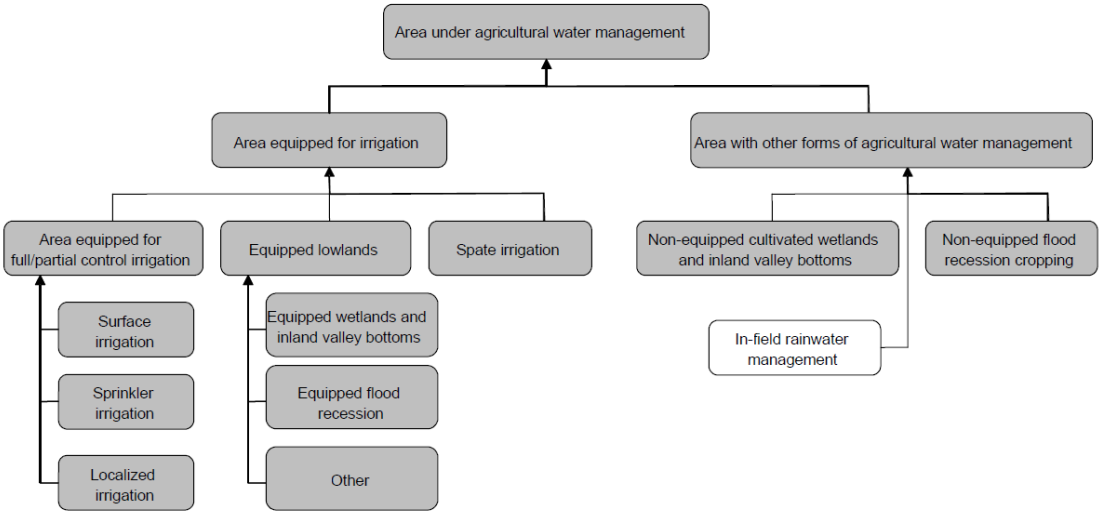
- A brief description of AWM and the new approaches to it, as well as the dynamics of the relationship between the value chain and AWM investment, mainly through supply changes;
- An assessment of the situation in Kenya regarding water development for agriculture (context, policy and investment);
- Some considerations related to the country's policy objectives and investment plans, based on MAFAP's findings on market price incentives faced by producers and other actors in the value chain.

The Land and Water division, FAO provided the unpublished Kenya National Investment Profile that was largely used as a basis for the presentation of this topic.

Agricultural water management investment – terms and trends

According to the World Bank (WB), Agricultural Water Management (AWM) covers irrigation and drainage as well as water management in rainfed agriculture. The UN Food and Agriculture Organization (FAO, 2005), provides a typology to define an *area under agricultural water management*, which distinguishes between *area equipped for irrigation* and *area with other forms of agricultural water management* (Figure 44). FAO did not include *water harvesting* in its original typology, mainly due to lack of a commonly accepted definition for the term, but the WB (2005a) incorporated it in its general concept of AWM as *in-field rainwater management*, using FAO's definition *the collection of rainfall for direct application to a cropped area, either stored in the soil profile for immediate uptake by the crop or stored in a reservoir for future productive use*.

Figure 44: Agricultural water management typology



Source: WB 2007 (white) adapted from FAO, 2005 (gray).

The term AWM investment thus comprises a wide variety of interventions[38]. Physical and non-physical AWM interventions can be distinguished, while both elements usually take place in a single functional structure (FAO, 2006).

Physical interventions are also placed in four categories, each with its own implications:

1) *Rehabilitation of infrastructure*. This can be a very cost-effective strategy if it is understood why the infrastructure has fallen into disrepair and if measures are taken to ensure that the new investment will not meet the same fate.
2) *Upgrading of existing schemes*. This could create more service demand or correct original miscalculations.
3) *New run-of-river schemes.* Their social, technical and budget constraints depend mainly on the scale of the intervention.
4) *New storage-based schemes*. Their environmental, social and economic challenges vary with their scale, techniques and management. Usually there is a tradeoff between economies of scale and alteration of livelihoods.

The viability of each set of interventions depends on their current state of development and effectiveness, on local demand opportunities, and on cultural preferences in terms of labour and cooperation around a shared natural resource FAO (2006).

Non–physical interventions can also be categorized in four (FAO, 2006):

[38] AWM includes, for example, irrigation and drainage, soil and water conservation, rainwater harvesting, agronomy, in-field water management, integrated watershed management, forest conservation, and livestock management. However, the supply of water to crops continues to be the main objective of AWM, mainly though irrigation schemes.

1) *Raising public awareness*. Communities that are not well informed tend not to take full advantage of supply-driven irrigation facilities. The benefits might be ignored, but also the responsibilities under the schemes in terms of maintenance, payments, management and environmental impactmay not be understood or accepted.
2) *Policy approaches*. A demand-driven approach, taking into account more than just how to provide the resource, is becoming more common. Investments in AWM should be backed by sector-wide and long-term policies that recognize the social, economic and environmental aspects of AWM implementation.
3) *Legal frameworks*. Within the context of the national policy and the scale of the investment the legal framework should establish transparent and stable water-use rights, identify clearly the property rights and obligations among users, and promote market efficiency.
4) *Institutions and service delivery*. There should be clarity and general understanding on the extent of institutional intervention, the level of administration (centralized or regionalized), the roles of the public and private sectors in service delivery, and the nature of their relationship with the users. The roles in the general investment strategy of other existing or new institutions (e.g., regarding the provision of extension services or supplementary inputs) should be clear as well.

The perception that many large twentieth-century dam-building and irrigation schemes and approaches failed has influenced investment trends in AWM. Despite major improvements in catchment and storage infrastructure, donor investment in large irrigation schemes declined during the past several decades because of four general trends or factors (FAO, 2005): the general decline of commodity prices; high development cost per ha, increasing where the easiest lands for irrigation development are already served); high maintenance costs; and higher standards to protect the environment.

New interest in investing in AWM, with a focus on small-scale schemes, appears to be emerging on the basis of good results with a user participatory approach (FAO, 2005). However, this has brought new problems because many of these schemes are based on pumped groundwater, with negative consequences from widespread overexploitation of aquifers (FAO, 2005). Market access for the new production of these schemes may also need supportive measures.

