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Analysis of public expenditures in support of food and agriculture in Rwanda, 2011/12–2015/16

TECHNICAL NOTE

MONITORING AND ANALYSING FOOD AND AGRICULTURAL POLICIES ◀ MAFAP

Analysis of public expenditures in support of food and agriculture in Rwanda, 2011/12–2015/16

TECHNICAL NOTE

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For more information visit: www.fao.org/in-action/mafap

Acronyms

AfDB	African Development Bank
ASIP	Agriculture Sector Investment Plan
BTC	Belgian Technical Cooperation
CICA	Canadian International Cooperation Agency
CIDA	Canadian International Development Agency
CIP	Crop Intensification Program
COFOG	Classification of the Functions of Government
DED	German Development Service
DFID	Department for International Development
EDPRS	Economic Development and Poverty Reduction Strategy
EICV	Enquête Intégrale sur les Conditions de Vie des Ménages
EU	European Union
FAO:	Food and Agriculture Organization of the United Nations
GDP	Gross Domestic Product
GFI	Government Fund for Irrigation
GLWH	Gishwati Land-Husbandry, Water-Harvesting and Hillside Irrigation
GoR	Government of Rwanda
IFAD	International Fund for Agricultural Development
JICA	Japan International Cooperation Agency
KWAMP	Kirehe community-based Watershed management Project
LISP	Livestock Infrastructure Support Programme
LWH	Land-Husbandry, Water-Harvesting and Hillside Irrigation
MAFAP:	Monitoring and Analysing Food and Agricultural Policies
MINAGRI	Ministry of Agriculture and Animal Resources
MINECOFIN	Ministry of Finance and Economic Planning
MINEDUC	Ministry of Education
MININFRA	Ministry of Infrastructure
MOH	Ministry of Health
NAEB	National Agricultural Exports development Board
NISR	National Institute of Statistics, Rwanda
OECD	Organisation for Economic Cooperation and Development
PAIGELAC	Inland Lakes Integrated Development and Management Support Project
PAIRB	Bugesera Natural Region Rural Infrastructure Support Project
PAPSTA	Support Project to the Strategic Plan for the Agriculture Transformation
PASP	Post-harvest and Agribusiness Support project
PE	Public Expenditures

PEA	Public Expenditure in support of food and agriculture, including administrative costs . .
PEAPT	public expenditures in support of food and agriculture, excluding administrative costs
PSE	Producer Support Estimate
PHHS	Post-Harvest Handling and Storage
PRICE	Project for Rural Income through Exports
PSTA	Strategic Plan for Agriculture Transformation
RAB	Rwanda Agricultural Board
RSSP	Rural Sector Support Project
SPIU	Single Project Implementation Unit
USAID	United States Agency for International Development
WB	World Bank
WDI	World Development Indicators
WFP	World Food Programme

Executive summary

The present note aims to analyse the level and composition of Public Expenditures in support of Food and Agriculture (PEA) in Rwanda for the 2011/12–2015/16 period. Further, it aims to assess the coherence of PEA with respect to stated development objectives, particularly those outlined in the Strategic Plans for the Transformation of Agriculture (PSTAs) phase II (2009–12) and III (2013–17). Its results are used to formulate several policy recommendations.

The note is based on a database of public expenditures, which contains data on the expenditures incurred by the Ministry of Agriculture and Animal Resources (MINAGRI), the Rwanda Agricultural Board (RAB) and the National Agricultural Exports Development Board (NAEB). As the MAFAP PEA methodology also considers agriculture-supportive expenditures (i.e. expenditures targeting rural health, education or infrastructures), the database is currently incomplete, and will be updated as soon as new data become available. The expenditure data was obtained from the MINAGRI Corporate Services (accounting unit) and the national Budget Laws, which were downloaded from the Ministry of Finance and Economic Planning (MINECOFIN)'s website. Expenditures were originally classified by programme, sub-programme, output and economic category. Authors then mapped these expenditures to multiple categories and commodities as per the MAFAP public expenditures methodology (see section 1 below).

Expenditure dynamics

- MINAGRI expenditures represented about 80 percent of expenditures included in the database during 2011/12–2015/16. RAB expenditures represented 15 percent of the spending, and NAEB expenditures amounted to 5 percent.
- PEA grew at a slightly higher average rate than overall state Public Expenditures (PE) over the reviewed period. However, the share of PEA within PE remained low, persistently standing below 7 percent. A drop in the share of PEA within PE was observed in 2013/14, as both donors and the government diverted resources from the sector.
- Execution rates for PEA averaged 105 percent. Such a high share however follows from the absence of data on actuals for RAB and NAEB, whose execution rates were assumed equal to 100 percent. Real PEA execution rates thus presumably were lower. The share of administrative costs identified by MAFAP within PEA averaged 10 percent.
- The composition of PEA was dominated by 'input subsidies and other payments to producers' and 'agricultural infrastructures' over the reviewed years. These categories absorbed 34 and 44 percent of agriculture-specific expenditures, on average between 2011/12 and 2015/16 respectively. The relative size of technical assistance, training, extension and inspection averaged 12 percent. For agricultural research and 'storage and marketing', average relative sizes stood at 5 and 3 percent, respectively.
- Most of the spending on 'input subsidies and other payments to producers' were variable input subsidies for seeds and fertilisers provided under the Crop Intensification Programme (CIP 2007-present). Most of the spending on agricultural infrastructures went to off-farm irrigation schemes, through programmes such as the Kirehe community-based Watershed Management Project (KWAMP 2009–16), the Land Husbandry, Water Harvesting and Hillside Irrigation (LWH) project or the Rural Sector Support Project (RSSP 2012–18). In 2014/15–2015/16, irrigation expenditures dominated the agriculture budget and exceeded input subsidies.
- About 50 percent of agriculture-specific expenditures targeted groups of commodities during the reviewed period. Only a limited fraction went to single commodities (4 percent). Food crops, namely maize, rice, wheat, Irish potatoes, beans and cassava (the six CIP priority crops, which are also prioritised under other programmes), represented around 78 percent of expenditures to groups of commodities. Another 16 percent of expenditures on groups of commodities was spent for export crops, particularly in the context of the Project for Rural Income through Exports (PRICE 2012–19). Food crop expenditures focused on input subsidies, while export crop spending was more balanced and included some funding for research and knowledge dissemination and training.
- Disaggregating policy transfers (PEA without administrative costs) across programmes of the Strategic Plan for the Transformation of Agriculture Phase 3 (PSTA3) shows that about 74 percent of policy transfers made by MINAGRI, RAB and NAEB went to 'Programme 1. Agriculture and Animal Resource Intensification' over 2013/14–2015/16. 'Programme 3. Value Chain Development and Private Sector Investment' could be linked to about 19

percent of the transfers. Programmes 2 and 4 received minor shares of policy transfers in support of food and agriculture.

- The repartition of expenditures across PSTA3 programmes did not change much over time, showing the introduction and implementation of the plan seemingly had little influence on spending practices.
- Comparing PEA amounts recorded by MAFAP and Agriculture Sector Investment Plan II (ASIP2) spending targets for 2013/14–2015/16 shows funding gaps were significantly lower for PSTA3's programme 1 than for other PSTA3 programmes. Programme 4 had funding gaps reaching almost 100 percent. The overall funding gap for PSTA3 implementation stood at about 46 percent on average during 2013/14–2015/16. In a scarce resources context, budget holders prioritised PSTA3's programme 1 over other planned activities.
- About 50 percent of PEA originated from donor sources over the reviewed years. The share of donor contributions was significantly higher within expenditures on public goods such as irrigation or research and knowledge dissemination and training than within expenditures on private goods, such as inputs for producers.

Recommendations

- The share of agricultural expenditures within total public expenditures is still small, and below 10 percent according to the indicators used here. As shown by Diao et al. (2014), a one percent increase in public expenditures on agriculture is estimated to induce a 3.6 percent increase in agricultural GDP and a 0.2 percent increase in non-agricultural GDP through multiplier effects. Policymakers should consider allocating a larger share of public expenditures to agriculture, as part of a broad structural transformation agenda.
- Agricultural expenditures were very much supply-focused over the last five years. While it is clear that agricultural intensification has led to significant productivity improvements in the country (Del Prete et al., 2017), demand-side factors now need to be addressed. Renewing public support to agricultural research and channelling more resources to storage and marketing therefore appears necessary. Such expenditure categories have also been proved to yield high development returns in other countries (Fan et al., 2008; 2009)
- The possibility of broadening the commodity basket should be considered. Agricultural budgets have been mostly targeting CIP priority crops during the reviewed period. The possibility of broadening the commodity basket should be considered. Alternative commodity groups (such as fruits and vegetables or dairy) could receive increased attention, in addition to export crops whose relative importance in public expenditures has been rising in recent years.
- The mapping of agricultural expenditures across PSTA3 components and the comparison of actual expenditures with planned expenditures of the ASIP2 shows that the mainstreaming of strategic development objectives in budget practices has been limited. There is an apparent need to reinforce the link between public investment planning and the effective disbursement of funds across fiscal years.
- The preparation of the PSTA4 and of the ASIP3 offers room to develop a balanced public support strategy for the Rwandan agriculture, and to enhance budget management and monitoring across all sector partners.

1. Introduction

The purpose of this technical note is to analyse spending patterns of public expenditures in support of food and agriculture in Rwanda. The technical note does not intend to provide an in-depth analysis of the relationship between sector performance and public expenditures, nor does it provide an impact assessment of projects and programmes covered in the analysis. Instead, it focuses on a detailed analysis of the level, composition and coherence of public expenditure in support of food and agriculture in the country. The objective of such an analysis is to identify trends in the allocation of funds towards specific categories (research, input subsidies, infrastructure, etc.) and commodities over time, by type and sources of funding. The analysis also aims to evaluate the coherence of agricultural expenditures with respect to objectives outlined in the PSTAs.

1.1. Methodology

This technical note uses the Monitoring and Analysing Food and Agricultural Policies (MAFAP) methodology for analysing public expenditures in support of food and agriculture (FAO, 2015). It allows to identify, disaggregate and classify all public expenditures in support of food and agriculture in the country, whether they originate from national or external sources.

The methodology follows a typology derived from the classification of public expenditures in support of agriculture used by the Organization for Economic Co-operation and Development (OECD) to compute its Producer Support Estimate (PSE) indicators (OECD, 2010; 2016). It is primarily conceived as an analytical tool, and not a reporting tool. The methodology classifies expenditures of projects and programmes in support of the food and agriculture sector according to their economic characteristics. Expenditures are therefore classified depending on how the activities they fund are implemented, and not in function of the objectives or impacts of these activities. The methodology provides with a disaggregation of expenditures across sources of funding (national and external/donor) and implementing agencies. It differentiates between recurrent and investment expenditures, policy transfers and administrative costs, and budgeted and actual expenditures. It also includes a mapping of expenditures towards major agricultural commodities. When an activity targets more than one agricultural commodity, it is mapped to a commodity group. Broad commodity groups were considered, namely food crops, export

MAFAP uses the following distinctions to take all expenditures in support of food and agriculture into account:

- A broad distinction between expenditures which are (i) agriculture-specific (direct support to the agricultural sector), (ii) agriculture-supportive (indirect support to the agricultural sector) and (iii) non-agricultural.
- Within agriculture-specific expenditures, a distinction between (i) payments to producers and to other value chain agents (for instance, input subsidies) and (ii) general sector support (for instance, research). Agents in the value chain include producers, consumers, input suppliers, processors, traders and transporters.

