



Food and Agriculture Organization
of the United Nations

Public expenditure on food and agriculture in sub-Saharan Africa

TRENDS, CHALLENGES
AND PRIORITIES



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Foreword

Never has there been a more critical time for governments to scrutinise and scale-up their expenditure on food and agriculture. Over the last year, efforts to achieve Zero Hunger by 2030 were derailed further owing to COVID-19, with many more millions of people likely to have gone hungry, on top of the 690 million that already suffered from undernourishment before the pandemic hit societies worldwide. In sub-Saharan Africa, the geographic focus of this report, over 250 million are undernourished and hunger affects one out of five persons – more than twice the global average.

As hunger rises in the region, so do the challenges facing agriculture and food systems. More broadly, the need for economic recovery post-pandemic also calls for governments to step up resources and productive investments to create an enabling environment so that private investors' aversion diminishes. Given the importance of agriculture for economic growth, employment, rural livelihoods, food production and so on in this region, the sector should be a natural recipient of such investments for faster recovery.

Climate change, water scarcity, land degradation, food loss and limited access to finance and technology are holding back the transformation of Africa's agriculture and food systems. So great are the challenges that the UN Secretary-General will convene a dedicated international summit this year to galvanize global action for healthier, more sustainable and equitable food systems.

Better food systems and an economic recovery from the COVID-19 pandemic in sub-Saharan Africa will mean governments looking closer at how and where they spend and invest in food and agriculture.

Almost twenty years on from the 2003 Maputo Declaration, which saw countries in the African Union commit to spend 10 percent of national budget to food and agriculture to drive socio-economic growth in the continent, many countries, including the 13 studied in this report, are struggling to do so.

This year we must seize the global attention on our agriculture and food systems to improve public expenditure monitoring systems and to pinpoint how and where funds should be best disbursed for food security, nutrition and agricultural production. We need to look at redirecting – and repurposing – investments that bring about agricultural transformation.

This report, *Public expenditure on food and agriculture in sub-Saharan Africa: trends, challenges and priorities*, provides us with over a decade's worth of data and analysis on government spending on food and agriculture in 13 sub-Saharan African countries. It not only deals with how much is being spent by governments in support of the food and agricultural sector, but just as importantly, what funds are spent on. By breaking down expenditure and looking closely at budget allocations we can reveal trends and challenges. In this way, the report tackles key questions, *inter alia*: What are the most common types of food and agricultural expenditures in the region? Which spending categories have seen an uptick in the last years? How does this differ according to the level of development of a country?

This report seeks to find the answers to those questions and to provide policymakers, development partners and donors with recommendations for the future of public spending on food and agriculture, a sector that employs over half of sub-Saharan Africa's active labour force. Now more than ever before, the COVID-19 pandemic is making it more critical to look closer at public expenditure to scale up investments on transforming agriculture and food systems for better production, better nutrition, a better environment and a better life.

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Acronyms

ASGTS	Agriculture Sector Growth and Transformation Strategy (Kenya)
ASTI	Agricultural Science and Technology Indicators
CAADP	Comprehensive Africa Agriculture Development Programme
COFOG	Classification of the Functions of Government
DAES	Directorate of Agricultural Extension Services
DEA	data envelopment analysis
FAO	Food and Agriculture Organization of the United Nations
FISP	Farm Input Subsidy Programme
FLE	forestry, land and environment
FSPE	food security public expenditures
GDP	gross domestic product
GEA	Government Expenditure on Agriculture database
IDS/CRS	International Development Statistics/Creditor Reporting System database
IFPRI	International Food Policy Research Institute
IMF	International Monetary Fund
ISPs	input subsidy programmes
MAAIF	Ministry of Agriculture, Animal Industry and Fisheries
MAFAP	Monitoring and Analysing of Food and Agricultural Policies (FAO)
NAADS	National Agricultural Advisory Services
NAIP	National Agricultural Investment Plan
NAIVS	National Agricultural Input Voucher Scheme
ODA	official development assistance
OECD	Organisation for Economic Co-operation and Development
OWC	Operation Wealth Creation
PSDSA	<i>Plan stratégique de développement du secteur rural</i> (Rural sector strategic development plan)
PSNP	Productive Safety Net Program

RESAKSS	Regional Strategic Analysis and Knowledge Support System
R&D	research and development
SDGs	Sustainable Development Goals
SPEED	Statistics of Public Expenditure for Economic Development
SSA	sub-Saharan Africa
UNECA	United Nations Economic Commission for Africa

Executive summary

In Africa, public expenditure is one of the main tools enabling governments to alleviate poverty, fight hunger, and accelerate the transformation of agriculture. Agriculture remains an essential sector of the economy, providing jobs and acting as an engine of growth. However, despite government pledges to invest more in agriculture, several areas of the sector remain underfunded, which holds back their development potential. This is especially true for sub-Saharan Africa.

In 2003, the Heads of State and Government of the African Union recognized that greater public spending was needed on agriculture across the continent. This prompted them to make a political commitment – the Maputo Declaration – under the Comprehensive Africa Agriculture Development Programme (CAADP), to allocate at least 10 percent of total public spending to agriculture.

While increasing expenditures to 10 percent would help to spur agricultural development, data presented in this report for sub-Saharan Africa indicate that many countries have not yet reached the objective pledged in Maputo. Nevertheless, understanding how public money is spent has much to reveal. For that reason, this report analyses public expenditure and aims to provide guidance on how it can be better used to boost agricultural transformation and in doing so, contribute to alleviating poverty and eradicating hunger in sub-Saharan Africa.

Produced by the Monitoring and Analysing of Food and Agriculture Policies Programme (MAFAP) of the Food and Agriculture Organization of the United Nations (FAO), this report takes stock of over a decade of data on food and agriculture expenditure in a subset of sub-Saharan Africa countries. Through rigorous classification of national budget data, we have been able to track public expenditure on food and agriculture in Benin, Burkina Faso, Burundi, Ethiopia, Ghana, Kenya, Malawi, Mali, Mozambique, Rwanda, Senegal, Uganda and the United Republic of Tanzania. This report identifies key trends in the amount and composition of public expenditure on food and agriculture from 2004 to 2018 and explores how spending is linked to agricultural performance.

Spending better, and when possible, more, is key

The report found that, in addition to Africa spending less per capita on agriculture relative to other regions in the world, very few of the countries analysed met the 10 percent Maputo target, despite a renewed commitment in 2014 through the Malabo Declaration. This suggests that investment levels remain suboptimal, a finding supported by our analysis of the links between agricultural gross domestic product (GDP) and intensity of public expenditures.

However, this does not necessarily imply a lack of political commitment. Fiscal constraints determined by limited revenue growth, substantial debt burdens and multiple sectors competing for scarce resources have made it difficult for governments to meet the target. This was true before the COVID-19 outbreak and is likely to become even more challenging now, as the current crisis is expected to reduce national revenues and, possibly, shrink donor aid to developing countries. Together, these factors, and in particular the fiscal constraints, call for a renewed emphasis on the composition of spending so as to enhance its effectiveness in meeting agriculture and development objectives.

A fifth of budgets goes unspent

The report found that, on average, 21 percent of budgets devoted to food and agriculture were not spent, suggesting that large financial commitments are not sufficient to enable a country to transform its agricultural sector. Implementation is equally important. This is particularly true for donor-funded expenditures, where the share of unspent funds is substantially higher (at around 40 percent). Together with the high reliance on donor expenditures, another driver of low budget execution rate in agriculture is the slow disbursement of funds in such a highly seasonal business, which requires certain investments at a very specific time of the year. The relatively low shares of salaries – easier to implement – in food and agricultural expenditure compared to other sectors, such as the health or education ones, is another factor affecting funds execution. This not only delays the implementation of potentially transformative projects but may also jeopardize future donor allocations to the agricultural sector. Moreover, large portions of allocated funds going unspent may be a reason why governments are reluctant to increase food and agricultural expenditure. It is therefore crucial to pursue improvements at the implementation level, increase coordination and capacity of civil servants to manage and operationalize agricultural projects, especially highly decentralized contexts, as well as rely more on budget support as a funding modality. At the same time, it is essential to ensure at the political level that there are sufficient allocations to the sector, despite the low(er) levels of execution.

Deciphering trends in composition: governments are changing how they allocate expenditure

A breakdown of expenditures for food and agriculture reveals that, in several countries, the largest share of public spending was allocated to subsidies for agricultural inputs (e.g. in Burkina Faso, Burundi, Malawi, Mali and Senegal). However, in some countries, following recent reforms, large input subsidy programmes have been downsized, increasing the fiscal space to allocate more funds to other types of expenditure.

Our analysis also found that countries have spent an increasing share of their budgets on social protection, such as cash transfer and school feeding programmes. In some cases, larger expenditures on input subsidies and cash transfers come at the expense of certain public goods, such as extension services and research and development (R&D). Since such public goods have relatively high returns in terms of productivity and poverty reduction, they generate more sustainable and broad-based impacts (Mogues *et al.*, 2012). However, as our report shows, they remain significantly underfunded.

In contrast, spending on infrastructure and irrigation has risen across sub-Saharan Africa. Similarly, there has been an upward trend in expenditures earmarked for forestry, land management and environmental protection. This is owing to several national and international commitments, including the call for an environmentally sustainable ‘Green Revolution’ in Africa.

In countries with a decentralized administrative structure, such as Ethiopia, Ghana, Kenya, Mozambique and Uganda, generally tend to spend less on food and agriculture than countries where public expenditure is concentrated at the central level of government. However, these few resources seem to be disbursed in higher poverty areas, where potentially they have wider-ranging benefits for rural development.

Agricultural performance and efficiency of expenditure

Our analysis reveals that higher spending per capita is associated with better agricultural outcomes (proxied by technical efficiency). Beyond a certain level of spending, however, this relationship becomes weaker, with a possible ‘saturation’ point. The majority of African countries are well below this point, indicating underfunding in the agricultural sector.

Countries that allocate larger shares to input subsidies fare worse in terms of agricultural outcomes than those spending more on consumer transfers (i.e. cash transfers and food aid programmes), R&D and extension services. The negative effect of overinvesting in private goods, such as input subsidies, seems to be particularly harmful for countries at more advanced stages of agricultural transformation.

Governments will need to spend resources more wisely post-COVID-19

Sub-Saharan Africa could face its worst recession in decades. Already overstretched agricultural budgets will no doubt suffer. In the final part of this report, we look at how governments have responded to COVID-19 thus far and the implications of the crisis in the medium to long term. Whether or not food and agricultural expenditures will be shifted to other sectors, such as healthcare, remains to be seen. Nevertheless, there will be limited room for manoeuvre in fiscal terms as a result of potential debt increases and decrease in revenues.

What is clear is that the COVID-19 crisis risks pulling the 13 sub-Saharan African countries studied a step back from the progress they have made in recent years in transforming their agriculture. With the Sustainable Development Goals ahead, it is more critical than ever that governments and policymakers look carefully at their public expenditures and spend more wisely in the future, considering at the same that agriculture can still be one of the engines for economic recovery in the region. Effective spending should seek to prioritize productivity gains, more resilient food systems and socio-economic benefits. It is our hope that countries will find useful guidance in the data and analysis contained in this report to do so.

The way forward: tracking public expenditure for better spending on agriculture and food systems transformation

One major factor preventing better evidence-based policy support to governments is the limited coverage of highly detailed public expenditure data. It is imperative to understand how expenditures (and which expenditures) impact agriculture and food systems, including agricultural, nutritional, environmental, and poverty outcomes.

However, data constraints remain the main factor preventing policymakers from having access to reliable estimates of return per dollar spent and full understanding of how different types of expenditure affect different outcomes. Models and tools that are currently used to advise policymakers are data-demanding and require not only estimates of total government spending on agriculture, but also a detailed breakdown of these expenditures. However, the quality of these data is often uneven, both in coverage, quality and detail, assuming the data exist. This is a factor hindering the quality of evidence-based policy support, which could potentially have far-reaching impacts in terms of improving fiscal policies in agriculture. To address this data gap, a sustained widespread effort to monitor the levels, composition and impact of public spending is needed. This necessity is even more pressing in Africa, where the data gaps are sizeable, and every effort should be made to make data collection and analysis a priority within a country's public sector.



1 Introduction

In most developing countries, agriculture is the backbone of society, providing food for people, jobs for workers and trade for economies at local, national and international levels.

Yet, as we get closer to the Sustainable Development Goals (SDGs), the opportunities for agriculture to be at the forefront of alleviating hunger, ending poverty and helping ensure sustainable development could be derailed.

Before the COVID-19 pandemic and its social and economic aftermath unfolded, hunger levels were slowly on the rise and this was particularly true in the context of sub-Saharan Africa (SSA) (FAO *et al.*, 2020). In 2019, an estimated 690 million people suffered from undernourishment, 235 million of which were in sub-Saharan Africa (FAO *et al.*, 2020). This implies that substantial additional resources will be required to be able to achieve Zero Hunger and that these will need to be invested wisely.

One way to achieve Zero Hunger is by investing more in the agriculture sector. This is emphasized in the SDGs – specifically Target 2.a of SDG 2 – which calls for greater investment and regional commitments to enhance agricultural productivity by 2030.

There has been a longstanding need to invest more. Almost 20 years ago, in 2003, the Heads of State and Government of the African Union – a continent-wide body of 55 member states – pledged to commit at least 10 percent of their public expenditure to agriculture as part of the Comprehensive Africa Agriculture Development Programme (CAADP). This has, for the most part, not been met yet, despite renewed assurances in 2014.

The CAADP also supports national agricultural investment plans as a means to close investment gaps, prioritize spending and attract further private sector investments in agriculture, which provides jobs for more than half of the total workforce.

But while more food and agricultural investment is needed, particularly in sub-Saharan Africa, it will be critical to spend often-scarce public resources for food and agriculture wisely. The current crisis, as a result of COVID-19, calls for efforts to do so. Given the unprecedented circumstances of the current pandemic, the international community must come together to support necessary economic recovery packages in countries with insufficient resources. In turn, this creates an added responsibility for beneficiary countries to exert fiscal responsibility and reallocate resources in the best way possible to tackle the COVID-19 pandemic and enable a post-pandemic recovery (FAO, 2020).

SDG 2 – Target 2.a

Increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development and plant and livestock gene banks in order to enhance agricultural productive capacity in developing countries, in particular least developed countries.

Monitor, analyse and adjust

With that scenario, and sub-Saharan Africa set to experience its deepest recession in 25 years (World Bank, 2020b), public purse strings will be no doubt tightened, prompting governments and policymakers to allocate resources extremely carefully to ensure the best possible returns. Policy monitoring and analysis can play a vital role in informing decision-making to accelerate Africa's agricultural transformation, particularly in times where an economic recovery is urgently needed.

At the Food and Agriculture Organization of the United Nations (FAO), the Monitoring and Analysing Food and Agricultural Policies (MAFAP) programme compiles and tracks trends in public expenditure on food and agriculture across the SSA region. Expenditure monitoring and analysis – carried out in this report – can play a vital role in informing policymaking and advising governments on expenditure and on reforming agricultural policies for agricultural transformation and food security.

Scope of the report

The MAFAP team of economists and policy analysts has tracked and analysed the level and composition of public expenditure in 13 countries in SSA – the only such initiative in the region – covering Benin, Burkina Faso, Burundi, Ethiopia, Ghana, Kenya, Malawi, Mali, Mozambique, Rwanda, Senegal, Uganda and the United Republic of Tanzania for the last 14 years (2004–2018). The countries analysed in this report are very diverse. Nevertheless, despite differences in economic development and the size of their budgets, in most of them, agriculture remains the main source of employment and a critical sector in terms of economic development (see map in Figure 1). Consequently, the amount of public budget and the way it is allocated can have far-reaching implications for people's livelihoods and economic growth.

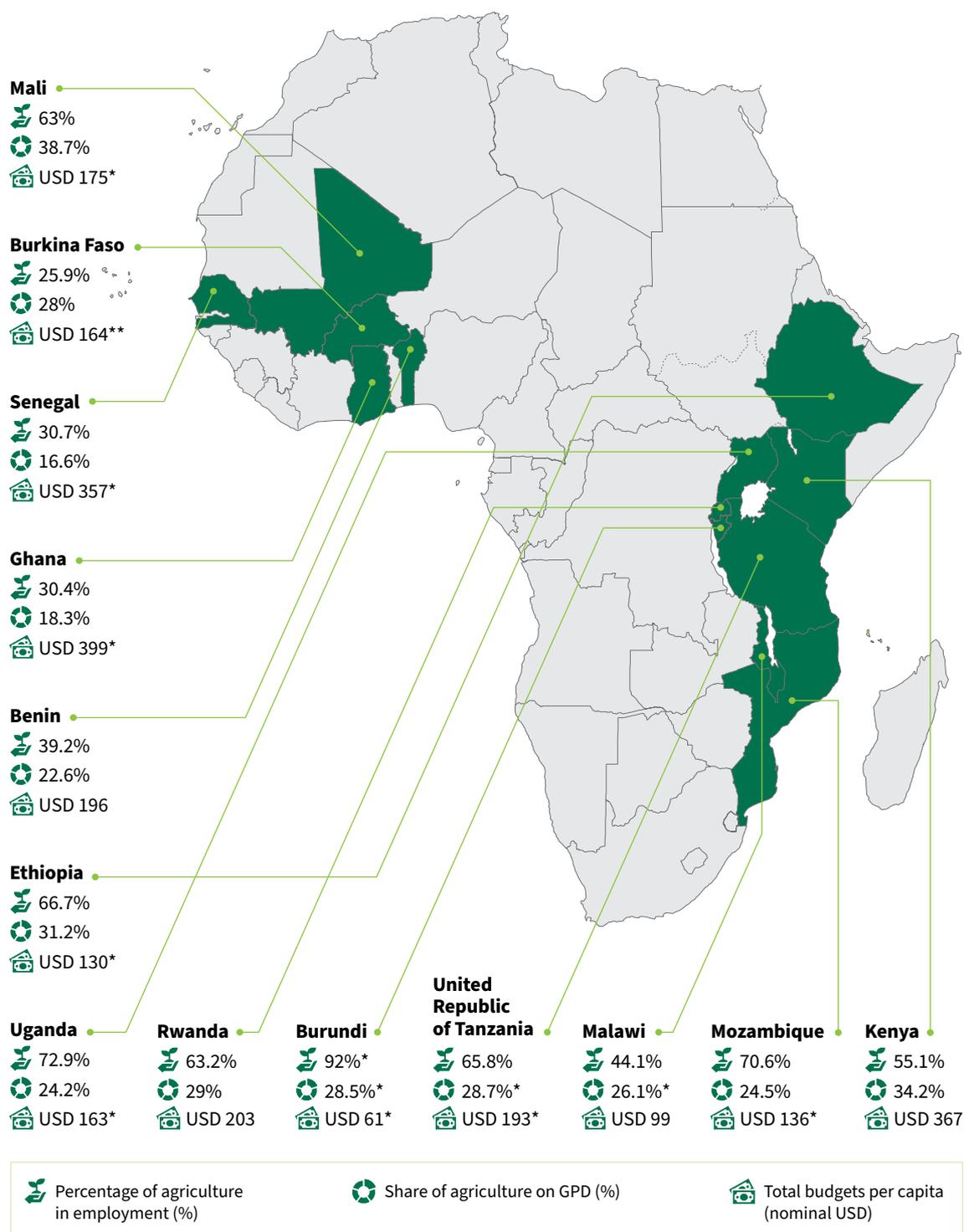
This report is structured in four main parts:

- **Chapter 2** presents the methodology and approach for monitoring and analysing public expenditure on food and agriculture.
- **Chapter 3** reviews the level of public expenditure on food and agriculture in sub-Saharan Africa, the source of financing and budget execution. The chapter concludes with an analysis of decentralized spending and the motives behind subnational spending.
- **Chapter 4** breaks down the composition of expenditure – how spending is allocated – on input subsidies, research and development (R&D), extension services, irrigation and environmental protection, among others.
- **Chapter 5** analyses the effectiveness of public expenditure on food and agriculture in relation to agricultural performance in the 13 countries in our study.

The report presents several **country case studies**, which feature MAFAP analyses and recommendations for donor funding, budget allocations, national agricultural investment plans, among others.

This report also includes a dedicated **box on the impacts of the COVID-19 pandemic on food and agriculture**. It outlines how countries have responded to the coronavirus and lists a series of counter measures to mitigate the effects on agriculture and the potential knock-on effects on agricultural budgets.

Ultimately, the analyses presented in this report aim to provide the means to the reader to examine public spending in close detail, while pinpointing priorities, needs and the benefits of corrective action to drive agricultural transformation, achieve Zero Hunger and boost socio-economic prosperity in sub-Saharan Africa.

FIGURE 1 KEY STATISTICS ON MAFAP PROGRAMME COUNTRIES, 2018

Notes: * data for 2017; ** data for 2016. Final boundary between the Republic of Sudan and the Republic of South Sudan has not yet been determined. Final status of the Abyei area is not yet determined.

Source: Authors' own elaboration with data from World Development Indicators and MAFAP public expenditure database (accessed in June 2020). Conforms to Map No. 4170 Rev. 19 UNITED NATIONS (October 2020).



2 Methodological approach

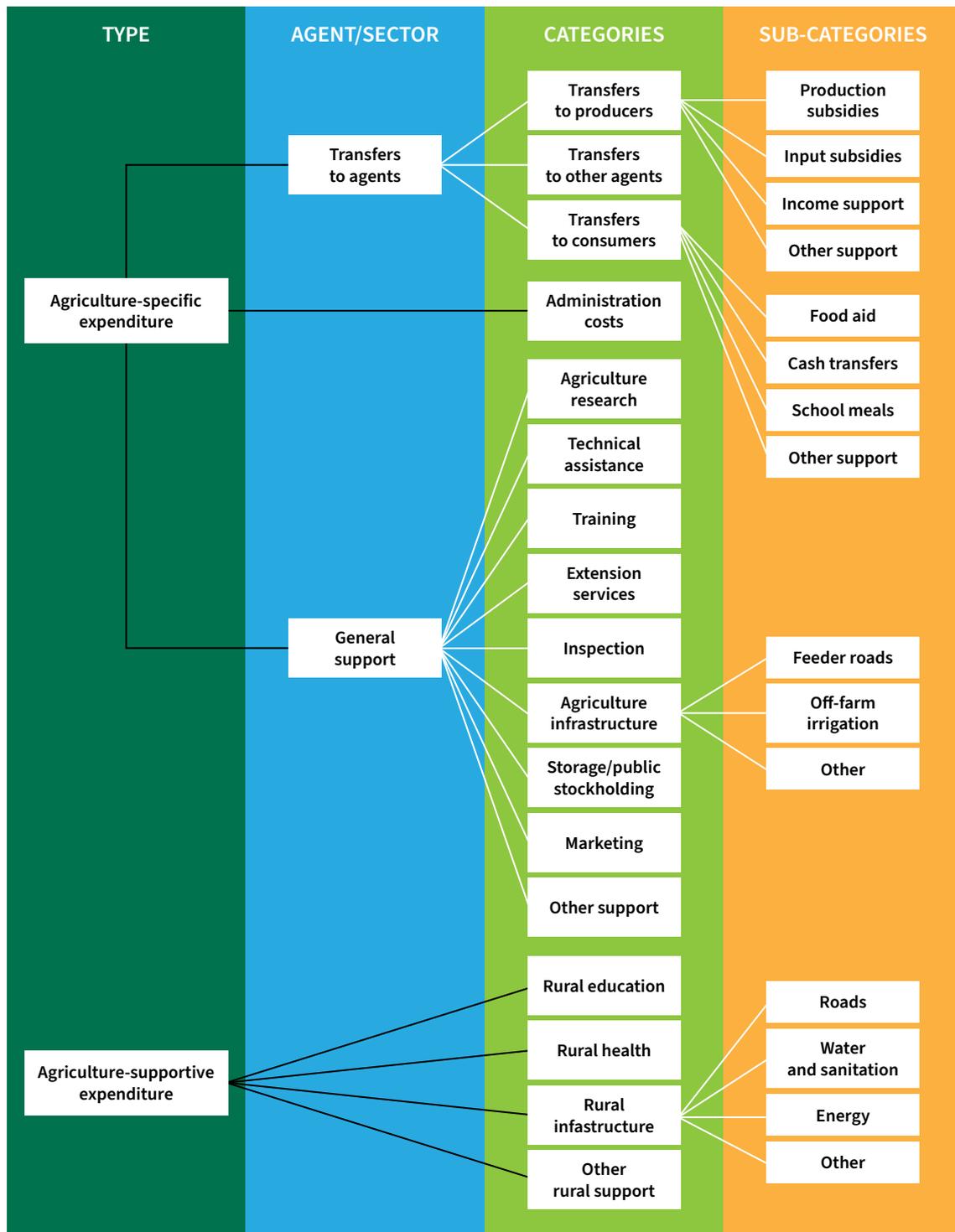
- The MAFAP methodology tracks country's public expenditures specific for the food and agriculture sector, and also those allocated to broader rural development.
- Food and agricultural-specific expenditures are grouped into (i) private transfers to agents such as producers, consumers, traders, transporters and input suppliers; (ii) general support for agricultural infrastructure, R&D and extension services, marketing, storage or inspection facilities, among others, and (iii) administrative costs.
- The MAFAP approach to public expenditure monitoring is well standardized and goes full circle. Starting from intensive data collection, classification and compilation, moving to capacity development and engagement with country partners, then finally to dissemination and uptake of results to shape better policies.
- The data generated by this unique approach are not only key to measuring the level and composition of government spending on food and agriculture, but also useful to simulate the impact of different investment options, to assess how efficient different types of expenditure are, as well as to develop targeted expenditure, such as for food security and nutrition.

Since 2009, the MAFAP programme has closely monitored and analysed national public expenditures on food and agriculture in 13 African countries. The expenditures include:

- **Agriculture-specific expenditures** (see Figure 2), directly benefitting the agricultural sector and divided into:
 - **Payments (or transfers) to agents** in the agricultural sector, including producers, consumers, traders, transporters and input suppliers. Most expenditures in this category are transfers to producers and consumers, with transfers to other agents representing a very small share.
 - **General support expenditures** benefit the sector, rather than a specific agent, for example through agricultural infrastructure, extension services, research or marketing.
 - **Administrative costs** linked to policy formulation and coordination and running costs of ministries and other public entities.
- **Agriculture-supportive expenditures** (see Figure 2) do not directly relate to agriculture but support rural development more broadly. As such, they could indirectly affect agricultural performance (e.g. rural roads). These expenditures are not considered in the report as they do not directly target the food and agriculture sector and are less comparable across countries.

This categorization and breakdown of expenditure type allows us to study and interpret the data in more detail. Some key definitions of expenditures and concepts used throughout the report are summarized in Box 1 while Table A1 in Annex 1 provides a glossary of MAFAP public expenditure categories.

FIGURE 2 HOW MAFAP CLASSIFIES PUBLIC EXPENDITURE



Source: Authors' own elaboration based on MAFAP, 2015.

BOX 1 FIVE KEY DEFINITIONS AND CONCEPTS USED IN THE REPORT

Expenditure on food and agriculture: includes all transfers to agents, as well as all general support expenditures that target the sector as a whole, including administrative costs (see Figure 2). This is the definition used in the report, unless otherwise stated.

Expenditure on food and agriculture – narrow definition: excludes transfers or payments to consumers (e.g. cash transfers and food aid). It is used in the report to address country performance in achieving the 10 percent target in the ‘Malabo Declaration’. Other approaches to classifying public expenditure tend to use this definition (e.g. the augmented classification of the functions of government, known as Classification of the Functions of Government [COFOG+] used by the African Union, and the World Bank Agriculture Public Reviews).

Private goods: include transfers to producers, consumers and other agents. These are considered private goods because they target specific components of the agricultural sector, rather than the sector in general.

Public goods: include general support to the food and agricultural sector (see Figure 2) that benefit groups of individuals, rather than specific agents (producers, consumers, others).

Research and development (R&D) and extension: covers four spending categories: research, training, extension and technical assistance. These categories are combined because: i) MAFAP labels expenditure that may be considered research by other public expenditure monitoring initiatives (e.g. Agricultural Science and Technology Indicators initiative [ASTI] of the International Food Policy Research Institute [IFPRI]) under categories other than research (e.g. agronomy faculty in a university classified under training in the MAFAP methodology) and ii) research and extension are often considered to be complementary and, as such, MAFAP takes the view that it makes most sense to report these categories together.

2.1 How the MAFAP approach is carried out

The MAFAP approach on public expenditure monitoring and analysis is standardized and includes a set of predefined steps represented in Figure 3.

Data collection and cooperation

A key feature of MAFAP methodology is that it provides a detailed mapping of the levels and composition of public expenditure for food and agriculture. Aware that the methodology is only as good as the quality of the underlying data and thus in order to provide a detailed classification, access to detailed data on both budgeted and actual expenditures was sought from ministries. The MAFAP programme places importance not only on obtaining high-quality data but to creating processes that ensure it is feasible and sustainable to collect similar data on a regular basis. This process differs across countries. In some countries, data is sourced directly from ministries of finance, whereas in others it is obtained through agreements with the ministries of agriculture.

Data classification and compilation

The MAFAP methodology places a strong emphasis on analysing spending composition, as this is critical to provide information on the quality of expenditures. This requires meticulously classifying individual projects and processing large volumes of data.

To address this challenge, MAFAP developed over the years a number of tools, including text- and code-based classification mechanisms, to assist policy analysts and country partners in categorizing large volumes of data. Annex 2 presents additional information on the specificities of the data classification process, as well as details on data coverage, limitations and main assumptions.

Engaging with country partners

Close collaboration with country partners is key to this approach as they are instrumental in making data available and possess country-specific knowledge essential to accurately classify expenditures. This knowledge, the liaison between MAFAP and partner countries and MAFAP technical expertise, are the key ingredients to a successful analysis of public expenditures.

The MAFAP programme also recognizes the importance of local expertise and developing local capacity. Ultimately, local policymakers, technical experts and domestic stakeholders are key actors responsible for shaping food and agricultural policies in-country. For example, since 2012, the MAFAP programme has been working together with the Ministry of Agriculture and Rural Development in Mozambique on developing capacities, mapping and analysing public expenditures. Similarly, in Burkina Faso, a team at the Ministry of Agriculture, trained by MAFAP, now undertakes the monitoring and update of public expenditure on a regular basis.

Results dissemination and further uses of our data

The database that comes from the exhaustive classification process contains a detailed disaggregation of agricultural public expenditures, enabling users of MAFAP data to carry out in-depth analyses, which are usually undertaken jointly with country partners and results are generally validated in-country through workshops and/or presentations.

The usefulness of the MAFAP methodology is not limited to the analysis of levels and composition of expenditure. Over the years, databases classified using the MAFAP methodology have been increasingly used as essential inputs in further analyses, including:

1. Simulating the impacts of different investment scenarios. Based on a number of expenditure scenarios, these simulations inform policymakers about the best allocation of expenditures to reach a particular set of desired agriculture and social outcomes. This type of work has been carried out in a number of countries, including Burkina Faso, Ghana and Kenya. More details will be presented later in the report, such as in Box 14.
2. Classifying expenditures from a different perspective. In some countries, in addition to agriculture and food, there is an increased focus on the role of nutrition. For these cases, MAFAP has developed a food security and nutrition methodology which is broader and covers the various dimensions of food security. This type of analysis has been recently done in Senegal to inform the planning of the food security budget, as detailed in Box 2.
3. Supporting the monitoring of investment plans. As part of the CAADP process, many sub-Saharan African countries have developed National Agricultural Investment Plans (NAIP) and the MAFAP methodology and approach has been used to support this process in some countries (see Box 12 and Box 13, as examples).

Expenditure and efficiency

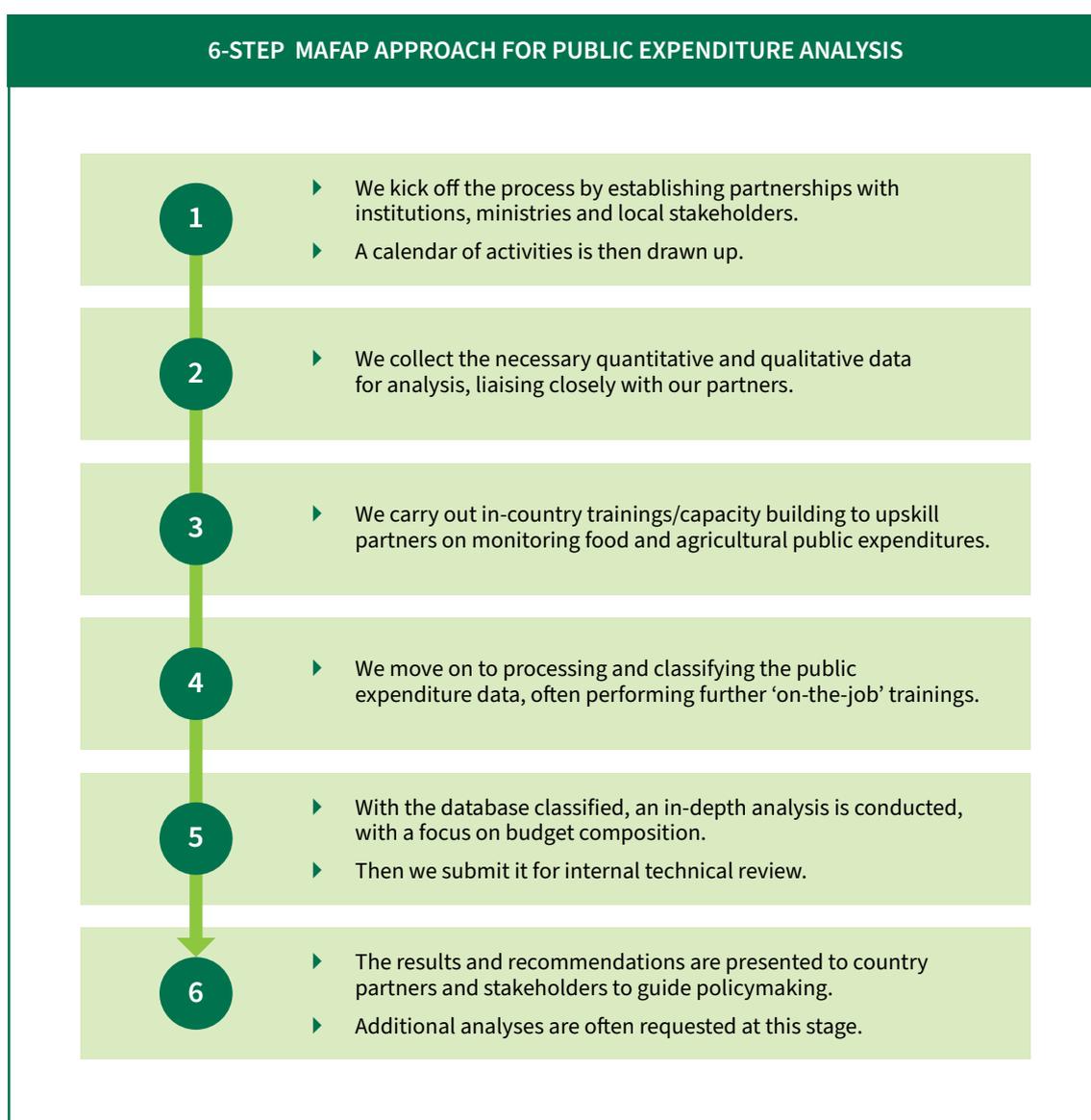
Additionally, this wealth of disaggregated information enables the analysis of how expenditure composition is linked to efficiency. In Chapter 3, we explore how public expenditures on agriculture influence the performance of the sector. This analysis first requires combining both MAFAP and the Regional Strategic Analysis and Knowledge Support System (RESAKSS) data to compute agricultural performance efficiency scores for all available countries. In a further

step, we assess whether there is a strong relation between expenditure categories and how well countries perform in terms of agricultural GDP.

While this approach does not determine a causal relation between expenditure and outcomes (i.e. we cannot claim that a given expenditure category directly influences better agricultural performance), it does highlight the spending categories that are associated with higher agricultural GDP. This shows that not all expenditures are equal and that spending better is crucial to the development of the agriculture sector.