The World Bank (2005) identified five major shifts in national development policies regarding water management interventions over the past 15 years:

- A stronger focus on poverty reduction;
- Increasing awareness of the need to “manage scarcity”—of water, capital, and institutions;
- Growing emphasis on sustainability and environmental externalities;
- More consideration on the value of markets and economic incentives;
- Political economy processes of democratization, decentralization, and participation.

The following sections pay special attention to market considerations and impacts regarding investment in AWM, as well as the mutual links between AWM investment and the economic incentives and market structure faced by the farmers.

Market, value chain and economic incentives in AWM investment

Patterns in agricultural production are determined mainly by market incentives and agroclimatic conditions, but can also be greatly influenced by policy interventions such as trade regulations, infrastructure investments or subsidy programmes. AWM, mainly as irrigation, has been one of the main strategic interventions for achieving food security in developing countries.

Three main impacts of water-managed agriculture in the market structure can be identified (FAO, 2006): increased agricultural output due to yield increases; change towards higher-value crops; change in prices for both irrigated and non-irrigated commodities due to the change in supply.

The size of the impact on price depends on the production increase relative to the size of the potential market (FAO, 2006), which could vary significantly between products and regions depending on market integration and the level of international trade, as well as on the characteristics of each commodity and its trade status (import or export). While individual actions may not have a significant impact on the overall agricultural sector (local, regional or national), large investment projects affecting many producers may have an impact on commodity prices, producing winners and losers. Therefore, the characteristics of the market structure and the likely response of producers to the changing demand and supply patterns should be considered before any intervention (FAO, 2006).

In addition to the price impact, the introduction of AWM also affects the volume, stability, composition, seasonality and physical characteristics of the agricultural supply, with a range of implications throughout the value chain and market. The next paragraphs highlight certain aspects of these impacts and some implications of AWM on the agricultural structure in Kenya.

Reduction in transaction and access costs in the value chain could result from the reorganization of the cropland into a single continuous area or increased production per hectare with irrigation in new AWM schemes by:

a) Increased efficiency of marketing by economies of scale, especially in transport, but also in input supply and machinery leasing schemes. It also facilitates the smallholders' organization, increasing their control over the market chain.
b) The creation of larger and more cost-efficient processing plants, as well as reducing the distance between the factory and its outgrowers.
c) Enhancing competitiveness by raising the number of traders able to operate in the area.

The relative processing and marketing gains due to concentration would be larger for perishable, bulky and sensitive commodities than for other commodities. Lands allowing such a concentration of irrigated agriculture are generally distant from markets. Effective links to markets are especially important when governments seek to develop or stabilize rural communities in remote areas through AWM investments. Development of small-scale irrigation schemes in areas not effectively linked to markets has generally produced disappointing results (FAO, 2006).

Reduced dependence on seasonal weather patterns by AWM may increase production availability, stability, predictability and quality. Well planned and implemented AWM areas will have several benefits:

a) Farmers can benefit from better off-season prices and more certain planting dates and harvesting periods. Produce quality can become better and more uniform because of more dependable water supply.
b) In the medium term, and depending on their extent, AWM areas have a buffering effect on prices throughout the year by reducing inter-seasonal price variations.
c) The capacity of a crop-processing industry is utilized more efficiently, more months per year. The more uniform and higher quality of produce should also increase the efficiency and transformation ratio of machinery that is adjusted for a specific standard of raw material, as for seed cotton.
d) Farmers will be able to build a reputation for a particular quality of produce that attracts regular customers, prepared to pay a premium price for dependable quality. This also facilitates the establishment of contract farming schemes and facilitates access to credit.

Reduced risk faced by farmers by AWM might be reflected in their incentives to produce. However, FAO (2006) also cautions that ill-conceived or inflexible institutional measures could cause bankruptcy of farmers, even where productivity is both high and efficient. This is especially risky where production becomes more specialized and dependent on inputs in monopolistic markets and with rent-seeking creditors and intermediaries.

Finally, *price reduction* because of the production increase by AWM may be the main social effect for consumers. However, it might be a detrimental effect on rainfed producers of the same commodities and the rural landless, further marginalizing them. This negative effect could be aggravated because irrigated producers are commonly subsidized (through low recovery of recurring cost) while rainfed farmers rarely benefit from any subsidy (FAO, 2006).

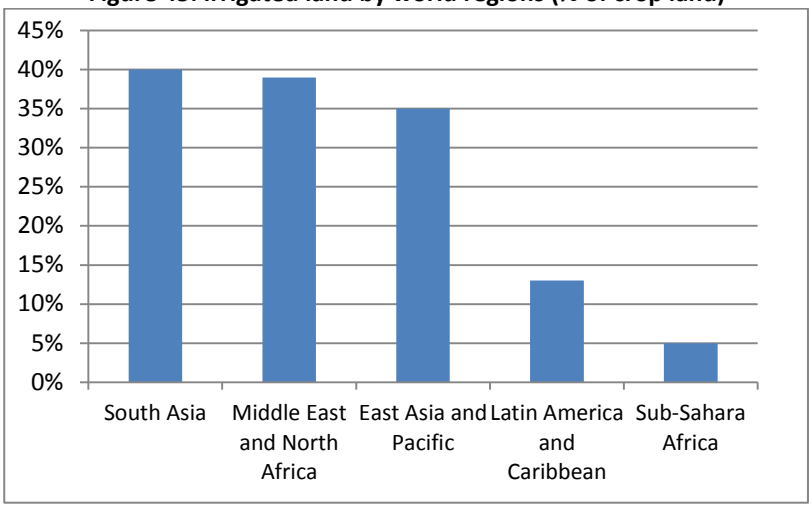
Situation of agricultural water management investment in Kenya

This section provides a general view of investment in AWM in Kenya: the actual situation in agricultural water development, the country's national objectives and strategies, and an assessment of investment trends in AWM.

General state of AWM

Sub-Saharan Africa (SSA) has the least agricultural water development of all world regions. During the last forty years, only over 4 million ha of new irrigation have been developed in the region, while China and India added 25 and 32 million ha, respectively (FAO, 2003). The area under irrigation in SSA represents only 5 percent of the total cultivated area, way behind the next region, Latin America and Caribbean with 13 percent (Figure 45). Within SSA, the distribution among countries is also very unequal; three countries, Sudan, South Africa and Madagascar, account for around two thirds of the area under irrigation in the region (WB, 2007).