The sum of agriculture-specific and agriculture-supportive expenditures equates what MAFAP refers to as policy transfers. Public expenditures in support of food and agriculture (PEA) are equal to the sum of policy transfers and administrative costs identified by MAFAP. The full MAFAP classification table for PEA is given in Annex 0, Box 1. More information on the methodology can be found in the methodological guidelines, available on the MAFAP website (http://www.fao.org/in-action/mafap/products/tool-methodology/en).

In addition to the use of the MAFAP methodological guide, a mapping of expenditures across programmes and sub-programmes of the PSTA3 was carried out. The mapping was done using the information available in the PSTA3 document (MINAGRI, 2013a) and secondary sources and literature found online or through direct interaction with MINAGRI staff.

1.2. Data sources and limitations

The data sources used for the analysis are given in Table 1. The covered period is 2011/12–2015/16. No years prior to 2011/12 were included since soft copies of budget books were available at MINAGRI only from 2011/12 on.

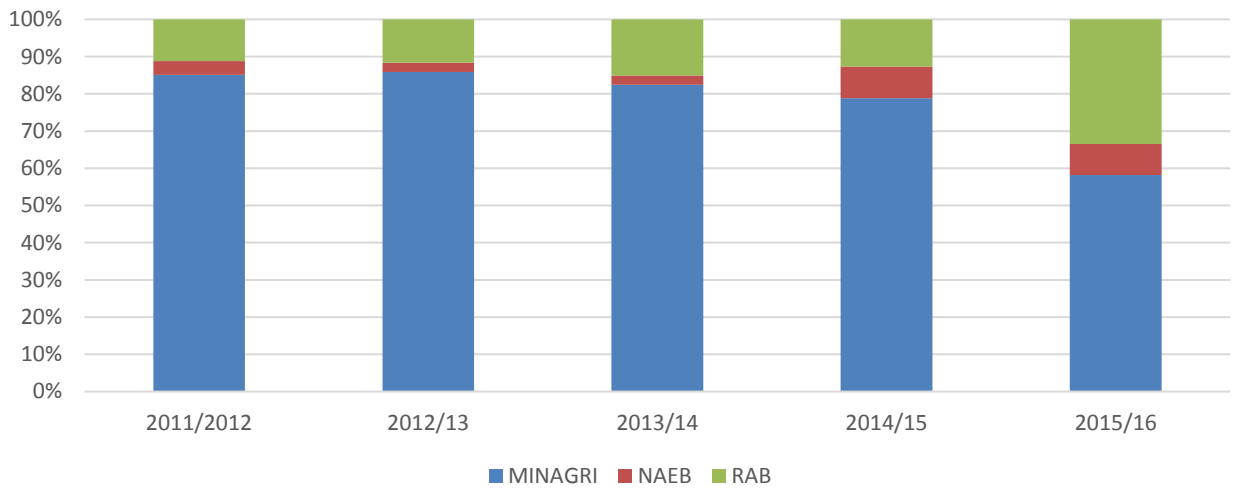
Table 1. Data sources for the MAFAP analysis of PEA in Rwanda

Source	Description	Notes
MINAGRI Corporate Services	MINAGRI balances for 2011/12–2015/16	In the original files, expenditures are classified by programme, sub-programme, output and economic category. Columns are labelled as "Budgeted", "Commitments" and "Balances". Figures under "Budgeted" were considered budgeted expenditures and figures under "Commitments" were considered actual expenditures.
MINECOFIN Budget Laws	RAB and NAEB expenditures for 2011/12–2015/16	Laws were downloaded from the MINECOFIN website. Sections for RAB and NAEB in Annexes II.1 in the laws were converted from pdf into Excel. Only budgeted amounts are given in the laws. Actual expenditures were therefore assumed equal to budgeted ones for these two agencies.

Source: authors.

The relative sizes of MINAGRI, RAB, and NAEB public expenditures captured in the Rwandan MAFAP PE database are displayed in Figure 1. MINAGRI expenditures have represented about 80 percent of PEA, on average over the reviewed period. In 2015/16, the share of RAB expenditures in the MAFAP database has raised to over 30 percent. NAEB expenditures represented no more than an average 5 percent of expenditures included in the database.

Figure 1. Share of MINAGRI, RAB and NAEB expenditures in support of food and agriculture, including administrative costs identified by MAFAP, actual spending



Source: MAFAP based on data from MINAGRI (2016) and MINECOFIN (2017).

The main limitations of the data are as follows.

- No actual expenditures were available for RAB and NAEB. Therefore, for these agencies actual expenditures were assumed equal to budgeted expenditures – which drives up execution rates that were computed here. Tables and graphs indicating "actual spending" thus show actual expenditures for MINAGRI and budgeted expenditures for RAB and NAEB.
- The disaggregation of RAB and NAEB expenditures was not as detailed as for MINAGRI, given the national finance laws only contain a broad division of expenditures across major programmes. The classification of RAB and NAEB expenditures was therefore based on a lower level of detail. The RAB and NAEB expenditures were mostly allocated to input subsidies (categories B1, B2 and B3), infrastructures (categories N1, N2 and N3) and
- As per the MAFAP classification table, agriculture-supportive expenditures include rural infrastructures, rural health and rural education expenditures. Such expenditures are incurred by several agencies outside MINAGRI,

i.e., the Ministry of Health (MOH), the Ministry of Education (MINEDUC) or the Ministry of Infrastructure (MININFRA). Given that no expenditure data for these ministries was included in the database, the "agriculture-supportive" category is almost empty. Hence, only expenditures on categories of agriculture-specific expenditure should be seen as representative. Expenditures for other ministries than MINAGRI were not included because they were not available in Excel format and in a sufficiently disaggregated form on MINECOFIN's website. Attempts to obtain data directly from MINECOFIN were made in early 2016, together with the World Bank. However, no additional data was obtained as a result of these exchanges.

- No precise mapping of MINAGRI, RAB and NAEB expenditures from identifiable donors was available. The MINAGRI expenditure data only indicates whether budgeted or actual expenditures originate from internal or external sources – donor names are not mentioned.
- Some expenditures incurred by the MINAGRI Single Project Implementation Units (SPIUs, which are donor-supported project coordination clusters) were not recorded. This implies an unknown proportion of donor spending on the food and agriculture sector is missing in the MAFAP PEA database.
- The mapping of MINAGRI, RAB and NAEB expenditures towards major projects and programmes was not complete. Hence, expenditures reported for selected programmes (such as the Crop Intensification Programme) may be lower than real expenditures.

2. PEA level

Budgeting for the agriculture sector in Rwanda is done yearly by MINAGRI in collaboration with MINECOFIN. Needs are established in reference to the objectives of the PSTA3 (the government's development plan for agriculture) and the second Agriculture Sector Investment Plan (ASIP2 2013–2018). The ASIP2 outlines estimated budget needs and plans for achieving PSTA3 targets. The PSTA3 and the ASIP2 aim to ensure that the food and agriculture sector successfully contributes to the targets set out in the second Economic Development and Poverty Reduction Strategy (EDPRS II 2013–2017), which foresees to develop a "productive high-value and market-oriented" agriculture sector by 2020.

Fiscal years in Rwanda start on July 1st and end on June 30. The budgeting cycle is as follows:

1. July-December: performance reviews of previous plans by MINAGRI and the Agriculture Sector Working Group (the discussion platform for agriculture sector stakeholders, which is supervised by MINAGRI's Planning Unit and includes donors) and prioritization of activities for the next years;
2. January-March: consultations, budget formulation and endorsement by Rwanda's Cabinet (includes the President and all Ministers);
3. April-June: budget scrutiny, approval by parliament (budget law) and beginning of disbursements from MINECOFIN to MINAGRI as per the law.

The present section discusses the evolution of Rwanda's total public budget and expenditures, the evolution of PEA, the share of PEA within total public budget and the share of administrative costs identified by MAFAP within PEA over 2011/12–2015/16.

2.2. General trends in the global budget

Actual total public expenditures (PE) in Rwanda expressed in nominal terms grew steadily over the reviewed period, going from 1.19 billion RWF in 2011/12 to 1.81 billion RWF in 2015/16. The average growth rate of expenditures was 11 percent. Execution rates for PE were high, exceeding 100 percent in all reviewed years. Rates were pushed upwards by NAEB and RAB, for which no actuals were available and rates were assumed equal to 100 percent. Expenditures expressed in constant 2011 RWF (real terms) also increased, although at a slightly lower rate (Table2).

Table 2. Total public expenditures in Rwanda: budgeted and actual spending in nominal and real terms, in billions of RWF

	2011/12	2012/13	2013/14	2014/15	2015/16	Average growth rate 2011/12–2015/16
PE Budget allocation	1 117	1 385	1 653	1 754	1 768	13%
PE Actual spending	1 194	1 440	1 678	1 762	1 809	11%
Execution rate	107%	104%	102%	100%	102%	
PE Budget allocation (constant 2011 RWF)	1 117	1 307	1 489	1 523	1 518	8%
PE Actual spending (constant 2011 RWF)	1 194	1 359	1 511	1 531	1 553	7%

Source: authors using data from MINECOFIN (2017) and World Bank (2016) for the GDP deflator.

2.3. General trends in PEA

Table 3 shows trends in budgeted and actual PEA, both in nominal and real terms. Differences between budgeted and actual amounts are to be attributed to MINAGRI, given the data limitations pointed out above. Actual spending, both in nominal and real terms, was superior to budget allocation in all periods except 2015/16. In 2011/12, budgeted PEA expressed in nominal terms stood at about 72 billion RWF. It reached about 118 billion RWF in 2015/16. Actual spending equated about 79 billion RWF in 2011/12, and reached 116 billion RWF in 2015/16. PEA execution rates were high, averaging 105 percent over the period. Amounts expressed in real terms were lower but followed similar trends. Substantial drops (of about 20 percent) in both budgeted and actual expenditures were recorded in 2013/14. This is

attributable to an overall decrease in total public expenditures, which followed from significant cuts in both donor and domestic funding for agriculture in that year (MINECOFIN, 2013).