While the implementation of the public expenditure monitoring and analysis of the MAFAP programme depends on country specificities, the typical approach is a 6-step collaborative process, outlined in Figure 3.

FIGURE 3 IN A NUTSHELL: THE MAFAP APPROACH FOR MONITORING AND ANALYSING PUBLIC EXPENDITURE



Source: Authors' own elaboration.

2.2 How does the MAFAP approach compare to other analyses?

In recent years, a number of initiatives have sought to measure and/or analyse public expenditures on agriculture. These initiatives can be broadly divided into two groups, based on their focus and objectives. Figure 4 provides a visual comparison between the different approaches to analysing public expenditure on food and agriculture and highlights the dimensions that are emphasized under the different approaches. Each approach is reviewed against four dimensions or criteria, namely (i) level of data disaggregation, (ii) depth of analysis; (iii) suitability to track CAADP commitment; and (iv) focus on raising capacities on monitoring and analysing public expenditure.

The first group of methods generally aims to obtain data from a large number of countries, relying on national reporting systems. The studies either focus on agricultural spending as a whole (GEA, SPEED, RESAKSS) or on a specific aspect of agricultural spending, such as donor spending (IDS/CRS), agriculture R&D spending (ASTI) or monitoring the CAADP commitment (RESAKSS).¹ This format is well-suited for comparing public expenditures by country, but generally disregards how the money is spent (for the purposes of the report we will refer to this as expenditure or spending composition) and lacks the level of detail for closer analysis at the country-level.

Other approaches, most notably those taken by the World Bank Agriculture Public Expenditure Reviews, have a strong focus on assessing how well expenditure is spent and analysing policy options in certain areas of agriculture. Generally, these studies are less concerned with making comparisons between countries, are not carried out on a regular basis and the depth of analysis is not always comparable across countries. This means the 'big picture' on trends, priorities and needs is difficult to obtain.

The MAFAP approach, however, focuses on a narrow set of countries – 13 in sub-Saharan Africa – to examine comparable public expenditure indicators and conduct deep data analyses. Importantly, MAFAP carries out this work regularly (most often on an annual basis) and helps countries to strengthen their monitoring systems.

¹ RESAKSS is the Regional Strategic Analysis and Knowledge Support System, facilitated by IFPRI; SPEED is the Statistics of Public Expenditure for Economic Development, a database maintained by IFPRI, and ASTI is the Agricultural Science and Technology Indicators initiative, also led by IFPRI. IDS/CRS stands for International Development Statistics/Creditor Reporting System database, which is maintained by the Organization for Economic Cooperation and Development, while GEA is the Government Expenditure on Agriculture database managed by FAO.

FIGURE 4 COMPARISON OF DIFFERENT PUBLIC EXPENDITURE MONITORING APPROACHES

Notes: Each public expenditure monitoring approach was assessed against the four identified criteria with a score from 0 to 5, where 0 means no orientation/focus towards the specific criterion, while 5 means the maximum degree of orientation/focus of the approach towards the specific criterion. RESAKSS: Regional Strategic Analysis and Knowledge Support System; SPEED: Statistics of Public Expenditure for Economic Development; ASTI: Agricultural Science and Technology Indicators; IDS/CRS: International Development Statistics/Creditor Reporting System; GEA: Government Expenditure on Agriculture.

Source: FAO, 2015.

BOX 2 PLANNING AND COORDINATING EXPENDITURES ON FOOD SECURITY IN SENEGAL

In 2020, 17 percent of the Senegalese population are considered to be acutely food insecure (FSIN, 2020). Despite this, the government does not plan or monitor food security public expenditures (FSPE) in a comprehensive fashion. Because FSPE are multisectoral, Senegal's Ministry of Finance, other ministries and donors have trouble budgeting them in a predictable, transparent and accountable manner. This affects the quality of budget management, increasing the risks of overlapping projects and programmes and underfunding specific food security dimensions. Ultimately, a lack of coordination reduces the effectiveness of the budget response to food insecurity, as well as its credibility and transparency when mobilizing resources from donors.

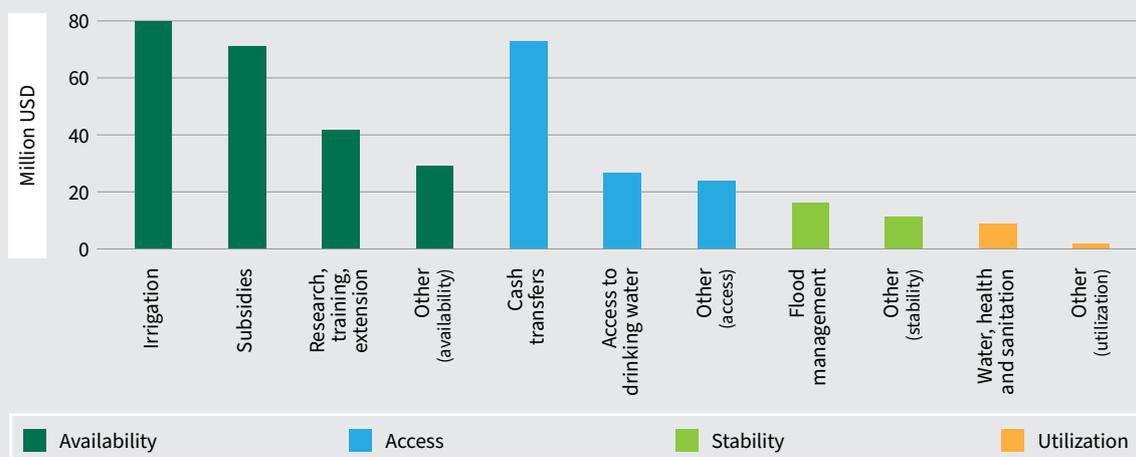
MAFAP and food security spending in Senegal

To tackle this challenge, the Ministry of Finance and the MAFAP programme worked together, in collaboration with all relevant ministries, to develop a methodology and budget process that would help identify, plan and monitor FSPE. A budget planning document – the Medium-Term Framework for FSPE – was designed and integrated with the standard budget cycle. This helps the government to identify the planned expenditures that contribute to food security in all its dimensions and to compile them in a three-year scheme. This tracks dimensions of food security, beneficiaries, function of investment, as well as the ministries involved. The MAFAP programme was heavily involved in steering the process to deliver an annual plan, of which there have been three to date.

In 2020, it was estimated that the Senegalese Government was spending USD 349 million on food security-specific actions. Sixty-four percent of these funds were aimed at making food available to people, mainly through subsidies and irrigation projects under the Ministry of Agriculture. The remaining thirty-six percent was spent on accessibility measures, especially the *Bourses de Sécurité Familiales* cash transfers for vulnerable households.

The government also spent USD 36 million on food security supportive measures, spread between food stability (64 percent) and utilization (36 percent) dimensions. The bulk of these expenditures fell under the Ministry of Water and Sanitation and supported actions to prevent flooding around production areas as well as to guarantee safe drinking water (see Figure 5).

FIGURE 5 KEY FUNCTIONS OF SPENDING ON FOOD SECURITY IN SENEGAL BY DIMENSION, 2020



Source: Programmation Triennale de Sécurité Alimentaire (DPTSA) 2020–2022.

3 Level of public expenditure on food and agriculture in sub-Saharan Africa

- Eight out of 13 countries analysed in the report have experienced double-digit growth in their food and agricultural budgets during the study (2004–2018).
- Despite this, on average, the sub-Saharan African countries studied in this report spent around 6 percent of national budgets on food and agriculture, with Malawi being the only country that consistently met the 10 percent CAADP threshold/Maputo Declaration.
- About 20 percent of food and agricultural budgets were left unspent, often due to either funds being disbursed too slowly or complications in project implementation.
- Donor funding accounts for over one-third of total spending on food and agriculture.
- In countries with a more decentralised governance structure, expenditure on agriculture tends to be lower. However, it appears that more agriculture spending per capita is allocated where poverty rates are higher.

The importance of investing in the food and agricultural sectors as an engine for growth, employment creation and poverty reduction is widely acknowledged in economic literature (Ligon and Sadoulet, 2018; Dorosh and Thurlow, 2018; Moguees *et al.*, 2012). Country-specific studies, for Ethiopia and Ghana for example, have also emphasized how the provision of public goods and services in agriculture have substantial impacts on agricultural productivity as well as on rural welfare (Benin *et al.*, 2009; Moguees, 2011).

Investing in the food and agricultural sector is important for two key reasons. First, evidence has shown that public expenditure in agriculture is particularly effective at reducing poverty (Ligon and Sadoulet, 2018; Dorosh and Thurlow, 2018; Moguees *et al.*, 2012). Second, expenditure on agriculture is fundamental to addressing market failures, such as a lack of infrastructure and R&D, which are major limitations to the sector's growth (Moguees *et al.*, 2012).

In countries with limited resources where agriculture is critical to the economy, it is important to have sufficient resources allocated to the sector. In African countries, including those analysed for this study, increasing the volume of public spending on agriculture is an important way to boost productivity and reduce poverty.

Indeed, evidence on successful agricultural transformations in twelve Asian economies found that during their periods of high agricultural growth (i.e. the so-called “Green Revolution”) they devoted around 10 percent of total public spending to agriculture (Goyal and Nash, 2017).

Ten percent benchmark

In an attempt to increase funding for agriculture, African leaders and heads of state signed the Maputo Declaration on Agriculture and Food Security in 2003, in which they pledged to allocate 10 percent of their budgets to agriculture. A recommitment to this spending threshold was made in 2014 in the Malabo Declaration.

This chapter will review expenditure amounts and trends, mainly in relation to the CAADP commitments, with an analysis of budget execution and sources of financing. The chapter will also look at expenditure in administrative terms (i.e. spending by subnational or decentralized government units) and investigate trends and geographic composition.

3.1 Trends in expenditure on food and agriculture

Over the 2004–2018 period, total government spending on food and agriculture in the analysed sub-Saharan African countries has averaged around 6 percent, below the 10 percent Maputo target.

In the countries analysed, public expenditure on food and agriculture increased quickly (by approximately 13 percent on average) during 2004–2018, with eight out of the thirteen countries under study experiencing double-digit growth in their food and agricultural budgets (see Figure 6).²

However, when considering inflation, currency depreciation and demographic factors, this growth was much more modest, at approximately 5 percent on average. In Ghana and the United Republic of Tanzania, expenditures on agriculture (in real terms) even experienced negative growth (see Figure 6). With rapid population growth and national economies experiencing high inflation and rapid currency depreciation (which makes imported inputs, like fertilizers, more expensive), more resources are needed to achieve a sustained growth in real expenditure on food and agriculture per capita.

Most countries spent less than 10 percent on agriculture

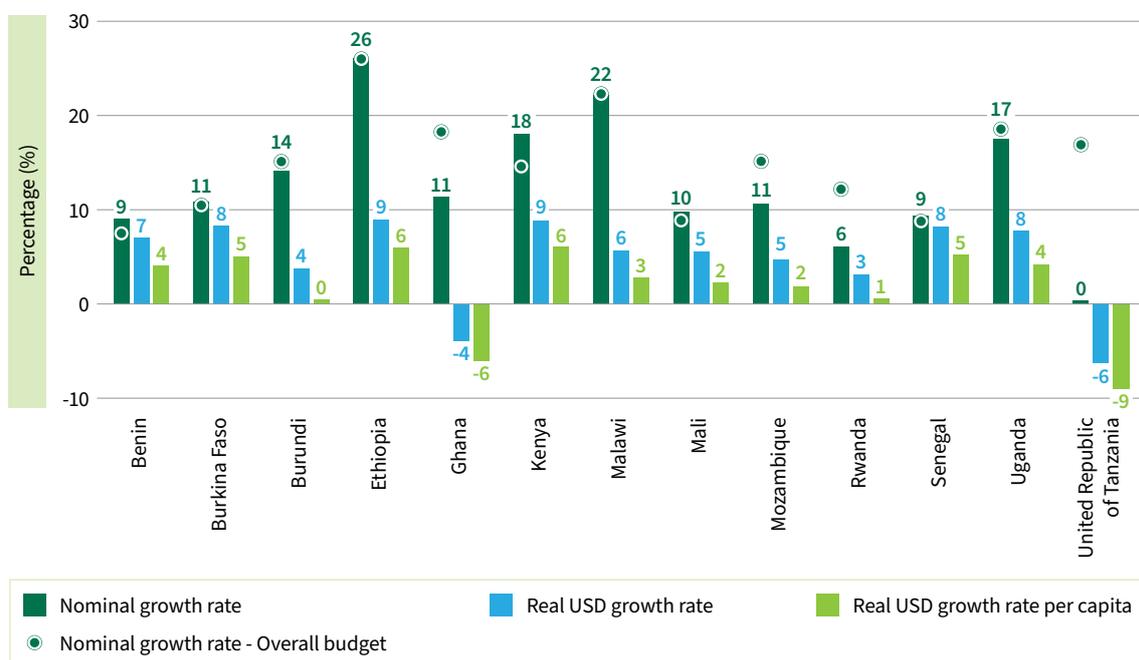
Despite increases in nominal budgets, the average share of actual expenditure allocated to food and agriculture during the period under study was less than 10 percent (the CAADP target) for the vast majority of countries (see Figure 7).³ In the study period, only Malawi, in every year, and Mali, in some years, achieved the Maputo Declaration in the 2004–2018 period.⁴ These results are consistent with the finding that allocations have not significantly increased as a result of signing the CAADP agreement (Benin, 2016).⁵

² These countries are Burkina Faso, Burundi, Ethiopia, Ghana, Kenya, Malawi, Mozambique and Uganda.

³ Here, expenditure on food and agriculture is considered in its ‘narrow’ definition. As explained in the methodology section, the closest MAFAP aggregate to the CAADP definition of expenditure corresponds to the agricultural-specific expenditure, but it excludes transfers/payments to consumers (e.g. cash transfers and food aid).

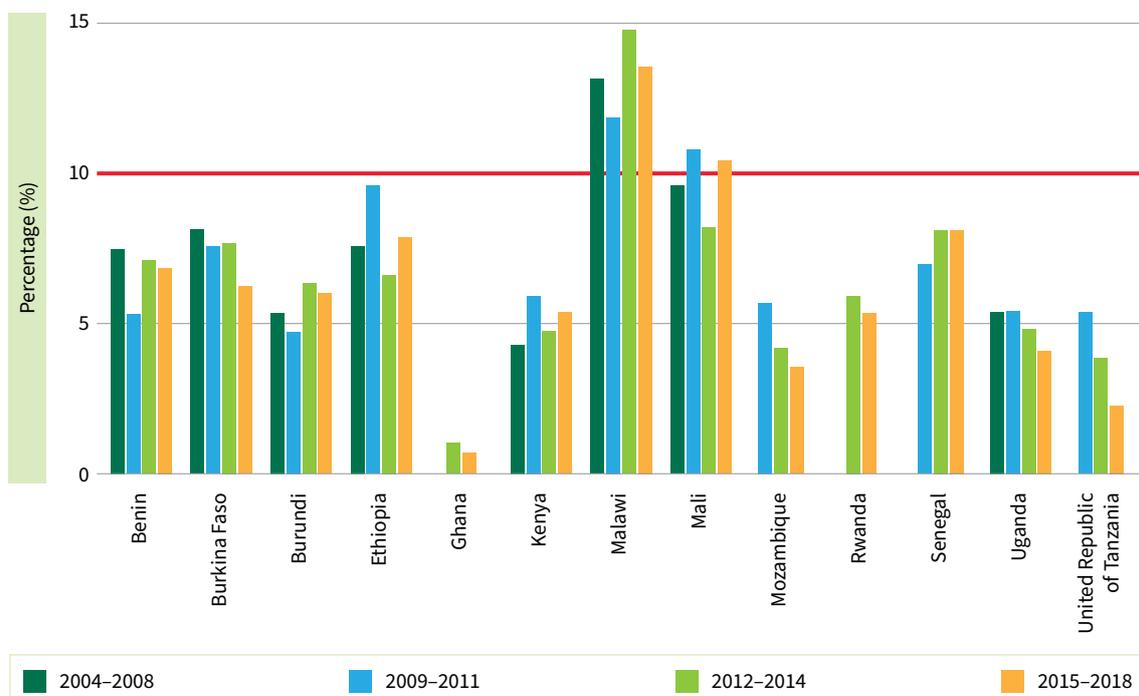
⁴ In the case of Ethiopia, it is important to note that the large safety net programme (so-called “Productive Safety Net Programme”, PSNP) is excluded from the narrow definition. In the case of Rwanda, as explained in Table A3 in Annex 2, the coverage is partial, which means that the amounts are likely to be an underestimate.

⁵ It should be noted that MAFAP data capture only on-budget expenditures and, as suggested by Benin (2016), in some countries off-budget financing in the agricultural sector may have increased during the period, suggesting that there may have been substitution effects between the government’s own funding and external sources of funding for the sector. On-budget expenditures refer to the financial transactions that are accounted for in the budget. In most countries, rather than being a statement of all public expenditures, certain governmental activities and expenditures are excluded from the national budget and these are called “off-budget” expenditures (Schick, 2007). While “off-budget” expenditures are very country-specific, these normally consist of off-budget funds (normally health or social security), public-private partnerships, as well as certain donor expenditures (Kraan, 2004).

FIGURE 6 GROWTH RATE OF EXPENDITURE ON FOOD AND AGRICULTURE BY COUNTRY, AVERAGE FROM 2004–2018

Note: For assumptions on these indicators, see Table A3 in Annex 2.

Source: Authors' calculations based on MAFAP database (2020 version).

FIGURE 7 SHARE OF ACTUAL PUBLIC EXPENDITURE ON FOOD AND AGRICULTURE (NARROW DEFINITION) OVER TOTAL BUDGET

Note: For assumptions on these indicators and differences with RESAKSS aggregates, see Table A3 in Annex 2.

Source: Authors' calculations based on MAFAP database (2020 version).

Underspending in the agricultural sector is not a new or recent trend in sub-Saharan Africa (Fan and Breisinger, 2011). Between 1980 and 2010, food and agricultural expenditure per capita in sub-Saharan Africa was below that of other regions and, overall followed a declining trend (Figure 8). In addition, the share of expenditures allocated to agriculture in SSA has generally been lower than in Asia and has declined over time (see Figure 9).

There are at least three reasons for this negative trend.

One was the implementation of structural adjustment programmes (SAPs), in the 1980s and 1990s. These were designed to promote the privatization of state-owned enterprises, phase out government support in agriculture and increase market efficiency (Yu *et al.*, 2015). The agricultural sector was especially hard-hit by these programmes, which led to significant cuts in input subsidies and other forms of government support to farmers. It also contributed to a continuing decline in food and agricultural public expenditures.

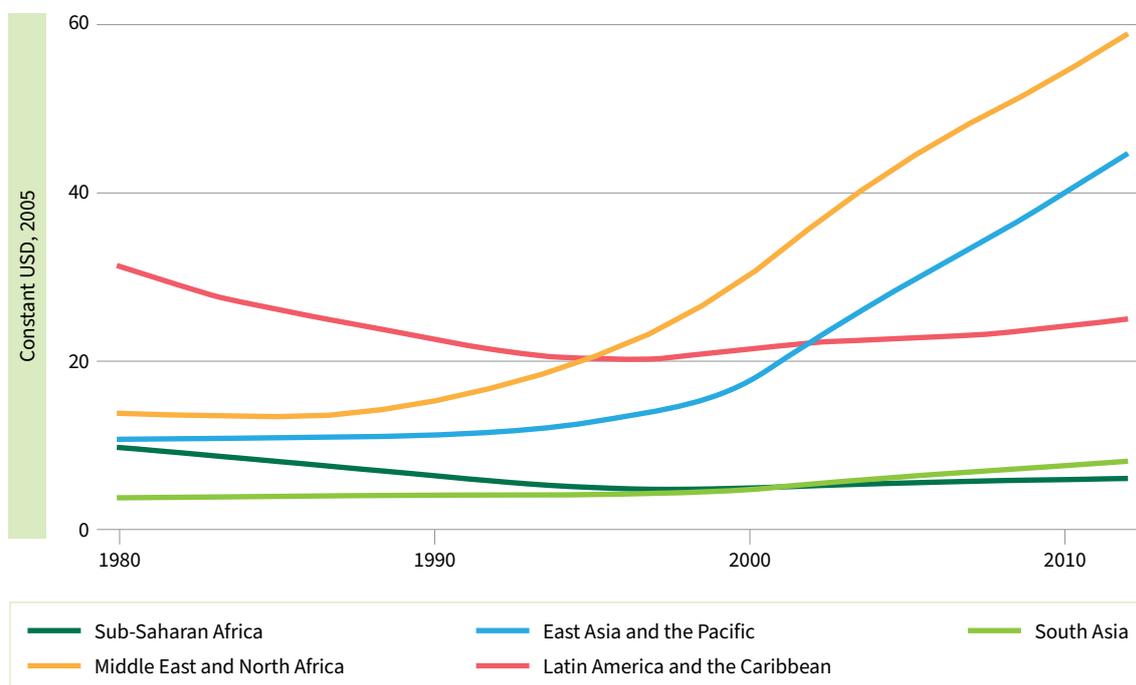
Second, it is important to highlight that the context in which African countries have committed to allocating 10 percent of public expenditures to agriculture is extremely challenging. The fiscal space available for a sustained increase in expenditure is fairly narrow. The average annual growth of tax revenue (excluding grants) in the countries under study during the 2004–2018 period was 16 percent, according to International Monetary Fund (IMF) data.⁶ This means that the rate of growth in food and agricultural expenditures (13 percent) is close to that of revenue (16 percent). Thus, without substantial budget reallocation or incurring debt, agriculture expenditures are ultimately constrained by revenue growth. Furthermore, according to data from the IMF, in 2018, countries in sub-Saharan Africa spent an average 10 percent of their public budget on debt interest payments, with this amount being slightly higher (12.6 percent) in the subset of countries analysed in this report.⁷ Financing constraints are not unique to the agricultural sector. Governments need to ensure adequate financing of all sectors that are important to economic development, including infrastructure, health and education, and this may jeopardize potential allocations to agriculture. Ultimately, the limited resources available for public expenditure across sectors explains the underspending in agriculture.

Third, there is the issue of implementation and use of budgets for food and agriculture. In some countries, governments do allocate 10 percent of their budget to agriculture, but a large portion of these funds go unspent. When unspent funds occur, not only does it delay the implementation of potentially transformative investment projects, but it also conveys the idea that additional resources to agriculture may not be necessary, since the implementing institutions are not capable of fully disbursing the resources that they already have available. This, in turn, may lead the ministry of finance in charge of public spending to question future increases in allocations to agriculture, despite widespread evidence of their positive impacts on agriculture and poverty reduction, despite existing inefficiencies. In such cases, a low(er) level of actual expenditure on food and agriculture is not an issue of political commitment but of implementation, as will be discussed in the next chapter. In these specific countries, there should be a strong focus on improving how agricultural budgets are implemented, so that funds do not go unspent. This, as well as a concerted effort to ensure that despite lower execution rates, much-needed agricultural investments are increased, rather than reduced.

⁶ Tax revenue in local currency. Data from the IMF Government Finance Statistics Yearbook and data files. Data was downloaded from the World Bank website. All available observations were used. However, data for Benin and Burundi are missing and there were many data gaps for Ghana, Kenya, Malawi, Mozambique, Rwanda and Senegal.

⁷ Interest payments as a percentage of total government expenditure. Data from the IMF's Government Finance Statistics Yearbook and data files. Data was downloaded through the World Bank website.

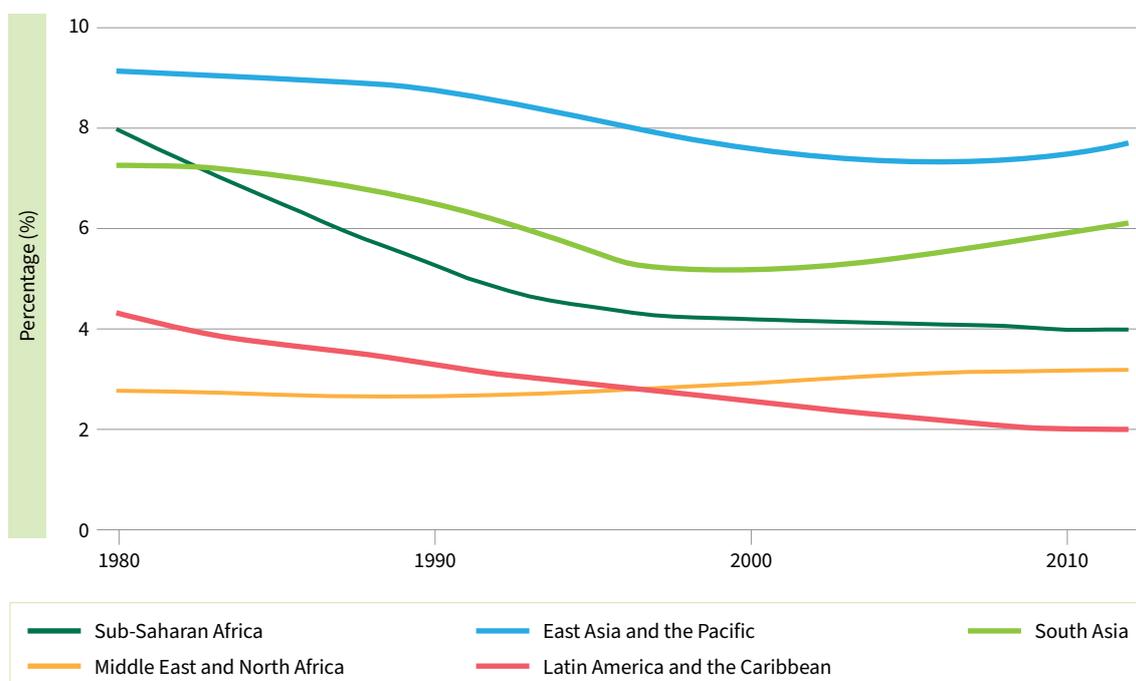
FIGURE 8 TREND OF EXPENDITURE ON FOOD AND AGRICULTURE (NARROW DEFINITION) PER CAPITA BY REGION



Note: For assumptions on these indicators, see Table A3 in Annex 2.

Source: Authors' calculations based on SPEED data, 2019.

FIGURE 9 TREND OF SHARE OF EXPENDITURE ON FOOD AND AGRICULTURE (NARROW DEFINITION) OVER TOTAL BUDGET BY REGION



Note: For assumptions on these indicators, see Table A3 in Annex 2.

Source: Authors' calculations based on SPEED data, 2019.

3.2 Budget execution

Execution rates of public expenditure – the percentage of budgeted funds that are spent – have long been an area of concern, especially for capital investments such as infrastructure. On general infrastructure expenditure in Africa, for example, some studies have revealed that addressing low execution rates could increase spending by 50 percent, on average, without additional budgeted resources. The low execution rates are often attributed to poor planning, deficiencies in project preparation and delays in procurement (Briceno-Garmendia *et al.*, 2008).

One of the reasons for low spending in agriculture is that the money is disbursed too slowly and thus is left unspent. The average execution rate for expenditure on food and agriculture is 79 percent over the study period, meaning that, on average, 21 percent of the budget was left unspent across countries and thus undermine transformative investments. This is due to an over-reliance on donor-funded projects, delays in the release of funds, a misalignment between the release of funds and the seasonal nature of the agriculture sector, and the nature of some expenditures that are harder to plan.

Execution rates may influence low and decreasing actual expenditure on agriculture in the analysed countries, where execution tends to be lower and more variable for food and agricultural public expenditure than for non-agricultural spending (see Figure 10).

If we consider budgeted rather than actual expenditures, an additional two countries, Burkina Faso (in 2012–2014) and Burundi (from 2012 to 2018) allocated more than the 10 percent CAADP target. In these cases, government commitment does not seem to be the main problem, but rather budget implementation.

Budget bottlenecks

Many of the challenges to budget execution are common across agriculture and non-agriculture sectors and include, among other things, inaccurate revenue forecasts and implementation issues.

In the United Republic of Tanzania, for example, revenue forecasts were consistently higher than the actual revenue for the years between 2007/08–2011/12 and the shortfall in revenues exceeded 10 percent in two out of five years (Simson and Welham, 2014). The revenue shortfall often means that the funds will not even reach ministries involved due to liquidity issues or funds are released with delays. The second aspect affecting execution is the economic composition of spending as some types of expenditure are more predictable and easier to execute (wages and salaries) than others (capital expenditure), which often require lengthy and complicated procurement processes that can result in unspent funds.

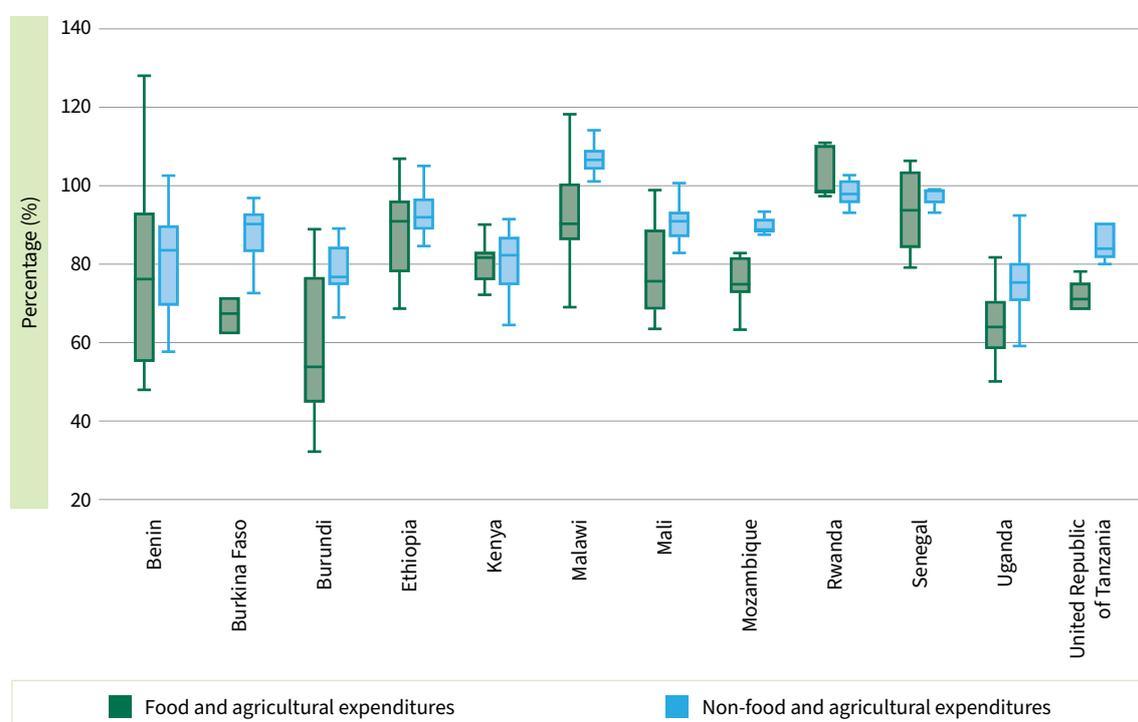
There are also a number of aspects that make execution rates in agriculture lower and more variable than in other sectors (see Figure 10).⁸ The first is the inherent seasonality of the sector. This means that for certain investments to be successful, the right amount of funding needs to be disbursed at the right time. A good illustration is the case of the National Agricultural Advisory Services (NAADS), a semi-governmental authority in Uganda in charge of delivering agriculture

⁸ The box plots in Figure 8 give an idea of the distribution of budget execution rates across the analysed period for the analysed countries. Specifically, observed values between the lower and upper quartile are represented by the vertical box. The median is represented by the dash in the box. The variability outside of the box is represented by two adjacent lines which provide an idea of the distribution below and above the 25th (first quartile) and the 75th (third quartile) percentiles. Therefore, looking at Figure 8 we know, for example, that the execution rates of food and agricultural expenditures in Burundi were not only lower but more variable than those in Mozambique. In Mozambique, over the analysed period (2009–2017), the median execution rate was approximately 75 percent and half of the observed execution rates fell between 73 percent and 80 percent, so the execution rates did not vary that much from one year to another. In Burundi, on the other hand, the median execution rate for food and agricultural expenditures over the 2005–2017 period was approximately 50 percent, but we can also see that the execution rates varied a lot more as we need a range covering 45 percent (first quartile) to almost 80 percent (third quartile) to cover half of the observations.

extension services.⁹ Funds were generally released to NAADS in four equal tranches. However, this did not reflect its needs, which usually peaked in the first and third quarters of the year when crops were being planted (World Bank, 2010). Therefore, funds released later were left partially unspent.

Secondly, another factor behind the lower execution are the components of the expenditure compared to other social sectors (especially education), as certain categories like salaries are easier to execute. In the education sector in Africa, staff compensation (for teachers and other education officials) accounted, on average, for approximately two-thirds of the total education expenditure during the 2004–2018 period (UNESCO, 2020). For agriculture, however, according to a World Bank review of public expenditure analyses in Africa covering the period 2005–2014, the share of salaries in total agricultural expenditure ranged from 6 to 53 percent (Mink, 2016), with this share being higher for countries at a higher level of development (e.g. Namibia and South Africa). For the countries analysed in this report, the share of salaries was below 10 percent in Senegal and Uganda and, between 10–15 percent in Burkina Faso and between 20–30 percent in Ghana and Rwanda (Mink, 2016). The lower share of salaries in the total expenditures increases the complexity of the execution of such expenditures as well as the implementation of agricultural projects. It is therefore important to increase coordination and develop capacity to manage and operationalize agricultural projects, even more so in highly decentralized contexts. Finally, another explanation for lower and more variable execution rates in expenditures on food and agriculture is the high reliance on donor expenditures, as discussed in the following chapter.

FIGURE 10 EXECUTION RATES FOR FOOD AND AGRICULTURAL (NARROW DEFINITION) AND NON-FOOD AND AGRICULTURAL EXPENDITURE



Notes: For assumptions on these indicators, see Table A3 in Annex 2. Ghana is excluded as actual expenditure data is partial for all years, therefore accurate execution rates cannot be calculated.

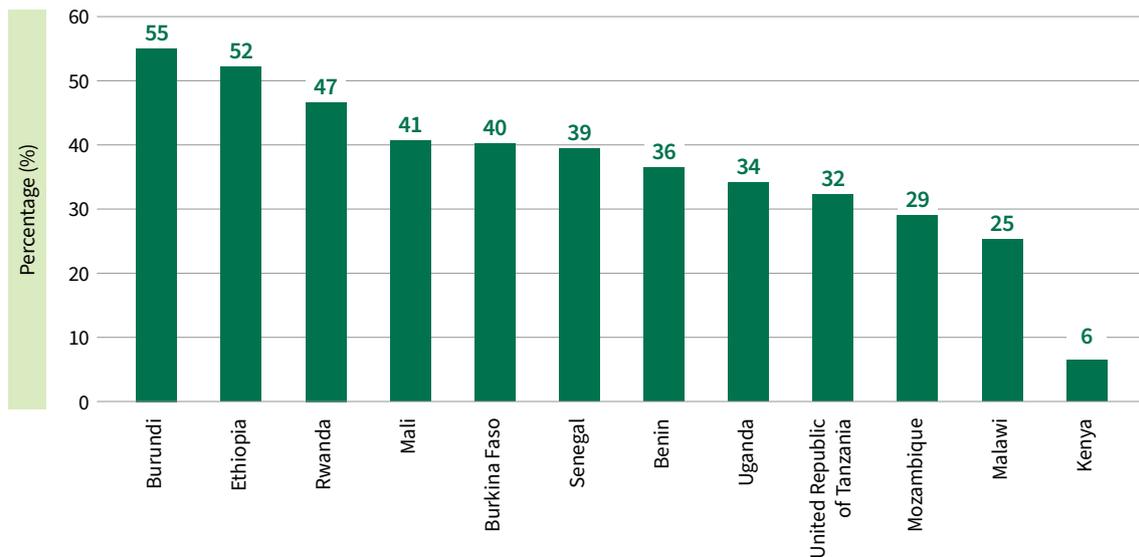
Source: Authors' calculations based on MAFAP database (2020 version).

⁹ More details are available in Box 10.