Figure 45: Irrigated land by world regions (% of crop land)



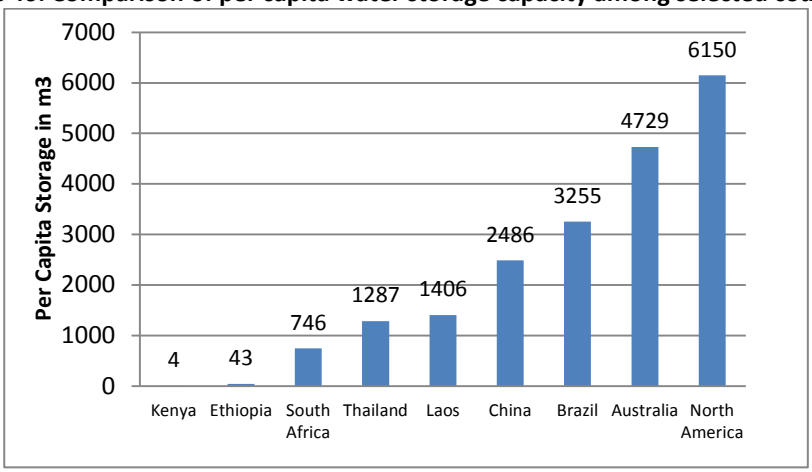
Source: WB, 2007

Kenya has an irrigation potential was estimated at 539,000 ha based on surface water, and a further 800,000 ha if groundwater and water harvesting are taken into account (FAO, 2005). By 2008, only 119,200 ha had been developed, representing 2.85 percent of the cultivated area[39] (MWI, 2008). Kenya thus still relies heavily on rainfed agriculture for production of staple crops and other marketed crops. Smallholders account for 56,024 irrigated ha (47%); Private business for 48,872 ha (41%); and Government-managed large-scale schemes for 14,304 ha (12%) (FAO AQUASTAT). The main irrigated crops are rice, maize, fruits, vegetables, bananas, citrus, coffee, tea and flowers.

The National Water Master Plan of 1992 projected Kenya's total water requirements (domestic, industrial, livestock, inland fisheries, wildlife and irrigation) to rise from 2.1 billion m^3/year in 1990 to 5.8 billion m^3/year in 2010. Despite the projected increase in annual water requirements, Kenya is among the countries with the lowest storage capacities, with 186 million m^3 stored in small dams and water pans (NWPC inventory of 2003), resulting in a per capita storage capacity of 4.4 m^3 (Figure 46). In the event of a drought, the stored water would not last for three months. In some regions, inadequate water harvesting has resulted in uncertain water availability with abundant water during rainy seasons and little or no water during dry periods (FAO, 2011c).

[39] The total agricultural water managed area (not only irrigation) is estimated at 165,200 ha, representing 3.9 percent of the total cultivated area.

Figure 46: Comparison of per capita water storage capacity among selected countries



Source: IWMI, 2007

Climate change is already affecting Kenya. Droughts and floods have become more frequent and intense. Over 70 percent of the natural disasters affecting the country are weather-related. The effects of climate change, likely to become more severe, could slow down Kenya's projected economic growth for two main reasons; the economy is heavily dependent on climate-sensitive sectors, such as agriculture and tourism, and the country does not yet have effective means to cope with climate hazards.

Policy objectives

In the Arid and Semi-Arid Lands (ASALs), 84 percent of Kenya's land, 9.2 million ha have potential for irrigated crop production, an area equivalent to the total farmland in high- and medium-potential areas. Since their limiting factor is water, the national agricultural production can be substantially increased through investment in water harvesting and storage, exploitation of groundwater resources, and improvement in water use efficiency. The future growth and development of the agricultural sector will strongly depend on the innovative use of the ASALs, and irrigation will play an increasingly important role in the intensification of agricultural production. Therefore AWM is identified as one of the country's strategies to expand productive land in the country. Among other actions, the Vision 2030 aims to increase the area under irrigation at a rate of 40,000 ha per year, which should have a noticeable impact on the structure of the agricultural sector as a whole.

Agriculture is recognized as one of the main economic pillars for the country's development under Vision 2030. The Vision identified five challenges in the sector: the unfavourable institutional framework; productivity; land use; markets; and value addition. To face these challenges five key strategies are proposed:

- Reforming institutions
- Increasing productivity through provision of services and inputs to producers
- Better utilization of productive land
- Developing the ASALs
- Increasing market access through value addition.

Aligned with the Vision 2030, a *National Irrigation and Drainage Policy* (MWI, 2009) has been approved by the Government. This policy should facilitate coordinated resolution of sector constraints and promote the future development in irrigation. Sector growth should be achieved through accelerated development of irrigation infrastructure, increased water harvesting and storage, improved scheme management, enhanced stakeholder participation, and improved business orientation. The critical conditions to enable this development include promotion of research, innovation, technology development and adoption to modernize production and improve productivity; improved access to investment capital and credit; facilitation of macroeconomic stability; capacity building for both technical staff and farmers; improved support services and infrastructure.

The *Draft National Irrigation Master Plan* (GOK, 2012) promotes coordination in the irrigation sector in a manner that endorses empowerment of communities and also allows private sector participation where needed. The Plan underlines the necessity to rehabilitate and expand existing irrigation schemes while new ones are put in place. The sustainability of irrigation schemes is to be achieved by communities´ responsibility over the management of their schemes.

The water sector is also aligned with the national *Sector-Wide Approach to Planning* (SWAP) since 2006 (GOK, 2012; Evans, Cabral, & Vadnjal, 2006). The SWAP is a common approach to planning and implementation to be followed by the Government and Development Partners (DPs). The Partnership Principles, which define the responsibilities of the Government and the DPs in development issues, were signed in August 2006 by the Ministry of Finance, the Ministry of Water and Irrigation and DPs in the sector.

Investment trends

The planned investment and the budgetary provisions for AWM projects in Kenya are summarized below on the basis of the unpublished National Investment Profile for water development, prepared by FAO´s Land and Water Division. To estimate the investment plans in the country the study applied a project-based approach, covering 142 recently implemented, ongoing and pipeline projects between 1991 and 2030[40], funded by the government and several international donors.[41] The distribution of the investment cost across sources of financing appears to be similar for ongoing and pipeline projects. Donor funding accounts for around 60 percent to two thirds of the investment envelope, the other third mainly consists of public funding. The private share is estimated at 5 to 10 percent.