Table 3. Total public expenditures in support of the food and agriculture sector, including administrative costs (PEA) in Rwanda: budgeted and actual spending in nominal and real terms, in billions of RWF

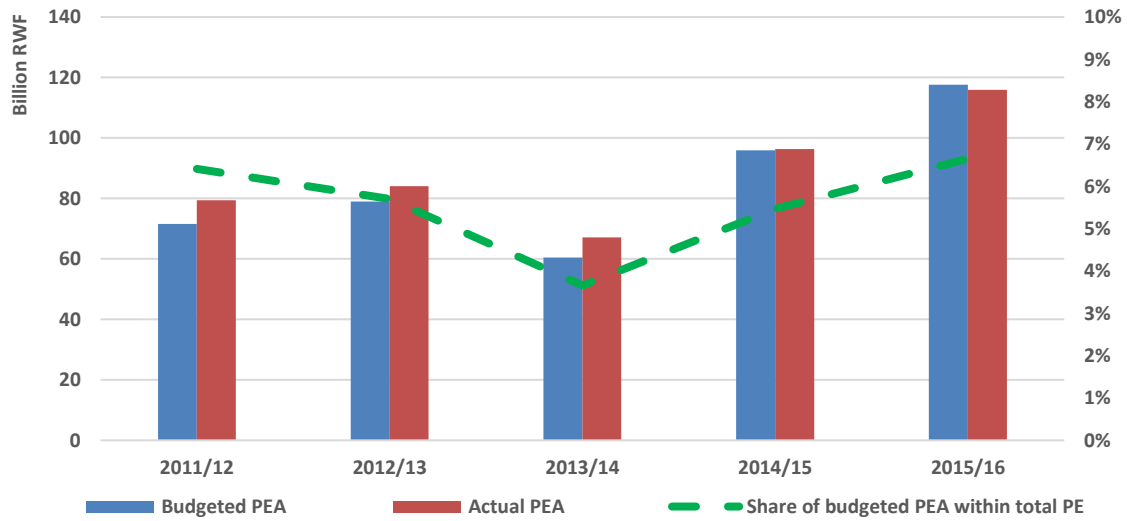
	2011/12	2012/13	2013/14	2014/15	2015/16	Average growth rate 2011/12–2015/16
PEA Budget allocation	71.6	78.9	60.5	95.9	117.7	17%
PEA Actual spending	79.4	84.1	67.1	96.3	115.9	12%
Execution rate	111%	107%	111%	100%	98%	
PEA Budget allocation (constant 2011 RWF)	71.6	74.5	54.5	83.3	101.0	13%
PEA Actual spending (constant 2011 RWF)	79.4	79.3	60.4	83.7	99.5	8%

Source: authors based on data from MINAGRI (2016) and MINECOFIN (2017).

Note: PEA budget allocation: sum of MINAGRI, RAB and NAEB budgeted expenditures; PEA actual spending: sum of MINAGRI actual expenditures + RAB and NAEB budgeted expenditures.

Figure 2 shows the share of budgeted PEA within PE. The share fluctuated between 4 and 7 percent during 2011/12–2015/16. A large decline was observed in 2013/14, consistent with the increase (decline) in PE (PEA) in that year. The diminution in domestic resources allocated to agriculture in 2013/14 may have resulted from a general decrease of donor spending in the country in that year, which also affected the agriculture sector. As a result, the Government may have shifted resources away from agriculture to compensate for funding gaps in other sectors. From 2013/14 on, the share of budgeted PEA within total public budget has been increasing, indicating that the introduction of the PSTA3 might have led MINAGRI and its related agencies to attract a larger proportion of public resources. The share however remains low, standing below 10 percent of total public expenditures for all years under review.

Figure 2. Share of budgeted PEA within total public budget (right) and level of PEA (budgeted and actual) (left) in Rwanda



Source: authors, 2017.

The MAFAP methodology considers expenditures that accompany policy transfers but do not directly fund a good or a service supporting the agricultural sector as administrative costs. These costs are, for instance, running costs faced by Ministries (including personnel remunerations), the costs of training of Ministry staff or the costs associated with policy design work (FAO, 2015). The administrative costs reported here are therefore likely to differ from the ones reported in budget laws, since the national definition of administrative costs is different from the MAFAP definition of administrative costs. The administrative costs identified by MAFAP can however be used as a very rough measure of expenditure efficiency. A lower proportion of administrative costs in PEA usually means more goods and services for beneficiaries in agriculture, other things being equal. In Rwanda, about 10 percent of actual PEA were administrative costs during

2011/12–2015/16 (Table 4). The share remained stable across time and seems to be reasonably low. For instance, the share of administrative costs in PEA over 2006/07–2012/13 in Uganda and Kenya equated 20 and 14 percent respectively (Shinyekwa et al 2014, Laibuni et al 2015).

Table 4. Share of administrative costs and policy transfers PEA, actual spending

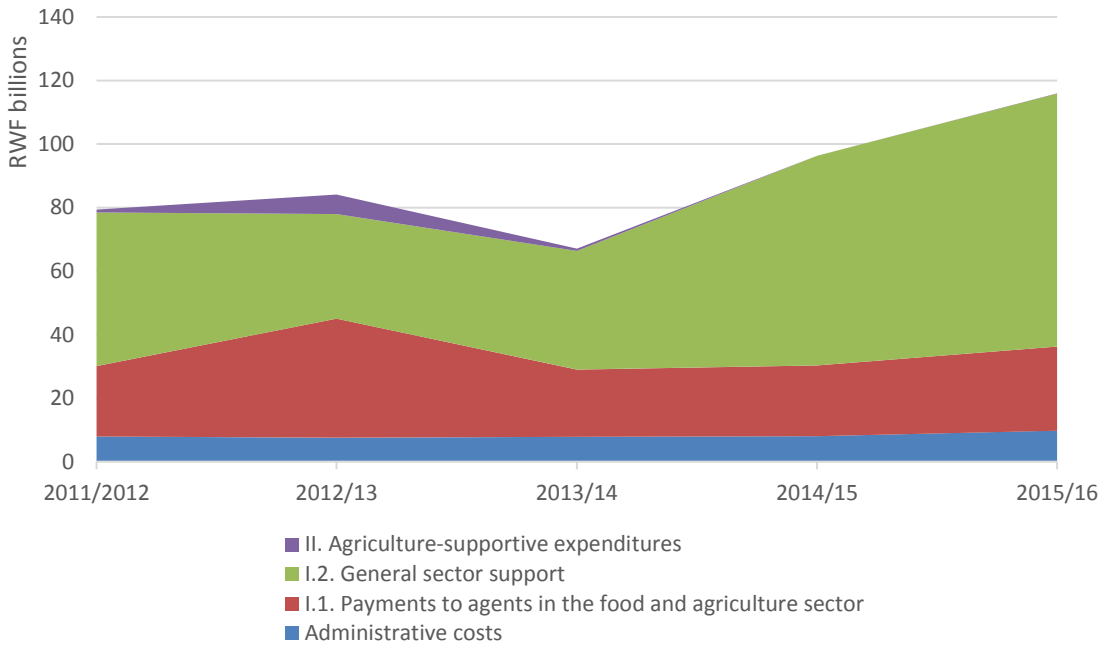
	2011/12	2012/13	2013/14	2014/15	2015/16	Average 2011/12–2015/16
Share of administrative costs within PEA	10%	9%	12%	8%	8%	10%
Share of policy transfers within PEA	90%	91%	88%	92%	92%	90%

Source: authors using data from MINAGRI (2016) and MINECOFIN (2017).

3. PEA composition

As per the MAFAP methodology, PEA were mapped to all the categories of the classification table given in Annex 0, Box 1. The resulting total expenditure amounts for all MAFAP categories are given in Annex 0, Table 6. PEA have also been mapped to major agricultural projects and programmes in the MAFAP database. Although the mapping is not complete, it gives an idea of the relative size of the main initiatives supervised by MINAGRI, RAB and NAEB. The amounts per project and programme over 2011/12–2015/16 are given in Annex 0, Table 7. As much as 17 projects and programmes were identified in the database. The Crop Intensification Programme (CIP 2007–present) and the Rural Sector Support Project (RSSP 2012–18) had the largest average weights within PEA (11 and 10 percent over 2011/12–2015/16, respectively).

Figure 3. Composition of public expenditures in support of food and agriculture in Rwanda, actual spending



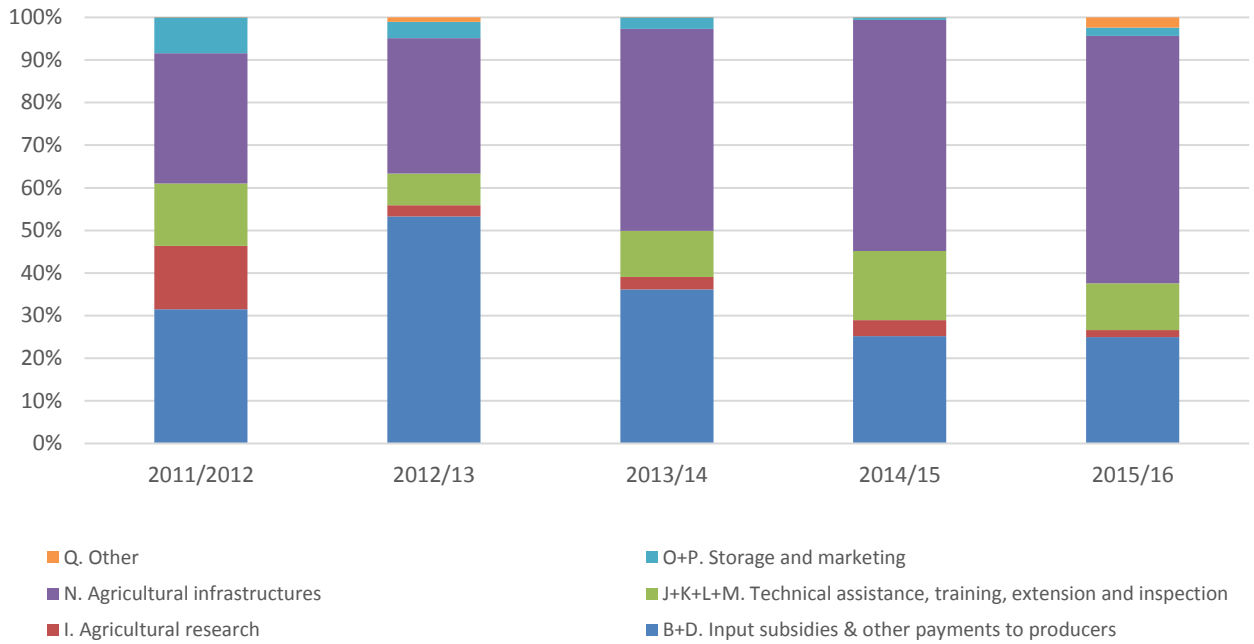
Source: authors, 2017.

Figure 3 displays the level of major MAFAP PEA categories, namely 'administrative costs', 'payments to agents', 'general sector support' and 'agriculture-supportive expenditures' between 2011/12 and 2015/16. 'Payments to agents' and 'general sector support' sum up to agriculture-specific expenditures (see Annex 0, Box 1). Almost all policy transfers recorded in the MAFAP database count as agriculture-specific, given the data limitations pointed out above. The relative size of general sector support has been rising considerably in recent years, going from about 40 percent in 2013/14 to 75 percent in 2015/16.

3.1. Agriculture-specific expenditures

Agriculture-specific expenditures have been dominated by 'input subsidies and other payments to producers' and 'agricultural infrastructures' over 2011/12–2015/16 (Figure 4). These categories represented an average 34 and 44 percent of agriculture-specific spending, respectively. The relative size of input subsidies and other payments to producers has been decreasing since 2012/13, going from around 50 to about 25 percent in 2015/16. Concomitantly, agricultural infrastructures have absorbed an increasingly large portion of the budget, summing up to almost 60 percent of expenditures in 2015/16. The relative decline (increase) in input subsidies and other payments to producers (agricultural infrastructures) has been concurrent with the closure of the PSTA2 and the beginning of PSTA3 over fiscal year 2013/14. Nominal expenditures on input subsidies and other payments to producers however increased since 2013/14. The Government is willing to continue supporting fertiliser supply systems and smart fertiliser use, which is likely to require large expenditures on input subsidies in the short and medium run (MINAGRI, 2015). Average shares of expenditures on 'technical assistance, training, extension and inspection', 'agricultural research' and 'storage and marketing' were low during the reviewed period (averages stood at 12, 5 and 3 percent respectively).