3.3 Source of funding

Overall, the share of donor expenditure as a proportion of total agricultural spending is significant in the countries in this study, averaging at 36 percent (see Figure 11). This implies that a number of SSA countries still strongly rely on donor-funding for the agriculture sector.

FIGURE 11 AVERAGE SHARE OF DONOR FUNDING TO THE FOOD AND AGRICULTURAL SECTOR



Notes: For assumptions on these indicators see Table A3 in Annex 2. Ghana is excluded as actual expenditure data is partial for all years, therefore accurate execution rates cannot be calculated.

Source: Authors' calculations based on MAFAP database (2020 version).

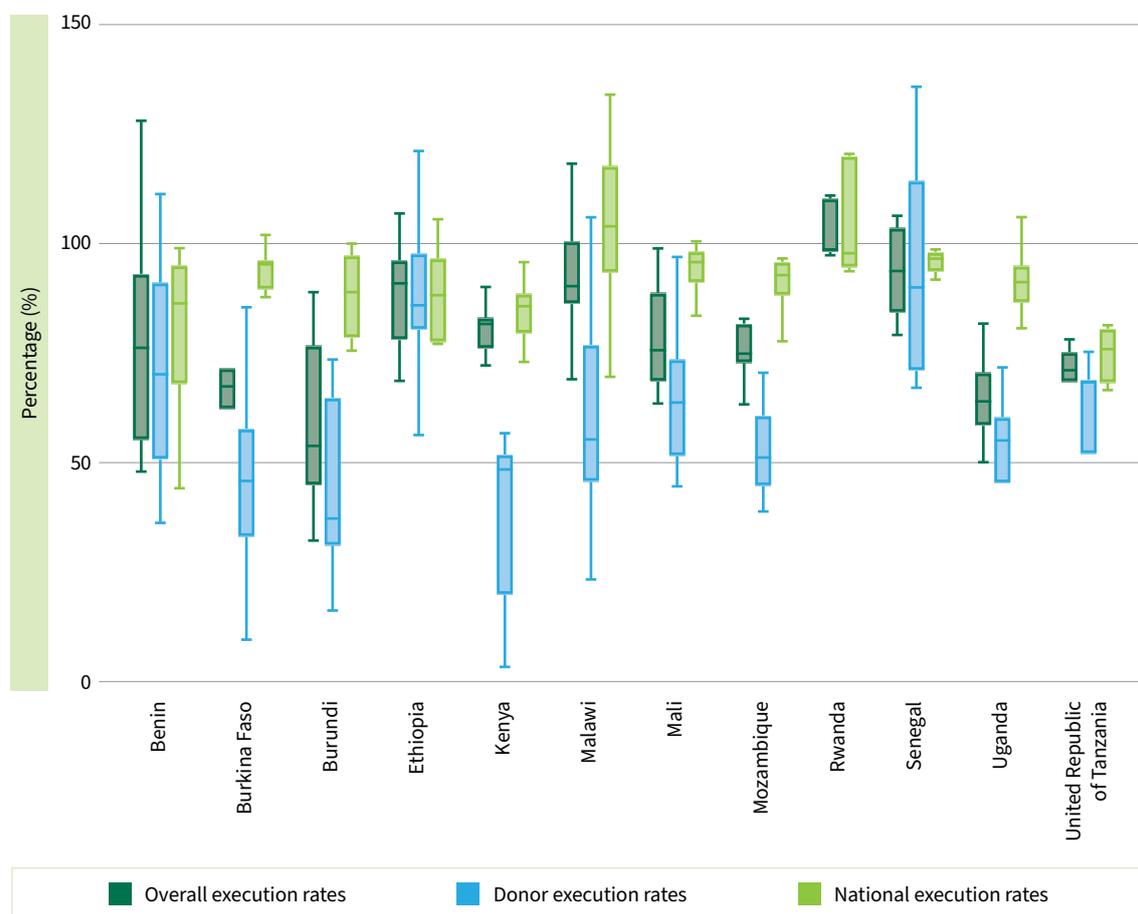
This trend could be problematic, as the execution rate of donor expenditures tends to be lower and more variable (see Figure 12) at about 61 percent on average, against an execution rate of 91 percent for national expenditure.¹⁰ Here, the implications are that a large proportion of the available funds are not used, thereby delaying or hindering critical investments.

The difference between national and donor execution rates can be explained by at least three factors. First, salaries, wages and other recurrent expenditures are typically more predictable and are usually financed by domestic sources as opposed to donor-funded expenditures, which mostly fund capital expenditures that are more difficult to implement and more exposed to abrupt changes. Second, investment projects – mainly funded by donors – may require legislative approval (even when resources have been budgeted) and procurement plans may not be drafted before budgets are made available, delaying the implementation of projects and undermining execution of expenditure by donors. Finally, donor-funded programmes tend to be large and require governments to comply with specific project-management rules, which add a layer of complexity to their implementation (Mink, 2016).

¹⁰ For interpretation of Figure 12 please see footnote 8. As an example, execution rates of donor expenditures on food and agriculture in Burundi (second box with median value at about 40 percent execution rate) were a lot lower and much more variable than the execution rate of national expenditure, represented by the lighter blue box, which is smaller than the donor execution rate box and has a median value of about 90 percent. Execution of donor expenditure is particularly low and variable also in Burkina Faso and Kenya. In all countries, the box for national expenditure execution rate and the median value stand above the donor expenditure box and its median. Variability of national spending on food and agriculture is also smaller than that of donor spending.

Beyond the above-mentioned factors, there are also country-specific reasons why the execution rates of donor expenditure are lower than for national expenditures. For example, following the mismanagement of public funds in the hidden debt scandal¹¹ (Jornal de Negócios, 2016) in Mozambique, several development partners either withdrew their support or implemented stricter controls. This led to a steep decline in the disbursement of expenditures in the agricultural sector (MASA, 2017). Similarly, in Burundi (see Box 3) and in Malawi (in 2012–2013 mainly), donors temporarily withheld their support during the period under this study, due to the deteriorating governance, political instability and financial scandals. In Mali, especially in 2012, execution rates on donor projects dropped substantially, following political turmoil (FAO, 2014). In Burkina Faso (between 2004–2011) and Uganda (mainly in 2005–2007), complexities in procurement, weak coordination with donors and with decentralized governments were identified as key constraints to the execution of donor support for food and agriculture (World Bank, 2010, 2013).

FIGURE 12 EXECUTION RATES OF NATIONAL AND DONOR EXPENDITURE ON FOOD AND AGRICULTURE (NARROW DEFINITION)



Notes: For assumptions on these indicators see Table A3 in Annex 2. Ghana is excluded as actual expenditure data is partial for all years, therefore accurate execution rates cannot be calculated.

Source: Authors' calculations based on MAFAP database (2020 version).

¹¹ Between 2013 and 2014 Mozambican state-owned companies contracted a large amount of state-guaranteed debt (over USD 2 billion, according to an article from The Economist) and a substantial part of this debt was borrowed in secret, which explains the name of the scandal.

BOX 3 BURUNDI: CHALLENGES OF RELYING ON DONOR FUNDING FOR AGRICULTURE

Burundi's agriculture relies heavily on official development assistance (ODA). Donor allocations accounted, on average, for 70 percent of the agricultural budget during the period 2005–2017 (see Figure 13).

Development partners predominantly fund public goods: 60 percent of the budget devoted to infrastructure, storage, marketing, training and extension activities is funded by donors. Conversely, private goods, such as input subsidies or cash transfers, are funded mainly by national sources, with donor expenditures accounting for less than 40 percent of these expenditures.

FIGURE 13 FOOD AND AGRICULTURAL EXPENDITURE BY SOURCE OF FINANCE IN BURUNDI



Note: Indicators not available for 2011 and 2013 due to lack of donor-funded expenditures.

Source: MAFAP, 2020.

More than half of donor funds are unused

The execution rate of donor expenditure has been low and is decreasing (see Figure 13), with an average rate of 42 percent over the analysed period. As a result of the low execution, actual expenditure by donors represents only 50 percent of agricultural spending (against the 70 percent of budgeted amounts). The low capacity to disburse resources is mainly due to complex procurement procedures, governance issues, delayed payments, political instability, and limited fund absorption capacity (World Bank, 2013). For example, in 2006, only 39 percent of funds from the World Bank Emergency Programme were disbursed because of the donor's concern over funds mismanagement.*



▶▶ BOX 3 (CONT.) BURUNDI: A RELIANCE ON DONOR FUNDING FOR AGRICULTURE

The lowest overall donor execution rate was experienced in 2009 (16 percent), partly due to the global financial crisis, which led to reduction in donor expenditures (World Bank, 2013). In 2015, the low rate was partly driven by surging political instability, which led to the suspension of direct budgetary support to the government and affected the implementation of ongoing projects. The EU, for example, suspended funding, which at the time accounted for about half of the annual budget of Burundi (The Guardian, 2016).

The above-mentioned volatility in donor financing due to both internal and external factors ultimately undermines service delivery and public expenditure. Given that donors finance most of the food and agricultural expenditure and mainly public goods, which are recognized to be associated with higher returns on investment, a delay or a suspension in this funding is likely to have significant adverse effects on the sector. A World Bank review of Burundi's public expenditures found that, during shortfalls of funds compared to contributions pledged, expenditure reductions mainly affected capital expenditures, rather than current expenditures (World Bank, 2013).

Looking to the future, for Burundi to achieve its ambitious target of agricultural transformation by 2027, the government needs to scale up domestic financing for agriculture to ensure financial sustainability and improve the efficiency of spending by increasing capital expenditure and provision of public goods, such as infrastructure and research and development services.

NOTE

*According to an independent external evaluation of the Peacebuilding Fund projects in Burundi (see https://reliefweb.int/sites/reliefweb.int/files/resources/CABFEA3AB9A416D34925779C000EAE96-Full_Report.pdf).

Solutions for spending shortcomings

Given that a large proportion of donor funding for agriculture currently goes unspent, it is important that countries, together with their development partners, come up with solutions. These could include simplifying existing procedures, improving coordination, improving local capacities to manage and execute funds particularly among civil servants, or shifting to budget support as an aid modality.¹² Box 4 presents the case of European Union (EU) budget support to Benin, which was made conditional on improving monitoring and analysis of expenditure flows to identify issues and priorities. Following a technical analysis, the EU gave the green light to disburse EUR 9 million (3 percent of the average annual budget for agriculture) in budgetary support to the Government of Benin.

¹² Budget support generally entails a direct contribution to the recipient government's budget. In terms of scope, it is generally broader in scope than project aid and aims to support the (general or sectoral) development strategy of the recipient government.

BOX 4 MONITORING AND ANALYSING PUBLIC EXPENDITURE TO MOBILIZE DONOR FUNDING IN BENIN

In 2019, the Ministry of Agriculture of Benin produced a comprehensive analysis of public expenditure on food and agriculture for the 2008–2018 period, following a collaboration with the MAFAP programme dating back to 2016 (see Baborska *et al.*, 2020). This detailed analysis of trends and composition of sectoral expenditures was a precondition to receiving budgetary support from the European Union (EU). The EU programme aimed to support the Government of Benin in its ambitious structural and institutional reforms detailed in the *Plan stratégique de développement du secteur rural* (PSDSA) for the 2017–2020 period. The main reforms were restructuring decentralized administrative units and adopting territorial approaches to value chain development. In order to release the funds, the EU established conditions of eligibility, which mainly related to addressing governance challenges, decentralizing the responsibilities of the Ministry of Agriculture, and supporting the development of key priority value chains as well as technical and financial aspects of implementation.

Late reforms led to slower release of funds

The regular monitoring of expenditure and the analysis of its composition provided a timely, comprehensive and credible assessment of public spending in the agricultural sector. The analysis found that introducing a programmatic approach to the Ministry of Agriculture's budget improved the predictability of food and agricultural public expenditures. However, slow institutional reforms during the first years of the PSDSA led to low execution of public funds allocated to the sector. Indicators showed an important increase in public spending on agricultural research and knowledge dissemination as part of the reform aimed at promoting a territorial approach to value chain development. However, investments to promote activities beyond the farm gate, such as processing and marketing, remain limited.

Analytical evidence facilitated funding

On the basis of this analysis, the EU granted EUR 9 million in budgetary support to the Government of Benin, representing about 3 percent of the annual average budget for agriculture. The results of the analysis also provide a basis for the government to elaborate its own funding strategy for agricultural sector development in the framework of the new PSDSA, which is currently underway.

3.4 Decentralization and expenditure at subnational levels

During the early 1990s, reforms on fiscal decentralization gained momentum in Africa (Hobdari *et al.*, 2018).¹³ Conceptually, increasing the proximity of policymakers to their beneficiaries through decentralization could lead to a better alignment of local policies with stakeholder needs, especially the poorest people (Bardhan, 2002), as well as reducing corruption and strengthening accountability among local authorities (Fisman and Gatti, 2002). Nevertheless, there have been concerns around the risk of funds being diverted to cover the costs associated with the establishment and maintenance of new local governments (Mogues and Erman, 2016).

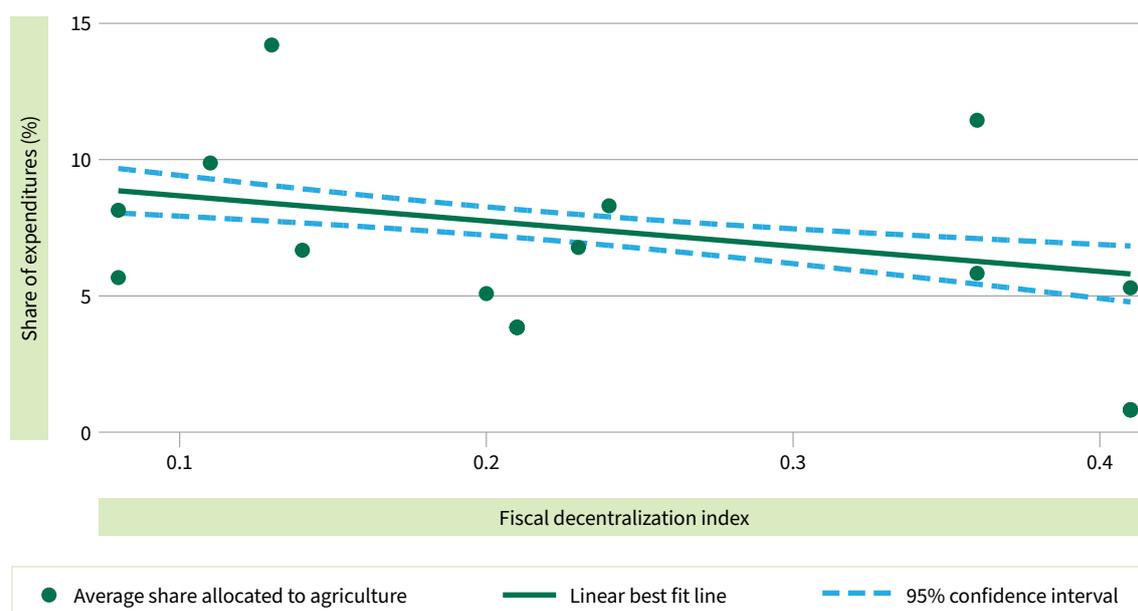
¹³ Fiscal decentralization refers to a shift of some responsibilities related to expenditures or revenues to lower levels of government. For example, certain responsibilities that were held by the central government will now be implemented by a regional or a district government.

It is reasonable to expect the impacts of fiscal decentralization on agriculture depend largely on the geographical distribution and composition of subnational expenditures.

According to our analysis, the amount of expenditure on food and agriculture is smaller in countries where public funding decisions or their implementation are more decentralized. However, subnational (province, county or region) per capita expenditure on agriculture is generally higher where poverty rates are higher. Spending has targeted poorer areas with high agricultural potential, where returns of investment are likely to be higher.

As visible in Figure 14, countries with a higher value on the fiscal decentralization index¹⁴ allocate a smaller share of their budgets to agriculture. There is not much evidence available on the expected effect of greater decentralization on agricultural allocations and it is likely that the effect will depend on a number of country-specific factors, including the degree of autonomy exercised by the subnational governments, the policy priorities of local governments and their capacity to manage and execute agricultural expenditures (Akroyd and Smith, 2007). However, the negative relation between decentralization and food and agricultural expenditure shown in Figure 14 is consistent with general findings that higher levels of decentralization are normally associated with an increase in the share of health and education expenditures (Arze *et al.*, 2016), which could explain the lower share allocated to agriculture.

FIGURE 14 CORRELATION BETWEEN SHARE OF FOOD AND AGRICULTURAL EXPENDITURE AND DECENTRALIZATION INDEX



Note: For assumptions on these indicators see Table A3 in Annex 2.

Source: Authors' calculations based on MAFAP database (2020 version) and Ivanyna and Shah (2012).

¹⁴ The fiscal decentralization index is calculated by Ivanyna and Shah (2012). To calculate the value of the index, the authors assign weights to different variables capturing i) the degree of local expenditure autonomy; ii) the degree of autonomy to tax; iii) the ability to borrow money; iv) the fiscal vertical gap (share of central government transfers in local government revenues; and v) the share of unconditional transfers in the total. A higher value index denotes a higher level of fiscal decentralization or expenditure autonomy.

The geographical distribution of subnational expenditures on food and agriculture is likely to depend on the objectives of the government as well as a number of country-specific socio-economic and political conditions.

Targeting high-potential vs high-poverty areas

Some people argue that prioritizing high potential over high-poverty areas offers the highest return-on-investment in terms of agricultural performance. Others argue that areas with high agricultural potential may not require large amounts of public funding since expenditure levels may already be high, implying that further improvement in agricultural productivity in these areas can only be achieved at a large cost. Hence, resources should be geared towards areas with high concentrations of poverty (and some agricultural potential), where additional expenditure may have greater impacts in terms of poverty reduction and agricultural performance (Mogues *et al.*, 2012). More integrated approaches, such as presented by Maruyama *et al.* (2018) suggest prioritizing investments according to a region's agricultural potential, technical efficiency and poverty rate.¹⁵

To further investigate the geographical distribution of food and agricultural expenditures at the subnational level, we examined six of the countries in our sample: Ethiopia, Ghana, Kenya, Mozambique, Uganda and the United Republic of Tanzania.¹⁶

The geographical composition of subnational agricultural expenditures is likely to be driven by a myriad of complex political, administrative, fiscal and social factors. In this chapter, we attempt to understand whether a pattern exists between subnational on food and agriculture expenditures and poverty levels in the countries under study. This does not mean that food and agricultural expenditure should be allocated to regions solely based on their poverty levels regardless of their natural potential. The returns to investment are likely to be determined by a large number of factors, including, among other things, demographic factors, the total amount (stock) of previous investments and natural potential. Nevertheless, in poorer regions where the natural potential is sufficient for agriculture to flourish, and where private resources to develop the sector may be scarcer, higher levels of public spending are more likely to be needed.

Diverse decentralization processes

The level of decentralization of food and agricultural expenditure in the countries under study is quite mixed (see Figure 15). Ethiopia has the highest proportion of spending on food and agriculture by subnational governing bodies (over 50 percent in 2016–2017), followed by Mozambique, with an average 36 percent in 2009–2017. Kenya, Uganda and the United Republic of Tanzania follow, with shares of spending at subnational level slightly below 30 percent.

¹⁵ Results of the study suggest that in areas with high poverty but moderate potential (i.e. critical area), agricultural productivity can be improved by long-term investments in technological changes and large-scale infrastructure projects, while off-farm opportunities can be increased by short-term safety net programmes providing immediate assistance and incentives, such as cash transfers. In areas with high poverty but medium or high potential, innovation investments should focus on reducing the inefficiencies that are preventing farmers from performing better. In areas with moderate poverty, medium or high agricultural potential (i.e., high performing areas), support should be directed to farmers, to connect them to urban and export markets and allow them to obtain higher prices for their produce, via quality improvement and processing certificates (Maruyama and Torero, 2018).

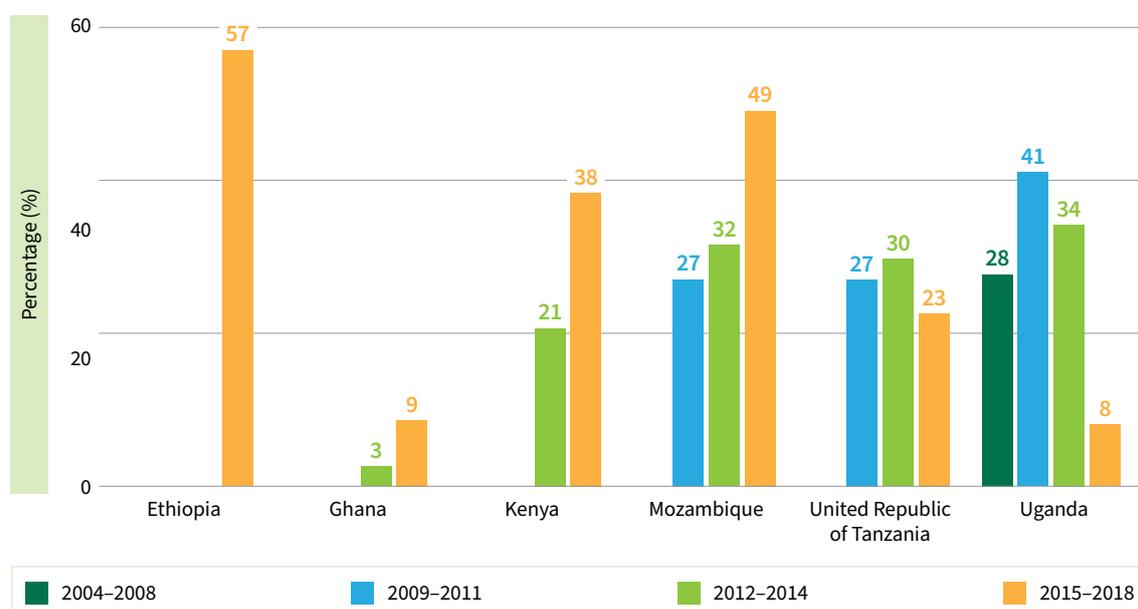
¹⁶ The analysis focuses only on actual on-budget expenditures – those public expenditures that feature on the budget – implemented by subnational governments, with central level expenditures being excluded. The fact that a country was not included does not mean that it does not have subnational expenditures. Indeed, there are certain countries (e.g. Malawi and Rwanda) where there are subnational food and agricultural expenditures, but for which data were not available for this report.

Different countries in sub-Saharan Africa have made a differing commitment in terms of decentralizing the management of public budgets, especially in terms of the autonomy enjoyed by subnational governments in revenues collection and spending-related decisions. In some countries, local administrations may be responsible for both the allocation of resources and their implementation, whereas in other countries local governments may be only responsible for implementing expenditure. These commitments are usually driven by sectoral, political, and administrative authority considerations that, most often, are not linked to agriculture-specific concerns (Mink, 2016).

In countries like Ethiopia and Kenya (see Box 5), transfers to subnational entities are unconditional, meaning that such entities have broad spending autonomy (Hobdari *et al.*, 2018).¹⁷ Conversely, in Mozambique, Uganda and the United Republic of Tanzania, most of the transfers are conditional and are designated by the central government for the provision of the specific services, leaving little flexibility on spending decisions to local authorities (Hobdari *et al.*, 2018; Hart and Welham, 2016).

In Ghana, although its constitution states that fiscal decentralization allows unconditional transfers, the process seems constrained by legislative conflicts and repeated budget administration reforms, which undermine the authority and revenue collection systems of the local governments (Amoako-Asiedu and Domfeh, 2016).

FIGURE 15 SHARE OF SUBNATIONAL EXPENDITURE ON AGRICULTURE OVER TOTAL FOOD AND AGRICULTURAL SPENDING



Notes: Expenditure data at the subnational level is available only for the following periods: Ethiopia (2016–2017); Ghana (2013–2017); Kenya (2014–2018); Mozambique (2009–2017); Uganda (2004–2016); and United Republic of Tanzania (2011–2017). This figure shows the share of subnational expenditure on food and agriculture over total agricultural expenditure (i.e. expenditure at the central and subnational levels). For assumptions on these indicators see Table A3 in Annex 2.

Source: Authors' calculations based on MAFAP database (2020 version).

¹⁷ However, according to Hobdari *et al.* (2018), the rapid speed of fiscal decentralization in Kenya has not been matched by the capacity of subnational governments to effectively carry out the spending assigned to them, and this has created problems for service delivery at the subnational level.

BOX 5 INSIGHT AND CHALLENGES FOR AGRICULTURE IN A DECENTRALIZED KENYA

The process of decentralization in Kenya dates back to the late 1990s with the introduction of geographically specific funds and transfers aimed at addressing emerging challenges of marginalization, inequality and resources management. With the approval of its new constitution in 2010, Kenya embarked on a major process of devolution, folding three levels of administration – provinces, local authorities and national functions – into one. The constitution also divided the government into two levels: a national central government and 47 county governments.

The national government retained the responsibility of formulating policies and setting priorities for the agricultural sector. On the other hand, county governments implement the national policies on agriculture, and facilitate and oversee all other agriculture-related matters, including service delivery. This organization of the responsibilities involves a high level of collaboration and coordination between the two levels of government. In terms of public allocations, transfers from the central level to the counties are mainly unconditional, granting a high degree of spending autonomy to the local authorities.

Problems encountered at county level

While decentralization can be an important opportunity for enhancing public participation in the agricultural sector, several factors have limited the scale and impact of such participation. The transfer of functions from the central level to the counties, originally planned to take place over a three-year period, was compressed into one year during which total spending by the counties quadrupled. The speed of the process hindered the delivery of public services as the new county authorities lacked the knowledge and capacity necessary to effectively manage the resources allocated to them for agriculture (Hobdari *et al.*, 2018). The situation has been further constrained by the lack of coordination between central and decentralized authorities.

Looking ahead

The Kenyan Agriculture Sector Growth and Transformation Strategy (ASGTS) foresees a central role for county governments in implementing the strategy and advocates for increased coordination between county authorities, the central government, development partners and the private sector (MoALF, 2019). The lack of a solid reporting system for public expenditure at local level can lead to duplication of expenditures, impede in-depth analysis of spending composition and, therefore, an efficient management of public resources. Developing a systematic mapping and reporting of expenditures on food and agriculture at the county level could help overcome such setbacks.

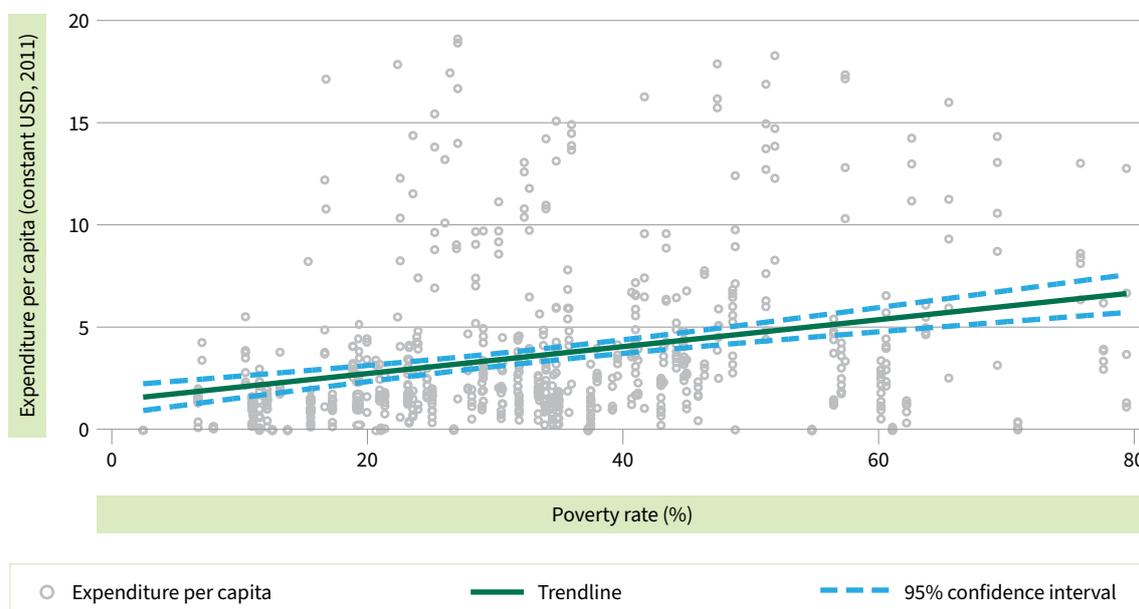
Higher expenditure in poorer areas

While overall food and agricultural expenditure by subnational authorities remains low, below USD 4.5 per capita (constant USD, 2011), it is higher in areas with greater poverty rates (see Figure 16). This can be explained by a number of factors.

First, areas with a high incidence of poverty are more likely to receive food aid and cash transfers. Second, in areas characterized by low poverty levels and high agricultural potential, the initial stock of expenditure is likely to be higher, implying lower returns on additional investment. In addition, the private sector may also be more likely to invest in these areas, reducing the need for public transfers. Correlation of subnational expenditure per capita and the poverty rate

are reported in Figure A1 in Annex 4. These relationships are positive for all countries, but the strength of the association differs between countries.¹⁸

FIGURE 16 CORRELATION BETWEEN POVERTY RATE AND SUBNATIONAL EXPENDITURE ON FOOD AND AGRICULTURE PER CAPITA



Note: For assumptions on these indicators, see Table A3 in Annex 2.

Source: Authors' calculations based on MAFAP database (2020 version) and various national sources.

Figure 17 to Figure 22 present various maps indicating country spending per capita (also defined as spending intensity) and poverty rates.

In **Ethiopia**, the average food and agricultural expenditure per capita at the regional level was USD 13 in 2016–2017, with four regions (Gambella, Afar, Benishangul-Gumuz and Tigray) spending more than the regional average. Gambella, where expenditure per capita is almost USD 40, is sparsely populated with fewer than 500 000 inhabitants, most of whom are poor and rely on subsistence agriculture.

Situated in the western-most corner of Ethiopia, Gambella is characterized by optimal agroecological conditions, rich water resources, and vast and untapped agricultural potential. These characteristics likely prompted the Ethiopian Government to select it, along with Benishangul-Gumuz, as high-potential areas for public and private investments in food and agriculture (Degife *et al.*, 2019), thereby drawing regional-level expenditure towards agricultural development. Benishangul-Gumuz and Tigray, in addition to having high agricultural potential, have high poverty rates, making these regions priority areas for pro-poor expenditures on education, health and agriculture.¹⁹ Afar has the second highest expenditure per capita but, relative to the other regions, has low overall agricultural potential. The dry lowlands are affected by both drought and flooding. However, as part of the Awash River basin, there is irrigation

¹⁸ Correlation coefficients range from 0.08 (weak correlation) to 0.61 (moderate-strong correlation), vary substantially by country, and are significant in the cases of Ghana, Kenya and Uganda.

¹⁹ In the past, large-scale agricultural land acquisitions in these regions faced local and international criticism for a lack of transparency and consultation with affected communities (Olay and Okumo, 2017). Higher spending may be an indirect mechanism to compensate for these land acquisitions.

potential. The top expenditures in Afar are capital investments in irrigated grazing land. All regions, excluding the city states, spent an average of about 10 percent of their budget on agriculture in 2016 and 2017.

It should also be noted that a larger share of regional spending on food and agriculture relates to recurrent expenditures (i.e. expenditures that do not result in the creation or acquisition of fixed assets, like salaries and wages) at about 65 percent on average versus 45 percent at the federal level.

Spending per capita in **Kenya**, on average, is USD 6.15 per person, but varies a lot within regions, ranging from USD 1 to 16 per capita in Wajir and Tana River, respectively. Overall, spending seems to be higher in the drought-prone, semi-arid pastoralist northern regions of the country (IPC, 2020). These areas have significant unrealized agricultural potential and are characterized by high levels of poverty, making them priority areas for agricultural expenditure (Maruyama *et al.*, 2018).

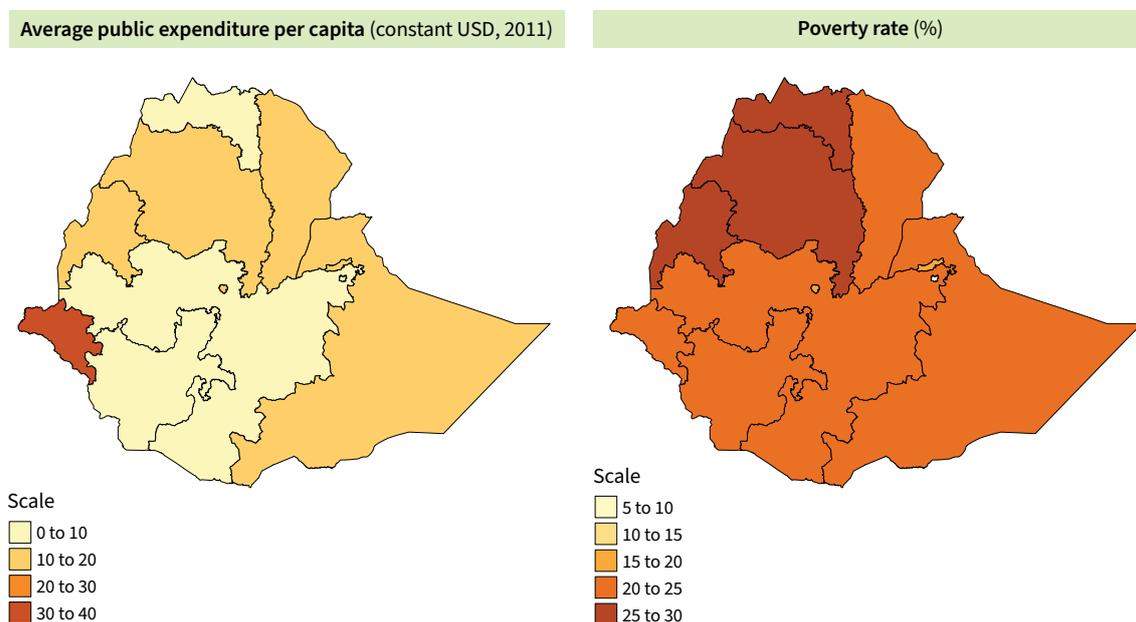
In **Mozambique**, the average per capita spending on food and agriculture across all regions during 2009 and 2017 was USD 4.16 (constant USD, 2011), with southern regions, such as Gaza, Inhambane, Manica, and Sofala, typically experiencing higher levels of public expenditure per capita. Areas with high agricultural potential in the north of the country, including Cabo Delgado, Nampula, Niassa, Tete and Zambezia, tend to exhibit lower spending per capita and experience high poverty. While this pattern could partly be driven by the private sector, which is present in these regions for cash crops (thereby reducing the need for public spending), areas characterized by lower-than-average spending intensity, high potential and high poverty rates could have higher returns to investment.

In the **United Republic of Tanzania**, food and agricultural spending at subnational levels is low, at about USD 2 per person during 2011–2017. Rukwa stands out as a poor region (with 45 percent poverty rate) with low agriculture potential and very limited expenditure (less than USD 3 per person). Here, it could be argued that agriculture may not be the most appropriate allocation of funds. Rather, social safety nets may be more suitable for addressing high poverty and low agricultural potential regions (Maruyama *et al.*, 2018).