The investment envelope for agricultural water projects in Kenya (see Table 26) accounts for a total of about USD 4.6 billion: USD 1.9 billion to be invested in the short term, USD 1.1 billion in the medium term (between 4 and 8 years) and the remaining USD 1.5 billion in the long term. 72 percent of the total investment envelope is to be invested in large-scale irrigation development, 20

[40] The National Investment Profile also includes projects of water management for electricity generation. This chapter only considers water management projects with an agricultural component.

[41] the World Bank (IBRD/IDA), GEF, NEPAD (CAADP), IFAD, African Development Bank (AfDB), the EU (EDF), JICA, the Arab Bank for Economic Development in Africa (BADEA), Kuwait Fund, SIDA, German Development Bank (KfW), the Italian Government and UNICEF.

percent in small-scale irrigation development and 8 percent in rehabilitation and modernization of irrigation schemes.

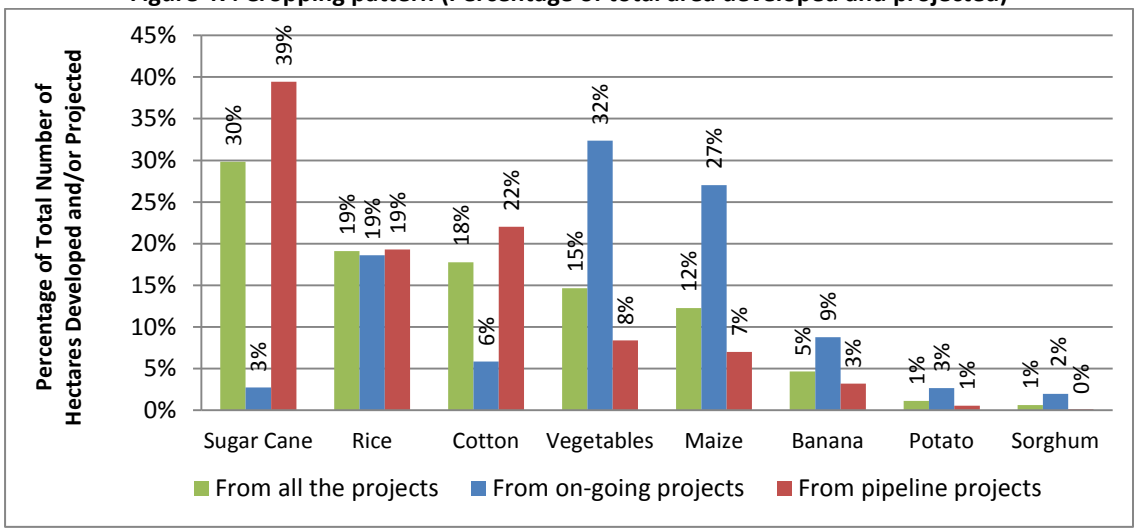
Table 26: Kenya Investment Envelope (USD million)

Time Frame/Size of project	Small-scale irrigation development	Rehabilitation of irrigation schemes	Large-scale irrigation development	Total
Short-term	680 (15%)	303 (6%)	986 (21%)	1,969 (42%)
Medium-term	219 (5%)	62 (1%)	918 (20%)	1,199 (26%)
Long-term	21.8 (0.5%)	0 (0%)	1,482 (32%)	1,503.8 (32%)
Total	920.8 (20%)	365 (8%)	3,386 (72%)	4,671.8 (100%)

Source: Author's table based on FAO, unpublished

Planned cropping patterns for ongoing and pipeline projects were identified (Figure 47) because linkages of market and economic incentives with investment in AWM may vary depending on the crop or crop group. Due to the early stage of formulation or implementation, only 37 out of 74 ongoing projects and 32 out of 60 pipeline projects could provide sufficient information on the cropping pattern.

Figure 47: Cropping pattern (Percentage of total area developed and projected)



Source: Author's figure based on FAO, 2012.

There is a clear shift towards sugarcane and cotton from ongoing to pipeline projects. Sugarcane accounts for only three percent (33,200 ha) in the ongoing projects, while it is planned for 39 percent (129,000 ha) of the total pipeline area. A similar trend, although less massive, can be seen for cotton, from 6,800 ha for the ongoing projects to 72,000 ha for the pipeline.

The increase for these cash crops is matched by a decrease for staple crops and vegetable produce: maize from 27 percent in the ongoing projects to 7 percent for the pipeline projects, and vegetables from 32 to 8 percent. The percentage reductions should be seen in the light of the extent of ongoing and pipeline projects: the latter cover three times the area of the ongoing ones. Rice has a stable 19 percent in both ongoing and pipeline projects, so its planned area in pipeline projects will be three

times that in the ongoing projects. Sorghum, potatoes and bananas play a minor role in the cropping patterns of ongoing and pipeline projects, and have a decreasing percentage share.

The next section briefly discusses the trends highlighted above and their different impacts, combined with some MAFAP findings, with specific attention to sugar and cotton.

The case of sugar and cotton

This section provides some insights based on the extensive analysis in Chapter 5 of the market incentives to production (expressed as the Nominal Rate of Protection[42]) faced by Kenyan farmers and other actors between 2005 and 2010. The analysis, which covers ten commodities[43], is used to identify challenges and opportunities for AWM development. Special attention is given to cotton and sugar, which are planned on the largest area in the pipeline investment projects analyzed.

It is important to consider the level and causes of the Nominal Rates of Protection (NRPs) faced by the producers. If determined actions are not taken to generate incentives to production, the chances of success of AWM investment would be strongly reduced, even if the consequences of increased supply due to AWM investment[44] would correct some of the disincentives for production. The analysis showed an average NRP for the agricultural sector of -10 percent between 2005 and 2010 (*see page 111*). Government policies and several inefficiencies throughout the value chain are among the causes.

The impacts of AWM vary with type of intervention and between commodities. The benefits should be higher for sugar and cotton than for other crops, as their transport cost per unit value is relatively high.