Figure 4. Composition of agriculture-specific expenditures in Rwanda, actual spending

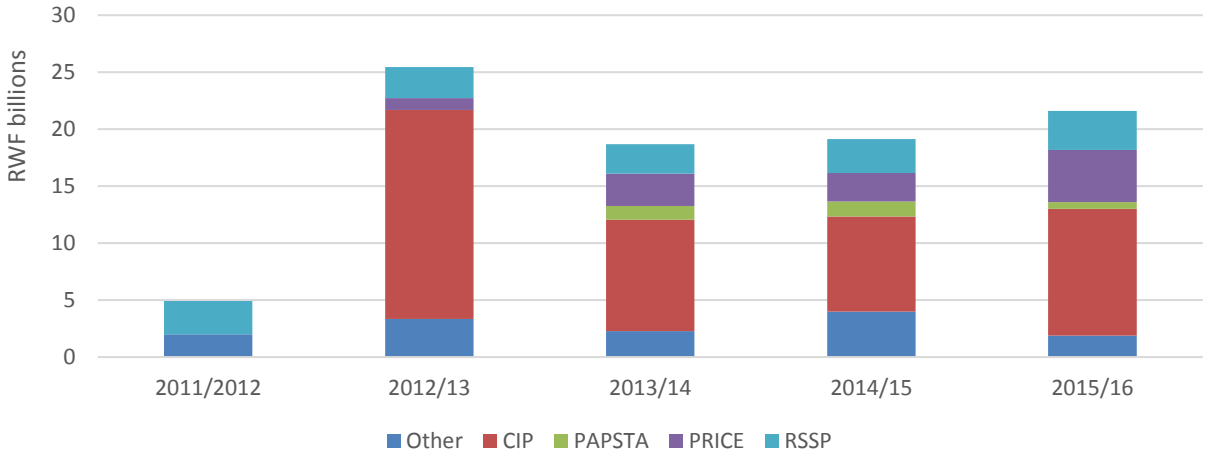


Source: authors, 2017.
Note: the 'input subsidies & other payments to producers', 'storage and marketing' and 'technical assistance, training, extension and inspection' categories were taken as the sum of categories in the MAFAP classification table, as indicated in the graph legend. Categories A, C, 1.1.2, 1.1.3, 1.1.4, 1.1.5 and 1.1.6 did not receive any funds over the period and were therefore ignored.

Payments to agents were almost exclusively done in the form of input subsidies (spending on category 'D. Other payments to producers' was negligible) for producers. No transfers to consumers were recorded. Most of these input subsidies were for variable inputs (MAFAP category B1), namely seeds and fertilisers. From 2013/14 on, 85 percent of input subsidies were consistently allocated to variable inputs, the remainder going to capital inputs such as machinery and equipment (B2, 10 percent) and on-farm services such as training or disease controls (B3, 5 percent). Total spending on input subsidies increased, but at a lower rate than total agricultural-specific expenditures – which explains their declining relative share in Figure 4 during 2012/13–2015/16.

Most spending on variable input subsidies was done through the CIP. The CIP aims to increase agricultural productivity in the country through crop regionalisation and land consolidation. It focuses on six priority crops: maize, rice, beans, cassava, Irish potatoes and wheat. Figure 5 shows an indicative repartition of expenditures on variable inputs across major agricultural projects and programmes. In addition to the CIP, programmes such as the Rural Sector Support Project (2012–18) or the Project for Rural Income through Exports (PRICE 2012–19) also provided variable input subsidies, although at a smaller scale.

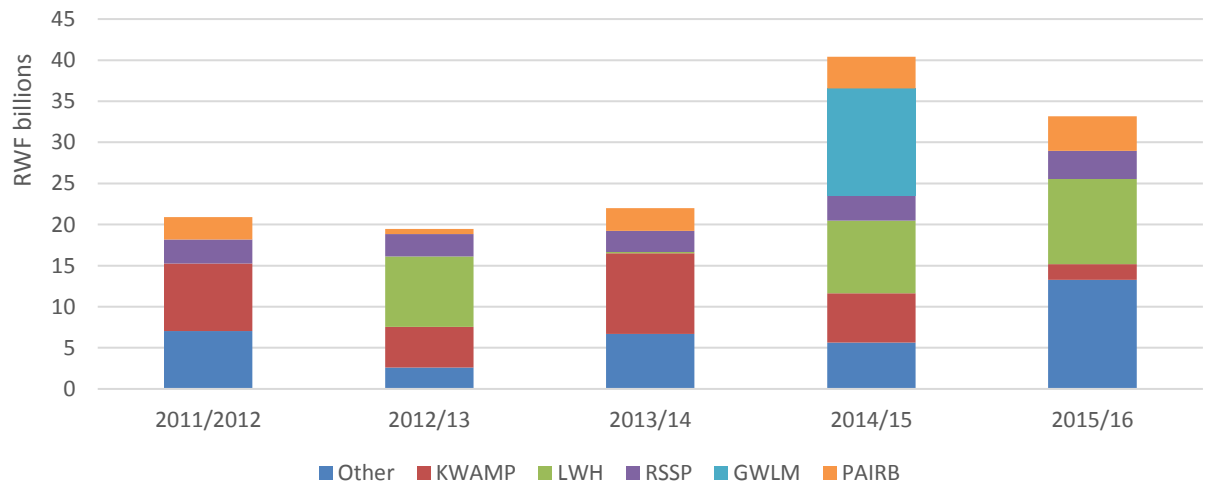
Figure 5. Main projects/programmes contributing to expenditures on variable inputs subsidies (MAFAP category B1) in Rwanda, actual spending



Source: authors, 2017.
Note: Crop Intensification Programme (CIP 2007–present), Support Project for the Strategic Plan for the Transformation of Agriculture (PAPSTA 2006–15), Project for Rural Income through Exports (PRICE 2012–19), Rural Sector Support Project (RSSP 2012–18).

Expenditures in agricultural infrastructures can also be disaggregated across sub-categories, projects and programmes. About 80 percent of expenditures on agricultural infrastructures were incurred for the development of off-farm irrigation schemes during 2011/12–2015/16 (MAFAP category N2, see Annex 0, Table 6). Expenditures on irrigation were made through a breadth of initiatives, of which major ones were the Kirehe community-based Watershed management Project (KWAMP 2009–16) or the Land Husbandry, Water Harvesting and Hillside Irrigation (LWH) project. The World Bank is the major source of funds for both the LWH (hillside focus) and the RSSP (marshland focus). Together, these two initiatives went to represent an increasing share of public expenditures for irrigation during the last two years under review. In 2014/15, a notable increase in spending on off-farm irrigation occurred due to expenditures made through the MINAGRI-funded Gishwati Water and Land Management Project (GWLM 2014–17). In 2015/16, overall spending on agricultural infrastructures increased in spite of the diminution of spending on off-farm irrigation, as expenditures on feeder roads (MAFAP category N1) surged in the context of MINAGRI's Feeder Roads Development Project (FRDP 2015–2021).

Figure 6. Main projects/programmes contributing to expenditures on off-farm irrigation (MAFAP category B2) in Rwanda, actual spending



Source: authors, 2017.
Note: Kirehe community-based Watershed management Project (KWAMP 2009–16), Land Husbandry, Water Harvesting and Hillside Irrigation (LWH), Rural Sector Support Project (RSSP 2012–18), Gishwati Water and Land Management Project (GWLM 2014–17), Bugesera Natural Region Rural Infrastructure Support Project (PAIRB 2010–15).

Looking into categories that received smaller shares of agricultural-specific expenditures is of interest. Large expenditures on agricultural research were first recorded in 2011/12, due to the funding of several activities at MINAGRI, such as the creation of the E-Soko (agricultural commodity prices), CountrySTAT (agricultural statistics) or Geographical Information System (GIS) databases. In subsequent years, support to agricultural research shrunk. Some expenditures on agricultural research were incurred within the Support Project for the Strategic Plan for the Transformation of Agriculture (PAPSTA 2006–15) over 2013/14–2015/16, but did not exceed 1.3 billion RWF yearly. The diminution of support to agricultural research coheres with the progressive decline of the Agricultural Information and communication centre (CICA), which is based at MINAGRI but dormant since 2014 (MINAGRI, 2014).

Expenditures on 'technical assistance, training, extension and inspection' have mainly been disbursed under the RSSP, the PRICE and the Post-Harvest and Agribusiness Support Project (PASP 2014–2019). This latter programme drove up spending on the 'technical assistance, training, extension and inspection' category over 2014/15–2015/16. The few expenditures on storage and marketing, which were mainly incurred in 2011/12 and 2012/13, followed from the work of a Post-Harvest Handling and Storage (PHHS) task force. The task force was set up by MINAGRI to accelerate the construction of warehouses in various parts of the country, in an attempt to reduce post-harvest losses, safeguard food supplies and ensure food security (MINAGRI, 2012). Its financial resources however sharply declined from 2012 on.

It should be noted that spending on research, technical assistance, training, extension and inspection mostly came from donor sources throughout the reviewed period. The trends thus illustrates the incidence of high reliance on donor support – when donors shift priorities, activities may be abruptly stopped (see discussion in section 7 below). Support to storage and marketing, which represented a minor share of agriculture-specific expenditures, mostly declined during 2011/12–2015/16. Main expenditure destinations within that category were the National Strategic Grain Reserve (NSGR), which is supervised by MINAGRI, and NAEB's Market-oriented Infrastructure for Post-Harvest Management Systems programme.

3.2. Agriculture-supportive expenditures

Agriculture-supportive expenditures include expenditures on 'rural education' (MAFAP category R), 'rural health' (S) and 'rural infrastructures' (T). The T category is itself subdivided into 'rural roads', 'water and sanitation' and 'energy'. The few expenditures (2 percent of policy transfers) recorded under agriculture-supportive in our database limit opportunities for analysis (see section 1.2). These recorded expenditures went to either 'rural roads', 'rural health' or 'other support to the rural sector'.

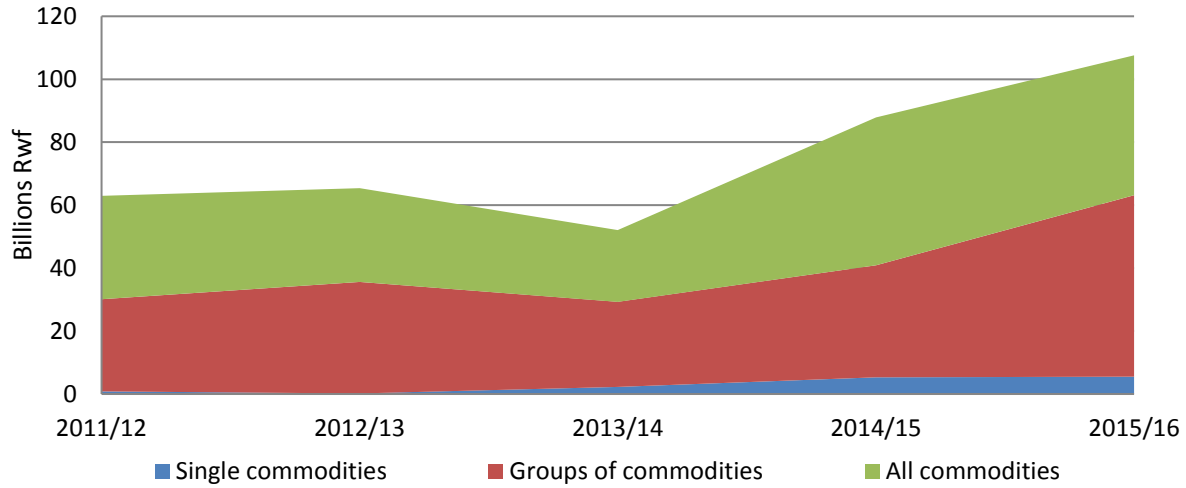
More than 80 percent of agriculture-supportive expenditures in 2014/15–2015/16 were made under the "Rural Community Support Project" (RCSP 2014–present) funded by the Korea International Cooperation Agency (KOICA). The RCSP is dedicated to the rehabilitation of marshlands and hillsides, commodity value chain development and capacity building. In the same years, expenditures on rural health were chiefly dedicated to mainstreaming HIV awareness into the agriculture sector or to monitoring the 'One cup of milk per child' programme. These expenditures followed from the implementation of the Nutrition Action Plan (2013–17) at MINAGRI. Expenditures on rural roads were mainly done over 2012/13, in the context of the Inland Lakes Integrated Development and Management Support Project (PAIGELAC 2006–12) funded by the African Development Bank. PAIGELAC aimed at providing support to fisheries around Rwandan lakes through the construction of post-harvest infrastructures (cold storage, ice making machines at selected sites, drying racks, smoking ovens, etc.) (MINAGRI, 2012).