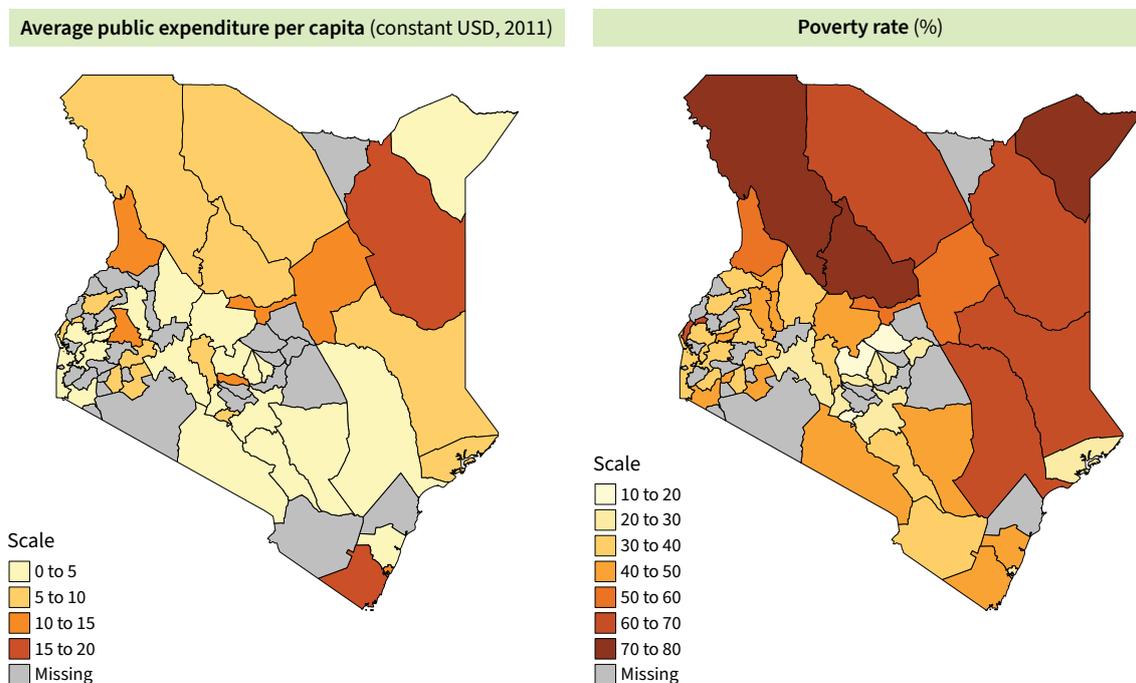
In **Uganda**, the average spending on food and agriculture across all regions was USD 1.30 per capita during 2013–2017. Spending does not vary much across subregions but is noticeably higher in the remote areas of Karamoja and Acholi, which have higher spending per capita (over USD 2) compared to other regions. Karamoja and Acholi regions also have higher poverty rates (see Figure 21), and low agriculture potential. In this case, expenditure on food and agriculture might help to increase equity across regions.

Based on our analysis, we have found that countries experience different degrees of decentralization in terms of public spending on food and agriculture, and that there are different degrees of correlation of this expenditure with poverty incidence.

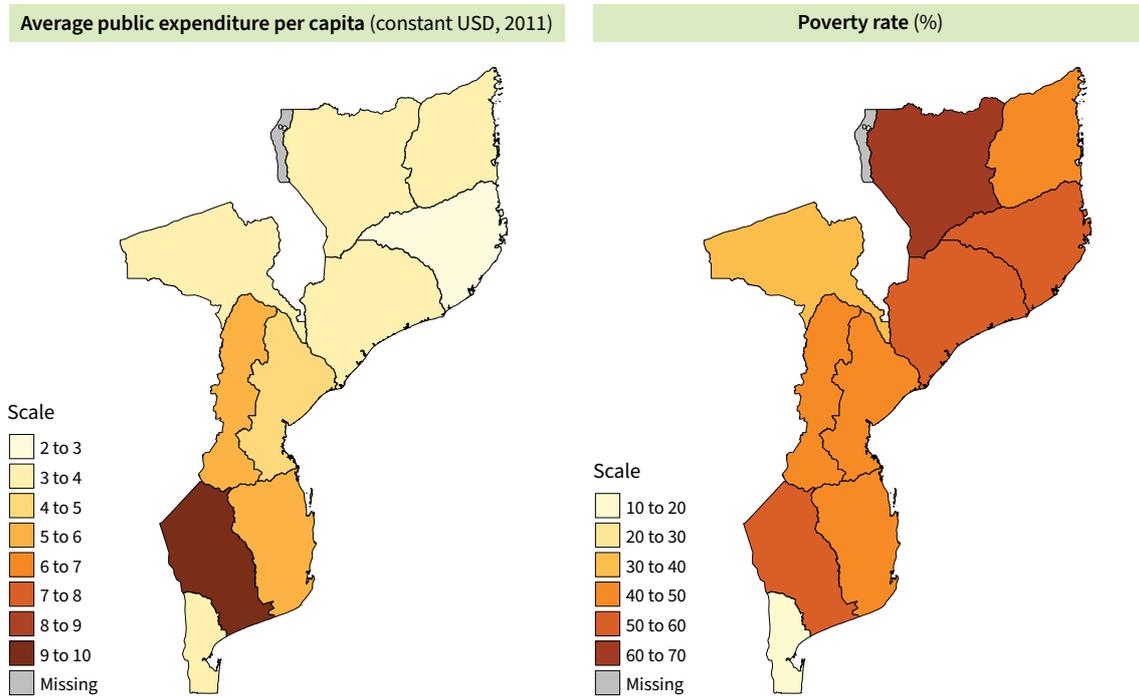
While there is room to improve the quality (how money is spent) and allocation (how much money is spent) of food and agricultural expenditure by decentralized governments, the countries analysed here already seem to be investing in poorer areas, which appears to be associated with higher returns on investment. Unfortunately, given data constraints, analysing the composition of subnational spending was not feasible. These expenditures are often included under 'other' food and agricultural expenditures in the MAFAP classification, as data provided by official counterparts are not detailed enough to allow for more specific classification.

FIGURE 17 INTENSITY OF SUBNATIONAL FOOD AND AGRICULTURAL EXPENDITURE AND POVERTY RATE IN ETHIOPIA

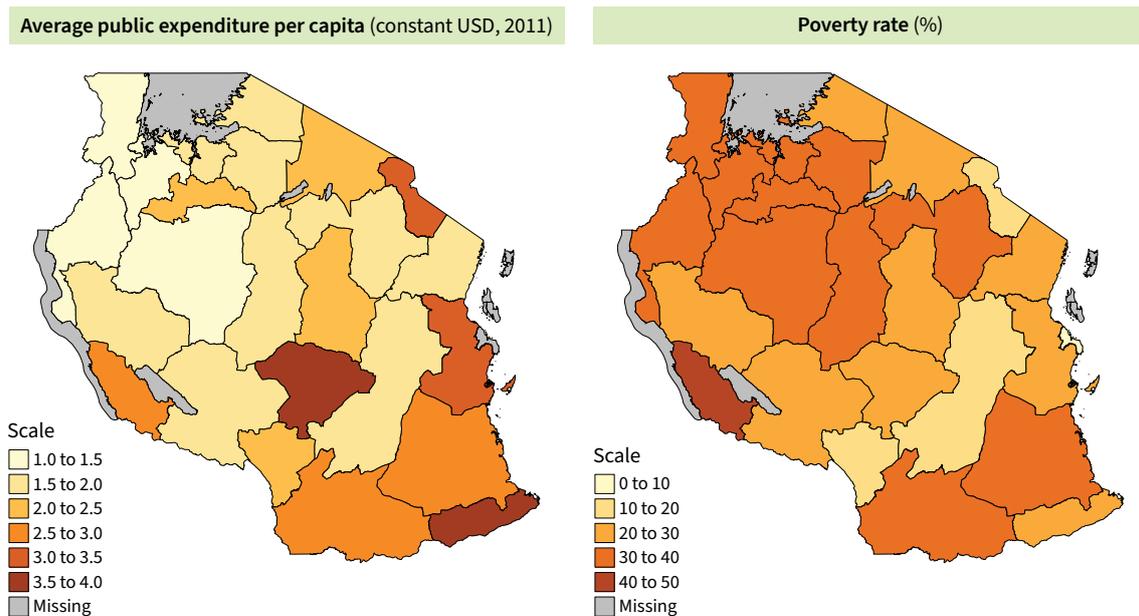
Sources: Authors' own calculations based on MAFAP database (2020 version); Ethiopia Central Statistics Agency (2015/16) for poverty rate; and Central Statistics Agency for the population data. Conforms to map No. 4045 Rev. 8.1 UNITED NATIONS (July 2018).

FIGURE 18 INTENSITY OF SUBNATIONAL FOOD AND AGRICULTURAL EXPENDITURE AND POVERTY RATE IN KENYA

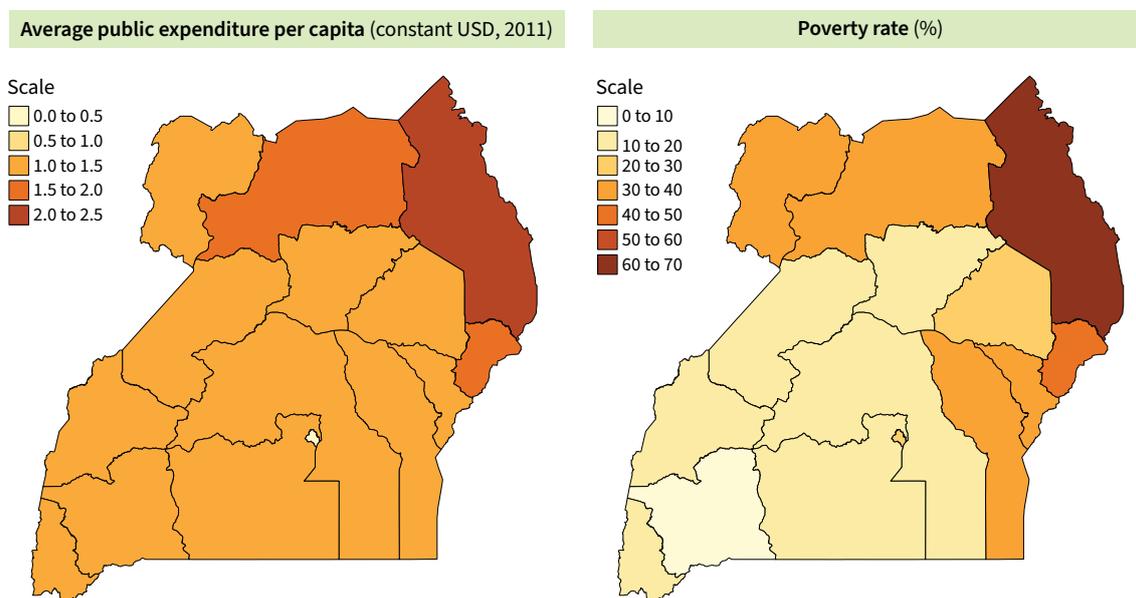
Sources: Authors' own calculations based on MAFAP database (2020 version); 2015/16 Kenya Integrated Household Budget Survey (2015) for the poverty rate; Kenya Bureau of Statistics (2009 and 2019) for the population data. Conforms to Map No. 4187 Rev. 3 UNITED NATIONS (December 2011).

FIGURE 19 INTENSITY OF SUBNATIONAL FOOD AND AGRICULTURAL EXPENDITURE AND POVERTY RATE IN MOZAMBIQUE

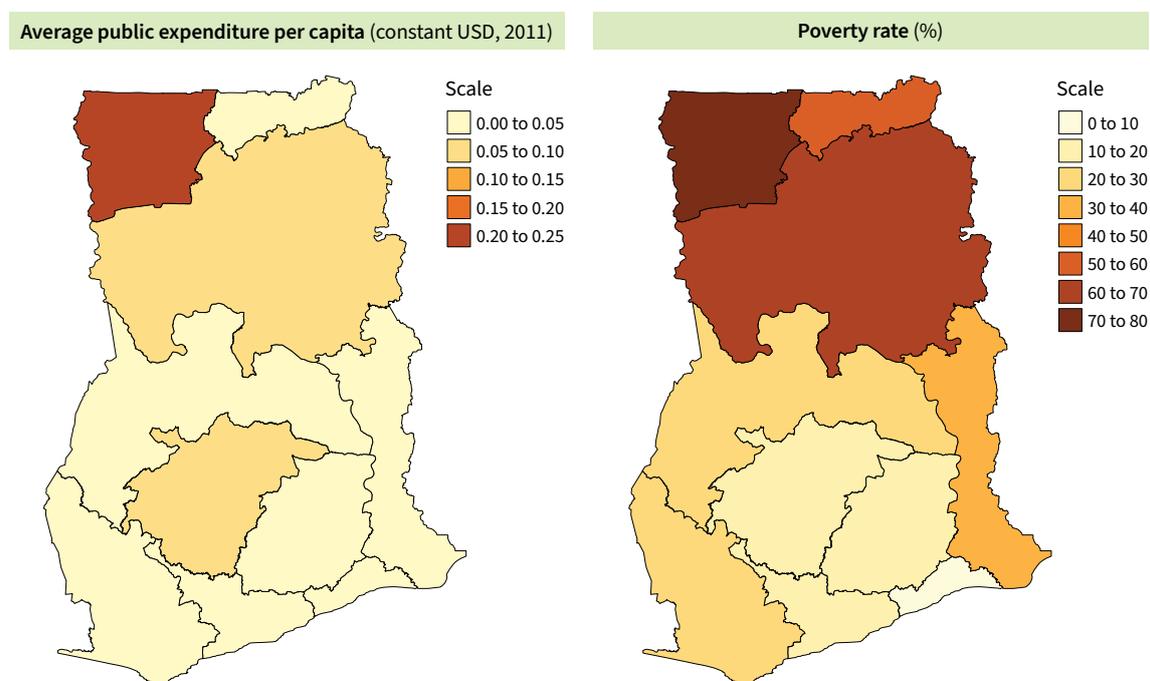
Sources: Authors' own calculations based on MAFAP database (2020 version); *Inquérito aos Agregados Familiares sobre Orçamento Familiar* (2015) for the poverty rate; National Institute of Statistics (projections) for the population data. Conforms to Map No. 3706 Rev. 7 UNITED NATIONS (July 2020).

FIGURE 20 INTENSITY OF SUBNATIONAL FOOD AND AGRICULTURAL EXPENDITURE AND POVERTY RATE IN THE UNITED REPUBLIC OF TANZANIA

Sources: Authors' own calculations based on MAFAP database (2020 version); Tanzania National Bureau of Statistics (2017/18) for the poverty rate; Tanzania National Bureau of Statistics (2016 and 2017) for the population data. Conforms to map No. 3667 Rev. 6 UNITED NATIONS (January 2006).

FIGURE 21 INTENSITY OF SUBNATIONAL FOOD AND AGRICULTURAL EXPENDITURE AND POVERTY RATE IN UGANDA

Sources: Authors' own calculations based on MAFAP database (2020 version); Uganda National Bureau of Statistic, 2016/17) for the poverty rate; National Statistics Office (2015–2018), census data (for 2002 and 2014) and authors' calculation (other years) for the population data. Conforms to map No. 3862 Rev. 4.1 UNITED NATIONS (September 2020).

FIGURE 22 INTENSITY OF SUBNATIONAL FOOD AND AGRICULTURAL EXPENDITURE AND POVERTY RATE IN GHANA

Sources: Authors' own calculations based on MAFAP database (2020 version) and Central Bureau of Statistics (2015) for the poverty rate; Population & Housing Census (2010) for the population data. Conforms to map No. 4186 Rev. 3 UNITED NATIONS (February 2005).

3.5 Food for thought: chapter takeaways

Globally, there is a clear call in the Sustainable Development Goals (SDGs) – SDG 2 Target 2.a – to invest in agriculture to end hunger. Investment in agriculture has also been long recognised as a driving force for economic and social development. From this chapter, we can take away the following key points:

- Sub-Saharan African countries have not reached the target of allocating 10 percent of national budgets to agriculture, an African-wide commitment under both the 2003 Maputo Declaration and the 2014 Malabo Declaration. Malawi was the only country in the study to have consistently spent 10 percent of its national budget to food and agriculture, compared to an average of 6 percent across the 13 analysed countries throughout 2004–2018.
- Overall, no clear common trend emerges in terms of the share allocated to agriculture, with trends being very country specific. A declining share of total expenditure allocated to food and agriculture is noted in some East and Southern African countries, such as Mozambique, Uganda and the United Republic of Tanzania, whereas there is an upward trend in countries such as Burundi and Senegal. For the other 8 countries, no clear-cut trend has been found as food and agricultural expenditures have been too volatile.
- Countries with more decentralised governance structures tend to spend less on agriculture. However, in these countries, namely Ethiopia, Kenya, Uganda and the United Republic of Tanzania, food and agricultural expenditures per inhabitant at the decentralized level are higher where levels of poverty are higher.
- Across the analysed countries, donor funding is a major contributor to the agriculture sector. On average, 36 percent of budgets are made up of donor contributions, which often have a larger share of unspent project funds.
- A fifth of the total budgeted amount for agriculture went unspent. The failure to spend the budgeted amounts may explain why ministries of finance might be reluctant to allocate more financial resources to food and agriculture.
- Although political turmoil stalls projects, beating bottlenecks – such as slow access to funds, inaccurate forecasts on revenue and complicated procedures for project implementation – all affect a country's agricultural development. These problems can mostly be mitigated with the regular monitoring of public expenditure and by improving local capacities to manage and execute funds.

To achieve a 6 percent growth per year in the African agriculture sector – as marked in the Maputo Declaration – and to reach the 2030 SDGs, more investment in this sector is needed. Besides political will, major obstacles such as debt repayments and weak revenue growth impede governments from spending more.

Also, addressing low execution rates could increase the level of actual expenditure, without additional resources and support potentially transformative projects.

Therefore, the future debate needs to focus on how budgets are spent. This shift toward better monitoring and analysis of public expenditure will be more imperative than ever as countries grapple with the ongoing COVID-19 pandemic and its effects on food and agriculture. In Box 6, we review the impact and responses to the pandemic in the countries analysed in this report and give thought to the main challenges and potential long-term implications on the size and composition of food and agriculture budgets.

BOX 6 COVID-19 AND PUBLIC EXPENDITURES: IMPACTS, RESPONSES AND OPTIONS FOR THE FUTURE

Despite sub-Saharan Africa registering, so far, a number of COVID-19 cases and casualties lower than other regions in the world, the latest economic projections from the International Monetary Fund (2020a) expect a contraction in regional economies by about 3 percent, with an average GDP per capita drop up to 5.4 percent back to levels of the beginning of the decade.

The continent is facing an unprecedented health and economic crisis which could push an additional 5 to 29 million people into poverty, destroy up to 19 million jobs on the continent and the number of undernourished people in food-importing countries could increase by an additional 14.4–80.3 million (UNECA, 2020; ILO, 2020; FAO, 2020). As a result, and in order to minimize and mitigate the potential negative effects of a COVID-19-induced lower growth, many African governments have resorted to fiscal stimuli. However, with fewer resources at their disposal, they are likely to face some difficult choices.

How have sub-Saharan African countries responded to the first wave of the pandemic?

In March 2020, FAO called on countries to minimize the effects of the pandemic on agriculture by:

- expanding and improving food assistance and social protection programmes;
- helping smallholders to enhance their productivity and sell their output;
- addressing key logistical bottlenecks;
- keeping global food trade open (Torero Cullen, 2020);
- putting food and agriculture at the centre of the economic recovery packages (FAO, 2020).

Most of the countries reviewed in this report have already implemented a number of these policies. In the short term, the main policies have aimed at expanding safety nets to protect the most vulnerable people, introducing subsidies in support of agricultural production, and providing fiscal exemptions.*

Measures to support farmers

To protect smallholders' profits from price shocks, Mozambique has implemented a cotton subsidy, Burkina Faso announced the acquisition of agricultural inputs and animal feed to support food and pastoral production, and Kenya announced a K Sh 3 billion (USD 28 100 000) stimulus package to provide inputs to farmers and a further K Sh 1.5 billion (USD 24 050 000) to support flower and horticultural producers accessing the international market. In Rwanda, where a bumper harvest has occurred, the government has proactively sought to purchase key food commodities (beans and maize) to increase the amount of stored food in its national food reserves and absorb some of the excess supply, which could result in a decline of producer prices.

Economic measures to protect the poorest people

An increasing number of measures aimed at protecting poorest consumers have also been undertaken by some countries. The most common measures are the expansion of cash transfers and food aid. Malawi, for example, has announced a USD 40/month (roughly the minimum wage) transfer for vulnerable populations. In Mali, Senegal and Uganda, governments pledged large-scale food aid programmes, with cereals distribution in Mali, massive food procurement for one million poor households in Senegal, and the announcement of a food distribution scheme for about 1.5 million urban poor people in Uganda.

Regulatory measures on and beyond agriculture

Governments also implemented regulatory measures to ease key logistical bottlenecks, reduce the cost of basic services (electricity, fuel and water) and/or curb food prices. Mozambique, for example,



▶▶ **BOX 6 (CONT.) COVID-19 AND PUBLIC EXPENDITURES: IMPACTS, RESPONSES AND OPTIONS FOR THE FUTURE**

declared a VAT exemption on a set of priority goods. Kenya temporarily reduced the corporate tax rate and granted a 100 percent tax exemption for low-income earners. Malawi and Rwanda have announced a lower price of fuel and a controlled charcoal price, respectively. Rwanda fixed prices on a number of key commodities (including rice, beans, maize flour, among others) and set guidelines to ensure that fertilizer warehouses, feed factories and large agro-processing continue to operate, even if at a reduced capacity.

Short-term interventions with potential long-term implications

As the pandemic continues, short-term actions to stem the impacts of the pandemic will have long-term implications for food and agricultural budgets.

Resources could switch to investments with low returns (e.g. subsidies) or even be channelled away from agriculture to other sectors, such as healthcare. Private-sector investment could fall substantially. Moreover, short-term increases in subsidies and the anticipated large increases in healthcare expenditure may impact food and agricultural budgets in the medium and long term, in at least five ways.

1. Budget changes

There is a real possibility that changes and/or cuts will be applied to national budgets. This occurred during the Ebola pandemic when additional health financing led to a drop in agricultural financing. In most African countries, where agriculture is already underfunded, the reallocation of expenditure could lead to further sector shortfalls.

2. High-return investments in agriculture may be compromised

As we publish the report, we are seeing increasing expenditures going to social safety net schemes as a result of the COVID-19 outbreak and, in some cases, producer subsidies in African countries. It is widely acknowledged that the removal of such input subsidies is complex and unpopular (Dionne and Horowitz, 2016). As such, it is not impossible that these ad hoc short-term measures may last longer, diverting resources away from key investment areas, such as agricultural R&D and infrastructure.

3. Longer concessional terms on debt and donor grants or loans

While lengthening concessional terms on debt and donor grants or loans may help countries to face the effects of the pandemic, they could eventually result in an increased level of debt. A number of countries have received emergency funding from the IMF and other sources (World Bank, 2020c). This has led to the debt distress rating deteriorating in certain cases, like in Kenya (Miriri, 2020). The worsening of the debt situation in some countries could both make it more difficult for them to borrow in the future and result in higher debt-repayments that could limit the fiscal space available for investments on food and agriculture.

4. Impact on the agrifood private sector

A recent study on a small sample, by the Economic Policy Research Center in Uganda, found that firms in the agrifood sector had suffered the most from the COVID-19-induced restrictions. These created obstacles in terms of accessing input markets (transport restrictions) and output markets (market closures), which could lead to company closures in the sector (EPRC, 2020). A large contraction in the agrifood private sector could exert additional pressure on governments to invest in the sector.



▶▶ **BOX 6 (CONT.) COVID-19 AND PUBLIC EXPENDITURES: IMPACTS, RESPONSES AND OPTIONS FOR THE FUTURE**

5. Lower public spending and higher export taxes

Current tax reductions and expansionary fiscal policies mean that governments are likely to have to make up for this imbalance once the pandemic ends. There are two options for the medium and long term:

- Raising revenues (i.e. by increasing taxes) or decreasing public expenditure (i.e. by lowering public spending). When confronted with such unpopular options, it is not unusual for governments to opt for raising revenues by taxing agricultural commodities, especially cash crops, through the use of export taxes.
- Steep tax increases on the agricultural sector or drastically reducing expenditures are both likely to negatively affect agriculture, especially if the decrease in expenditures is through cuts in key public goods.

NOTES

* Information on responses to COVID-19 in selected SSA countries are retrieved mainly from the FAO's Food and Agriculture Policy Decision Analysis tool (FAPDA) and other media-based sources. For more detailed information see <http://fapda.apps.fao.org/fapda> and other media-based sources.



FAO/Fredrik Lerneryd

4 Composition of public expenditure on food and agriculture in sub-Saharan Africa

- Subsidies to producers (22 percent of total expenditure) and to consumers (9 percent of total) account for almost one-third of total spending on food and agriculture in the SSA countries analysed.
- While input subsidies remain the biggest spending category, lately they have been downscaled through reforms in some countries (e.g. Malawi) or shifts towards more consumer subsidies spending in others (e.g. Ethiopia).
- Infrastructure received 16 percent of total expenditure on food and agriculture but relies the most heavily on donor funding. One-quarter of total funding for infrastructure was donor-financed during 2004–2018, which represents a threat for the sustainability of these investments.
- On R&D and extension services, governments spent on average 18 percent of their food and agricultural budgets, but fell short of the African Union target to spend 1 percent of agricultural GDP on R&D.
- A recent and marked rise of expenditure on forestry, land and environmental protection has happened in several countries, such as Ethiopia, Ghana, Kenya, Malawi, Uganda and the United Republic of Tanzania.

Monitoring the amount national governments spend on agriculture is as important as understanding the composition of these expenditures. Empirical evidence suggests that returns on certain types of investment are higher than others. Spending on public goods, especially research and extension services and off-farm irrigation, is recognized to have the highest payoffs (Mogues *et al.*, 2012; Fan *et al.*, 2018; Nin-Pratt and Magalhaes, 2018). Hence, it is important to understand where often-limited resources are allocated and where they could be reallocated to improve agricultural performance.

The aim of this chapter is to analyse the breakdown of expenditures on food and agriculture by country – as defined by the MAFAP methodology outlined earlier – during the 2004–2018 period.

We will also review in detail spending trends on private goods targeting specific producers and consumers (e.g. input subsidies), as well as expenditures on important public goods, such as research and extension services and irrigation infrastructure. Similarly, we will look at expenditure on forestry, land management and natural resources protection, which are becoming increasingly important as African countries seek to improve resilience in the agricultural sector.

This chapter aims to answer the following guiding questions:

- Which types of expenditures received the most funding?
- Which investments did governments favour?
- And how does the composition of budgets differ between countries?

The results of this analysis can identify the types of expenditure that have been prioritized in the past and gaps that need to be filled in order to improve agricultural performance in sub-Saharan Africa, as a further step towards sustainable agricultural transformation.

4.1 Composition of expenditure in support of food and agriculture

Expenditures on private goods consist mainly of transfers to agricultural producers – in the form of variable input subsidies, capital subsidies and other on-farm services – and to consumers of food via food aid, cash transfers and school meals programmes. The former are intended to support farmers and increase food production; the latter have the objective of improving people's access to food.²⁰ On average, these two types of expenditures together accounted for over 30 percent of total spending on food and agriculture for the countries studied (see Figure 23). Expenditures targeting other agents of the food and agricultural system, such as processors, traders or inputs suppliers, remain limited.

Spending in sub-Saharan Africa largely focused on supporting producers through input subsidies, which accounted for over 20 percent of total expenditure on food and agriculture. Yet while funding for irrigation infrastructure and natural resources management is on the rise, R&D and extension services remain underfunded – if one considers the important challenges facing agriculture in Africa.

Producer transfers represent the largest share of total food and agricultural expenditure, averaging 23 percent, across countries and years (see Figure 23). Farm subsidy programmes (which are classified under producer transfers), launched or revamped, which in most cases were in response to the 2007/08 food crisis, continued to absorb a large share of public resources, even after the consequences of the crisis faded away and to a large extent such subsidies were no longer justified (see Figure 24).

Spending on research and knowledge dissemination (including extension, technical assistance and training) follows as the second largest share and represents 18 percent on average of the total expenditure on food and agriculture (see Figure 23). However, as explained in Chapter 2.4, despite variation across countries, such expenditures are decreasing overall (see Figure 24) and remain below the target set by the African Union of allocating 1 percent of agricultural GDP to R&D expenditures.

Agricultural infrastructure

Investments in agricultural infrastructure, which mainly include feeder roads and off-farm irrigation, have increased in many countries, especially in Eastern and Southern Africa. During the

²⁰ The increases in food production and/or access to food in most cases do not distinguish between nutritious and non-nutritious foods.

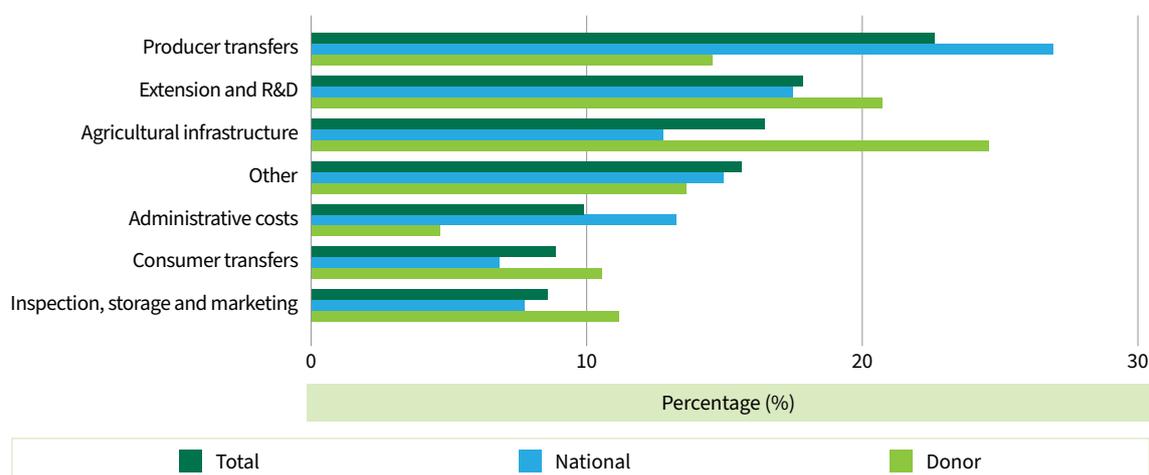
period under study, they accounted, on average, for 16 percent of spending (see Figure 23). Post-production facilities and integrated value chain development initiatives seem to have received less attention from governments. Indeed, storage and marketing programmes account for a relatively small share of the budgets (9 percent on average). However, the share of expenditures allocated to the category ‘other expenditures,’ which accounted for about 16 percent of resources across countries has increased over time (see Figure 24), it includes projects on value chain development, such as agro-processing services. Spending on value chain development is critical to commercializing the sector for agricultural transformation.²¹

Where do donors invest the most?

Typically, donors tend to fund agricultural infrastructure, such as roads and off-farm irrigation: an average of 25 percent of donor funding goes to this category (see Figure 23). On the other hand, national resources are mainly directed towards providing producer transfers, i.e. input subsidies. Overall, donor-funded expenditures fluctuate a lot more than national funds do for most expenditure categories. For example, the variability of donor spending on agricultural infrastructure is almost three times higher than that of domestic spending, according to our estimates. This may raise concerns for two reasons:

- Firstly, donor funds usually have lower execution rates (as discussed in the previous chapter), resulting in poor implementation of infrastructure projects, which have higher returns on investment.
- Secondly, increases in donor-financed infrastructure could discourage national spending in this area, as national resources are invested elsewhere, challenging sustainability in the long term (Acharya *et al.*, 2006; Briceno-Garmendia *et al.*, 2008; Leiderer, 2012).

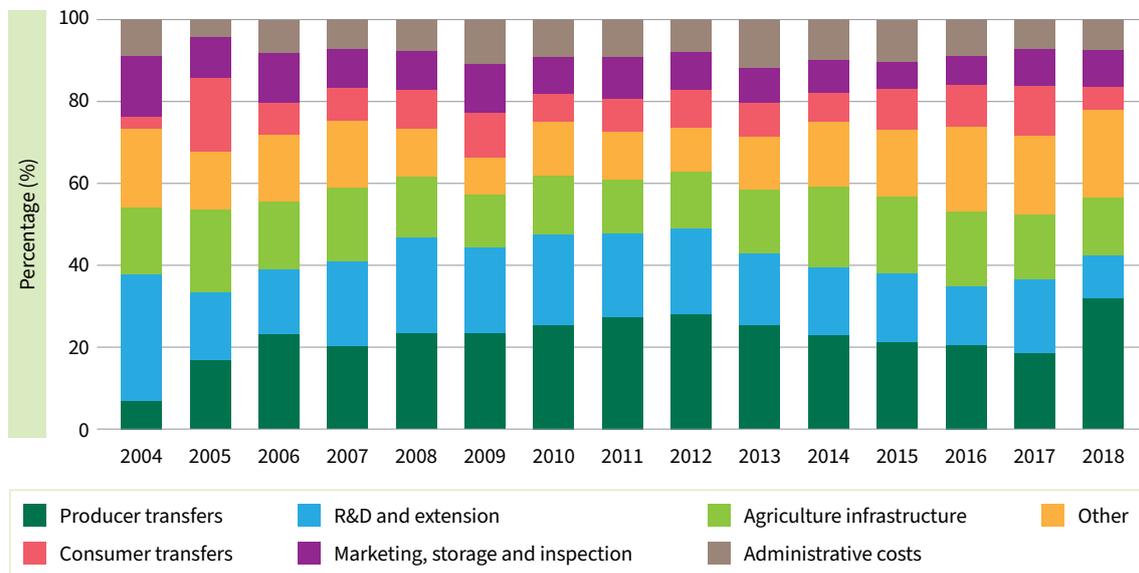
FIGURE 23 SHARE OF EXPENDITURE OVER TOTAL EXPENDITURE ON FOOD AND AGRICULTURE, AVERAGE FOR ALL COUNTRIES 2004–2018



Note: All observations where actual donor expenditures are missing are excluded from the donor sample.

Source: Authors' calculations based on MAFAP database (2020 version).

²¹ ‘Other’ is a residual category that includes a variety of measures that cannot be listed in the other spending categories used by MAFAP (see classification map in the methodology chapter), because: i) they do not fit or ii) there is not enough information on the function of the expenditure to allow for accurate classification. In case i), for example, expenditure on post-production services, mainly agro-processing, and natural resources preservation (e.g. forest-related) and land management are included. Case ii) includes the bulk of expenditures at decentralized subnational levels (see analysis in Chapter 1.3), for which information provided in the budget books of the country tends to be extremely scarce.

FIGURE 24 TREND OF EXPENDITURE SHARES OVER TOTAL EXPENDITURE ON FOOD AND AGRICULTURE, AVERAGE FOR ALL COUNTRIES BY YEAR

Note: For assumptions on these indicators see Table A3 in Annex 2.

Source: Authors' calculations based on MAFAP database (2020 version).

4.2 Producer support: input subsidies

Economists have long recognized that, under certain conditions, input subsidies are a potentially useful tool, especially in developing countries where food markets are largely imperfect. The main rationale is that budgetary support to farmers generates significant public benefits in terms of food availability and affordability. Nonetheless, during the 1990s, input subsidy programmes (ISPs) were largely phased out in SSA following a widespread agreement that their costs exceeded the benefits – imposing unsustainable burdens on national treasuries while only weakly contributing to the goals of agricultural growth, food security and poverty reduction (Jayne *et al.*, 2018).

In the early 2000s, a new wave of ISPs resurged, focusing on smart subsidies that could correct past shortcomings (Morris *et al.*, 2007). While benefits and disadvantages largely depend on country contexts, recent studies have found that a failure to address the key limitations of ISPs resulted in limited benefits and a suboptimal allocation of resources. Poor targeting and inefficient distribution mechanisms, characterized by diversion and leakages, are the most problematic issues (Pan and Christiansen, 2012; Brooks *et al.*, 2013; World Bank, 2017).