Sugar

According to the MAFAP analysis, between 2005 and 2010 the average observed NRP for factories and farmers was 16 and 31 percent, respectively. Although factories and producers faced incentives, the general trend was declining due to gradual market liberalization. For producers, it evolved from an NRP of 83 percent in 2005 to a NRP of -6 percent in 2010. For factories, it remained positive, but declined from 29 percent in 2005 to 3 percent in 2010 (*see page 75*).

While increasing sugarcane production through irrigation seems consistent with the country´s objective of becoming a net exporter in the medium term, the analysis suggests that the main problems are not at the production level but are related to the low efficiency of the processing factories and the concentrated market structure. Recently, due to the high protection provided by the government, the sugar factories were able to obtain high benefits, which were partly shared with the producers, but this will be difficult to sustain once the market is completely liberalized. It is expected that under a liberalized market with internationally competitive prices, only a few of the sugar companies would be able to market their products. This could lead to a general cut in

[42] A detailed definition of the Nominal Rate of Protection is provided in Part 2, Chapter 5 on page 45 of this report.

[43] Maize, wheat, rice, sugar, cotton, coffee, tea, dairy, live cattle and sorghum.

[44] Section 'Market, value chain and economic incentives in AWM investment'.

processing costs as well as sugarcane payments, and to a less competitive market structure, as the largest sugar company currently accounts for more than 40 percent of national production. Market incentives faced by the sugar growers could be consequently reduced.

One indicator of the efficiency of a sugar factory is the amount of cane needed to produce a unit of processed sugar. This ratio largely depends on the sucrose content of the sugarcane supplied by the producers, which is significantly increased by irrigation, and on the factory management and processing efficiency. One of the main causes of the low sucrose content of the cane processed in Kenya is sucrose loss during the long period from crop maturity until the sugar companies harvest and process the cane – sometimes up to six months.

Hence, an increase of sugarcane supply to the factories might not be reflected in a proportional increase of processed sugar and consequent increase in farmers' income, unless the structural and efficiency problems are overcome. The analysis shows that the existing market structure hinders sugarcane farmers. If factories continue to capture most of the profits from sugar sales, farmers will likely face market price disincentives in future years, as international trade restrictions continue to be reduced and Kenya moves towards full market liberalization.

Cotton

Jointly with drought-resistant crops such as sorghum, cotton is identified by the Government as a strategic crop for the development of the ASALs, and the government is investing in rehabilitation of the diminished cotton sector. In contrast to sugarcane farmers, seed cotton farmers and ginners faced negative incentives in the entire period between 2005 and 2010, with average NRPs of -32 and -16 percent, respectively (*see page 81*).

In the cotton sector, unlike sugarcane, a deficient supply in terms of crop quality and quantity was identified as one of the main causes of market price disincentives faced by producers and ginners. This negative effect on the incentives was due to operational inefficiencies and a low ginning outturn, low yields and inconsistent production, with consequent inability to compete and fulfil national demand for cotton lint. An increase in production through irrigation could help increasing the incentives for cotton farmers by improving the quality and quantity of the seed cotton and consequently, of cotton lint.

However, apart from the identified benefits of AWM, and as in the case of sugar, it is unlikely that the increase of production will result in benefits to the cotton producers unless structural market problems are resolved. One of the main causes of the general disincentives faced by both ginners and farmers is the high market power exercised by the spinners, who are the only buyers for national cotton lint, with the option to procure duty-free imported lint.

If an increase in the quantity and quality of the cotton supply will be effectively complemented with access to markets, Kenyan cotton lint could diversify its market internationally, leading to a more equitable national market structure and market price incentives.

This section showed how investment in agricultural water management might impact the level of incentives and disincentives faced by producers measured by the MAFAP indicators and, conversely, how the existing incentives and disincentives faced by farmers could affect the success of investments in AWM.

Conclusions

Although irrigation development is one of the main components of AWM, the term covers an ample spectrum of interventions that comprises more than just linking available water with available land. An increase in agricultural production through AWM will not necessarily result in increases in farmers´ income. Therefore, any AWM proposal, its objectives and secondary effects, as well as needed complementary initiatives, investments and policy changes should be assessed from a holistic point of view before any investment in AWM.

Since the objective of investing in AWM is part of a national strategy for the development of lagging parts of the country, all the supportive strategies needed for its success should be taken in consideration, such as access to market and inputs, storage infrastructure, an efficient regulatory and legal framework and government extension services. The development of ASALs in Kenya has been a government objective for a long time. AWM investment could help achieve this objective but it should not be considered as the main strategy, let alone the only one, to achieve ASALs development.

Kenya still has a large unrealized AWM potential, so investment in the sector appears promising. However, it also represents a challenge, and it is important to understand the causes of past failures and be informed on experiences in other countries. Kenya is following a sector-wide policy approach with stakeholders' participation, and investment for efficiency improvement in the value chain and value addition is taken into account. In this approach, special attention is needed on production costs, price formation, effective local, farmer- or community-managed water allocation mechanisms, economically efficient water use, and strong, responsive institutions. Through consultative coordination, government can ensure that the joint efforts of a significant number of actors, ranging from donors to smallholders, are complementary and consistent with the government strategy, so that government expenditure in public goods can be applied to best effect.

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Annexes

1. List of projects and programmes included in the public expenditure analysis

Public expenditure measure	Implementing government body
General administration and planning services of the MoA	Ministry of Agriculture
Policy and Agricultural Development Coordination Services	Ministry of Agriculture
Tea Board of Kenya	Ministry of Agriculture
Pesticide Control Products Board (PCPB)	Ministry of Agriculture
Horticultural Crops Development Authority (HCDA)	Ministry of Agriculture
Kenya Plant Health Inspectorate Services (KEPHIS)	Ministry of Agriculture
Headquarters land and Crop Development Services	Ministry of Agriculture
Cotton development Programme	Ministry of Agriculture
Plant Genetic Resource	Ministry of Agriculture
Coconut Development Authority	Ministry of Agriculture
Food security Management Programme 'Njaa Marufuku Kenya'	Ministry of Agriculture
Small Scale Horticulture Development Projects	Ministry of Agriculture
Agriculture Engineering Services	Ministry of Agriculture
State Corporation Unit	Ministry of Agriculture
Agriculture Development Headquarters Technical Services	Ministry of Agriculture
Integrated Development	Ministry of Agriculture
Coffee board of Kenya	Ministry of Agriculture
Agricultural Technology Development and Testing Stations	Ministry of Agriculture
Horticultural Crop Development Services	Ministry of Agriculture
National Agriculture and Livestock Extension Programme	Ministry of Agriculture
Headquarters extension Research Liaison and Technical Building services	Ministry of Agriculture
Farmers Training Stations	Ministry of Agriculture
National Extension Projects	Ministry of Agriculture
Provisial Agicultural Extension Services	Ministry of Agriculture
District Agricutural Extension Services	Ministry of Agriculture
Seruculture Stations-Thika	Ministry of Agriculture
Kenya Agricultural Research Institute	Ministry of Agriculture
Soil and Water Management Research	Ministry of Agriculture
National crops and Horticultural Research Project	Ministry of Agriculture
Veterinary Research	Ministry of Agriculture
Range and Arid Land Research	Ministry of Agriculture
Animal Production Research	Ministry of Agriculture
Kenya Agricultural productivity and Agribusiness Project(KAPAP)	Ministry of Agriculture
KAPAP (KAPP II) - Kenya Agricultural Productivity Agribusiness Project.	Ministry of Agriculture