4. PEA across agricultural commodities

This section proposes a disaggregation of agriculture-specific expenditures across key commodities. The expenditures were partitioned across three groups in the MAFAP PEA database, namely 'single commodities', 'groups of commodities' and 'all commodities'. Expenditures mapped to single commodities target identifiable individual products. Those mapped to groups of commodities target sets of products (food or export crops, for instance). Expenditures mapped to 'all commodities' affect all commodities indistinctively.

Around 50 percent of agriculture-specific expenditures targeted groups of commodities during 2011/12–2015/16. Another 46 percent went to 'all commodities', and the remainder went to single commodities. The relative importance of 'groups of commodities' ('all commodities') augmented (declined) over time, going from 46 (52) percent in 2011/12 to 54 (41) percent in 2015/16 (Figure 7).

Figure 7. Disaggregation of agriculture-specific expenditures across single, groups of and all commodities, actual spending



Source: authors, 2017.

A closer look can be given to the composition of these commodity subsets. Expenditures for food crops represented 78 percent of spending on groups of commodities during 2011/12–2015/16, followed by export crops (16 percent) (Table 5). About 98 percent of these expenditures on food crops went to CIP priority crops, namely maize, rice, wheat, Irish potatoes, beans and cassava on average for period under review. The remainder went to other legumes and pulses. The relative importance of food crops within groups of commodities slightly declined over time, mainly to the benefit of export crops and, to a smaller extent, livestock. Spending on export crops were mostly incurred by NAEB and focused on coffee, tea and other (still nascent) value chains such as pyrethrum, silk or horticulture.

Table 5. Disaggregation of agriculture-specific expenditures across commodities, 2011/12–2015/16, actual spending

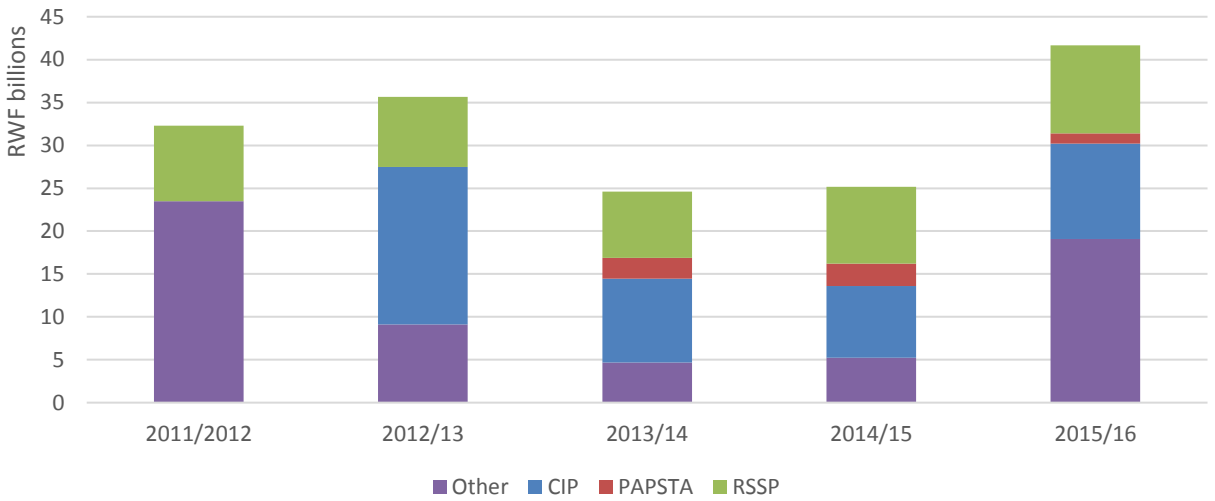
	2011/2012	2012/13	2013/14	2014/15	2015/16	Average
Single commodities	848	173	105	1,754	2	
Silk	89%	87%	96%	100%	0%	74%
Beekeeping	2%	6%	4%	0%	100%	23%
Guinea pigs	8%	8%	0%	0%	0%	3%
Milk	0%	0%	0%	0%	0%	0%
Groups of commodities	34,933	40,294	31,913	39,176	62,065	
Food crops	92%	88%	77%	64%	67%	78%
Export crops	3%	11%	16%	27%	24%	16%
Livestock	4%	0%	7%	9%	9%	6%
All commodities	34,768	29,894	26,484	47,381	44,034	

Source: authors, 2017.

Note: amounts are in millions of RWF, actual spending. Percentages are the relative shares of each single commodity or group of commodities within 'single commodities' and 'groups of commodities', respectively. Some percentages do not sum up to 100 percent because of numbers after decimal points that are not shown.

Looking at food crops only and disaggregating across programmes and MAFAP categories provides with interesting results. Spending on food crops was mostly done through the CIP, RSSP and PAPSTA programmes (Figure 8). Together, they accounted for more than 60 percent of spending on food crops, on average during 2011/12–2015/16. RSSP was more focused than other initiatives as it targeted maize, Irish potato and rice specifically. The increase in food crop expenditures observed in 2015/16 is due to a rise in spending on the National Strategic Grain Reserve at MINAGRI and on irrigation and water management at RAB.

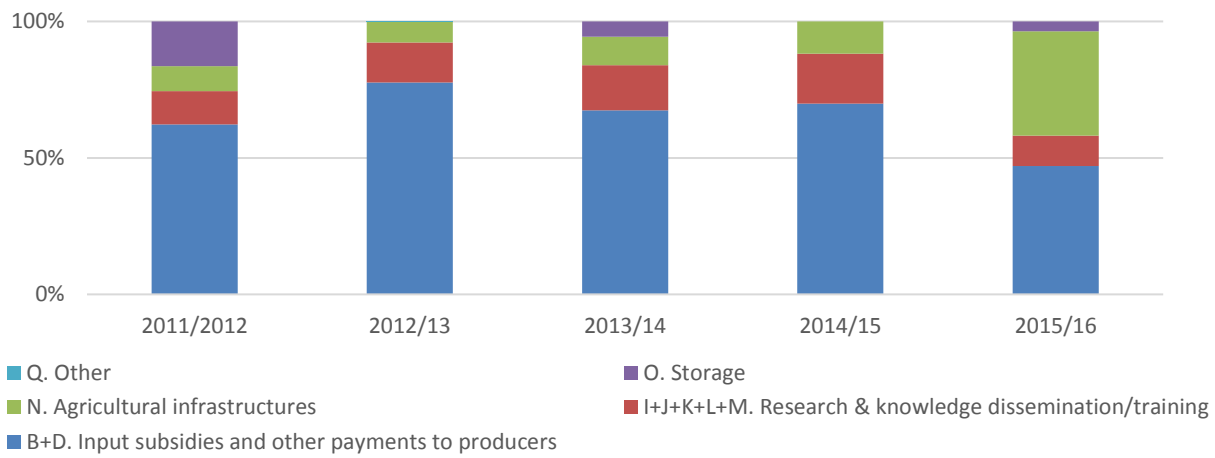
Figure 8. Main projects/programmes contributing to expenditures on food crops in Rwanda, actual spending



Source: authors, 2017.
Note: Crop Intensification Programme (CIP 2007–present), Support Project for the Strategic Plan for the Transformation of Agriculture (PAPSTA 2006–15), Rural Sector Support Project (RSSP 2012–18). Expenditures falling under the 'other' category are expenditures that were not mapped to a specific programme.

Expenditures on food crops mainly came in the form of input subsidies, as Figure 9 reveals. Research and knowledge dissemination and training activities did not receive more than 20 percent of food crop expenditures in all covered years. The share of input subsidies has been declining recently. The trend can be attributed to the increase in spending on irrigation and water management (allocated to MAFAP category N2) at RAB, particularly in 2015/16.

Figure 9. Disaggregation of food crop expenditures across groupings of MAFAP PEA categories, actual spending

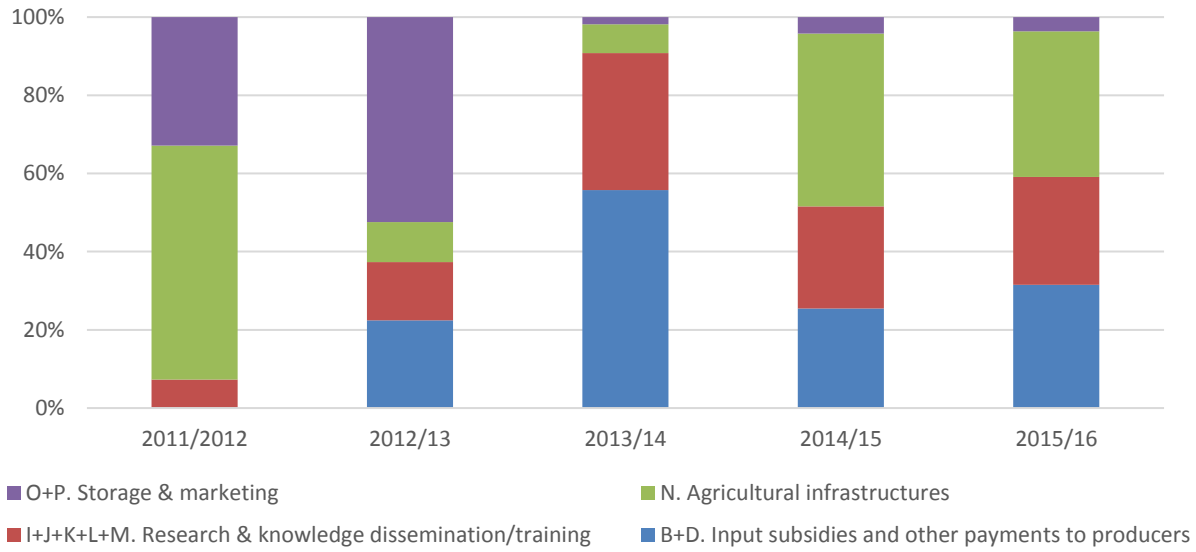


Source: authors, 2017.