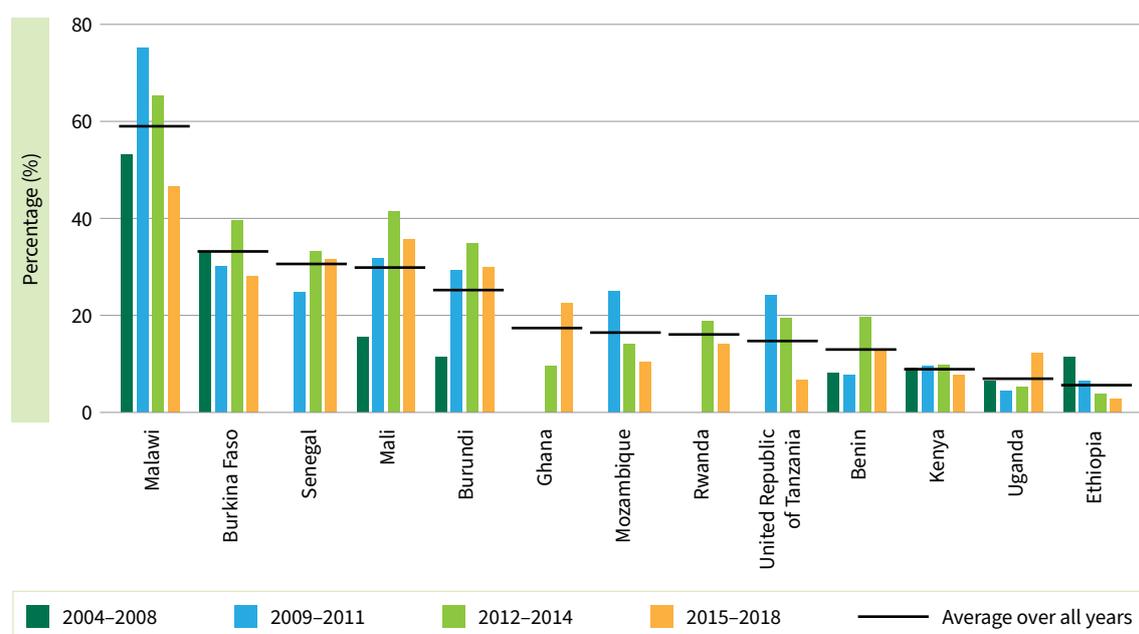
About 23 percent of budgets on food and agriculture in sub-Saharan Africa were spent on input subsidy programmes during 2004–2018. In the aftermath of the 2007/08 food crisis, these programmes regained momentum. More recently, there has been a wave of new reforms in countries like Malawi, Senegal and the United Republic of Tanzania to limit the costs of subsidy schemes, which has led to a decrease in the share allocated to input subsidies.

The share of expenditure allocated to input subsidies has varied significantly across countries and years. In Burkina Faso, Burundi, Malawi, Mali and Senegal, input subsidies accounted for over 20 percent of expenditures on food and agriculture in almost every year in the study period (see Figure 25). Kenya (6 percent period average), Ethiopia (4 percent), and Uganda (2 percent) have allocated the least of their total budgets to input subsidies.

STABLE
EXPENDITURE
TREND

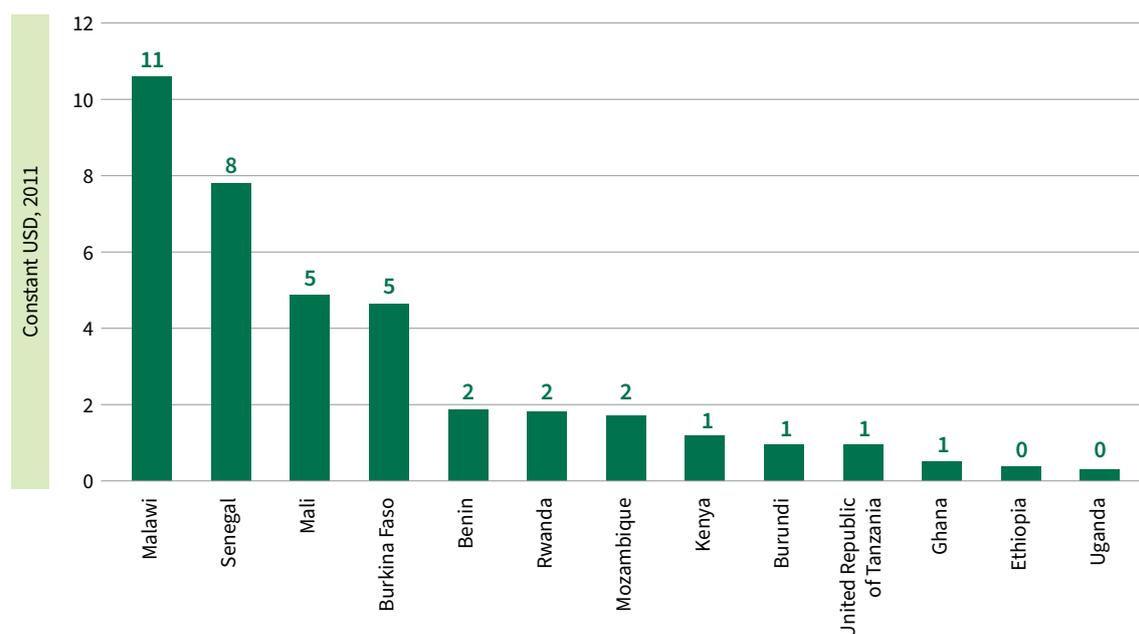
However, per capita spending on input subsidies was relatively low, less than USD 10 in all years and all countries, except Malawi during 2009–2014 (see Figure 26). The higher values were in Malawi and Senegal, with an average of USD 11 and USD 8 per capita, respectively (see Figure 26).

FIGURE 25 SHARE OF VARIABLE INPUT SUBSIDIES OVER TOTAL EXPENDITURE ON FOOD AND AGRICULTURE



Source: Authors' calculations based on MAFAP database (2020 version).

FIGURE 26 INPUT SUBSIDIES PER CAPITA, AVERAGE 2004–2018



Source: Authors' calculations based on MAFAP database (2020 version).

Many SSA governments, including in the countries under study, revamped or expanded nationwide ISPs following the 2007/08 food price crisis. For a number of years following the food price crisis, these policies remained in place, partially due to the fact that they bring about immediate results and are politically difficult to remove once in place. They only started declining recently.

In Malawi, home to the largest ISP on the continent, agricultural input subsidies for maize and a few other crops were reintroduced in 2005/06, to counteract production shortages caused by weather shocks (see Box 6). In Mali, the increasing share of spending on input subsidies since 2008 was as a result of the adoption of an initiative to boost local rice production. The initiative was subsequently extended to other staple crops (maize, millet, sorghum and wheat), driving up the amount of the subsidies.

In Benin, the situation is quite the opposite. There, the input subsidy scheme is largely oriented towards the cotton value chain. The upsurge of subsidies during 2012–2018 compared to the previous period (see Figure 25) is linked to the increased support provided by the *Office National de Stabilisation et de Soutien des Prix des Produits Agricoles* (ONS), in particular for the 2015–2016 cotton cropping season.

In Senegal, variable input subsidies (together with on-farm capital subsidies) mainly target the groundnut sector. A significant production shortfall in 2011 pushed the government to increase subsidies significantly in the 2012–14 period. The Senegalese government, in the framework of its strategic agriculture acceleration programme, set the objective to reduce input subsidies to 0.3 percent of the GDP by 2017. In this context, a partial phasing out of subsidies has taken place in recent years, with the ratio of subsidies over GDP declining from 1.2 in 2012 to 0.4 in 2017 (Gouvernement du Senegal, 2014).

Reforms and cuts to input subsidy programmes

As in Senegal, other countries started reducing input subsidies through ISP reforms during 2015–2018 (see Figure 25). Such decisions were made necessary, in some cases, by the rise in the international prices of fertilizers, which imposed increasing costs on subsidy schemes.

Significant cuts were implemented in Malawi, for example, where the Farm Input Subsidy Programme (FISP) has undergone major reforms since the 2016/17 cropping season through efficiency-enhancing measures and reduction of the subsidy amount (see Box 7 for more details).

In the United Republic of Tanzania, the National Agricultural Input Voucher Scheme, in place since 2008, ended after external funding stopped in 2014. The impossibility to continue input subsidies pushed the government to assess alternative options to reduce the cost of inputs for smallholder farmers, in particular inorganic fertilizers (see Box 8).

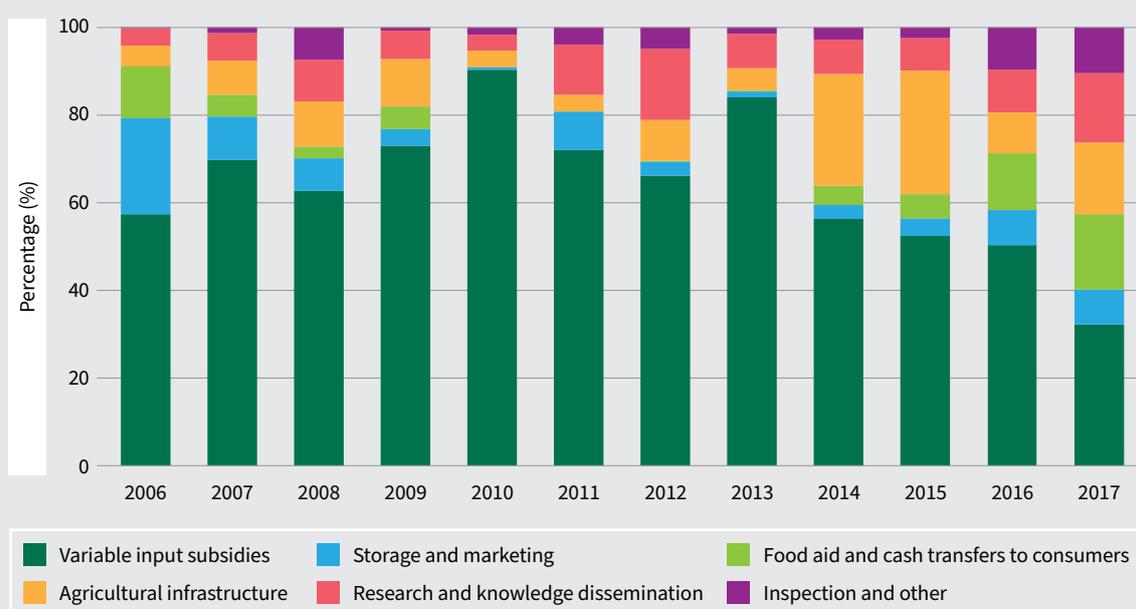
BOX 7 REFORMING THE FARM INPUT SUBSIDY PROGRAMME IN MALAWI: BETTER EFFICIENCY AND SHIFTING EXPENDITURE

The Farm Input Subsidy Programme (FISP) reintroduced agricultural input subsidies in Malawi during the 2005/06 cropping season, having been abolished in the 1990s. During 2005–2017, FISP accounted on average for 60 percent of the total budget on food and agriculture, and 8 percent of Malawi's total budget. Its main aim is to provide fertilizers and seed subsidies for maize, targeting poor smallholder farmers through vouchers. Inputs for other crops were subsidized in the past, such as fertilizers for tobacco (until 2008/09), legume seeds, cotton seeds and chemicals in certain cropping seasons. Evidence suggests that FISP has had positive effects on maize productivity as a result of increased fertilizer use. Studies show an increase in maize yields of up to 500 kg/ha and higher production after the first year of implementation (from 1.2 million tonnes in 2004/2005 to 2.6 million tonnes in 2005/2006), reaching a record production level of 3.7 million tonnes during 2011/2012.*

Important reforms of the FISP have been implemented since 2015/16 and these enabled Malawi to reduce the FISP budget by almost half, which allowed the government to reallocate these resources to other sectoral investments.

Nevertheless, the total cost of the programme increased nominally until 2016, mainly driven by the devaluation of the national currency and hyperinflation starting in 2012. These factors raised the cost of inputs, which are almost all imported. In 2017, FISP spending declined to 27 percent of food and agricultural spending, making room for increased maize procurement for food aid in order to address the humanitarian crisis caused by repeated weather shocks in 2015 and 2016. These cuts (approximately MK 31.2 billion, or USD 42.6 million) also enabled a reallocation that resulted in increased expenditure on public goods, such as irrigation and agricultural research (see Figure 27).

FIGURE 27 COMPOSITION OF EXPENDITURE ON FOOD AND AGRICULTURE IN MALAWI



Source: Authors' calculations based on MAFAP database (2020 version).



▶▶ **BOX 7 (CONT.) REFORMING THE FARM INPUT SUBSIDY PROGRAMME IN MALAWI: BETTER EFFICIENCY AND SHIFTING EXPENDITURE**

Cost-cutting efficiency measures

To tackle the crisis and the fiscal constraints caused by the rising cost of imports and interest on debt repayment, the government has demonstrated its determination to rationalize public spending. Efficiency-enhancing reforms of the FISP have included fixed prices for delivering subsidized fertilizers, increased farmer contribution and, most importantly, the involvement of the private sector in importing and selling subsidized fertilizers (Chirwa *et al.*, 2016). The latter seems to have contributed significantly to reducing programme costs, especially during the 2016/17 season. Even if some challenges persist in FISP implementation, particularly on beneficiary targeting,** the reforms seem to have created space for increased spending on irrigation, agricultural research and technology transfer, as well as social protection measures (e.g. cash for work/food programmes), which are more aligned with the objective of enhancing the resilience of the agricultural sector.

NOTES

* These studies are summarized in Schiesari *et al.*, 2017.

** According to Chirwa *et al.*, 2016, non-poor farmers were as likely to receive coupons as poor farmers and the proportion of repeat beneficiaries was about 40 percent. Other authors report that 'inefficient' farmers kept receiving vouchers without visible impact on their productivity, thus reducing the cost-effectiveness of the programme (Asfaw *et al.*, 2017).

BOX 8 INPUT SUBSIDY PHASE-OUT AND SMALLHOLDERS' ACCESS TO INPUTS IN THE UNITED REPUBLIC OF TANZANIA

From 2008 to 2013 the Government of the United Republic of Tanzania assisted smallholder farmers in acquiring seed and fertilizer at reduced cost through its National Agricultural Input Voucher Scheme (NAIVS). The objective of NAIVS was to increase the adoption of modern inputs to raise productivity and improve food security in the wake of the 2007/2008 food price crisis. With the financial support of external donors, this programme subsidized half the cost of enough seed and fertilizer inputs to cultivate 0.4 hectares of maize or rice.

Over the years, the number of beneficiaries ranged from 700 000 in 2008/09 to over two million in 2010/11 and, by 2011/2012, 130 of the United Republic of Tanzania's 152 districts were covered by the scheme. Input subsidies, driven by NAIVS, grew to become the Ministry of Agriculture, Livestock and Fisheries' (MALF) largest expenditure item, totalling over 50 percent of its budget in 2011/2012 (see Figure 28).

Pioneering scheme

In contrast to other large-scale subsidy programmes in the region, the NAIVS has been commended for targeting farmers with limited experience in using modern inputs but with the capacity to apply those well and the willingness to co-finance the purchase. It also served to strengthen the agro-dealer network since subsidy vouchers were redeemed through commercial suppliers.



▶▶ BOX 8 (CONT.) INPUT SUBSIDY PHASE-OUT AND SMALLHOLDERS' ACCESS TO INPUTS IN THE UNITED REPUBLIC OF TANZANIA

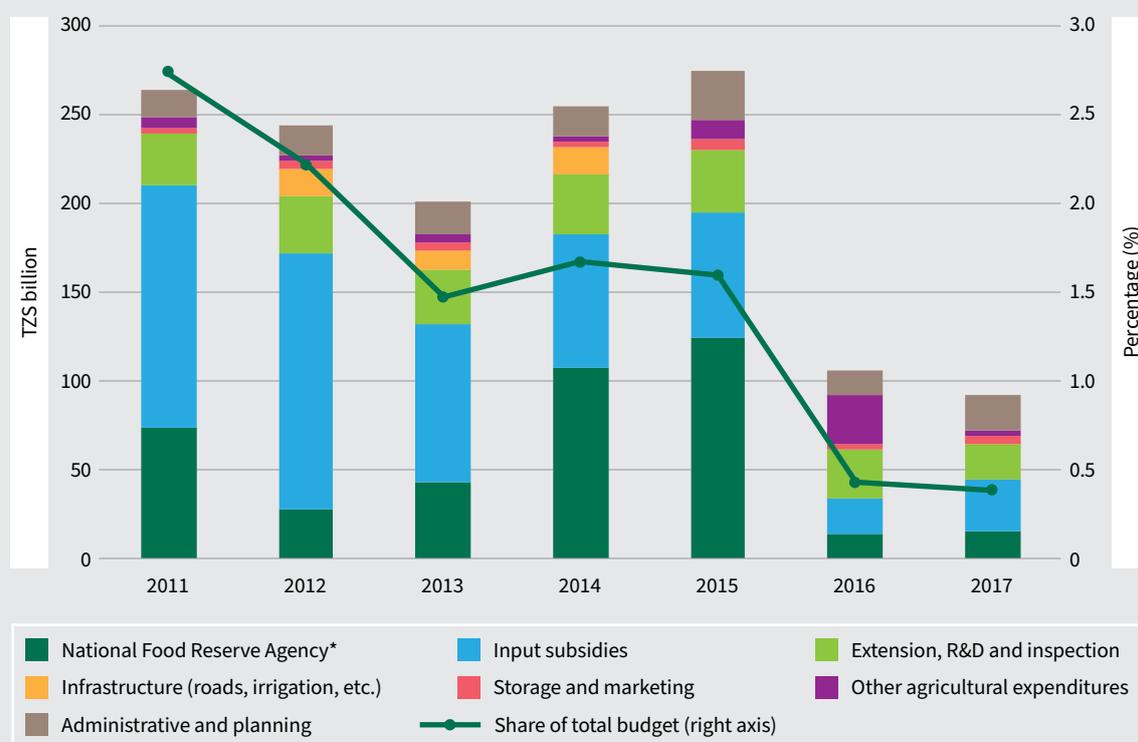
However, only around one-third of beneficiaries continued to purchase fertilizer inputs after leaving the NAIVS, thus raising question about the sustainability of input adoption gains after transition to a market-based system. The programme has also faced multiple implementation and logistical challenges, with delays affecting the issuance of vouchers, the delivery of inputs and the payment of fertilizer and seed suppliers.

Fiscal allocations to the MALF also gradually declined, from around 10 percent of the general budget in 2007/08 to seven percent by 2013/14. The termination of external funding with the official closure of NAIVS in 2014 limited the government's ability to extend the programme.

MAFAP support

In this context, the Government of the United Republic of Tanzania asked the MAFAP programme to identify policy options that would reduce the cost of inputs for smallholder farmers, with a focus on inorganic fertilizers. In collaboration with MALF, MAFAP assessed relevant evidence-based policy options to reduce fertilizer price at farm-gate (Cameron *et al.*, 2017). Achieving this objective will require in the short and medium term, improving fertilizer procurement, eliminating bottlenecks at port entry points, streamlining taxes and charges, and improving domestic storage and transport infrastructure.

FIGURE 28 COMPOSITION OF EXPENDITURE OF THE MINISTRY OF AGRICULTURE, LIVESTOCK AND FISHERIES OF THE UNITED REPUBLIC OF TANZANIA



Note: * includes food aid, output price support and storage expenditure.

Source: Authors' calculations, based on MAFAP database (September 2018 version).

4.3 Consumer support: food and cash transfers programmes



**INCREASING
EXPENDITURE
TREND**

Consumer-specific transfers include expenditures on social safety net programmes such as cash transfers, food aid and school meals. These interventions can have positive effects on other outcomes, including agricultural performance, since they have the potential to alleviate production constraints. According to a comprehensive review of over 200 studies, cash transfer programmes are associated with increases in total household food expenditure, improved nutritional outcomes as well as decreases in poverty rates (Bastagli *et al.*, 2016).

Cash transfers have also been shown to have positive impacts on the purchase and/or use of agricultural inputs, on harvest values and ownership of livestock assets, and, in some cases, the accumulation of agricultural capital (Bastagli *et al.*, 2016; Daidone *et al.*, 2019). In addition, in some contexts, cash transfers have also been found to lead to a decrease in wage labour participation and a re-allocation of labour towards farm labour, which could lead to increased production (Daidone *et al.*, 2019).

The amount of government spending for the benefit of consumers has recently increased. In some countries, this has been to the detriment of producers, who have received less support under existing budget constraints. Cash transfers, food aid and school meal programmes have expanded more in East African countries, such as in Ethiopia, Kenya, Mozambique and the United Republic of Tanzania.

In the countries in our report, consumer transfers, on average, accounted for 9 percent of the total food and agricultural expenditures during the period.²² As can be seen in Figure 29, countries where these transfers are particularly evident include Ethiopia (30 percent), Burundi, Mozambique, the United Republic of Tanzania (all about 15 percent on average) and Kenya (about 10 percent).

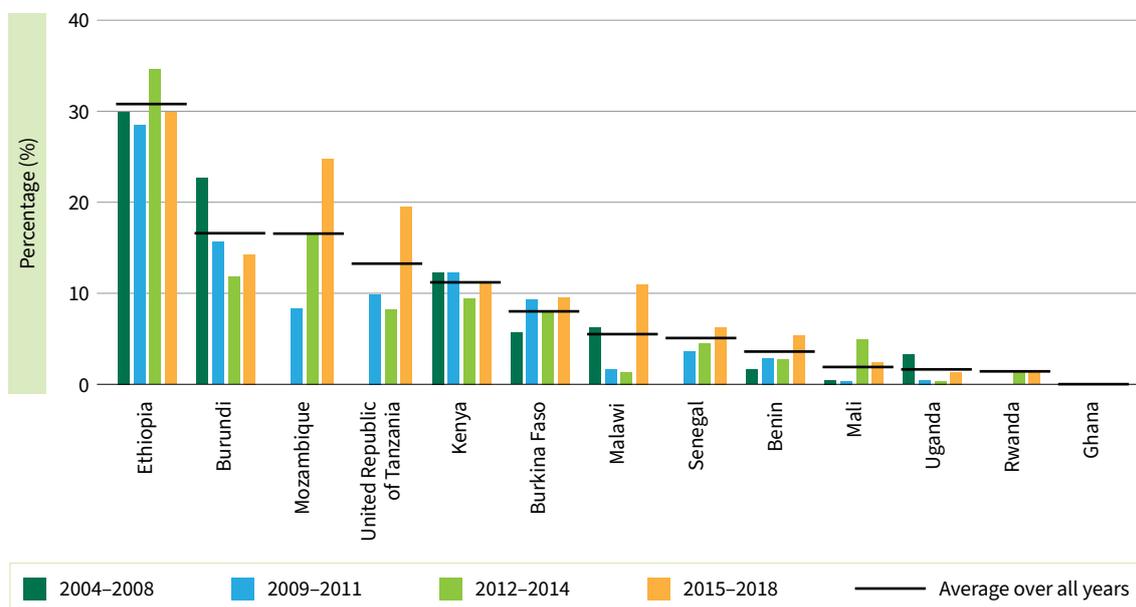
Our analysis also indicates a shift of allocations from producer support to consumer-oriented safety nets. This trend is more pronounced in Eastern and Southern Africa, in countries like Ethiopia, Mozambique and the United Republic of Tanzania (see Figure 30). In Mozambique, this shift started in 2007 with a law that set the framework for social protection, followed by the National Basic Social Protection Strategy in 2010 (Falange and Pellerano, 2016). This new policy direction led to a large increase in the number and coverage of social protection systems in Mozambique with the aim of lowering poverty levels.²³

In Box 9, we review the Productive Safety Net Programme (PSNP) in Ethiopia, which has had an explicit focus on agricultural productivity since its start, including components related to irrigation infrastructure as well as to soil and water conservation technologies.

In Kenya, consumer transfers have been on the rise since 2015. Since the start of fiscal decentralization in 2013, food aid expenditures have been decentralized at the county level, and cash transfer programmes have increasingly been employed to support the poorest and most vulnerable households. For example, the main cash transfer programme, the Cash Transfer for Orphans and Vulnerable Children Programme, established in 2004, was expanded in 2014/15 to reach a wider range of vulnerable households.

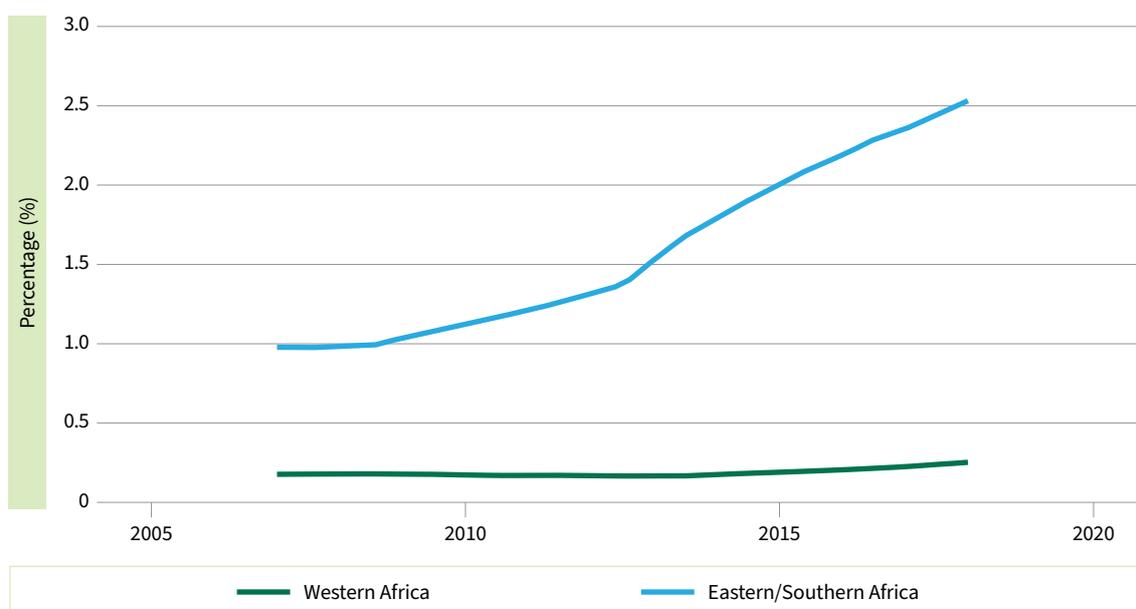
²² This is an underestimation, since for some countries (e.g. Burkina Faso or Rwanda) data on cash transfers to consumers are partial (not all programmes are captured in the raw data) or inconsistent across years (Malawi). In some cases, the data was not available, in others social transfers switched off budget (i.e. public expenditures not included in the government budget) in some years and could not be captured.

²³ The number of families benefiting from social security programmes increased from 254 000 to 427 000 between 2010–2014 and the real expenditures allocated to the main social protections scheme (*Programa de Subsídio Social Básico*) tripled within the period (Falange and Pellerano, 2016).

FIGURE 29 SHARE OF CONSUMER TRANSFERS OVER TOTAL EXPENDITURE ON FOOD AND AGRICULTURE

Notes: At least in the cases of Malawi, Mali, Rwanda and Uganda, the share devoted to consumer expenditures is likely to represent an underestimate, as data from certain ministries (Rwanda), for donor expenditure (Uganda) and for some large projects (Malawi and Mali) were not available for some years. For assumptions on these indicators see Table A3 in Annex 2.

Source: Authors' calculations based on MAFAP database (2020 version).

FIGURE 30 SHARE OF EXPENDITURE ON CONSUMERS OVER PRODUCER-SPECIFIC TRANSFERS

Notes: Western Africa includes Benin, Burkina Faso, Ghana and Mali, while Eastern and Southern Africa includes Burundi, Ethiopia, Kenya, Malawi, Mozambique, Rwanda, Uganda and the United Republic of Tanzania. For assumptions on these indicators see Table A3 in Annex 2.

Source: Authors' calculations based on MAFAP database (2020 version).

BOX 9 PRODUCTIVE SAFETY NET PROGRAMME IN ETHIOPIA: CONNECTING SOCIAL PROTECTION AND AGRICULTURAL DEVELOPMENT

MAFAP data shows that food and agricultural transfers targeting consumers in Ethiopia was, on average, 7 percent of total government expenditure, and 33 percent of expenditures on food and agriculture during 2007–2017.

These transfers are mainly carried out through the Productive Safety Net Program (PSNP), considered the second largest safety net programme in Africa (after South Africa) and among the largest in the world (Cochran and Tamiru, 2016).

Since its inception in 2005, with the objective of achieving sustainable food security for chronic and transitory food insecure households in rural Ethiopia, the PSNP has provided timely and predictable food and cash transfers to smooth consumption over the lean season, thereby preventing the distress sale of assets. A combination of food and cash is provided, often in return for labour on public works programmes. These are usually labour-intensive projects, such as road rehabilitation, soil conservation, and reforestation, which benefit the community in terms of improved soil fertility and land productivity, access to market infrastructure, drinking water and irrigation structures, education and health centres (Reach Project, 2019). Roughly 20 percent of households that benefit from the PSNP are unable to supply labour and thus receive an unconditional transfer known as direct support (FAO, 2014).

Social, agricultural and rural development safety net

While the PSNP is a social safety net scheme, it also encompasses agriculture and rural development. Through the Household Asset Building Program (HABP), PSNP beneficiaries are provided with employment so that they can attain sustainable food security and ‘graduate’ from the programme. These complementary interventions include microcredit for agricultural inputs, and technical support for productive investments in irrigation, terracing, and livestock fattening. The PSNP is implemented by the Ministry of Agriculture and usually equals over half of the Ministry’s budget.

Scaling up

The PSNP has been strongly supported by donors since its launch, and the government however is gradually increasing its contribution. It has demonstrated the benefits and long-term cost savings of a wide, predictable and sustained safety net scheme that enhances the population’s resilience to shocks, rather than relying on ad hoc humanitarian and emergency responses (Endale *et al.*, 2019). In light of this success, social protection schemes in Ethiopia are being scaled up to include more beneficiaries with diverse needs. Since 2017, the PSNP started to include urban households among its beneficiaries (Endale *et al.*, 2019). The programme’s budget also increased in 2015/16 in response to the worst drought in decades, which affected nearly 10 million Ethiopians (Endale *et al.*, 2019).

4.4 Research, knowledge dissemination and extension services

Agricultural research expenditures are found to have the largest effect on agricultural growth and poverty reduction, especially in the long run (Goyal and Nash, 2017; Mogues *et al.*, 2012).²⁴ Nevertheless, governments in Africa have been regularly underinvesting in agricultural R&D programmes for a number of reasons.²⁵

First, policymakers may be hesitant to increase research expenditures, since the effects and benefits of these investments take a long time to materialize. Second, a lengthy delay between expenditure and results runs a higher risk of making the expenditure less viable, if in the meantime, for example, the same technology is developed elsewhere and could be simply copied or adapted. Finally, politicians may be less proactive in promoting spending on R&D as they are less subject to pressure from specific interest groups, given that the long-term benefits of such expenditures are non-excludable (Mogues, 2012).

Across countries, the level of expenditure allocated to agricultural R&D and knowledge dissemination varies considerably, although it is still an underinvested area. Despite countries spending on average 18 percent of their budgets on R&D, all 13 countries under this study failed to reach the African Union target of 1 percent of their agriculture GDP – the so-called Khartoum target. Uganda, with 0.7 percent, is the closest country to meeting the target, with most other countries tallying around or below 0.6 percent (see Figure 31).²⁶

The trend varies across countries, but Uganda, Kenya and Benin stand out with the larger share of spending on these areas: over 50, 23 and 22 percent of food and agricultural budget, respectively (see Figure 32). However, more recently, these expenditures have seen a decline in the aforementioned countries and others in our sample (see Figure 32).

In Uganda, R&D and extension services were two of the main pillars of the Plan for Modernization of Agriculture (PMA), a major policy programme launched in 2001 and designed to address the factors undermining agricultural productivity. As such, they have been considered fundamental tools for the achievement of key policy goals, such as the transformation of the agricultural sector and the reduction of poverty and have attracted a significant share of public spending. The decrease in allocations since 2014 (see Figure 32) is due to the restructuring of extension services, as discussed in Box 10.

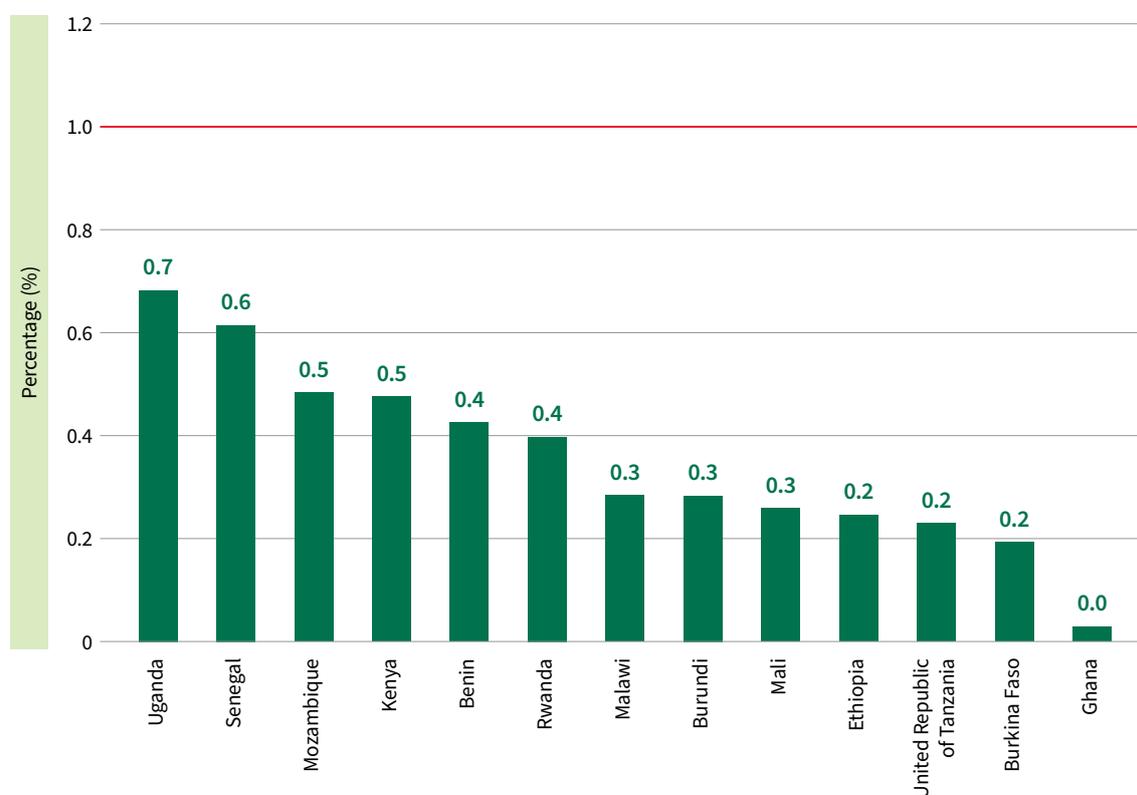


²⁴ It should be noted that even if recent studies found that the rates of return to R&D investments were overestimated in the past (see Hurley *et al.*, 2014; Nin-Pratt and Magalhaes, 2018, for example), these rates remain positive, large and significant.

²⁵ Like Goyal and Nash (2017), who found a declining trend in the funding of agricultural research institutions and programmes across the continent for the period 2000–2011, Lynam *et al.* (2016) used ASTI (Agriculture Science and Technology Indicators) data to find a similar trend for a longer period (1970–2011) in SSA countries, namely a significant decline of spending per agricultural researcher over the analysed period. During the 2000s, average spending on the national agricultural research systems, as a share of agricultural GDP, was well below the African Union target of allocating 1 percent of the agricultural GDP to agricultural R&D expenditure.

²⁶ These results differ in some cases from those of recent research by Mink (2016) and Stads (2016), who argue that countries like Kenya and Malawi are complying with said 1 percent target. These studies rely on different data sources (e.g. ASTI and the World Bank's Agriculture Public Expenditure Reviews), which use a broader definition of agricultural research expenditures and includes expenditures on university research and advisory services that are excluded in the MAFAP definition. If we were to adopt a less conservative definition of agricultural research spending (thus including certain extension and technology transfer activities), more countries in our analysis would have reached the target, but this by no means would still indicate that the performance in terms of agricultural research expenditures is satisfactory and that there are no important gaps to bridge in this regard.