East African Productivity Project(EAAPP)	Ministry of Agriculture
Agricultural Business Market Development and Agricultural Information Services	Ministry of Agriculture
PSDA	Ministry of Agriculture
Agricultural Information Resource Centre	Ministry of Agriculture
Embu Agricultural College	Ministry of Agriculture
Bukura Agricultural College	Ministry of Agriculture
Kilifi Institute of Agriculture	Ministry of Agriculture
Land Development and Machinery Services	Ministry of Agriculture
General administration and planning	Ministry of Livestock Development
ASPS-Agricultural Sector Programme Support	Ministry of agriculture
SHOMAP - Small Holder Horticulture Marketing Programme	Ministry of agriculture
SHEP-UP	Ministry of agriculture
NAAIAP - National Accelerated Agriculture Input Access Program	Ministry of agriculture
Traditional High Value Crop Project (THVCP)	Ministry of agriculture
CADSAL - Community Agricultural Development Project in Semi Arid Lands in Kenya	Ministry of agriculture
Provicial Livestock Production Services	Ministry of Livestock Development
District Livestock Production Services	Ministry of Livestock Development
Sheep and Goats Improvement Stations	Ministry of Livestock Development
Headquarters Livestock Production Support Services	Ministry of Livestock Development
Kenya Dairy Board	Ministry of Livestock Development
Business and Value Addition	Ministry of Livestock Development
Lenana Bee Keeping Station	Ministry of Livestock Development
Animal Production Farms	Ministry of Livestock Development
Animal Production Services	Ministry of Livestock Development
Smallholder Dairy Commercialisation Programme (SCDP)	Ministry of Livestock Development
Rural Dairy Services	Ministry of Livestock Development
Range Management and Improvement	Ministry of Livestock Development
Livestock Training- Support Services	Ministry of Livestock Development
Pastoral Areas Training Centre - Narok	Ministry of Livestock Development
Griftu Pastoral Training Centre	Ministry of Livestock Development
Mobile Pastoral Training Unit	Ministry of Livestock Development
Kenya Dairy Development Programme	Ministry of Livestock Development
Dairy Training School	Ministry of Livestock Development
District Livestock Information Services	Ministry of Livestock Development
District Livestock Education and Extension Services	Ministry of Livestock Development
Livestock Breeding and Laboratory Services	Ministry of Livestock Development
District Apicultural and Emerging Livestock Services	Ministry of Livestock Development
Project Development Monitoring and Evaluation	Ministry of Livestock Development
ASAL Based Livestock and Rural Livelihoods Support Project	Ministry of Livestock Development
Veterinary Headquarters	Ministry of Livestock Development
Livestock Vaccination and Branding Services	Ministry of Livestock Development
Artificial Insemination Services	Ministry of Livestock Development
Central Artificial Insemination Station	Ministry of Livestock Development

Tick Control Programme	Ministry of Livestock Development
Provincial Veterinary Services	Ministry of Livestock Development
District Veterinary Services	Ministry of Livestock Development
Veterinary Clinical Services	Ministry of Livestock Development
Meat Inspectorate	Ministry of Livestock Development
	Ministry of Livestock Development
Kenya Leather Council	Ministry of Livestock Development
Tsetse Control Services	Ministry of Livestock Development
Disease and Pest Control Services	Ministry of Livestock Development
Management and Mitigation of Rift valley East Coast Fever	Ministry of Livestock Development
AHITI- Ndomba	Ministry of Livestock Development
AHITI - Nyahururu	Ministry of Livestock Development
AHITI - Kabete	Ministry of Livestock Development
Meat Training School- Athi River	Ministry of Livestock Development
Veterinary Investigation Laboratory Services	Ministry of Livestock Development
Avian Influenza Interventions	Ministry of Livestock Development
Veterinary Farm Development	Ministry of Livestock Development
Central Veterinary Laboratory Services - Kabete	Ministry of Livestock Development
Foot and Mouth Disease Control	Ministry of Livestock Development
Pastoral Areas Veterinary Services	Ministry of Livestock Development
Rabies Control	Ministry of Livestock Development
General Administration and Planning	Ministry of Fisheries development
SDCP - Small Dairy Commercialization Project	Ministry of Livestock Development
PATTEC	Ministry of Livestock Development
FFEP - Fish Farming Economic Stimulus Programme	Ministry of Fisheries Development
Directorate of Marine and Coastal Fisheries	Ministry of Fisheries Development
Directorate of Inland and Riverine Fisheries	Ministry of Fisheries Development
Directorate of Aquaculture Development	Ministry of Fisheries Development
Directorate of Quality Assurance and Marketing	Ministry of Fisheries Development
Directorate of Fisheries	Ministry of Fisheries Development
Fisheries Stations	Ministry of Fisheries Development
Fisheries and Hatchery	Ministry of Fisheries Development
Fisheries Regional Centres	Ministry of Fisheries Development
Deep Sea Fisheries	Ministry of Fisheries Development
Marine Fisheries Research Institute	Ministry of Fisheries Development
Kerio Valley Development Authority	Ministry of Regional Development Authorities
Rural Development Services Coordination	Ministry of Regional Development Authorities
Tana and Athi River Development Authority	Ministry of Regional Development Authorities
Lake basin Development Authority	Ministry of Regional Development Authorities
Ewaso Nyiro South Development Authority	Ministry of Regional Development Authorities
Ewaso Nyiro North Development Authority	Ministry of Regional Development Authorities
Coast Developent Authority	Ministry of Regional Development Authorities
Headquarters and Administrative Services	Ministry of State for Development of Northern Kenya and Other Arid Lands
Food Stimulus Programme -	Ministry of Regional Development Authorities