Export crops were the second largest group after food crops within spending on groups of commodities. The share of public resources allocated to export crops rose markedly in recent years. The Project for Rural Income through Exports (PRICE 2012–19) was the main driver of this trend. PRICE is a large initiative implemented by NAEB and funded with support from IFAD, whose components include coffee development, tea development, sericulture and horticulture, with the aim of increasing smallholder farmer incomes. In contrast with food crops, categories of spending for export crops expenditures were quite balanced in recent years. Expenditures mostly went to research and knowledge dissemination and training, agricultural infrastructures (off-farm irrigation) and input subsidies (Figure 10).

Despite the overall focus on food crops, primarily through input subsidies, there has been a renewed attention for export crops since the introduction of the PSTA3 in 2013. The relative importance of support to single value chains or innovative products (such as horticulture or silk) remains small in agriculture budgets.

Figure 10. Disaggregation of export crop expenditures across groupings of MAFAP PEA categories, actual spending



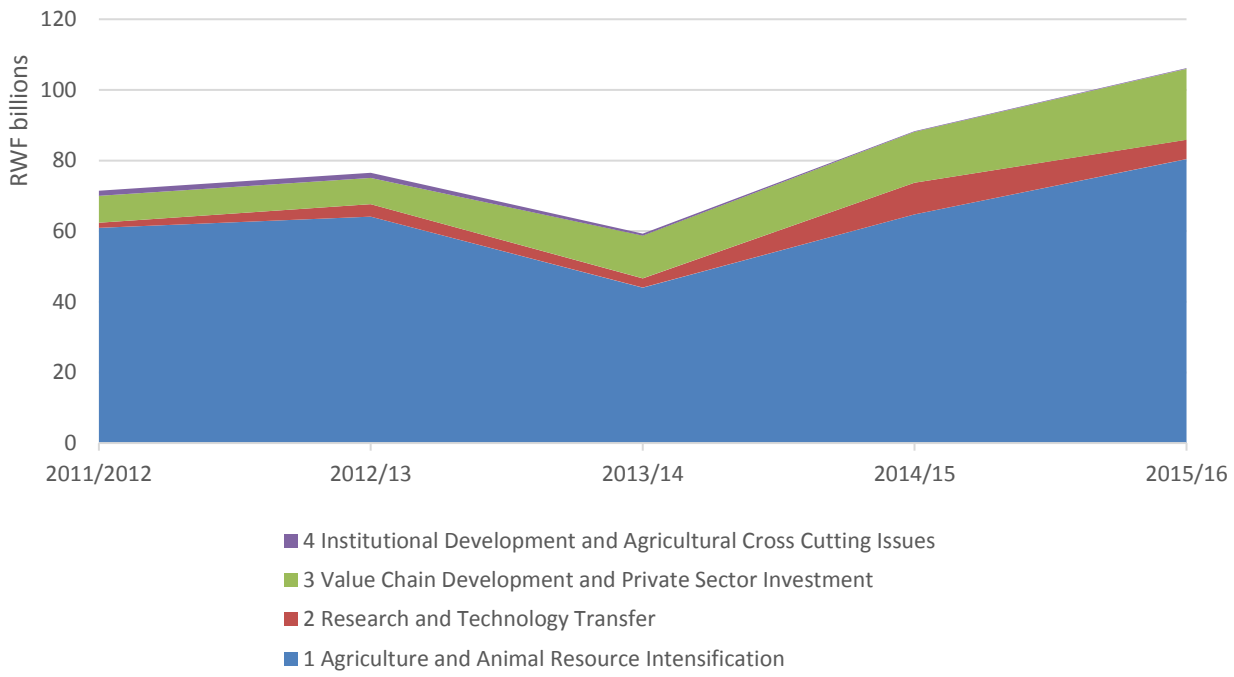
Source: authors, 2017.

5. PEA across PSTA3 components

Effective agricultural transformation in Rwanda will largely depend on the efficient and effective implementation of the PSTA3 and forthcoming PSTA4. It is therefore important to analyse the evolution of PEA across PSTA3 programmes and sub-programmes. The PSTA3 has four strategic programmes, namely: (i) agriculture and animal resource intensification, (ii) research, technology transfer and professionalization of farmers, (iii) value chain development and private sector investment, and (iv) institutional development and agricultural cross-cutting issues (MINAGRI, 2013a). These programmes are further divided into a total of 24 sub-programmes.

Figure 11 shows the allocation of policy transfers (i.e. PEA but without administrative costs) across PSTA3 programmes. The mapping was also done for 2011/12 and 2012/13, before PSTA3 entered into force – the timespan of many projects indeed overlapped the PSTA2 and the PSTA3. As Figure 11 shows, the repartition of policy transfers across the four strategic programmes of the PSTA3 has been unbalanced towards 'Programme 1. Agriculture and Animal Resource Intensification'. The programme accounted for around 74 percent of policy transfers, on average since 2013/14. 'Programme 3. Value Chain Development and Private Sector investment' was the second largest programme, and represented about 19 percent of policy transfers since 2013/14. Programmes 2 and 4 received minor shares of the spending, amounting to 6.6 and 0.4 percent respectively since 2013/14. Interestingly, the introduction of PSTA3 did not affect the repartition of expenditures across components, suggesting that the effect of adopting a new strategic plan on the composition of PEA has been limited.

Figure 11. Disaggregation of policy transfers across PSTA3 programmes, actual spending



Source: authors, 2017.

The disaggregation of PSTA3's programme 1 across projects and MAFAP PEA categories unsurprisingly resembles the disaggregation of agriculture-specific expenditures. Main projects were the CIP (16 percent of programme 1 expenditure over 2011/12–2015/16), the RSSP (14 percent), the KWAMP (11 percent) and the LWH (8 percent). Off-farm irrigation and input subsidies were dominant, jointly representing about 80 percent of spending on component 1 over 2011/12–2015/16. Similarly, the largest targeted commodity group was food crops, which captured around 45 percent of spending on component 1 during the period. Component 3 was dominated by export crops. In 2014/15–2015/16, about 75 percent of spending on component 3 went to export crops.

Policy transfers were also mapped to PSTA3 sub-programmes. Within programme 1, large sub-programmes items were 'SP 1.2. Irrigation and water management', 'SP 1.4. Inputs to Improve Soil Fertility and Management' and 'SP 1.1. Soil

Conservation and Land Husbandry', whose average shares amounted to 37, 13 and 11 percent during 2013/14–2015/16, respectively.

Figure 12 and Figure 13 show the repartition of expenditures on sub-programmes 1.2. and 1.1. across major projects. Some projects implement activities that can be mapped to different programmes or sub-programmes. The projects source their funds from a variety of partners. For example, the KWAMP project is co-funded by IFAD, the World Food Programme (WFP), the German Development Service and the government of Rwanda. Another example is the LWH project, which is co-funded by the United states Agency for International Development, the Canadian International Development Agency, the Japan International Cooperation Agency and the government of Rwanda.

Since contributions to PSTA3 programmes and sub-programmes are scattered across several agricultural development projects and activities, it is presumably difficult for budget holders to swiftly modify budget compositions over time and make them fit into PSTA and ASIP spending targets. Such budget inertia may explain why little changes in budget compositions have been recorded between 2011/12 and 2015/16.

Figure 12. Disaggregation of expenditures on PSTA3 sub-programme '1.2. Irrigation and water management' across major projects

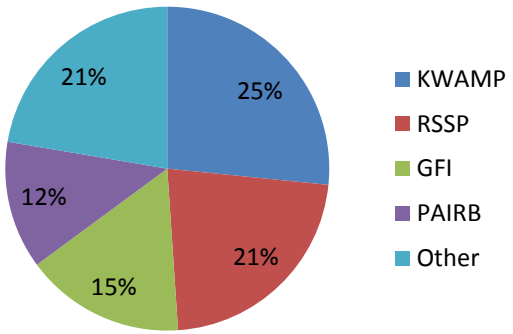
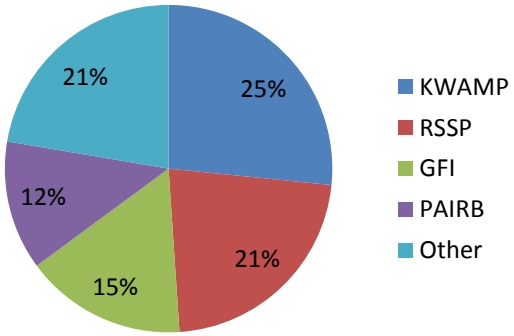


Figure 13. Disaggregation of expenditures on PSTA3 sub-programme 'SP 1.1. Soil conservation and land husbandry' across major projects



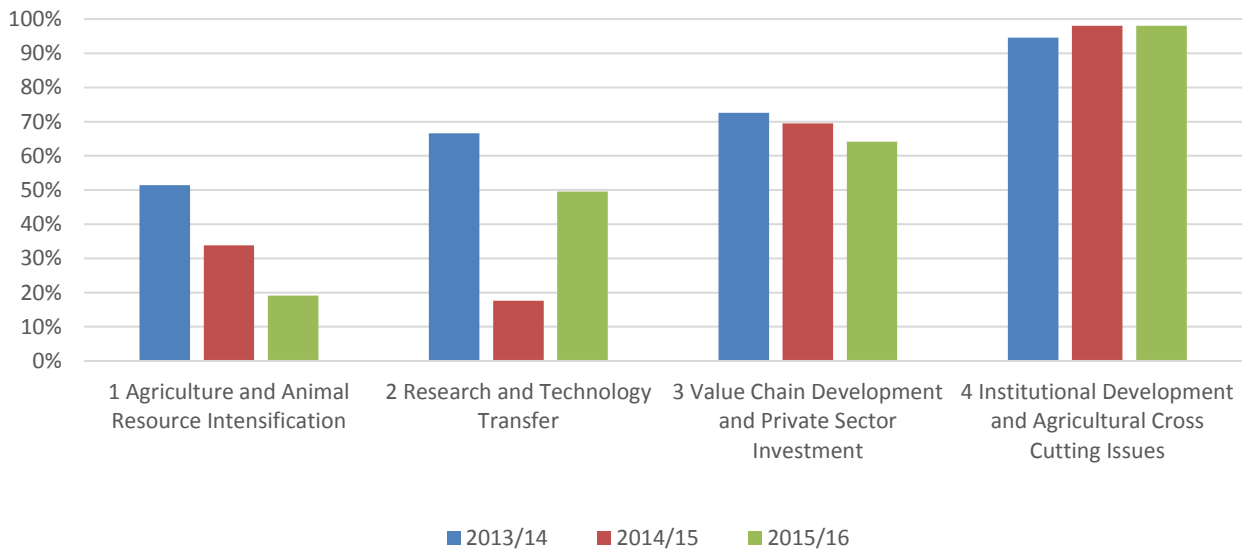
Note: the shares are averages for 2011/12–2015/16. Based on actual spending figures.
Source: authors, 2017.