FIGURE 31 SHARE OF AGRICULTURAL R&D EXPENDITURE ON AGRICULTURAL GDP BY COUNTRY (AVERAGE 2004–2018)

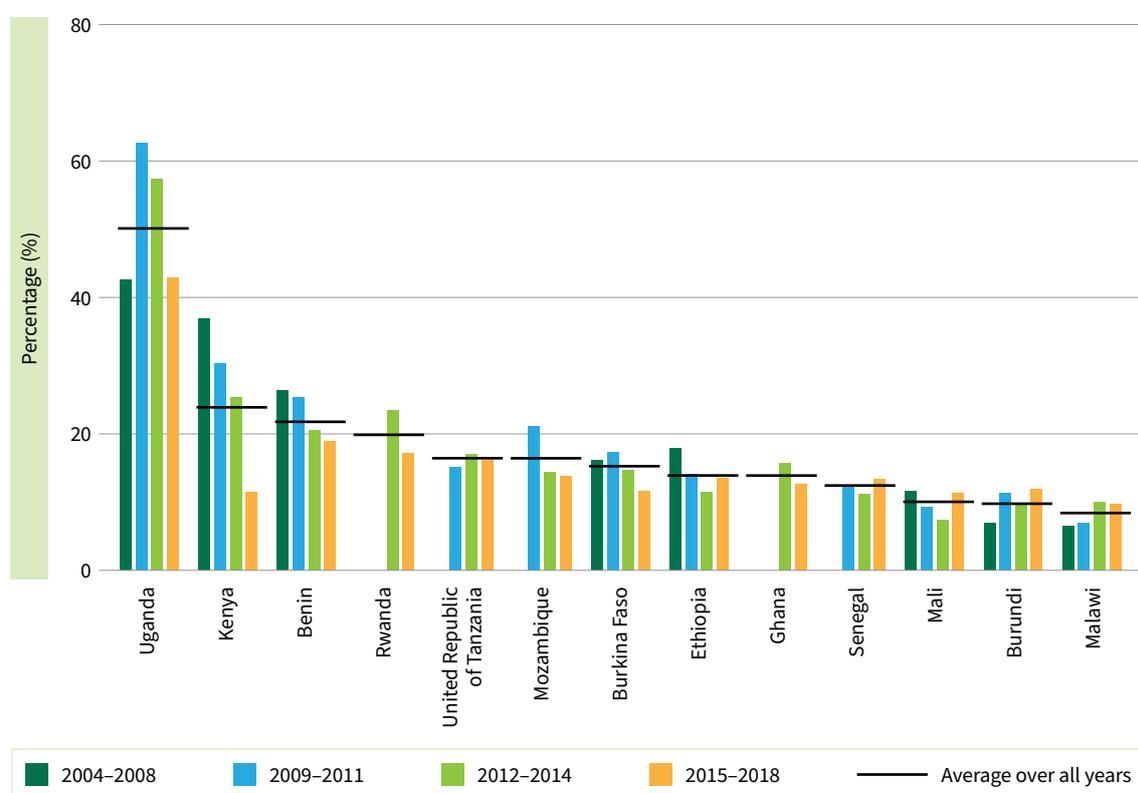


Source: Authors' calculations based on MAFAP database (2020 version) and World Bank World Development Indicators.

In **Kenya**, the largest share of the funds allocated to R&D and knowledge dissemination since 2013 have been delivered to the counties. In this context, the Kenya Agriculture Research Institute, the main national institution in charge of agriculture research in the past, was merged with other research foundations (for coffee, tea and sugar), becoming the Kenya Agriculture and Livestock Research Organization. As a result of this restructuring, and with the relocation of the commodity tax revenues to non-research-related activities, expenditures on R&D have declined in the country.

In **Benin**, agricultural extension services are a focus of the agricultural strategic development plan. The creation of the Centres for Agricultural Development (*Pôles de développement agricoles*) in 2017 and the adoption of the National Programme for the Agricultural Research (PNRA), with its specific plan of investment, envisaged important reforms in the delivery of extension services. However, delays in the adoption and implementation of these new systems led to a lower rate of execution of funds in 2018. This explains the declining trend of knowledge dissemination expenditure visible in the last period under analysis, 2015–2018 (see Figure 32).

Malawi is the only country where these expenditures have increased consistently, in particular since 2016 (see Figure 32). Most transfers take place under the Shire River Basin Management Project, which has an important extension and technology transfer component. It is possible that the increased expenditure in R&D and knowledge dissemination were made possible due to cuts and savings from the reforms in the input subsidy programme.

FIGURE 32 SHARE OF EXPENDITURE ON AGRICULTURAL R&D AND EXTENSION OVER TOTAL EXPENDITURE ON FOOD AND AGRICULTURE

Source: Authors' calculations based on MAFAP database (2020 version).

BOX 10 AGRICULTURAL EXTENSION SERVICES IN UGANDA AND THE ROLE OF THE NATIONAL AGRICULTURAL ADVISORY SERVICES

In Uganda, agricultural extension services are a fundamental tool for promoting rural development and agricultural transformation. Before 2014, agriculture extension services fell under the National Agricultural Advisory Services (NAADS), a semi-governmental authority under the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF). NAADS was established in 2001 to address inefficiencies in the agricultural extension system and facilitate effective delivery of agricultural advisory services (ESAFF, 2016).

NAADS promotes private-public partnerships in districts by connecting farmer organizations to private firms that provide specialized advisory services according to farmers' priorities and needs (Benin *et al.*, 2011). Despite a positive start, the NAADS programme has faced several challenges, such as a weak relationship with the research institutions, lack of participation of farmer groups, inability to address adequately farmers' needs and related issues. This led farmers to rely directly on the private sector for the provision of extension services. Indeed, since the liberalization of the Ugandan economy in the late 1980s, private companies have played a prominent role in the agricultural sector and extension services.

▶▶ **BOX 10 (CONT.) AGRICULTURAL EXTENSION SERVICES IN UGANDA AND THE ROLE OF THE NATIONAL AGRICULTURAL ADVISORY SERVICES**

Fifty percent cut

In 2014, with the implementation of a presidential initiative called “Operation Wealth Creation” (OWC), the Government of Uganda transferred the mandate for public extension services coordination and delivery to the Directorate of Agricultural Extension Services of the MAAIF. The OWC foresaw the distribution of free inputs and services to farmers by members of Uganda’s armed forces rather than by extension agents and designated to the NAADS the role of input provider. Following the reorganization of the agricultural extension services system, between 2013/2014 and 2015/2016, the government increased allocations for input subsidies and cut extension services funding by almost 50 percent, according to our public expenditure analysis.

In 2016, the government adopted the National Agricultural Extension Policy prepared by the Directorate of Agricultural Extension Services (DAES) of the MAAIF, with the aim to revitalize extension services by strengthening both public and private sector delivery. Despite the shortcomings of the OWC, the internalization of agricultural advisory functions within the DAES has enhanced the effectiveness of extension services and attracted additional funds, tripling public allocation to extension services from 2015/16 to 2016/17.

MAFAP programme support

Within this framework, the MAFAP programme and the International Food Policy Research Institute (IFPRI) joined forces to provide the MAAIF with evidence-based insights on the effect of combining input subsidies strategies with agricultural extension services on Ugandan agricultural productivity.

The study found that the Ugandan extension services system still faces several challenges, such as coordination with the private sector, monitoring and evaluation of extension agents and the design of crop-specific extension activities. Addressing these issues could further improve the delivery of extension services as a valuable tool for promoting long-term and sustainable agricultural growth.

4.5 Irrigation infrastructure

There is general consensus that investments in irrigation have a positive impact on agricultural productivity, which increases when they are implemented together with complementary measures such as input subsidies (Xiao *et al.*, 2010; Zhang and Fan, 2001; Mogues *et al.*, 2012; Lopez and Salazar, 2017).

Irrigation investment costs (average unit cost per hectare) are much higher in SSA than in other developing regions, which may have created some reluctance to invest additional resources in irrigation in the region (FAO, 1986; Brown and Nooter, 1992; Jones, 1995).

However, when accounting for key factors such as project size, rainfall, per capita income, beyond simple regional averages, it appears that costs in SSA are not significantly different to those of other regions (Inocencio, 2007). It is therefore important to identify cost-effective irrigation expenditure that are tailored to individual country characteristics. This is particularly relevant in view of the CAADP goals for agricultural development.



**INCREASING
EXPENDITURE
TREND**

For off-farm irrigation infrastructure in Eastern and Southern Africa, the portion of expenditure allocated to off-farm irrigation infrastructure in Eastern and Southern Africa has increased at an annual rate of 12 percent during 2004–2018, a greater pace than in Western Africa. In Western African countries, where there is the highest potential for irrigation expansion, funding for such would be essential for agricultural growth.

While additional potential productivity gains in rainfed agriculture can still be achieved (FAO, 2020) and should be pursued, an overreliance on rainfed agriculture remains a key restriction to productivity in SSA. Without a reliable water supply, high-yield crop varieties are unable to achieve their full production potential. Currently, only 4 to 6 percent of cultivated land in SSA is irrigated, despite the availability of enough water to cover larger areas (Wiggins and Lankford, 2019). This makes expenditure on irrigation a critical priority for the region.

Many of the countries in our study have spent an increasing proportion of their food and agricultural budgets on irrigation infrastructure. In Mali and Rwanda, irrigation expenditures accounted, on average, for more than 20 percent of the budget on food and agriculture over the period under study (see Figure 33).

In **Malawi**, the share has doubled since 2009, driven mainly by a large programme aimed at improving land and water management through the construction of dams and irrigation and community flood protection structures such as the Shire River Basin Management.

Strong policy focus on irrigation

In **Rwanda**, agricultural infrastructure (aggregate of feeder roads and off-farm irrigation) was the largest spending category during 2012–2018. This mainly comprised spending on irrigation (30 percent on average). In 2015, one-third of the public budget allocated to the food and agricultural sector was invested in building and maintaining irrigation systems. Small-scale irrigation projects (mainly funded by the Buffett Foundation) have accounted for a large proportion of recent spending, while large irrigation schemes, made through a variety of initiatives, were dominant in an earlier period.²⁷

Off-farm irrigation accounts for 27 percent of food and agricultural expenditure on average (2005–2017) in **Mali**, although this figure has been declining in recent years. Mali is among the countries most vulnerable to climate change since around 95 percent of its agriculture is rainfed (USAID, 2018). The government has a strong policy focus on irrigation and, over the past few years, has adopted institutional measures to secure food production and mitigate the adverse effects of climate change.²⁸

In **Ethiopia**, irrigation expenditure accounted for about 15 percent of total expenditure on food and agriculture and showed an increasing trend. Most of these investments are for the construction of new dams, primarily targeting sugarcane cultivation. The government undertook some institutional innovations to improve governance, such as the establishment of the Agricultural Transformation Agency, which is responsible for water resource mapping, and the Irrigation Development Policy, which was led and coordinated by the Ministry of Water, Irrigation and Electricity (Panel, 2018). Governance structure, especially for the management of large-scale projects, is a key factor determining the impacts and the efficiency of irrigation spending (Inocencio, 2007; Mogues, 2012).

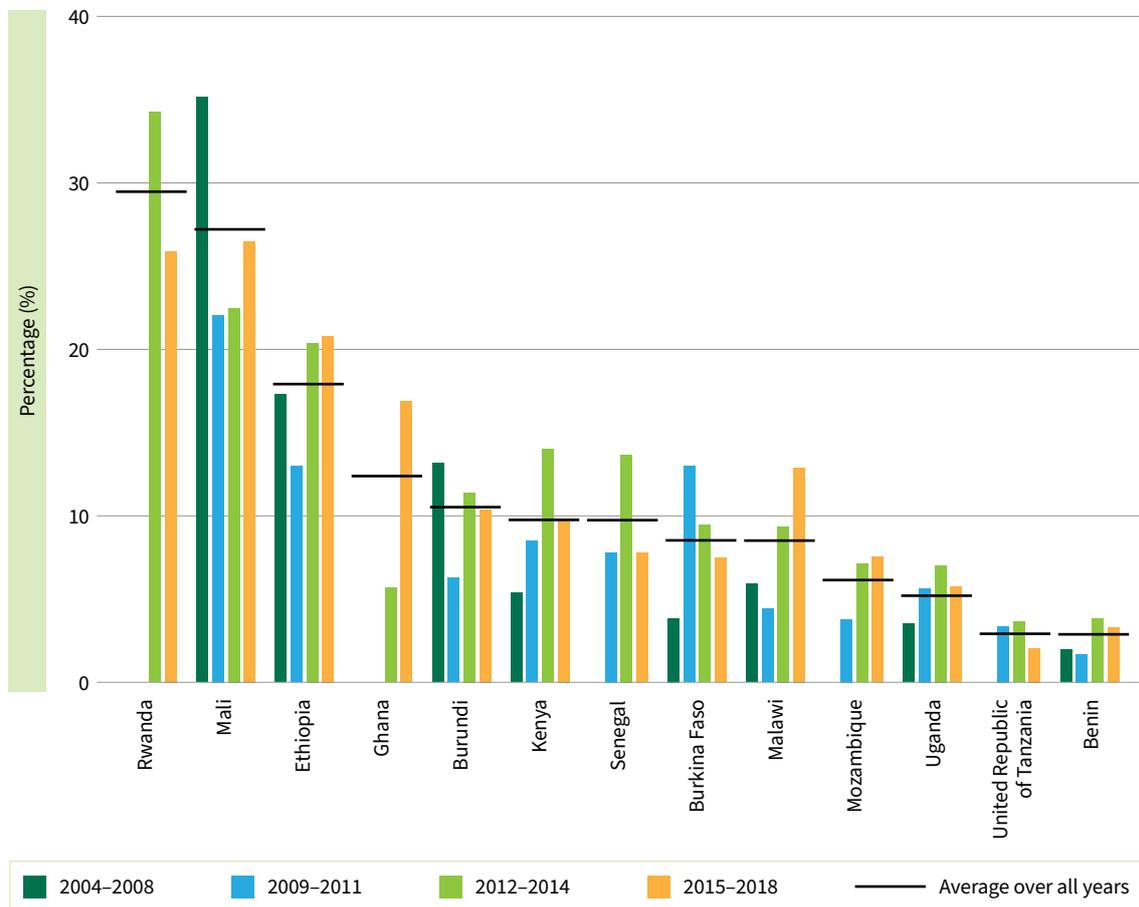
²⁷ The major large schemes were the Kirehe Community-based Watershed Management Project (2009–16), the Rural Sector Support Project (2012–2018) and the Land Husbandry, Water Harvesting and Hillside Irrigation Project (2010–present).

²⁸ Some flagship projects include a programme (2007–2012) to develop over 100 000 hectares of irrigated land and a project on strengthening food security through the development of irrigated cultivations (2016), among others. Since 2012, the government has adopted the National Program of Irrigation of Proximity (PNIP) in Delta Intérieur du Niger, Koulikoro, Pays Dogon and Sikasso to improve overall food security in these regions (Panel, 2018).

New potential for Western Africa

According to a recent study, the potential for irrigation expansion is greatest in Western Africa, which accounts for about 50 percent of the potential in dryland areas in sub-Saharan Africa, followed by Eastern and Southern Africa, each with more than 20 percent of total potential (Xie *et al.*, 2018). Our indicators suggest that the share of irrigation expenditures in Eastern and Southern Africa increased at a faster pace during the study period, while it remained steady in Western Africa and began to decline starting in 2015. A possible reason for this could be a shift from the construction of irrigation systems, which occurred some time ago in the Sahel, to rehabilitation interventions, which involve lower costs. At the same time, numerous new large-scale irrigation projects have kicked off in the last decade in Ethiopia, Kenya, Malawi and Mozambique.²⁹

FIGURE 33 SHARE OF IRRIGATION INFRASTRUCTURE EXPENDITURE OVER TOTAL EXPENDITURE ON FOOD AND AGRICULTURE



Source: Authors' calculations based on MAFAP database (2020 version).

²⁹ Examples are the construction of the Massingir dam in Mozambique and the Zarema Maydam Dam in Tigray in Ethiopia, as well as the Water Conservation and Dam Construction project in Kenya and the Shire River Basin Management in Malawi.

4.6 Expenditure on forestry, land management and environment protection

Expenditure on forestry, land management and environment (FLE) accounts for less than 0.5 percent of total public spending. Nevertheless, these expenditures are growing in size as countries sign more national and international commitments to increase the sustainability of agriculture.

Expenses on FLE accounted for more than 10 percent of public expenditures for food and agriculture in only four of the countries studied: Burkina Faso, Burundi, Ghana and Kenya (see Table A4 in Annex 3 for detailed data).³⁰

However, as shown in Figure 34, the share of food and agricultural budgets devoted to FLE programmes and projects has increased in about half of the countries studied, mostly in Eastern and Southern Africa, indicating a shift towards natural resources preservation, resilience and protection.

Such an emerging shift could be associated with the challenges facing land degradation, deforestation and climate change, which are particularly pronounced in Africa. Indeed, the increase in FLE expenditures in some countries is in fact an encouraging sign. Land degradation affects 65 per cent of Africa's land area, and every year the continent loses about 3 million hectares of forest (NEPAD *et al.*, 2015). Deforestation is mainly caused by the conversion of forest land to agriculture.

Africa, climate change and agriculture

Africa is extremely vulnerable to climate change due to its high dependence on natural resources and limited adaptation capacity (Leal Filho *et al.*, 2015). Without extensive adaptation and mitigation policies, the combined effects of natural resource degradation and climate change could hamper the agricultural growth that is needed to feed the continent's rapidly growing population.

In response, African governments have committed to a sustainable pathway towards agricultural transformation that invests in, maintains, and sustains the ecological infrastructure on which agriculture and livelihoods depend.³¹ The increases in FLE expenditures described above could reflect national and international commitments to achieving agricultural development more sustainably.

Ethiopia, Ghana, Kenya, Malawi, Uganda and the United Republic of Tanzania, and are all part of the African Forest Landscape Restoration Initiative and have pledged to restore millions of hectares of forest land under the initiative. In addition, land management and forestry concerns



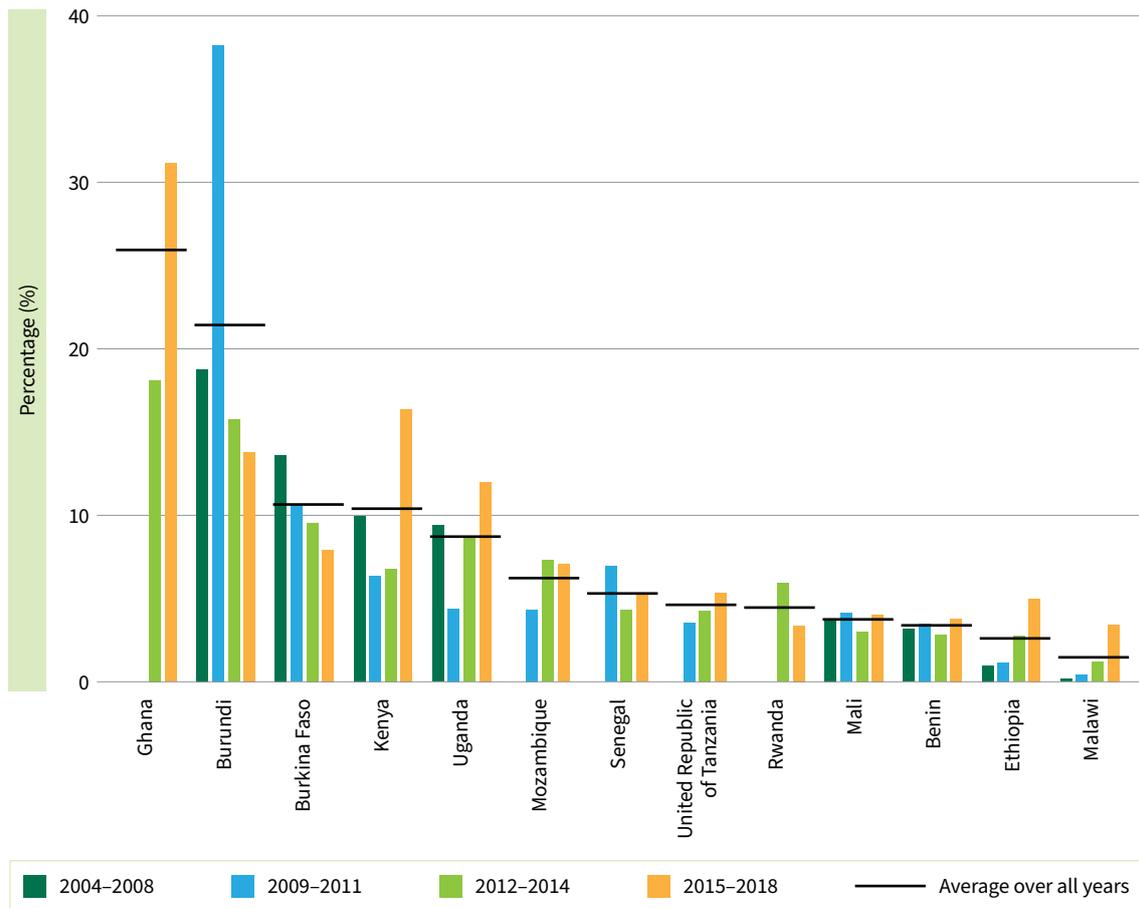
³⁰ These data have two main limitations. First, FLE expenditures were computed from direct support to the food and agriculture sector, which includes expenditures from the ministries of agriculture, livestock, fisheries, forestry, environment, and other agriculture-specific projects. Expenditures focusing purely on natural parks or other environmental transfers unrelated to the agricultural sector are excluded. Second, there is only partial information on donor expenditures in Burundi (2011 and 2013), Kenya (2007–2018) and Mali (2012 and 2017). There was no data on public expenditures carried out by the Ministry of Environment in Rwanda.

³¹ For example, through the Africa Union Agenda 2063 (available at <https://au.int/agenda2063/overview>), the continental blueprint and master plan for transforming Africa into the global powerhouse of the future, and the Conference of the Parties (COP21) in Paris, where African countries committed to combatting climate change by reducing greenhouse gas emissions and enhancing adaptation in order to limit temperature increases to 1.5 °C. In this regard, the African Union in 2015 launched the African Forest Landscape Restoration Initiative (AFR100) in which 28 African countries have committed to bring 113 million hectares of land into restoration by 2030. Other commitments include the 2020 and 2030 Bonn Challenges to restore degraded lands and the 2020 Aichi Biodiversity Target to save biodiversity, among others.

featured prominently in either the national agriculture strategies and/or plans in most of these countries.³²

In Burkina Faso, Burundi, and Rwanda (see Figure 34), the decrease in the share of FLE expenditures appears to be mostly due to the end of large projects. In Burundi, two major land management projects (*Projet Aménagement des Terres and Programme de Réhabilitation Agricole et de Gestion Durable des Terres*) ended in 2014. The latter two accounted for about 48 percent of FLE expenditures.³³

FIGURE 34 SHARE OF EXPENDITURE ON FOREST, LAND MANAGEMENT AND ENVIRONMENT OVER TOTAL EXPENDITURE ON FOOD AND AGRICULTURE



Note: Senegal 2018 omitted.

Source: Authors' calculations based on MAFAP database (2020 version).

³² FLE expenditure in Malawi increased by over 500 percent between 2012 and 2018, including major investments in rehabilitating forest plantations and land management research. The restoration of degraded land and protection of forest resources are central to Ethiopia's Climate Resilient Green Economy (CRGE) Strategy launched in 2011. In the United Republic of Tanzania, FLE spending decreased as a share of public spending but increased as a share of agriculture-specific expenditure. During 2011–2017, the country adopted several policies to enhance the sustainable management of natural resources in agriculture, including the Agricultural Environment Action Plan (2011–2017) to address land degradation as a result of deforestation and livestock overgrazing, the Revised National Forest Policy (2012) to foster sustainable forest land management and ecosystem conservation, and the Agricultural Climate Resilient Plan (2014–2019), among others.

³³ However, it should be noted that there is only partial information on donor expenditure in Burundi in 2011 and 2013, which could partly explain the decrease of FLE expenditure.

Scaling up funding for forestry land management and environment

As climate change increases its impacts on the continent, it will be vital to scale up financing for FLE in order to enhance the transition towards sustainable use of natural resources and climate change adaptation and mitigation.

FLE expenditures are mostly financed by national government funds and this trend is increasing. This trend indicates that the protection of natural resources and climate change adaptation measures are becoming increasingly relevant for national governments. FLE expenditures are largely donor-funded in only three countries: Burundi (86 percent), Benin (74 percent) and Burkina Faso (63 percent). The end of large projects significantly reduces FLE expenditures (see Table A4 in Annex 3). It is clear that when critical expenditures are mainly donor-funded, the sustainability of national climate change expenditure could suffer from low execution rates as well as higher unpredictability.

4.7 Food for thought: chapter takeaways

Delving deeper into the composition public expenditure helps governments to identify spending trends and determine how well (or not) expenditures are performing. From this chapter, the following are key takeaways:

- For many years, the question of whether producer transfers and input subsidies are a good use of public funds has been a bone of contention in the wider agricultural expenditure debate. Our analysis revealed that although these funds account for over one-quarter of total spending, some countries seem to have downsized input subsidies programmes more recently. In some cases, there seems to be a shift towards consumer transfers. These can help the poorest to afford food but need to be coupled with solid investments in infrastructure and R&D to make food more accessible.
- Our study found that infrastructure accounted for 16 percent of agricultural budgets across the 13 SSA countries. Out of all the categories, donors are more likely to fund infrastructure projects, for example, feeder roads and off-farm irrigation. This is a potential risk in several respects as it could reduce the incentives to invest national resources on infrastructure development, and donor-funded projects are likely to be affected by future changes in donor priorities.
- On average, 18 percent of the total food and agricultural expenditure was allocated to extension and R&D and represented the second largest category of food and agriculture spending. However, overall, there is a slight negative trend across the analysed countries, which is worrying given that research suggests that expenditures on agricultural R&D tend to have high returns per dollar spent.
- While government spending on forestry, land management and environmental protection accounted for a relatively small fraction of total food and agricultural expenditures, there is a clear upward trend in this category across the SSA countries analysed. These expenditures are likely to become increasingly important as the effects of climate change, land degradation and unsustainable practices of natural resources take their toll and resources are needed tackle these modern-day realities.

The ‘right’ investments in agriculture are essential to achieve SDG 2 on Zero Hunger, food security and improved nutrition and promote sustainable agriculture. Specifically, Target 2.a calls for more rural infrastructure and research and extension services, as a means to end hunger.

Regularly monitoring the composition of public expenditure on food and agriculture would allow governments to track and potentially redirect their spending to goods and services that would have the highest positive impact on the sector development and food security.



5 Analysing technical efficiency in public expenditure on food and agriculture in sub-Saharan Africa

- There is substantial room for improvement in the performance of the agricultural sector in the 13 SSA countries analysed in this report. They score an average of 0.33 in terms of the technical efficiency, Rwanda having the highest score (0.48) and, therefore, the highest technical efficiency on a scale 0 to 1, with 1 being the most efficient.
- Overall, there is a positive relationship between public expenditure and technical efficiency, but the results point to a possible ‘saturation point’, beyond which increases in expenditure then have a limited or even negative effect on agricultural efficiency.
- Correlation between technical efficiency scores and expenditure on food and agriculture depends largely on how well funds are allocated, which underscores the importance of the quality of spending.
- Higher spending on public goods, such as R&D and extension services, seem to influence positively agricultural efficiency, whereas the opposite holds true for expenditures on producer transfers (e.g. input subsidies).
- The correlation between input subsidies is particularly negative for countries at a higher stage of agricultural transformation, suggesting that spending a larger share of budgets on farm subsidies does not improve agricultural performance.
- On the other hand, the positive correlation between consumer transfers such as food aid and cash transfers and technical efficiency is higher in countries at lower stages of agricultural transformation.

In previous chapters, we analysed the trends in levels and compositions of public expenditures on food and agriculture in sub-Saharan Africa. Here, we go one step further to try to shed light on the link between the level and composition of public expenditure and the performance of the

agricultural sector. Specifically, we investigate the relationship between the allocation of public resources and the capacity of the sector to reach its potential as determined by the characteristics (land and labour) of a given country.

The purpose of this analysis is to deliver clear information to policymakers about how the sector performance could be improved through a better allocation of the available resources. To do so, we must determine whether the level and – more importantly – the composition of expenditure on food and agriculture are associated with higher technical efficiency.

To that end, we need to measure the capacity of a country to reach its maximum obtainable agricultural GDP per capita given its land endowment and its labour market characteristic using the following steps (see Box 11, for methodological details).

First, we calculate agricultural efficiency in all African countries for which data are available by combining data from two expenditure data sources: the MAFAP programme and the Regional Strategic Analysis and Knowledge Support System (ReSAKSS) platform. The latter is the primary platform for tracking CAADP progress and compiles data for countries where the MAFAP programme does not operate.

Second, we look at the relationship between efficiency and per capita expenditure on food and agriculture. In simple terms, we look at whether countries that spend more tend to have higher levels of technical efficiency.

Third, we use the group of sub-Saharan African countries in the MAFAP programme to analyse how the shares of spending devoted to certain types of expenditure are associated with agricultural efficiency. Here, recognizing that the different expenditures have very different levels of cost-effectiveness, we assess whether certain types have a stronger correlation with technical efficiency scores. Moreover, since these relationships can be influenced by varying degrees of agricultural transformation in countries, we complete our analysis by showing how the relationship between the allocation of resources and efficiency differs, depending on the level of agricultural transformation achieved.

The method we use (i.e. efficiency analysis described in Box 11) is determined by the data we have available. Given data constraints, we were unable to use more robust quantitative tools, such as an econometric analysis. This prevents us from determining a causal link between public expenditure and agricultural efficiency. Nevertheless, the following analysis is a first step towards a more complete understanding of the relationship between the composition of spending and the performance of the sector.

BOX 11 MEASURING TECHNICAL EFFICIENCY USING DATA ENVELOPMENT ANALYSIS

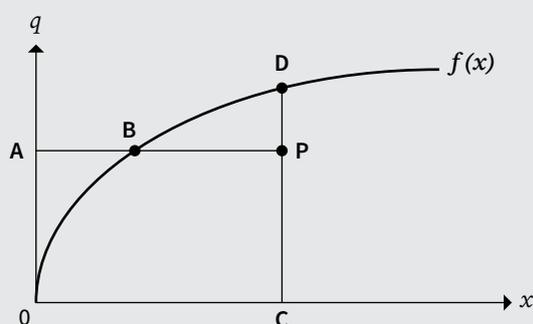
Data envelopment analysis (DEA) is a non-parametric statistical method used to measure relative efficiency. Together with the parametric approach, known as stochastic frontier analysis (SFA), it is the most common technique for evaluating efficiency in economics. DEA has been used extensively to assess the efficiency of public spending (Herrera and Pang, 2005; Dutu and Sicari, 2016; Minviel and Latruffe, 2016) since it allows analysts to compare performance among a set of countries. The main idea behind DEA is that, by observing the input-output sets of decision-making units (e.g. countries), a frontier of best-practices ($f(x)$ in Figure 35) can be constructed by ‘enveloping’ the data (Dutu and Sicari, 2016). Countries in the frontier (e.g. B or D) are considered efficient, whereas countries that are not on the frontier (e.g. P) are not considered efficient.



▶▶ BOX 11 (CONT.) MEASURING TECHNICAL EFFICIENCY USING DATA ENVELOPMENT ANALYSIS

The degree of technical efficiency (or inefficiency) is determined by how close (or far) the observed unit is from the frontier. Efficiency can be calculated using different orientations. Input-oriented measures (used in this report) help assess how much a given country could decrease its inputs while maintaining the same level of output (efficiency is determined by the ratio of distances from AB to AP in Figure 35). Output-oriented measures assess how much output could increase with no increase in inputs (efficiency is shown by the ratio of distances CP and CD in Figure 35). In this report, we assume variable returns to scale (VRS), which implies that increases in the inputs will lead to larger increases in the output at lower levels of inputs.

FIGURE 35 STOCHASTIC FRONTIER ILLUSTRATION



Source: Coelli *et al.*, 2005

Efficiency is measured by a score that ranges between 0 and 1. For a given set of inputs, a country is considered efficient when the score is equal to 1.

Since this is a relative measure, there will always be at least one country in the sample that will get the maximum score. This means that, given the country's features (i.e. hectares of arable land per rural capita and share of employment in agriculture), it achieves the highest observed agricultural outcome (agricultural GDP per rural capita). The set of inputs was restricted to land endowments and labour market characteristics for two reasons. First, the subsequent interpretation of the correlation coefficients is more straightforward since the correlations speak directly to the productivity of these inputs. Second, there were substantial data gaps for other inputs (e.g. capital), which would reduce significantly the sample size.

When the score is below 1, a country is considered inefficient. The distance between the actual score and 1 represents the proportion by which all inputs would need to be reduced in order for the country to be considered efficient (Coelli *et al.*, 2005). For example, an efficiency score of 0.5 means that an efficient country would achieve the same level of agricultural GDP per rural capita using half of the inputs.

The main advantages of DEA over SFA is that it does not require either: a) specifying a functional form for the production function; or b) specifying a distribution for the inefficiency term. DEA is also able to simultaneously handle multiple outputs and inputs. However, it is more sensitive to measurement error and, in a panel setting, it treats each period as a different sample (Salerian and Chan, 2005; Coelli *et al.*, 2005; Zhu, 2015).

5.1 Technical efficiency scores and public expenditure on food and agriculture in Africa

The average agricultural efficiency scores for countries in the sample across all analysed years (1990–2017) is reported in Figure 36. As explained in Box 11, the efficiency scores were calculated using the DEA method, whereby the closer a country scores to 1, the more efficient it is considered. The distance between the actual score and 1 represents the proportion by which all inputs (land and labour) could be reduced in order for an efficient country to achieve the same level of agricultural GDP per rural capita (Coelli *et al.*, 2005).³⁴

Most countries score low in efficiency

Figure 36 reveals three key facts. The average efficiency score of 0.45 suggests there are still substantial inefficiencies in African agriculture. Egypt, Gabon and Mauritius are the only African countries that are considered efficient, with a top score of 1. By definition, however, the methodology used assumes that at least one country in the subsample (of African countries) will be considered efficient. This does not mean that they would be efficient if compared to a larger set of countries. It is worth noting that Gabon is probably considered to be efficient in terms of agricultural production because of its small rural population (most people live in urban areas) and the small share of population employed in agriculture.

Looking at the 13 sub-Saharan African countries where the MAFAP programme operates, all of them are well below the average, except for Burundi, Kenya and Rwanda. The average efficiency score for SSA countries analysed in this report is 0.33. These estimated efficiency scores will be used to determine whether there is any correlation between how expenditure is allocated (composition of spending) and the efficiency of the sector.