Information Communication Technology Unit	Ministry of State for Development of Northern Kenya and Other Arid Lands
Monitoring and Evaluation	Ministry of State for Development of Northern Kenya and Other Arid Lands
Finance Management Services	Ministry of State for Development of Northern Kenya and Other Arid Lands
Disaster Emergency Response Coordination	Ministry of State for Development of Northern Kenya and Other Arid Lands
Arid Resource Management Project	Ministry of State for Development of Northern Kenya and Other Arid Lands
General Administration and Planning	Ministry for cooperatives and Marketing Development
Cooperative Tribunal	Ministry for cooperatives and Marketing Development
Cooperative Registration Services	Ministry for cooperatives and Marketing Development
Cooperative Marketing	Ministry for cooperatives and Marketing Development
Office of the Commissioner	Ministry for cooperatives and Marketing Development
Provincial Cooperative Extension Services	Ministry for cooperatives and Marketing Development
District Cooperative Extension Services	Ministry for cooperatives and Marketing Development
Headquarters Cooperative Audit Services	Ministry for cooperatives and Marketing Development
Provincial Cooperative Audit Services	Ministry for cooperatives and Marketing Development
District Cooperative Audit Services	Ministry for cooperatives and Marketing Development
Cooperatives Education and Training Programmes	Ministry for cooperatives and Marketing Development
Environmental Management and Protection	Ministry of Environment
Lake Victoria Environment Mangement Project	Ministry of Environment
Forestry Research Institute Headquarters	Ministry Forestry and Wildlife - Forest Department
Headquarters Forestry Development	Ministry Forestry and Wildlife - Forest Department
Kenya Forest Service Board	Ministry Forestry and Wildlife - Forest Department
Forest Industrial Training Center- Nakuru	Ministry Forestry and Wildlife - Forest Department
Forestry Training College - Londiani	Ministry Forestry and Wildlife - Forest Department
Forestry and Plantation Development	Ministry Forestry and Wildlife - Forest Department
Rural Afforestation Execution Schemes	Ministry Forestry and Wildlife - Forest Department
Road Construction Unit	Ministry Forestry and Wildlife - Forest Department

Arid and Semi-Arid Lands Forestry	Ministry Forestry and Wildlife - Forest Department
Construction of Rural Water Supplies	Ministry of Water and Irrigation
District Water Services	Ministry of Water and Irrigation
Water Resources - Pollution Control	Ministry of Water and Irrigation
water Resources	Ministry of Water and Irrigation
Water Resources - Surface Water	Ministry of Water and Irrigation
Coastal Water Supplies	Ministry of Water and Irrigation
Ground Water Investigation and Development	Ministry of Water and Irrigation
Trans-Boundary Water	Ministry of Water and Irrigation
Other Municipalities Water Supplies	Ministry of Water and Irrigation
Irrigation and Land Reclaimation	Ministry of Water and Irrigation
Community Based Smallholder Irrigation Promotion	Ministry of Water and Irrigation
Intergrated ASAL Programmes	Ministry of Water and Irrigation
West Pokot District	Ministry of Water and Irrigation
Baringo District	Ministry of Water and Irrigation
Laikipia West District	Ministry of Water and Irrigation
Laikipia East District	Ministry of Water and Irrigation
Turkana Rehabilitation Project	Ministry of Water and Irrigation
Garissa District	Ministry of Water and Irrigation
Turkana North District	Ministry of Water and Irrigation
National Irrigation Board	Ministry of Water and Irrigation
Flood Control Management	Ministry of Water and Irrigation
Smallholders Development, National Irrigation Board, Bura Irrigation Programme Expanded Irrigation Programme	Ministry of Water and Irrigation
Smallholder Irrigation Development & Management	Ministry of Water and Irrigation
National Water Conservation and Pipeline Corporation	Ministry of Water and Irrigation
Water Conservation and Dam Construction	Ministry of Water and Irrigation
Nutrition	Ministry of Public Health and Sanitation(Rural health)
Food Control Administrative Services	Ministry of Public Health and Sanitation(Rural health)
Rural Health Centres and Dispensaries	Ministry of Public Health and Sanitation(Rural health)
School Milk and Feeding Programme	Ministry of Education
University of Nairobi	Ministry of Education
Kenyatta University	Ministry of Education
Egerton University	Ministry of Education
Jomo Kenyatta University of Agriculture and Technology	Ministry of Education
Maseno University	Ministry of Education
Moi University	Ministry of Education
Western University College WEUCO	Ministry of Education
Disaster Mitigation Programmes	Ministry of Special Programmes
Relief and Rehabilitation	Ministry of Special Programmes
National Food Security	Ministry of Special Programmes
National Disaster Operations	Ministry of Special Programmes

Disaster Emergency Response Coordination	Ministry of Special Programmes
Arid Resource Management Project	Ministry of Special Programmes
Western Kenya Flood Mitigation Project	Ministry of Special Programmes
Support to Emergency Preparedness	Ministry of Special Programmes
Department of Mitigation and Resettlement	Ministry of Special Programmes
National Humanitarian Fund Secretariat	Ministry of Special Programmes
Kenya Rural Roads Authority	Ministry of Roads (Rural roads)
Rural education CDF	Constituency Development Funds
Rural Health CDF	Constituency Development Funds
Rural Infrastructure (roads) CDF	Constituency Development Funds
Water and Sanitation CDF	Constituency Development Funds
Energy CDF	Constituency Development Funds

2. Summary of main methodological concepts in public expenditure analysis

The methodology proposes to capture all public expenditures that are undertaken in support of food and agriculture sector development. That includes expenditures from the national budget, either central or regional government, regardless of the ministry that implements the policy, and external aid, provided through local governments or specific projects conducted by international organisations or NGOs.

The primary focus is on the food and agriculture sector; however, for some countries forestry and fisheries may be an important part of rural activity and are also included in the scope of the project.