6. PEA and ASIP2 targets

Referring to the ASIP2 - the expenditure plan for the implementation of the PSTA3 -, the disaggregation of PEA across PSTA3 programmes and sub-programmes can be used to assess whether the plan's funding targets were met. Planned amounts for each PSTA3 programme and sub-programme were taken from the ASIP2 (MINAGRI, 2013b) and compared with actual amounts extracted from the MAFAP PEA database. Planned amounts in the ASIP2 may differ from budgeted amounts as given in the MINAGRI, RAB or NAEB budgets. Indeed, planned amounts in the ASIP2 were proposed for the whole duration of the PSTA3. Planned amounts were the ones that were considered necessary to achieve the PSTA3 targets. Budgeted amounts are established for each fiscal year, and may differ from planned amounts – for instance if MINAGRI receives less funding than what was foreseen by the authors of the PSTA3 and ASIP2. Total PEA (policy transfers and administrative costs) were considered when comparing planned amounts and actual amounts. Even though the definition of PEA is larger than agricultural (PSTA3) funding per se, the comparison can be considered valid given PEA in the MAFAP database only consist of MINAGRI, NAEB and RAB expenditures. The results are given in Table 8 and Table 9 in Annex 0.

Although the mapping of policy transfers and administrative costs in the database to PSTA3 programmes and sub-programmes is not complete, the tables provide indications on the extent to which agriculture budgets deviated from the PSTA3 funding plan. Funding gaps for each programme and sub-programme were computed as the share of actual expenditures within planned expenditures. Gaps were lower for programme 1, which received more than 80 percent of planned funding in 2015/16 (Figure 14). Sub-Programme 1.4. on 'Inputs to improve soil fertility' had low funding gaps, not exceeding 10 percent in 2015/16 – which is indicative of strong attention from budget holders for that specific expenditure area. Programme 4 almost received none of the funding foreseen in the ASIP2. For programmes 1 and 3, gaps have been declining over time. Overall, actual PEA represented 46 percent of total planned PSTA3 funding during 2013/14–2015/16, showing implementation of the plan had to cope with a large resource gap.

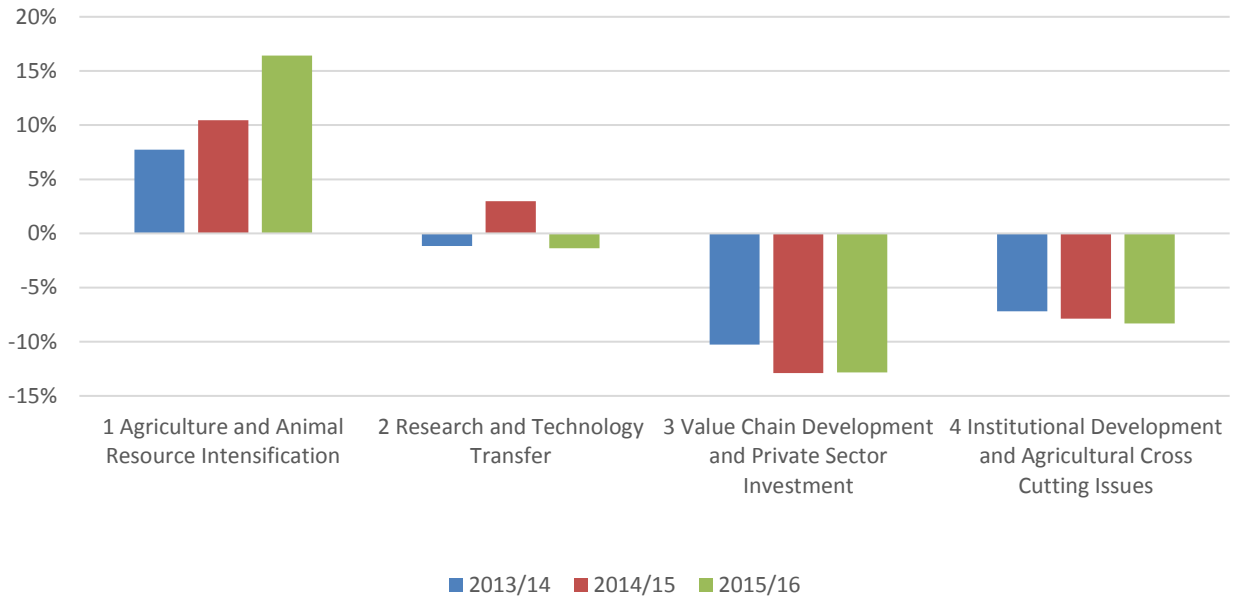
Figure 14. Estimated funding gaps for PSTA3 programmes



Note: the amounts were taken from Table 8, Annex 0. Based on actual spending figures.
Source: authors, 2017.

Planned and actual relative sizes of expenditures on PSTA3 programmes also differed. Within the ASIP2, programme 1, 2, 3 and 4 were planned to receive 56, 6, 29 and 9 percent of PSTA3 budgets, respectively, on average during 2013/14–2015/16. However, programme 1 ended up receiving 68 percent of PEA on average. The proportion of resources allocated to programmes 3 and 4 was significantly lower than what was initially planned (Figure 15).

Figure 15. Differences in allocation shares of PEA across PSTA3 programmes (actual share minus planned share)



Source: authors, 2017.
Note: the amounts were taken from Table 9, Annex 0. Based on actual spending figures.

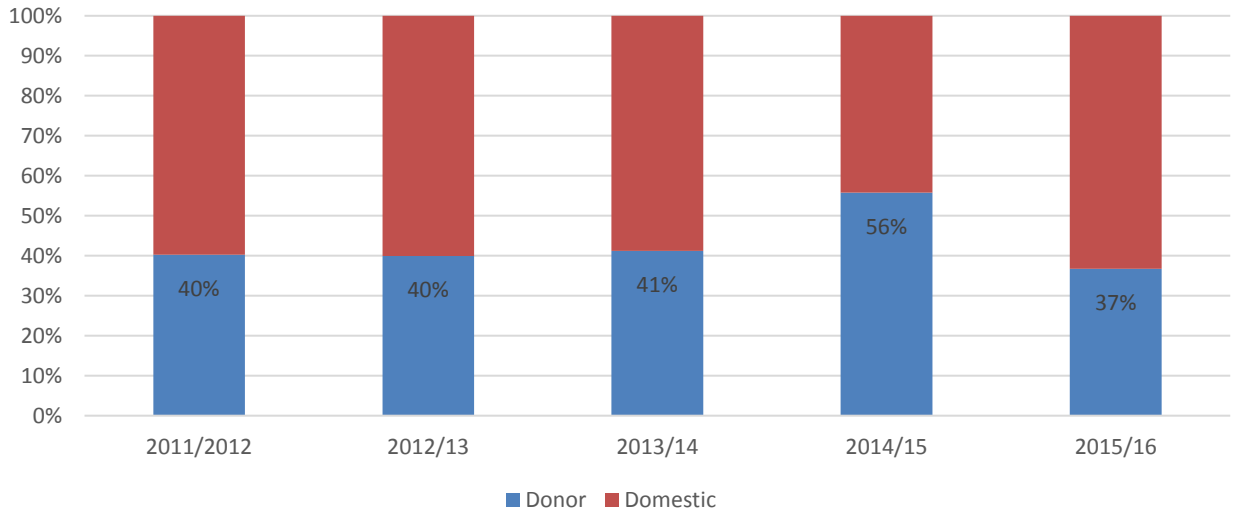
Although resources devoted to the implementation of PSTA3 were lower than what was initially planned in the ASIP2, budget holders seemingly rebalanced some expenditures in favour of programme 1 and to the expense of programmes 3 and 4 over the last three fiscal years. In a context of scarce resources, sub-programmes on inputs and irrigation were prioritised. In particular, explicit support to value chains (beyond the farm gate) was limited, as the high funding gaps for sub-programmes under programme 3 reveal.

7. Role of aid in PEA

PEA originate from either domestic or external sources. External funds can be disbursed as "sector budget support" or "project support". Project support may come in the form of grants or loans. Sector budget support typically reaches the agriculture sector through MINECOFIN, after it has been disbursed by donors. Project support at MINAGRI is provided through the Single Project Implementation Units (SPIUs). The World Bank supports four projects (LWH, RSSP, FRDP and RCSP), IFAD supports three projects (KWAMP, PRICE and PASP) and the African Development Bank supports two projects – the Bugesera Natural Region Rural Infrastructure Support Project (PAIRB 2010–15), and the Livestock Infrastructure Support Programme (LISP 2011–15).

The share of donor expenditures within the overall policy transfers has fluctuated between 40 and 56 percent throughout the period (Figure 16). On average, about 43 percent of policy transfers came from domestic sources. Although there was a cut in funding of all sectors from key donors in 2013/14, it did not affect the share of donor expenditures in PEA. This is probably due to the fact that the Government seemingly shifted domestic resources away from agriculture in that year to accommodate funding gaps in other sectors. The size of donor funding in policy transfers declined in 2015/16, showing that the sector may be on track to reduce its dependency on external resources.

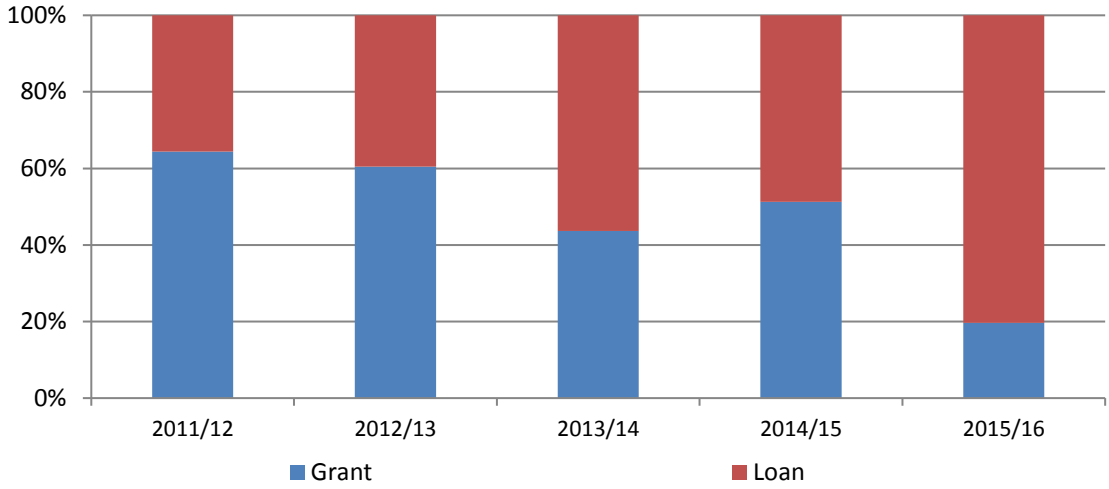
Figure 16. Share of donor expenditures within policy transfers (PEA minus administrative costs), actual spending



Source: authors, 2017.

Figure 17 shows the evolution of relative sizes of loans and grants in donor funding. Loans and grants may have different effects on public finances. The importance of resources provided through loans increased during the period under review, with the exception of 2014/15. The share of loans went from 36 percent in 2011/12 to more than 80 percent in 2015/16. The 2015/16 increase is due to the introduction of a new credit line by the World Bank, which led to a 30 million USD disbursement to MINECOFIN in that year. The credit was made in the context of the World Bank's programme-for-results initiative. The credit's objective is to support the PSTA3 goals, especially in regards to productivity improvements and value chain development (World Bank, 2014).