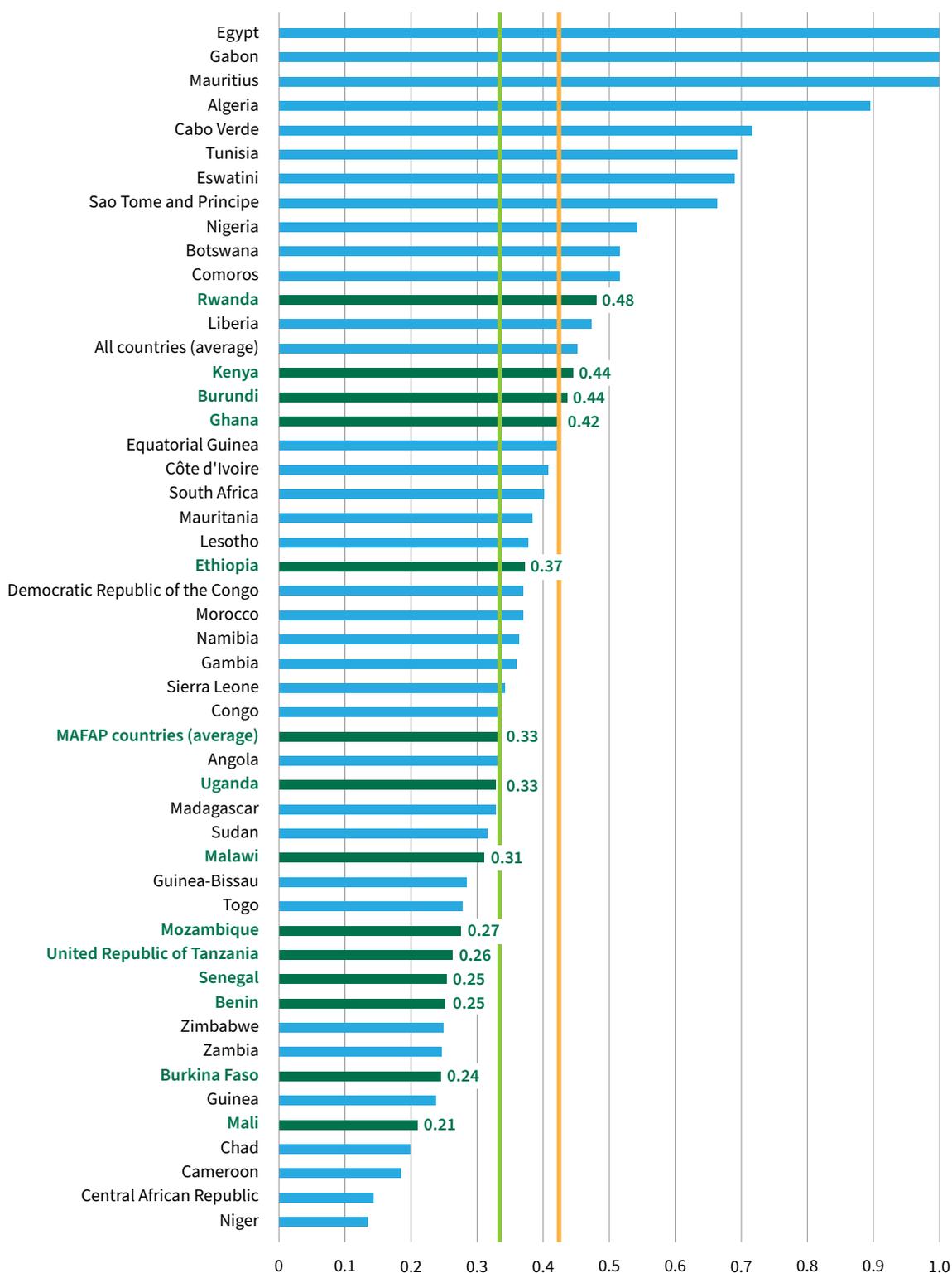
Saturation point?

Countries that spend more on food and agriculture experience higher levels of technical efficiency. This trend weakens when it reaches a ‘saturation’ point at around USD 80 per capita (see Figure 37). Nevertheless, most African countries are still well below this threshold, suggesting that there is substantial room to improve efficiency through additional public expenditure in the sector. Having said that, the correlation between the levels of technical efficiency and expenditure depends more on the type of expenditure, as explained for a subsample of countries in Chapter 5.2.

Overall, there is a positive relationship between expenditure per capita (i.e. spending intensity) and efficiency. In Figure 37, we show the relationship between per capita expenditure and agricultural efficiency, finding that the higher the public expenditure per capita in agriculture, the higher the degree of agricultural efficiency.³⁵

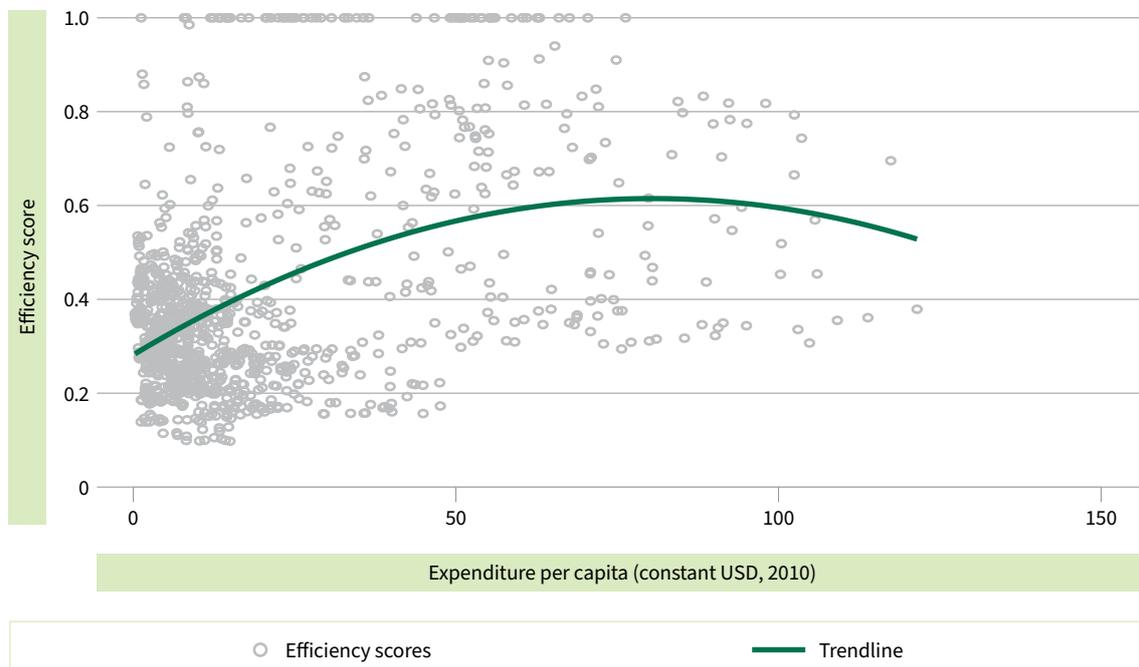
³⁴ In our analysis, we use land (arable area per rural capita) and labour (share of the population employed in agriculture as a proportion of total employment) as inputs and agricultural GDP per rural capita as the output. We considered extending the analysis to other indicators, such as poverty and malnutrition. However, the limited amount of data on poverty (not available at regular intervals) precluded such analysis. For the analysis on malnutrition, to the extent of our knowledge, the only indicator available at regular intervals is the indicator on undernutrition, which does not capture other important aspects of nutrition, such as dietary diversity and quality. As such, we did not pursue this in the report and focused only on agricultural GDP. Despite that, we recognize that these are two important avenues for future research.

³⁵ As already mentioned, this needs to be interpreted carefully since it is the result of a simple visual inspection of the data and does not rely on a fully-fledged assessment of the causality between the two variables. In addition, it must be also noted that, beyond the USD 80 per capita, there are few observations in the sample (304), so the relationship becomes more unstable and less accurate.

FIGURE 36 AGRICULTURAL EFFICIENCY SCORE FOR COUNTRIES INCLUDED IN THE ANALYSIS SAMPLE

Notes: Countries in dark green are those covered by the MAFAP programme and analysed in the report. The green vertical line represents the average efficiency score across MAFAP countries (0.33). The orange vertical line represents the average technical efficiency score across all analysed countries (0.42).

Source: Authors' own calculations.

FIGURE 37 INTENSITY OF PUBLIC EXPENDITURE ON AGRICULTURE AND EFFICIENCY SCORE

Source: Authors' own calculations.

The shape of the relationship suggests that it is not linear and weakens at high levels of agricultural spending intensity. In other words, up to a point, countries that spend more per capita seem to experience a higher degree of efficiency in agriculture. However, beyond a certain threshold, this trend seems to dissipate, and additional expenditures do not guarantee higher efficiency.

Although these results should be interpreted with caution since there are few countries that spend more than USD 80 per capita on agriculture, they do indicate a 'saturation point,' beyond which larger expenditures could decrease the levels of efficiency. This could reflect the decreasing returns to public expenditures which means that, beyond a certain point, improvement in agricultural outcomes may only be achieved with increasingly larger amounts of additional spending on food and agriculture.

Nevertheless, most African countries currently spend well below the saturation point: approximately 90 percent of observations have a spending intensity of less than USD 60 per capita (constant USD, 2010), supporting the general notion that agriculture is underfunded.

5.2 Correlation between efficiency and public expenditure composition

It is clear that the CAADP targets for public spending on agriculture will only be achieved if sufficient resources are invested in the sector. Simply spending a larger proportion of a country's budget on agriculture does not guarantee an improvement in outcomes. It is therefore important to move beyond the analysis of aggregate agricultural spending to gain a deeper understanding of how the composition of the expenditure influences technical efficiency.

The analysis presented below is based on correlations between technical efficiency and the composition of expenditure. While causal impacts cannot be claimed, the strength and sign of correlations reveal interesting patterns that can help us improve our understanding of the

relationship between public spending and agriculture GDP and how this relationship may differ starkly depending on the stage of agricultural transformation of a country.³⁶

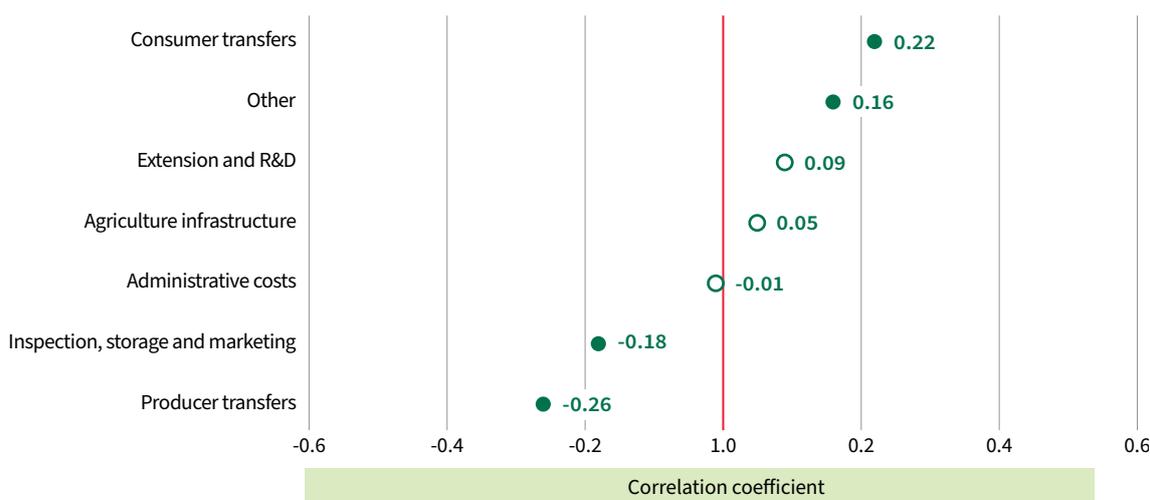
Our analysis focuses exclusively on the group of countries in which the MAFAP programme operates, as they are the only ones with data disaggregated by spending category (e.g. input subsidies, cash transfers, R&D and extension, infrastructure etc.). The relationship (correlation coefficients) between agricultural efficiency and the composition of agricultural budgets (measured as the share of the single expenditure categories over the total expenditure) is shown in Figure 38.

In Figure 39, we plot the same relationship according to the stage of agricultural transformation.³⁷ From these results, we can determine some interesting patterns, which are discussed below.

Countries that allocate a higher proportion of their agriculture budget to input subsidies (which are represented in the figures as “producer transfers”) show lower levels of efficiency overall. This is more pronounced in the subgroup of countries that are more advanced in terms of agricultural transformation. This reinforces the findings of previous studies (Latruffe and Minviel, 2016).

Returns on investment for input subsidies in Africa have been found to be variable and, on average, low (Jayne *et al.*, 2016).³⁸ However, as can be seen in Figure 38, the negative link between producer transfers and efficiency is only significant in countries at higher levels of agricultural transformation.

FIGURE 38 CORRELATION BETWEEN AGRICULTURAL EFFICIENCY AND SHARE OF EXPENDITURE



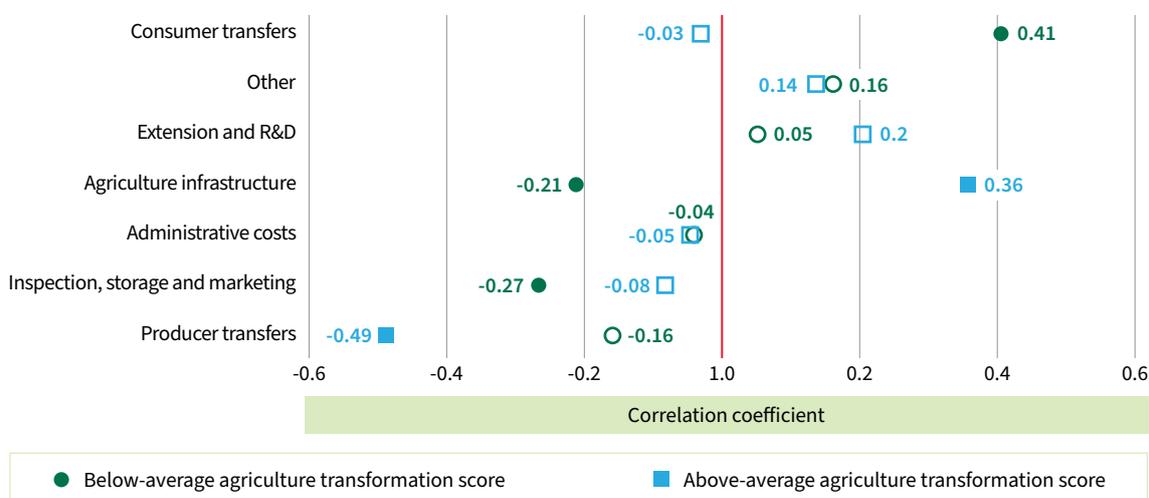
Notes: The markers represent the correlation coefficient between the efficiency scores and the share of expenditure. Filled markers indicate a correlation that is statistically significant, at least, at the 10 percent level. Markers that are not filled indicate that the coefficients are not statistically significant at the conventional levels.

Source: Authors' own calculations.

³⁶ Correlation coefficients are reported in Table A6 in Annex 5.

³⁷ To do so, we calculate an agricultural transformation score using a principal component analysis with three variables (employment in agriculture, fertilizer intensity, and agricultural GDP). The average score during the period 1990–2017 is then calculated for each country. Finally, we divide the sample into two subgroups: countries with an above-average score and those with a below the average score (see Table A5 in Annex 5). The sample is divided based on the agricultural transformation score for the subset of countries where MAFAP operates. Countries above the average are Benin, Burkina Faso, Ghana, Kenya, Rwanda and Senegal, whereas those below the average are Burundi, Ethiopia, Malawi, Mali, Mozambique, Uganda and United Republic of Tanzania.

³⁸ Note, however, that some studies (e.g. Latruffe and Bojnec, 2013) find that while fertilizer subsidies lead to lower efficiency, they also tend to result in higher on-farm profitability. In other words, they may not be efficient, but they seem to be effective.

FIGURE 39 CORRELATION BETWEEN AGRICULTURAL EFFICIENCY AND SHARE OF EXPENDITURE BY STAGE OF AGRICULTURAL TRANSFORMATION

Notes: The markers represent the correlation coefficient between the efficiency scores and the share of expenditure. Round markers denote the correlation coefficients for MAFAP countries with below-average (within the MAFAP subsample) agricultural transformation scores, whereas square markers denote correlation coefficients for countries with above-average agricultural transformation scores. Filled markers indicate a correlation that is statistically significant, at least at the 10 percent level. Markers that are not filled indicate that the coefficients are not statistically significant at the conventional levels.

Source: Authors' own calculations.

In countries at early stages of agricultural transformation, a large proportion of expenditures on producer transfers does not appear to have a negative effect on technical efficiency. This result is in line with the findings of previous studies, which show decreasing returns to producer transfers (especially input subsidies) as the agricultural sector develops (Fan *et al.*, 2008).

Countries that devote larger shares of spending to consumer transfers (e.g. cash transfers, food aid, etc.) have higher levels of technical efficiency. However, this is only true for countries at a lower stage of agricultural transformation. There are a number of possible explanations for this.

On the production side, it has been shown that cash transfers can increase on-farm investment as well as alleviate the cash constraints that may otherwise tempt farmers to engage in less profitable agricultural activities (Boone *et al.*, 2013; Todd *et al.*, 2009). On the demand side, consumer transfers can lead to an increase in local demand (Thome *et al.*, 2016) and higher producer prices (Robinson and Levy, 2014). Indeed, policy instruments such as cash transfers could help overcome the lack of local demand and low prices, which often discourage households from increasing their production.

We also find that the relationship between the share of consumer expenditure and technical efficiency differs substantially depending on the stage of agricultural transformation. Intuitively, in countries where subsistence agriculture plays a fundamental role and the sector is still in its initial transformational phase, factors such as the lack of local demand, limited market access and low prices are likely to constrain agricultural development.

This is shown in our results (see Figure 39), where the correlation is largely positive and statistically significant only for countries at a lower level of agricultural transformation. This seems to support the possibility that cash transfers may alleviate either a liquidity constraint, a demand-side constraint, or both. However, our current methodology does not allow us to confirm that this is the main driver behind these correlation coefficients across different stages of agricultural transformation.

Public goods and efficiency

In general, countries channelling larger shares of spending on public goods (with the exception of inspection, storage and marketing) display higher levels of efficiency, with this being particularly so for countries at a higher stage of agricultural transformation.

Results in Figure 38 show that countries that assign a higher proportion of their budgets to public goods, such as agricultural research and extension or off-farm infrastructure (with the exception of inspection, storage and marketing) display higher levels of efficiency, although this is only significant in the case of the expenditure category 'other.' 'Other' includes a large number of activities, most of which relate to either: a) subnational expenditures for which there is no information; and/or b) generic land management and forestry expenditures.

It is quite possible that there is a high match between one (or both) of these types of expenditure and agricultural performance. The fact that most coefficients are positive is certainly in line with several previous studies that conclude that investments in public goods have higher returns than producer subsidies do (Mogues, 2012; Anriquez *et al.*, 2016).

Another interesting result is the correlation between efficiency and agricultural infrastructure, extension and R&D depending on agricultural transformation stage of the country. While the coefficients are positive as expected, Figure 39 shows that they tend to be higher in countries at a higher stage of agricultural transformation. These results are consistent with previous studies, which have found that relative to returns on private goods (e.g. input subsidies), returns on investment on public goods in general and agricultural R&D, in particular, increase over time (Fan *et al.*, 2008). This could reflect the fact that, as the agricultural sector of a country develops, the nature of the constraints evolves significantly.

There is a negative correlation between shares of spending on inspection, storage and marketing services and technical efficiency in agriculture. One possible explanation is that such expenditures are typically of greater benefit to countries at a higher level of development, whereas most of the countries in our study are in their initial stages of agricultural transformation.

This is partially confirmed in Figure 39, where a negative and significant coefficient is seen for only those countries at an early stage of agricultural transformation. It is possible that marketing, inspection and storage infrastructure are not key drivers of agricultural performance in such countries. This is consistent with the fact that expenditure in marketing and inspection are usually more worthwhile in areas where agricultural potential is high, poverty-rates are lower and agriculture is already efficient (Maruyama *et al.*, 2018).

5.3 Food for thought: chapter takeaways

This chapter serves a first step towards a broader understanding of the relationship between the composition of public expenditure and agricultural performance. From these preliminary results, we can identify five key takeaways:

- The relationship between efficiency and per capita spending in agriculture is positive, but with a decreasing rate. This means that there could be a saturation point, beyond which the impact of additional public expenditure on agricultural efficiency could be very limited. Nevertheless, most African countries are still well below this threshold, suggesting that there is substantial room to increase efficiency through additional public expenditure in the sector.
- Governments need to consider their stage of agricultural transformation when deciding on their allocations to the food and agriculture sector. Some public expenditures may be premature for countries still at the initial stages of transformation and better suited to other categories.

- Spending large shares of the food and agricultural budget on input subsidies does not seem to improve technical efficiency, suggesting that those resources could be allocated to other types of expenditure, where returns are likely to be higher. This seems particularly the case for countries at more advanced stages of agricultural transformation.
- Cash transfers, food aid and other programmes targeting consumers seem to be positively correlated with agricultural efficiency, as they are likely to address liquidity constraints and lack of demand. The link between agricultural efficiency and consumer transfers is stronger in countries that are at a lower stage of the transformation process.
- Spending a higher proportion of the budget for agriculture on public goods, such as research, extension services and technical assistance, is positively correlated with agricultural efficiency. This is particularly the case in countries at a more advanced level of agricultural transformation.

As mentioned previously, data constraints make it difficult to obtain robust estimates on expenditure impacts, or to obtain precise measures of cost-effectiveness of expenditures. Ideally, more thorough assessments – which in turn require better data – would generate the kind of evidence to better inform and guide governments and donors on their budget allocations for the agricultural sector. This would also allow such analyses to go beyond agricultural growth and focus on other important outcomes related to food systems development, such as poverty and nutrition.

This is doable. With a bigger push to collect comparable and disaggregated data on food and agricultural public expenditures for more countries over a longer period of time, better analyses on public expenditure would benefit governments, the agricultural community and people.

6 Conclusions and recommendations

Over the past 15 years, total government spending on food and agriculture in sub-Saharan Africa has been low and most of the countries in our study have failed to fulfil their commitment to allocate at least 10 percent of their budgets to agriculture to achieve a 6 percent annual growth in the sector, as agreed in the CAADP framework in 2003 and again in 2014.

The 10 percent target is ambitious for SSA countries given the current fiscal contexts. Revenue growth is limited, preventing major increases in much-needed food and agricultural investments. The reallocation of expenditures to agriculture is also difficult given existing debt repayment obligations, the type of expenditures that predominate in social-related sectors (largely salaries and wages) and emerging priorities, such as the COVID-19 crisis.

Even when budgets are allocated to agriculture, a large proportion of expenditure (around 21 percent) goes unspent, mainly due to a number of project implementation challenges. Agricultural sector-specific characteristics, such as seasonality, a high reliance on donor-funding that is less predictable and more difficult to manage and implement, and a lower share of expenditures on salaries compared to other sectors, make agriculture budgets more challenging to execute. This undermines the capacity of governments to deliver on their budgetary commitments.

Our analysis also indicates that the share of expenditures on food and agriculture is smaller in more decentralized countries. Given the growing fiscal devolution in many SSA countries, particularly in Eastern and Southern Africa, this is an additional obstacle to funding agriculture.

But there is no doubt that higher levels of public expenditure, combined with sound sectoral policies and an enabling environment for private sector engagement, will be crucial for agricultural transformation in Africa to become a reality. However, the importance of the composition of expenditure cannot be stressed enough.

This is particularly true at present, when the fiscal space available to governments may not allow for additional investment or reallocation. More than ever before, governments will need to spend 'better' by increasing the effectiveness and efficiency of the use of public funds.

Money well spent?

High priority should be given to funding programmes and projects with the highest return on investment in terms of agricultural growth, food security, and poverty reduction. Extensive research has demonstrated that infrastructural investments, R&D and extension services, inspection facilities and strengthened value chains are among the areas of spending with the largest payoffs. However, as our report demonstrates, spending on food and agriculture in sub-Saharan Africa during the period 2004–2018 largely focused on providing subsidies for agricultural inputs, such as seeds and fertilizers. While reforms to such programmes are underway in a few countries, this type of direct transfer remains a key instrument for supporting agriculture.

While we cannot claim to find a causal impact, our analysis of the technical efficiency of expenditures indicates that, overall, countries that allocate a larger share of funding to input subsidies have lower scores on agricultural performance. In contrast, greater expenditures allocated to extension and R&D are associated with higher efficiency.

Over time, while irrigation infrastructure and natural resource management in the region have received more attention in public budgets, spending on R&D and extension services remain underfunded. In some countries, it has even declined.

Prioritizing and continuing to increase expenditure on public goods, such as R&D and infrastructure, should be a priority for governments in sub-Saharan Africa. Food systems in the region are increasingly affected by climate change, weather-related catastrophes and unprecedented crises, like the COVID-19 outbreak. Such shocks disrupt agricultural production, markets and food supply chains. With enhanced infrastructure and market facilities, improved technologies and digitalized extension services, these challenges could be confronted more quickly and effectively.

6.1 The importance of monitoring and analysing public expenditure for policymaking

A key recurring challenge that governments face is the lack of consistent and good-quality data to support evidence-based policies. As we have demonstrated, the MAFAP programme works closely with policymakers, while improving the capacity of countries to collect, process and analyse data.

We have shown that regularly monitoring how much public money flows into the sector and understanding how it is spent can improve food and agricultural policies. As the report shows, monitoring public expenditures helps identify areas where funds are limited and other critical issues, like budget execution problems, overreliance on donor funding etc. In addition, it enables an assessment of the extent to which expenditure decisions are aligned with national priorities, such as increasing agriculture productivity, diversifying production or reducing reliance on food imports. Such assessments on policy coherence can help advise on adjustments to national policies and prompt corrective actions and reforms when investments are considered to be inconsistent with government objectives. Box 12 presents how a MAFAP-supported analysis of public expenditures on food and agriculture in Rwanda enabled the government to track and monitor investments made under its Strategic Plan for the Transformation of Agriculture.

Regular monitoring is also critical for preparing robust budgets and National Agricultural Investment Plans (NAIP), which are often based on unrealistic expectations. The same goes for projections that put the end-goals at risk when adequate funds are unavailable. Monitoring these plans and their implementation programmes on an annual basis could assist the design of a second generation of NAIP that address these frequent challenges (see Box 13 for a concrete example).

The NAIP usually have a strong focus on prioritising commodities. Since MAFAP's public expenditure data are disaggregated by commodity and sectors (crops, livestock and fisheries), they can support the NAIP assessments in terms of allocations to the target commodities. Data on budget support to specific value chains can also feed into commodity-specific or sub-sectoral indicators and value chain studies, providing evidence for specific areas needing policy assistance.

Transparent monitoring systems can also improve resource mobilization. It is not unusual for donors and development partners to make their funding conditional on effective monitoring and evaluation systems to increase transparency, credibility and trust. The Benin case study in Box 4 (Chapter 1) provides an example.

BOX 12 RWANDA: TRADE-OFFS WITHIN AGRICULTURE BUDGET FRAMEWORKS

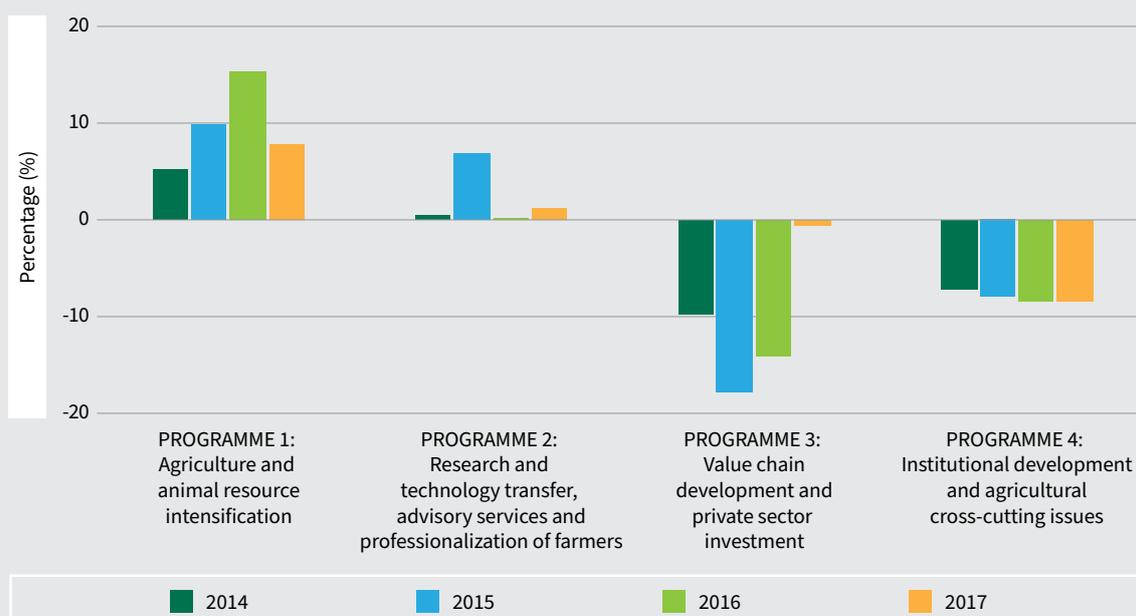
When implementing agricultural strategies, scarce resources mean that budget holders need to make hard choices around the allocation of public resources. In Rwanda, an analysis of public expenditures for food and agriculture undertaken by MAFAP in collaboration with the Ministry of Agriculture and Animal Resources (see Tuyishime *et al.*, 2020), allowed us to track actual investments in the Strategic Plan for the Transformation of Agriculture, Phase Three (PSTA3 2013–2017), and compare them to planned expenditures outlined in the Agriculture Sector Investment Plan, Phase Two (ASIP2). The comparison helps identify funding gaps by programmatic area over time.

Planned allocations vs realized expenditures

Planned amounts for the four PSTA3 Programmes (Programmes 1 to 4 as seen in Figure 40) accounted for an average 54, 7, 30 and 8 percent of the total PSTA3 budget, respectively. However, the results revealed that actual spending across programmes did not reflect the planned expenditures in the ASIP2. Actual expenditures on Programmes 1, 2, 3 and 4 accounted for an average 65, 7, 20 and 1 percent of the total budget, respectively. In a context of scarce resources for the implementation of PSTA3, budget holders and policymakers seem to have reallocated some expenditures to Programme 1 (mostly inputs for the soil fertility and irrigation and water management subcomponents) at the expense of Programmes 3 and 4. In particular, the pattern of spending suggests significant underfunding for Programme 3, which focused on value chain development and private sector investment, despite its importance for leveraging private investment, a key contributor to agricultural growth and job creation.

The take-away message here is that embedding strategic development objectives in budgets is a good initiative. However, it is less useful if there are no monitoring systems in place to track how disbursed expenditures deviate from the established and agreed policy orientation.

FIGURE 40 DIFFERENCES IN ALLOCATED SHARES OF PUBLIC EXPENDITURE ON FOOD AND AGRICULTURE ACROSS PSTA3 PROGRAMMES IN RWANDA



Note: Differences are computed as actual share minus planned share.

Source: Tuyishime *et al.*, 2020.

BOX 13 MONITORING THE NATIONAL AGRICULTURAL INVESTMENT PLAN OF MOZAMBIQUE: A TOOL TO IMPROVE DECISION MAKING

National Agricultural Investment Plans (NAIP) are an essential part of the CAADP process. At their core, NAIP allow countries to identify opportunities and fill investment gaps in the agricultural sector as well to use public funds as a catalyst for private sector development. With these objectives in mind, the Government of Mozambique developed its National Agriculture and Food Security Investment Plan (PNISA) 2013–2017 (subsequently extended to 2019). In 2018, following a request from the Ministry of Agriculture and Food Security (now the Ministry of Agriculture and Rural Development), the MAFAP programme developed a tool to assist ministry analysts to track PNISA expenditures, which could also be used to monitor future investment plans.

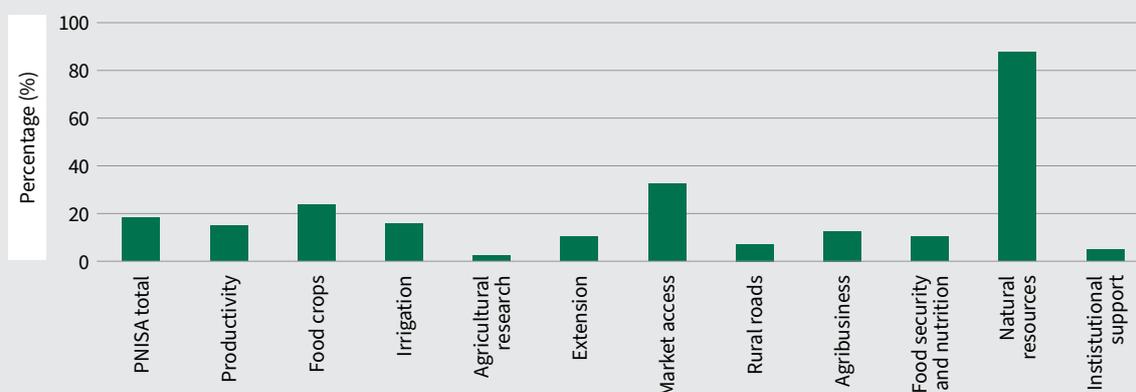
Low execution rates

An analysis of the data captured through this tool revealed that until 2016 (one year before the planned end of the PNISA), the overall execution rate of the plan was low at around 18 percent (see Figure 41). In addition, PNISA execution rates differed significantly by component of the investment plan. Specifically, while components related to land management and natural resources had high execution rates, spending on other components, such as agricultural production and productivity, were very low. Indeed, the execution rate of public investments in agricultural R&D was among the lowest in the PNISA. This is not surprising, since R&D spending is usually over-reliant on donor resources (which tend to have lower execution rates) and is underfunded in Africa (Stads and Beintema, 2015). However, it is a worrying trend, as R&D expenditures are more likely to have high returns on investment in the long term (Mogues *et al.*, 2012).

Main issues to tackle

As highlighted by the PNISA assessment (MASA, 2017), the yield trends for some crops (e.g. potato and sugarcane) were promising during the period covered by the plan. Nevertheless, the plan fell short of its potential to serve as a catalyst for broad-based agricultural development. Among other things, the assessment highlighted issues related to resource mobilization, forecasting of resource availability and an inadequate M&E system. This highlights the importance of developing monitoring tools for public expenditures early in the NAIP process, in order to enable evidence-based decision making with respect to budget allocations as well as to allow corrective actions throughout the life of the plan.

FIGURE 41 EXECUTION RATES OF THE NATIONAL AGRICULTURAL INVESTMENT PLAN COMPONENTS IN MOZAMBIQUE



Source: MAFAP and MASA calculation based on E-Sistafe data.

6.2 Expanding the potential of expenditure data

Another take-away message from this report is the potential to go much further in public expenditure analysis. More data, especially in terms of the number of countries studied and returns per dollar spent, are needed in order to be able to undertake more far-reaching analyses on different topics and get the best possible insight to shape policymaking.

It is evident that the impacts of expenditure on agriculture warrant more attention. Some of the links between food and agricultural expenditure and agricultural performance are still unclear and call for further study. In this regard, the efficiency analysis in Chapter 5 is a step in the right direction, but without additional comparable and disaggregated expenditure data, a robust and conclusive impact analysis is not feasible.

A breakdown of expenditure data can also be used to improve models that are commonly used to simulate the impact of different investment scenarios on both agricultural and economy-wide outcomes. These models require data on both the type and the elasticity of spending (i.e. how sensitive a given outcome is to a given type of expenditure). The data compiled by the MAFAP programme could improve the estimates used in investment models, which in turn, would improve the quality of analysis we provide to partner governments. As discussed in Box 14, such evidence-based assistance is often requested by governments and ministries of agriculture to improve the quality of their expenditure on agriculture.

Finally, we need a deeper understanding of where spending occurs. The effects of decentralized spending on agricultural outcomes are widely debated. It is also unclear which areas benefit most from food and agricultural spending (e.g. poorer vs. higher potential). These issues exist partly because there are few quantitative analyses of the geographical distribution of expenditure owing to a lack of reliable data. This is where MAFAP can fill the void.

6.3 The way forward

Going forward, particularly in the aftermath of the COVID-19 crisis, governments will no doubt need support to more thoroughly plan their public expenditures and to make evidence-based decisions on where to invest their money more effectively and efficiently under existing fiscal constraints. Given these limitations, renewed emphasis should be placed on the importance of targeting public expenditure properly, in terms of goods and services to fund, but also which products (i.e. value chains) and geographical areas to invest in, particularly where recovery is most urgently needed.

More evidence is needed to use recovery packages and fiscal stimulus in a greener, more sustainable and socially responsible manner. The dialogue around food and agricultural spending should open up to a more holistic approach and account for all the outcomes affecting agriculture and food systems transformation, going beyond the farm. This should mean environment, food security and nutrition as well as health dimensions. On this, developing solid tools that can assess and shed light on the trade-offs between spending decisions and different development outcomes would be crucial.

Lastly, with the implementation of the African Continental Free Trade Area starting this year, many countries in the region will be confronted with new international commitments, which oblige them to abandon trade distorting policies and repurpose agricultural support towards fiscal spending in public goods and smart subsidies. The repurposing agenda and dialogue in the continent would greatly benefit from high-quality data on spending priorities, impacts and returns.

The MAFAP programme stands ready to work hand-in-hand with governments, policymakers and the wider development community to make African agricultural transformation a reality, to support the efforts of countries to recover from the current unprecedented recession, to meet their CAADP commitments and to reach the Sustainable Development Goals.