All public expenditures in the rural areas are to be captured, including those not specific to the sector such as rural infrastructure, rural education and rural health, as they, too, may have an important role in agricultural sector development.

Expenditure measures generate explicit or implicit monetary transfers to supported individuals or groups. We consider all those expenditure measures that generate explicit or implicit monetary transfers in support of food and agriculture sector development. These measures are divided into two main categories of expenditures: agricultural-specific expenditures and agricultural supportive expenditures. Agricultural-specific expenditures include those measures that generate monetary transfers to agricultural agents or sector as a whole. The agents, or the sector as a whole, must be the only, or the principal recipient of the transfers generated by the expenditure measure. Agriculture supportive measures should include measures that are not strictly specific to agriculture sector, but that have strong influence on agricultural sector development such as investments in rural development. All the measures that comply with these criteria are considered, regardless their nature, objectives or perceived economic impacts.

Further, general expenditure measures available throughout the entire economy are not considered, even if they generate monetary transfers to the agricultural sector.

Finally, the expenditure measures are considered and classified according to the way in which they are implemented and not on the basis of their objectives or economic impacts.

Classification and disaggregation

Many expenditures of greatest relevance to agricultural development, in terms of their ability to expand the production frontier, may not be specific to agriculture, but could fall into other categories. Moreover, support can be provided in several different ways. Support to agricultural producers may be provided via reduced input prices (e.g. a fertiliser subsidy), cost sharing for fixed capital (e.g. machinery), revenue foregone by the government (tax concession), reimbursement of taxes or charges or services in kind (e.g. delivery of extension services). Agriculture-specific support to the sector more generally may be provided via spending on agricultural education, research, marketing of agricultural goods, irrigation etc. Some policies, which benefit agriculture, may be even more general, such as expenditures on rural infrastructure, rural education or rural health. Although the latter are not sector specific, they may be sector supportive. In order to capture all public expenditures in support of the food and agriculture sector, the following breakdown is proposed.

1) A broad distinction between policies that are: agriculture-specific, agriculture-supportive and non-agricultural expenditures.
2) Within the agriculture-specific category, a distinction between support to producers and other agents in the value chain, and general sector support. The agents in the value chain include farmers (producers), input suppliers, processors, consumers, traders and transporters.

The detailed classification of support follows the OECD's principle of classifying policies according to their economic characteristics, i.e. the way they are implemented, which provides the basis for further policy analysis (OECD, 2008). The particular categories, however, should be designed to reflect the types of policies applied in African countries. Likewise, the categories proposed in the box below have been elaborated based on the experience of various agencies, including FAO (e.g. FAO, 2006), working on public expenditures in developing countries (for a comprehensive overview, see MAFAP, 2010c). Further, drawing on the OECD's experience, the classification proposed aims at distinguishing, to the extent possible, policies providing private goods as distinct from public goods, given their different economic effects.

Box 2: Proposed classification of public expenditures in support of the food and agriculture sector

I. Agriculture-specific policies – monetary transfers that are specific to agriculture sector i.e. agriculture is the only, or major, beneficiary of a given expenditure measure

I.1. Payments to the agents in the agro-food sector – monetary transfers to the agents of agro-food sector individually

I.1.1. Payments to producers – monetary transfers to individual agricultural producers (farmers)

A. Production subsidies based on outputs – monetary transfers to agricultural producers that are based on current output of a specific agricultural commodity

B. Input subsidies – monetary transfers to agricultural producers that are based on on-farm use of inputs:

variable inputs (seeds, fertiliser, energy, credit, other) – monetary transfers reducing the on-farm cost of a specific variable input or a mix of variable inputs

capital (machinery and equipment, on-farm irrigation, other basic on-farm infrastructure) – monetary transfers reducing the on-farm investment cost of farm buildings, equipment, plantations, irrigation, drainage and soil improvements

on-farm services (pest and disease control/veterinary services, on-farm training, technical assistance, extension etc., other) – monetary transfers reducing the cost of technical assistance and training provided to individual farmers

C. Income support – monetary transfers to agricultural producers based on their level of income

D. Other – monetary transfers to agricultural producers individually for which there is insufficient information to allocate them into above listed categories

I.1.2. Payments to consumers – monetary transfers to final consumers of agricultural commodities individually in form of:

E. food aid – monetary transfers to final consumers reducing the cost of food

F. cash transfers – monetary transfers to final consumers to increase their food consumption

expenditure

G. school feeding programmes – monetary transfers to final consumers providing free or reduced-cost food in schools

H. other – monetary transfers to final consumers individually for which there is insufficient information to allocate them into above listed categories

I.1.3. Payments to input suppliers – monetary transfers to agricultural inputs suppliers individually

I.1.4. Payments to processors – monetary transfers to agricultural commodities processors individually

I.1.5. Payments to traders – monetary transfers to agricultural traders individually

I.1.6. Payments to transporters – monetary transfers to agricultural commodities transporters individually

1.2. General sector support – public expenditures generating monetary transfers to the agro-food sector agents **collectively**

I. Agricultural research – public expenditures financing research activities improving agricultural production

J. Technical assistance – public expenditures financing technical assistance agricultural sector agents collectively

K. Training – public expenditures financing agricultural training

L. Extension/technology transfer – public expenditures financing provision of extension services

M. Inspection (veterinary/plant) – public expenditures payments financing control of quality and safety of food, agricultural inputs and the environment

N. Infrastructure (roads, non-farm irrigation infrastructure, other) – public expenditures financing off-farm collective infrastructure

O. Storage/public stockholding – public expenditures financing public storage of agro-food products

P. Marketing – public expenditures financing assistance in marketing of agro-food products

R. Other – other transfers to the agro-food agents collectively for which there is insufficient information to allocate them into above listed categories

II. Agriculture-supportive policies – public expenditures that are not specific to agriculture, but which have a strong influence on agricultural sector development

S. Rural education – public expenditures on education in rural areas

T. Rural health – public expenditures on health services in rural areas

U. Rural infrastructure (rural roads, rural water, rural energy and other) – public expenditures on rural infrastructure

V. Other – other public expenditures on rural areas benefiting agricultural sector development for which there is insufficient information to allocate them into above listed categories

For more details on MAFAP methodology on measurement of public expenditures in support of food and agriculture sector development, see www.fao.org/mafap.

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