BOX 14 OPTIONS TO IMPROVE QUALITY OF SPENDING IN FOOD AND AGRICULTURE: THE CASES OF BURKINA FASO, GHANA AND MALI

Many countries in Africa simply do not have the means to significantly increase their public expenditure on agriculture. In countries where this is the case, better outcomes require improving the composition or the efficiency of public expenditures, or both. MAFAP has provided technical support to governments seeking to improve the quality of their expenditures, both at the aggregate level (e.g. Burkina Faso and Ghana) and for specific spending categories (e.g. Mali).

Analysing policy trade-offs

The analysis in Ghana evaluated an *ex ante* increase in the food and agricultural budget combined with shifts in the composition of expenditures (Aragie *et al.*, 2019). The analysis focused on extension services and input subsidies as two important components of Ghana's agricultural development strategy, while controlling for other types of expenditure, such as investments in irrigation infrastructure and rural roads.

The results of the Ghana study suggested that doubling agriculture's share in the total public budget can accelerate agricultural growth to somewhere between 7.6 percent and 8.6 percent against a business-as-usual scenario of about 3.5 percent, depending on agricultural policy. An input subsidy-oriented spending strategy may yield significant benefits in the short term (1–5 years), but investments in effective extension services are more sustainable and rewarding in the medium to long term (6–10 years).

In Burkina Faso, MAFAP conducted a simulation exercise, in close collaboration with the Ministry of Agriculture, to understand how changes in the level and composition of the agricultural public budget could affect agricultural productivity and other development objectives. The results highlighted important policy trade-offs.

For example, prioritizing public expenditure on perimeter irrigation could help close the maize yield gap by 30 percent, but would only have a limited impact on sorghum and millet yields, which are predominantly rainfed crops (see Figure 42).^{*} The heterogeneous effects on productivity are also reflected in commercialization, measured as change in the output produced and sold in markets. Increased spending on irrigation would marginally increase market participation among sorghum and millet smallholders, while maize yield gains would also translate into a higher rate of commercialization (see Figure 42). While beneficial for the maize sector, prioritizing public expenditures for perimeter irrigation may fail to address the challenges faced by millet and sorghum producers, despite the significance of these crops for rural household incomes and calorie consumption.

A more diversified set of investments – rather than a focus on a specific investment category – is therefore needed to pursue multiple development objectives.

NOTE

^{*} The (exploitable) yield gap is the difference between the maximum attainable yields (which are the potential yields that can be reached in real life farming conditions) and the actual yields.



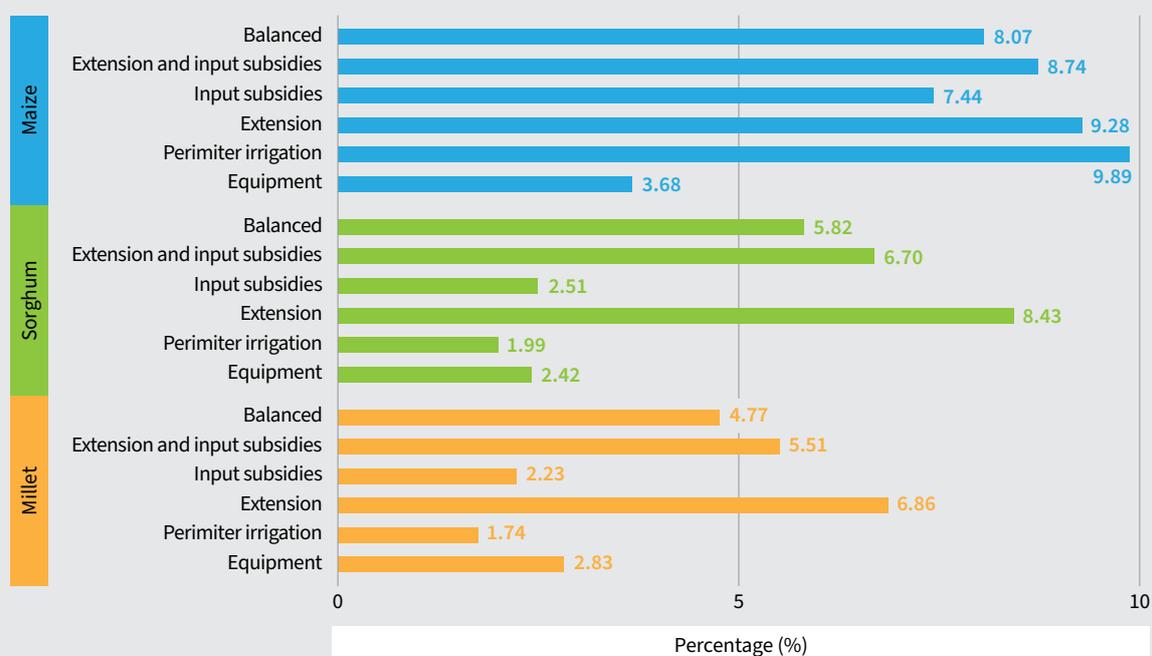
►► **BOX 14 (CONT.) OPTIONS TO IMPROVE QUALITY OF SPENDING IN FOOD AND AGRICULTURE: SOME CASE STUDIES**

Examples of how quality of expenditure can be improved

In Mali, in 2017, the MAFAP programme supported the review of the national public stockholding/storage strategy (Gourichon and Pierre, 2017), which accounted for a sizeable proportion of food and agricultural public expenditures (from 1 to 7 percent) in the years between 2006 and 2014. Among other aspects, the analysis found that small changes could generate potentially large cost savings. For example, if public purchases were made between November and February (when prices are lower) rather than after March (when prices are typically higher), this could reduce procurement costs by an average of 11 percent, potentially saving the government an average of FCFA 200 million per year (roughly USD 340 000). In addition, the analysis also found that further cost savings could be achieved if the public stockholding scheme prioritized commodities with the lowest price per calorie, such as sorghum and millet, which are the crops most consumed by the poor, rather than focusing on rice and maize. This would not only decrease procurement costs, but could also reduce the losses associated with storage, since millet and sorghum can be stored for a longer period before the quality of the product starts to deteriorate.

These examples highlight how the quality of expenditure can be improved, either through reallocation of expenditures or by improving the efficiency of specific types of expenditure. In countries where resources are scarce, ensuring the maximum value-for-money of public spending is crucial, since there may not be a lot of room for increasing total expenditure.

FIGURE 42 SIMULATED PERCENTAGE CHANGE IN COMMERCIALIZATION IN BURKINA FASO, BY CROP AND SCENARIO (2019–2025)



Source: Authors' elaboration from Artavia *et al.*, 2020.

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Annex 1

Glossary of MAFAP public expenditure categories

TABLE A1 MAFAP PUBLIC EXPENDITURE CATEGORIES AND DEFINITIONS

TARGET	SUBCATEGORY	DEFINITION
PRODUCER	A. Production subsidies based on outputs	Transfers to agricultural producers based on output of a specific agricultural commodity
	B. Production subsidies based on inputs	Transfers to agricultural producers are based on on-farm use of inputs
	B1. Variable inputs	Transfers reducing the on-farm cost of a specific variable input. Includes seeds, fertilizer, energy, credit and others
	B2. Capital	Transfers reducing the on-farm investment cost of farm buildings, equipment, plantations, irrigation, drainage and soil improvements
	B3. On-farm services	Transfers reducing the cost of on-farm technical assistance and training
	C. Income support	Transfers to agricultural producers based on their level of income
CONSUMER	D. Non-classified (producers)	Transfers to agricultural producers individually for which there is insufficient information to allocate them into above listed categories
	E. Food aid	Transfers to consumers to reduce the cost of food
	F. Cash transfers	Transfers to consumers to increase their food consumption expenditure
	G. School feeding programmes	Transfers to consumers to provide free or reduced-cost food in schools
OTHER AGENTS	H. Non-classified (consumers)	Transfers to consumers individually for which there is insufficient information to allocate them to the above listed categories
	Payments to inputs suppliers	Transfers to suppliers of agricultural inputs
	Payments to transporters	Transfers to transporters
	Payments to traders	Transfers to traders
	Payments to other agents	Transfers to other agents in the agricultural sector





TARGET	SUBCATEGORY	DEFINITION
SECTOR	I. Agricultural research	Public expenditure for research activities to support agricultural production
	J. Technical assistance	Public expenditure for agricultural extension, which includes expenditure for the provision of i) technical assistance; ii) training; iii) extension services; and iv) control of quality and safety of food and agricultural inputs
	K. Training	
	L. Extension	
	M. Inspection	
	N. Agricultural Infrastructure	Public expenditure for agricultural infrastructure
	N1. Feeder roads	Public expenditure to finance feeder roads
	N2. Irrigation	Public expenditure to finance off-farm irrigation
	N3. Other	Public expenditure to finance other off-farm infrastructure
	O. Storage/ public stockholding	Public expenditure to finance storage of agrifood products
	P. Marketing	Public expenditure to finance assistance in marketing of agrifood products
Q. Other (sector)	Other Public expenditure to the agrifood sector not classified in categories above, due to lack of information (as often the case of subnational expenditure) or the absence of appropriate category (e.g. expenditure on early warning systems, general forestry and land management, agro-processing, etc.)	
Administrative costs	Expenditures for the running costs of ministries not tied to a specific category as well as policy formulation and policy coordination	

Source: MAFAP, 2015.

Annex 2

Data description

Readers of this report should be aware that the MAFAP public expenditure approach and methodology differs from other initiatives and classifications in a number of ways:

- 1. Definition of agriculture.** The MAFAP definition of agriculture (see Box 1) is broader than that employed by other methodologies (e.g. COFOG+, CAADP guidelines, World Bank Agriculture Public Expenditure Reviews, AgPER). The main difference is that MAFAP includes both food and cash-related expenditures for consumers (school feeding programmes, food for work programmes, etc.) as food expenditures. In this report, when we focus on the total food and agricultural expenditure and compare this to the CAADP 10 percent target, we exclude consumer transfers to make our numbers as comparable to the COFOG+ definition as possible.
- 2. Level of disaggregation and detail.** The MAFAP approach is more time-consuming than other approaches because it aims to provide the highest level of detail possible. Specifically, the methodology aims not only to disaggregate food and agricultural expenditure into several categories (as seen in Figure 1), but also to provide disaggregation by sector and agent whenever possible. This level of disaggregation is important because it allows us to assess the quality of public expenditures. In addition, public expenditure data is often used to inform policymakers about the potential impacts of different spending scenarios. In order for the simulations to be accurate, these models often require data disaggregated by category. Finally, an underlying objective of the CAADP when setting the 10 percent target was to leverage private investment, which is seen as a key player in agricultural transformation. Assessing quality of expenditure can only be done with disaggregated data.
- 3. Frequency of the update.** Another aspect that distinguishes the MAFAP methodology from other approaches is that, to the extent possible, the dataset and classification are updated regularly (typically on a yearly basis) and updates are often performed in collaboration with government partners. This provides indicators that are up-to-date, comparable across countries and validated by local partners and governments.

There are also a number of limitations to the MAFAP dataset that readers should be aware of:

- 1. Coverage issues.** Despite the best efforts of the MAFAP programme to ensure the largest possible coverage and full comparability between countries, this is not always possible. In general, there are two types of coverage issues:
 - **Temporal coverage.** Country data were made available for different periods of time. For example, whereas the data is available for the full 2004–2018 period in some countries (e.g. Uganda), it is only available for shorter periods in others (e.g. Ghana).
 - **Budget coverage.** In some countries, MAFAP was provided access to the full budget for all years, whereas in others, certain expenditures (e.g. certain ministries, subnational expenditures, donor expenditures) were only made available for some years. In the vast

majority of cases, information on the most important expenditures were made available for all countries. In some cases (e.g. Burundi for 2011 and 2013), donor data were not provided.

A list of the main coverage issues by country is presented in Table A2.

TABLE A2 COVERAGE OF PUBLIC EXPENDITURE DATA BY COUNTRY

COUNTRY	COVERAGE	COVERAGE ISSUES
Benin	2008–2018	
Burkina Faso	2006–2016	
Burundi	2005–2017	Donor expenditures not available for 2011 and 2013
Ethiopia	2007–2017	Subnational expenditures not available for 2007 and partial coverage for 2008–2016
Ghana	2013–2017	Actual expenditure data is partial for all years
Kenya	2007–2018	Actual donor expenditures not available for 2008, 2012 and 2013. Partial coverage of donor expenditures for 2007 to 2013
Malawi	2006–2018	Subnational expenditures not available for 2006 to 2010
Mali	2005–2017	Provisional data on actual donor expenditures in 2017
Mozambique	2009–2017	
Rwanda	2012–2018	Data covers the Ministry of Agriculture, Rwanda Agriculture Board (RAB) and National Agricultural Export Development Board (NAEB) only. Data from other ministries are not available
Senegal	2010–2018	Donor expenditure not available for 2018
Uganda	2004–2018	Actual donor expenditures not available for 2009 to 2016. Donor budgeted data not available for 2018
United Republic of Tanzania	2011–2018	Actual expenditures not available for 2018

Source: Authors' own elaboration based on MAFAP database (2020 version).

2. Classification issues. In some cases, despite MAFAP's best efforts and cooperation with local experts, the project-level information obtained may not be enough to classify a given project with absolute certainty. This can lead to a number of issues related to classification. While not all the assumptions can be discussed here, the main challenges are the following:

- **Unclear beneficiary.** In cases where the expenditure is clearly related to a specific category (e.g. irrigation), but it is not clear whether it is a public or a private good (no information on who the beneficiaries are), it is assumed to be a public good. The reason is that, since the data may be used by modelers, it is preferable to know that this expenditure is related to irrigation (which may have a different elasticity) than this expenditure being "lost" in the "capital subsidy" category.
- **Unclear category.** In cases where a given expenditure is clearly agricultural, but the category cannot be identified (e.g. subnational expenditures by the ministry of agriculture with no further information) or no MAFAP category matches the expenditure (e.g. generic agricultural land-use or forestry expenditures), these are put in the "Q. Other expenditures" category.

- **Unclear perimeter.** In cases where, upon reviewing available information and discussing with local partners, it is still not clear whether a given expenditure fits the MAFAP agriculture definition (e.g. generic road expenditures, where it is not clear whether they are rural, feeder, or other), the MAFAP programme adopts a conservative approach and classifies these as non-agricultural expenditures.
3. **Other issues** mostly related to execution rate and assumptions made when data is missing. The following table summarizes the main ones for each affected graph.

TABLE A3 MAIN ASSUMPTIONS ON THE INDICATORS' COMPUTATION

INDICATORS AND RELATED FIGURE	OBSERVATIONS EXCLUDED	ADDITIONAL NOTES
FIGURE 6. GROWTH RATE OF EXPENDITURE ON FOOD AND AGRICULTURE BY COUNTRY, AVERAGE FROM 2004–2018	<ul style="list-style-type: none"> • Senegal (2018): partial data (missing donor data and execution is partial) • Mali (2017): partial data • Burundi (2011–2014): donor data are missing in 2011 and 2013; 2012 and 2014 are excluded because they use 2011 and 2013 as a base to calculate the y-o-y growth rate • Ethiopia (2016): before 2016, coverage of subnational expenditure is partial, thus, the growth rate from 2015–2016 would reflect a change in coverage 	Expenditure are in constant USD, 2011
FIGURE 7. SHARE OF ACTUAL PUBLIC EXPENDITURE ON FOOD AND AGRICULTURE (NARROW DEFINITION) OVER TOTAL BUDGET	<ul style="list-style-type: none"> • Senegal (2018): partial data (missing donor data and execution is partial) • Mali (2017): partial data 	<p>MAFAP figures are inconsistent with RESAKSS data for the following countries:</p> <ul style="list-style-type: none"> • Ethiopia, mainly due to the exclusion in MAFAP estimates of the PSNP related expenditures • Burkina Faso and Senegal due to classification of some large rural integrated projects and dams-related expenditure as fully agricultural expenditure under RESAKSS but not under MAFAP (apportioned between agricultural and rural spending) • Rwanda due to some unclear specificities on how the Government in Rwanda reports expenditure data to CAADP • Burundi likely due to the exclusion under MAFAP of donor expenditure (about 60 percent of total expenditure), as actuals are often not available • Kenya because RESAKSS estimates are likely to include only national expenditure for MINAGRI, while in Kenya large proportion of expenditures are involved in water boards, usually outside of MINAGRI





INDICATORS AND RELATED FIGURE	OBSERVATIONS EXCLUDED	ADDITIONAL NOTES
<p>FIGURE 8. TREND OF EXPENDITURE ON FOOD AND AGRICULTURE (NARROW DEFINITION) PER CAPITA BY REGION</p> <p>FIGURE 9. TREND OF SHARE OF EXPENDITURE ON FOOD AND AGRICULTURE (NARROW DEFINITION) OVER TOTAL BUDGET BY REGION</p>	<ul style="list-style-type: none"> Zimbabwe (all years): figures seem not reliable (with a huge total budget that makes the share of agricultural expenditures would be very low) 	<ul style="list-style-type: none"> The plotted lines are weighted averages. Within a given region, with weights determined based on the size of agricultural GDP of a given country <i>vis-à-vis</i> other countries in the region The graphs fit a local polynomial regression with a bandwidth of five
<p>FIGURE 10. EXECUTION RATES FOR FOOD AND AGRICULTURAL (NARROW DEFINITION) AND NON-FOOD AND AGRICULTURAL EXPENDITURE</p>	<ul style="list-style-type: none"> Ghana (all years): Actual expenditures are partial, especially for donor expenditures Senegal (2018): partial data (missing donor data and execution is partial) Mali (2017): partial data 	<ul style="list-style-type: none"> Rwanda: the share of donor expenditure is an overestimate, (assumed 100 percent when actual donor expenditures were not available) Execution rate for non-agricultural expenditures is calculated as the residual total actual budget (i.e. total actual expenditures minus total actual agricultural expenditure) divided by the total residual budgeted expenditure (total budget minus total budgeted expenditure for agriculture)
<p>FIGURE 11. AVERAGE SHARE OF DONOR FUNDING TO THE FOOD AND AGRICULTURAL SECTOR</p>	<ul style="list-style-type: none"> Ghana (all years): Actual expenditures are partial, especially for donor expenditures Senegal (2018): partial data (missing donor data and execution is partial) Mali (2017): partial data Burundi (2011, 2013): donor expenditures are missing Kenya (2008, 2012, 2013): donor actual expenditures are missing Uganda (2009–2016): donor actual data are missing 	<p>Rwanda, assumption above applies</p>
<p>FIGURE 12. EXECUTION RATES OF NATIONAL AND DONOR EXPENDITURE ON FOOD AND AGRICULTURE (NARROW DEFINITION)</p>	<p>National expenditures:</p> <ul style="list-style-type: none"> Senegal (2018): partial data Ghana (all years): Actual expenditures are partial, especially for donor expenditures Mali (2017): partial data <p>Donor expenditures:</p> <ul style="list-style-type: none"> Rwanda (all years): actual data not available (i.e. 100 percent execution rate assumed) Ghana (all years): actual donor data is partial Uganda (2009–2016): donor actual data are missing Kenya (2008, 2012, 2013): donor actual expenditures are missing Burundi (2011, 2013): donor expenditures are missing 	<p>Rwanda, assumption above applies</p>



INDICATORS AND RELATED FIGURE	OBSERVATIONS EXCLUDED	ADDITIONAL NOTES
FIGURE 14. CORRELATION BETWEEN SHARE OF FOOD AND AGRICULTURAL EXPENDITURE AND DECENTRALIZATION INDEX	<ul style="list-style-type: none"> Senegal (2018): partial data (missing donor data and execution is partial) Mali (2017): partial data 	
FIGURE 15. SHARE OF SUBNATIONAL EXPENDITURE ON AGRICULTURE OVER TOTAL FOOD AND AGRICULTURAL SPENDING	All cases where data on subnational expenditures are missing. Data included is Ethiopia (2016, 2017), Ghana (2013–2016), Mozambique (2009–2016), Kenya (2014–2018), United Republic of Tanzania (2011–2017), Uganda (2004–2016)	
FIGURE 16. CORRELATION BETWEEN POVERTY RATE AND SUBNATIONAL EXPENDITURE ON FOOD AND AGRICULTURE PER CAPITA	All cases where data on subnational expenditures are missing. Data included is as above	For sake of readability of the graph, we exclude very large observations from the scatterplot, but include them for the best-fit line (i.e. per capita expenditure above USD 20: Ethiopia-Gambella, 2016–2017; Ethiopia-Dire Dawa, 2017; Ethiopia-Benishangul-Gumuz, 2017; Kenya-Wajir, 2015–2016 and Kenya-Kwale, 2018)
FIGURE 24. TREND OF EXPENDITURE SHARES OVER TOTAL EXPENDITURE ON FOOD AND AGRICULTURE, AVERAGE FOR ALL COUNTRIES BY YEAR	Donor expenditure data excluded: <ul style="list-style-type: none"> Burundi (2011, 2013): missing data on donor expenditures Kenya (2008, 2012, 2013): missing data on actual donor expenditures Senegal (2018): missing data on donor expenditures Uganda (2009–2016): missing data on actual donor expenditures 	The average share refers to the mean of the country average shares (we first calculate the average share by country and then take the mean (unweighted) across all countries)
FIGURE 29. SHARE OF CONSUMER TRANSFERS OVER TOTAL EXPENDITURE ON FOOD AND AGRICULTURE		At least in the cases of Malawi, Mali, Rwanda and Uganda, the share devoted to consumer expenditures is likely to represent an underestimate, as data from certain ministries (Rwanda), for donor expenditure (Uganda) and for some large projects (Malawi and Mali) were not available for some years
FIGURE 30. SHARE OF EXPENDITURE ON CONSUMERS OVER PRODUCER-SPECIFIC TRANSFERS	All observations up to 2006 are excluded: i.e. Mali (2005–2006), Burkina Faso (2006), Uganda (2004–2006), Burundi (2005–2006), Malawi (2006)	The ratio is generated by computing the ratio between consumers' expenditures (national + donor) over producers' expenditures (national + donor). The local polynomial regression uses a bandwidth of two
FIGURE 34. SHARE OF EXPENDITURE ON FOREST, LAND MANAGEMENT AND ENVIRONMENT OVER TOTAL EXPENDITURE ON FOOD AND AGRICULTURE	<ul style="list-style-type: none"> Senegal (2018): missing data 	

Source: Authors' own elaboration based on MAFAP database (2020 version).

Annex 3

Public expenditures on forest, land and environment

TABLE A4 AVERAGE PUBLIC EXPENDITURES ON FOREST, LAND MANAGEMENT AND ENVIRONMENT BY COUNTRY

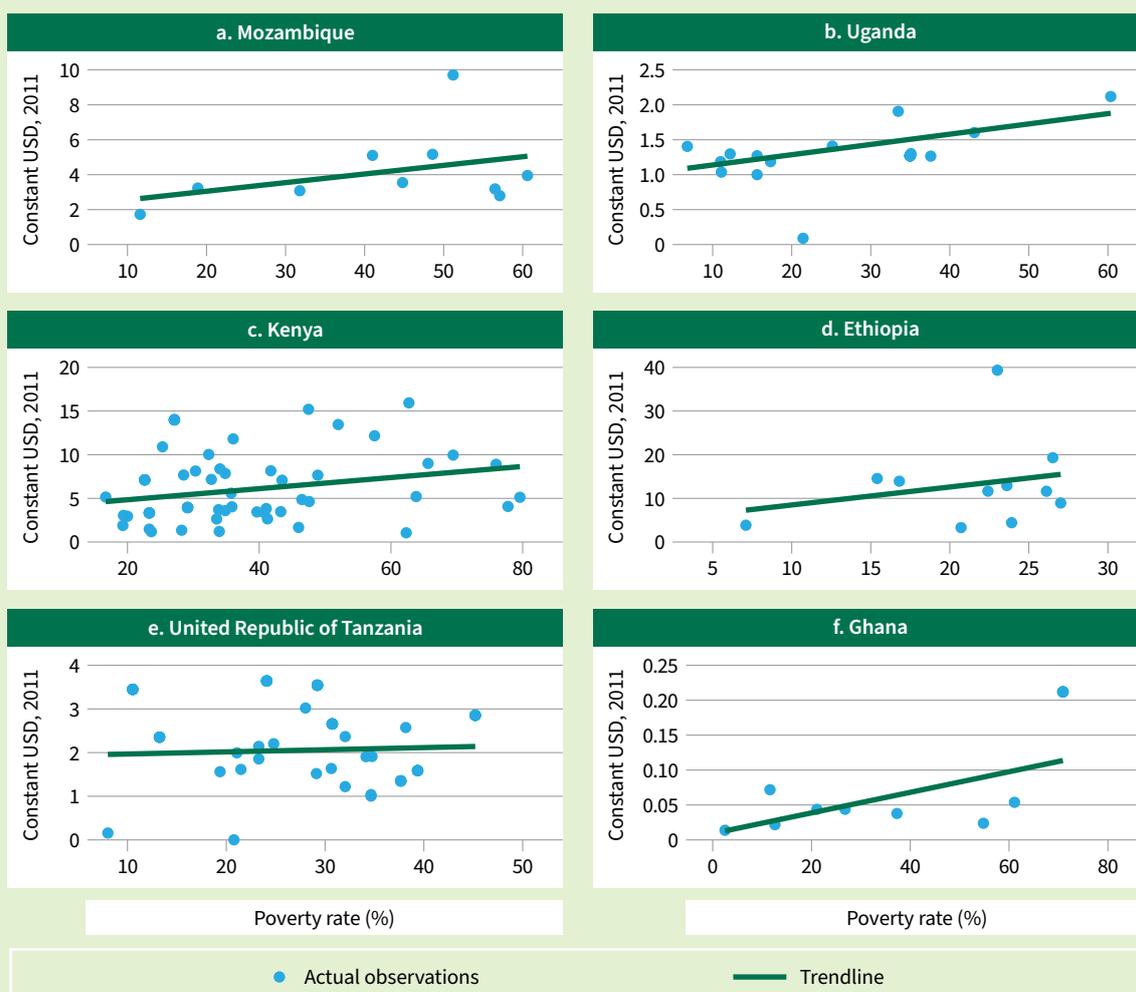
COUNTRY	TIME PERIOD	AVERAGE FLE EXPENDITURE SHARE OF AGRICULTURAL PUBLIC EXPENDITURE (%)	AVERAGE FLE EXPENDITURE SHARE OF TOTAL PUBLIC EXPENDITURE (%)	SOURCE OF FINANCE	
				DOMESTIC (%)	DONOR (%)
Burundi	2005–2017	26	1.4	14	86
Ghana	2013–2017	24	0.2	99.9	0.1
Burkina Faso	2006–2016	12	0.9	37	63
Kenya	2007–2018	12	0.6	100	–
Uganda	2004–2017	9	0.4	90	10
Mozambique	2009–2017	8	0.3	62	38
Senegal	2010–2017	6	0.4	72	28
Rwanda	2012–2018	5	0.3	56	44
United Republic of Tanzania	2011–2017	5	0.2	76	24
Mali	2005–2017	4	0.3	79	21
Ethiopia	2007–2017	4	0.3	51	49
Benin	2008–2018	3	0.2	26	74
Malawi	2006–2018	2	0.2	71	29

Source: Authors' own calculations based on MAFAP database (2020).

Annex 4

Subnational expenditure and poverty rate: correlation results

FIGURE A1 CORRELATION OF SUBNATIONAL EXPENDITURE ON FOOD AND AGRICULTURE PER CAPITA AND POVERTY RATE BY COUNTRY



Source: Authors' calculations based on MAFAP database (2020 version) and national sources for the poverty rate.

Annex 5

Additional tables for the efficiency analysis

TABLE A5 AVERAGE EFFICIENCY SCORES FOR AGRICULTURAL PERFORMANCE (GDP PER CAPITA) BY COUNTRY

COUNTRY	SCORE	COUNTRY	SCORE
Egypt	1.000	Gambia	0.358
Gabon	1.000	Sierra Leone	0.340
Mauritius	1.000	Congo	0.332
Algeria	0.894	Angola	0.329
Cabo Verde	0.714	Uganda	0.328
Tunisia	0.693	Madagascar	0.327
Eswatini	0.688	Sudan	0.315
Sao Tome and Principe	0.661	Malawi	0.310
Nigeria	0.541	Guinea-Bissau	0.284
Botswana	0.515	Togo	0.277
Comoros	0.514	Mozambique	0.274
Rwanda	0.480	United Republic of Tanzania	0.262
Liberia	0.473	Senegal	0.253
Kenya	0.444	Benin	0.250
Burundi	0.436	Zimbabwe	0.248
Ghana	0.424	Zambia	0.245
Equatorial Guinea	0.421	Burkina Faso	0.243
Côte d'Ivoire	0.406	Guinea	0.236
South Africa	0.401	Mali	0.209
Mauritania	0.382	Chad	0.198
Lesotho	0.376	Cameroon	0.185
Ethiopia	0.371	Central African Republic	0.143
Democratic Republic of the Congo	0.370	Niger	0.134
Morocco	0.369	Djibouti	NA
Namibia	0.362	Seychelles	NA

Source: Authors' own calculations based on sources listed in Table A8.

TABLE A6 CORRELATION COEFFICIENTS

VARIABLE	AGRICULTURAL GDP PER CAPITA		
	FULL SAMPLE	HIGH AGRICULTURAL TRANSFORMATION	LOW AGRICULTURAL TRANSFORMATION
Share of producer transfers	-0.260***	-0.487***	-0.159
Share of consumer transfers	0.224***	-0.031	0.405***
Share of research and knowledge dissemination	0.090	0.204	0.052
Share of agricultural infrastructure	0.054	0.357***	-0.212*
Share of inspection, storage and marketing	-0.185**	-0.083	-0.266**
Share of administrative costs	-0.013	-0.046	-0.041
Share of other	0.164*	0.137	0.161

Note: *, **, *** denote significance of the correlation coefficients at the 10, 5 and 1 percent levels, respectively.

Source: Authors' calculations based on sources listed in Table A8.

TABLE A7 AGRICULTURAL TRANSFORMATION INDEX

COUNTRY	PRINCIPLE COMPONENT ANALYSIS SCORE	COUNTRY	PRINCIPLE COMPONENT ANALYSIS SCORE
Egypt	6.99	Zimbabwe	-0.59
Mauritius	3.83	Mali	-0.60
South Africa	0.63	Ethiopia	-0.66
Tunisia	0.55	Uganda	-0.70
Algeria	0.37	United Republic of Tanzania	-0.75
Botswana	0.34	Democratic Republic of the Congo	-0.78
Nigeria	0.22	Guinea	-0.79
Morocco	0.18	Central African Republic	-0.84
Gambia	0.03	Madagascar	-0.89
Togo	-0.09	Mozambique	-0.92
Namibia	-0.11	Niger	-0.96
Ghana	-0.13	Burundi	-1.02
Côte d'Ivoire	-0.14	Comoros	NA
Benin	-0.15	Cabo Verde	NA
Senegal	-0.17	Djibouti	NA
Gabon	-0.22	Guinea-Bissau	NA
Sudan	-0.22	Equatorial Guinea	NA
Kenya	-0.28	Liberia	NA
Congo	-0.29	Lesotho	NA
Angola	-0.35	Mauritania	NA
Burkina Faso	-0.35	Sierra Leone	NA
Cameroon	-0.37	Sao Tome and Principe	NA
Rwanda	-0.46	Eswatini	NA
Zambia	-0.49	Seychelles	NA
Malawi	-0.56	Chad	NA

Notes: Numbers represent the average of the Principle Component Analysis (PCA) scores for the first factor loading (i.e. weight to be applied to the standardized variables to obtain the predicted component score for the agricultural transformation index) over the 1990–2017 period. They have no absolute interpretation. A higher value means that the country is considered to have achieved a higher level of agricultural transformation. Countries in green are MAFAP countries that are included in the high agricultural transformation subgroup. Countries in light blue are MAFAP countries that are included in the low agricultural transformation subgroup.

Source: Authors' own calculations based on sources listed in Table A8.

Annex 6

Data for the efficiency analysis

TABLE A8 DATA AND DATA SOURCES FOR THE EFFICIENCY ANALYSIS

VARIABLES	DESCRIPTION	SOURCE
Agricultural GDP (million, constant USD, 2010)	Agricultural value added (LCU) compiled by the World Bank. Agricultural GDP compiled by RESAKSS	RESAKSS, World Bank
Agricultural GDP per rural capita (constant USD, 2010)	Agricultural value added divided by rural population	RESAKSS, World Bank
Employment in agriculture (percentage of total employment)	Percentage of the employment in agriculture as a percentage of total employment	ILO
Arable land (ha)	Hectares of arable land in the country	FAO
Arable land per rural capita (ha per rural capita)	Hectares of arable land in the country divided by the rural population	FAO, World Bank
Government agriculture expenditure for non-MAFAP countries (billion, constant USD, 2010)	Public agriculture expenditure	IFPRI, national sources
Fertilizer consumption (kg/ha)	Fertilizer use per arable land	FAO
Government agriculture expenditure for MAFAP countries (constant USD, 2011)	Public agriculture expenditure according to the MAFAP definition	MAFAP, FAO
Government agriculture expenditure on producer transfers (constant USD, 2011)	Public agriculture expenditure on variable and capital input subsidies, as well as on-farm services. Most of the expenditures included in this category are related to input subsidies (fertilizer, credit and seed)	MAFAP, FAO
Government agriculture expenditure on consumer transfers (constant USD, 2011)	Public agriculture expenditure on consumer transfers. Includes expenditures on cash transfers, public works programmes and food aid	MAFAP, FAO
Government agriculture expenditure on knowledge dissemination (constant USD, 2011)	Public agriculture expenditure on knowledge dissemination. Includes expenditures on agricultural technical assistance, training and research	MAFAP, FAO





VARIABLES	DESCRIPTION	SOURCE
Government agriculture expenditure on agricultural infrastructure (constant USD, 2011)	Public agriculture expenditure on agricultural infrastructure. Includes mostly irrigation and feeder roads	MAFAP, FAO
Government agriculture expenditure on administrative costs (constant USD, 2011)	Public agriculture expenditure on administrative costs. This expenditure captures mostly running costs of ministries as well as costs associated with departments that can be seen as an 'internal' investment (legal department, human resources, audit, etc.). In some instances, when discernible, running costs of decentralized offices are considered and administrative cost	MAFAP, FAO
Government agriculture expenditure on inspection, marketing and storage (constant USD, 2011)	Public agriculture expenditure on marketing and storage. This expenditure captures expenditures related to market information systems, marketing infrastructure, certification, phytosanitary standards, plant and animal health expenditures, storage infrastructure and part of the expenditure related to public storage	MAFAP, FAO
Government agriculture expenditure on marketing and storage (constant USD, 2011)	Public agriculture expenditure on marketing and storage. This expenditure captures expenditures related to market information systems, marketing infrastructure, storage infrastructure and part of the expenditure related to public storage	MAFAP, FAO
Other government agriculture expenditure (constant USD, 2011)	Public agriculture expenditure on other items. A large proportion of the expenditures in this category relate to decentralized expenditures, land management and forestry expenditures	MAFAP, FAO

Source: Authors' own elaboration.

Public expenditure on food and agriculture in sub-Saharan Africa

TRENDS, CHALLENGES AND PRIORITIES

Monitoring and analysing food and agriculture policies and their effects is crucial to support decision makers in developing countries to shape better policies that drive agricultural and food systems transformation.

This report is a technical analysis of government spending data on food and agriculture during 2004–2018 in 13 sub-Saharan African countries – Benin, Burkina Faso, Burundi, Ethiopia, Ghana, Kenya, Malawi, Mali, Mozambique, Rwanda, Senegal, Uganda and the United Republic of Tanzania.

It analyses the level of public expenditure, including budget execution, source of funding and decentralized spending, as well as the composition of expenditure, including on producer or consumer support, research and development, infrastructure and more to reveal the trends and challenges that countries are facing. It also delves into the relationship between the composition of public expenditure and agricultural performance. As a way forward for future policymaking, the report offers a set of recommendations to strengthen policy monitoring systems and data generation for effective public investments in food and agriculture.

The report is produced by the Monitoring and Analysing Food and Agricultural Policies (MAFAP) programme at FAO in collaboration with MAFAP country partners.

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