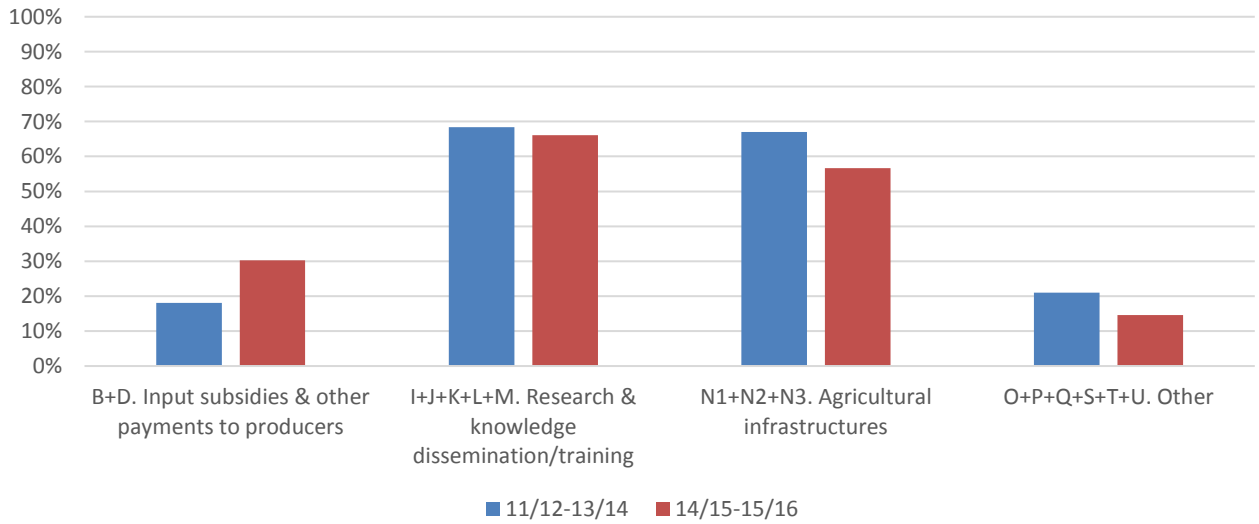
Figure 17. Relative sizes of loans and grants within donor-funded policy transfers, actual spending



Source: authors, 2017.

The share of donor funds was higher in some PEA categories than in others. As Figure 18 reveals, donors ensured more than 60 percent of spending on agricultural research, technical assistance, training, assistance and extension during the reviewed period. Similarly, they had strong presence within expenditures on agricultural infrastructures (chiefly off-farm irrigation, as noted above). Interestingly, donor contributions to input subsidies and other payments to producers was more limited. Donors showed preference for supporting the provision of public goods, such as research and knowledge dissemination and training, and infrastructures. By contrast, domestic resources were largely allocated to private goods, namely inputs for producers. The provision of public goods for agriculture development in Rwanda thus strongly depends on external funding. Lastly, the share of donor expenditures within expenditures on input subsidies increased from 2011/12–2013/14 unto 2014/15–2015/16. The trend is attributable to the expenditures incurred in the context of the RSSP, PAPSTA and PRICE projects. Spending under this latter programme increased markedly from 2014/15 on.

Figure 18. Shares of donor expenditures within major groupings of MAFAP categories, averages for 2011/12–2013/14 and 2014/15–2015/16, actual spending



Source: authors, 2017.

The current MAFAP PEA database does not allow for a precise disaggregation of expenditures across major donors. However, by looking at funding sources for MINAGRI projects the major donors intervening in the agriculture sector can be identified. These core donors are, in decreasing order, the World Bank (RSSP and LWH projects), IFAD (KWAMP, PRICE and PASP) and the African Development Bank (PAIRB and LISP). Projects that were not implemented through the SPIUs, such as the CIP, the Government Funded Irrigation (GFI 2010–18) project or the GLWH, were funded by multiple partners.

8. Conclusion and policy recommendations

The present technical note looked at expenditures made by MINAGRI, RAB and NAEB during 2011/12–2015/16, following the MAFAP PEA methodology.

Main results

- The share of budgeted agricultural expenditures within total budgeted public expenditures was low during the last five years, averaging 6 percent.
- Budget efficiency as measured by the execution rates (105 percent for PEA on average) and the share of administrative costs within PEA (10 percent on average) stood at acceptable levels. As a comparison, administrative costs represented 20 and 14 percent of PEA in Uganda and Kenya respectively over 2006/07–2012/13 (Shinyekwa et al 2014, Laibuni et al 2015).
- Input subsidies and off-farm irrigation were the dominant expenditure categories, jointly representing almost 80 percent of policy transfers to agriculture over the period under review. Input subsidies were mainly provided through the CIP. Support to off-farm irrigation came through a breadth of projects such as the RSSP, the KWAMP, the LWH, the GWLM and the PAIRB. Irrigation expenditures dominated policy transfers to agriculture during the last two years.
- Agricultural research, training, technical assistance and extension absorbed only a small share of agricultural expenditures, not exceeding 17 percent on average. Storage and marketing received less than 5 percent of public resources managed by MINAGRI, RAB and NAEB.
- About half of agriculture-specific expenditures targeted groups of commodities. Within spending on commodity groups, CIP priority crops (food crops) took up almost 79 percent of available resources. The remainder went chiefly to export crops.
- The mapping of PEA across PSTA3 programmes and sub-programmes shows that as much as 74 percent of agricultural expenditures were allocated to 'Programme 1. Agriculture and Animal Resource Intensification' over 2013/14–2015/16. 'Programme 3. Value Chain Development and Private Sector Investment' received about 19 percent. These allocations differ from what was initially planned in the ASIP2, which foresaw to allocate 56 and 29 percent of agricultural expenditures to these two components during 2013/14–2015/16 on average.
- The funding gap between PEA and total PSTA3 budget as defined in the ASIP has averaged 46 percent over 2013/14–2015/16. In a scarce resource context, agriculture budget holders prioritised activities related PSTA3's programme 1 over the three other programmes. Programme 4, in particular, had funding gaps close to 100 percent.
- The allocation of resources across PSTA3 programmes and sub-programmes did not vary much across the reviewed period, showing that the introduction and implementation of the plan seemingly did not have a large influence on budget practices.
- About half of PEA identified by MAFAP originated from donor sources. Donors tended to focus on public goods such as agricultural research, knowledge dissemination, training and off-farm irrigation, while domestic resources were chiefly allocated to the provision of private goods, namely fertilisers and seeds.

Policy recommendations

- Envisage the allocation of a greater share of total public resources to the agriculture sector. The issue should be discussed with MINECOFIN. The increase in agricultural GDP obtained from a one percent increase in PEA has been estimated to stand at around 3 percent (see the Computable General Equilibrium analysis on Rwanda done by Diao et al., 2010). The sector should receive sufficient public support in order to fully contribute to the structural transformation of the economy. This is consistent with the recommendation recently made in the Rwanda Agriculture Public Expenditure Review (AgPER) prepared by Nwoko et al. (2016).
- Agricultural expenditures in Rwanda mainly targeted the supply side over the last five years. It is time to introduce interventions focusing on the demand-side of agriculture markets. This implies developing a bold agriculture research strategy - comprising a large component on market monitoring and analysis - and beefing up current extension programmes. Further, downside stages of value chains such as storage and marketing should receive increased attention.
- A reflection on priority commodities should be initiated. Developing a "menu approach" to product selection should be a priority of MINAGRI and RAB planning services. As of now, the list of priority commodities is quite

narrow. There should be room to broaden the number of targeted commodities in view of comparative advantages, agro-ecological conditions and food security objectives.

- The linkage between strategic frameworks, investment plans and disbursement practices could be enhanced. Development plans can only be impactful if they are accompanied by consistent expenditure decisions. As the comparison of ASIP2 targets and expenditure patterns reveal, such consistency still needs to be improved.
- Channelling more domestic resources to public goods would be necessary to diminish reliance on external funding.
- The PSTA4 and ASIP3 preparation processes offer a unique opportunity to raise resources, rebalance agriculture budgets and improve financial management with all sector partners. It is proposed that the present analysis be considered in these processes.

The recommendations are synthetized in the following table.

Responsible partner	Policy domain	Recommendation
MINECOFIN	Public support to agriculture	Increase the share of public resources devoted to the agriculture sector, as part of a broad structural transformation strategy
MINAGRI and donors	Agriculture budget composition	Rebalance agriculture budgets in favour of research, training, marketing and storage to ease links between agricultural supply and demand
MINAGRI and donors	Agriculture budget composition	Envisage broadening the set of priority crops depending on agronomic, economic and food security factors
MINECOFIN, MINAGRI and donors	Monitoring and financial management	Develop tools to mainstream monitoring of PSTA4 and ASIP3 targets in agriculture budget processes
MINECOFIN, MINAGRI and donors	Monitoring and financial management	Ensure agriculture budgeting and disbursement practices are evaluated and taken into account throughout PSTA4 preparation

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Annex

Annex 1. MAFAP classification

The categories of the MAFAP methodology (see Box 1) are designed to reflect the types of policies applied in developing countries. Those categories have been elaborated based on the experiences of various agencies, including FAO, that have worked on public expenditures in developing countries. Furthermore, drawing on the OECD's experience, the proposed classification seeks, as much as possible, to distinguish between policies providing private goods (category I.1) and those providing public goods (categories I.II and II), given their different economic effects.

Box 1. MAFAP classification table for public expenditures in support of food and agriculture

I. AGRICULTURE-SPECIFIC EXPENDITURE – monetary transfers that are specific to the agricultural sector, i.e. agriculture is the only, or principal, beneficiary of a given expenditure measure

I.1 Payments to agents in the food and agriculture sector – monetary transfers to individual agents of the food and agriculture sector.

- I.1.1 Payments to producers – monetary transfers to individual agricultural producers (farmers)
  - A. Production subsidies based on outputs – monetary transfers to agricultural producers that are based on current output of a specific agricultural commodity
  - B. Input subsidies – monetary transfers to agricultural producers that are based on on-farm use of inputs:
    - B1 - Variable inputs (seeds, fertiliser, energy, credit, other) – monetary transfers reducing the on-farm cost of a specific variable input or a mix of variable inputs
    - B2 - Capital (machinery and equipment, on-farm irrigation, other basic on-farm infrastructure) – monetary transfers reducing the on-farm investment cost of farm buildings, equipment, plantations, irrigation, drainage and soil improvements
    - B3 - On-farm services (pest and disease control/veterinary services, on-farm training, technical assistance, extension etc., other) – monetary transfers reducing the cost of technical assistance and training provided to individual farmers
  - C. Income support – monetary transfers to agricultural producers based on their level of income
  - D. Other payments to producers – monetary transfers to agricultural producers individually for which there is insufficient information to allocate them into above listed categories
- I.1.2 Payments to consumers – monetary transfers to final consumers of agricultural commodities individually in the form of:
  - E. Food aid – monetary transfers to final consumers to reduce the cost of food
  - F. Cash transfers – monetary transfers to final consumers to increase their food consumption expenditure
  - G. School feeding programmes – monetary transfers to final consumers to provide free or reduced-cost food in schools
  - H. Other payments to consumers – monetary transfers to final consumers individually for which there is insufficient information to allocate them into above listed categories
- I.1.3 Payments to input suppliers – monetary transfers to agricultural input suppliers individually
- I.1.4 Payments to processors – monetary transfers to agricultural commodities processors individually
- I.1.5 Payments to traders – monetary transfers to agricultural traders individually
- I.1.6 Payments to transporters – monetary transfers to agricultural commodities transporters individually

I.2 General support to the food and agriculture sector – public expenditures generating monetary transfers to agents of the food and agriculture sector collectively.

- I. Agricultural research – public expenditures financing research activities improving agricultural production
- J. Technical assistance – public expenditures financing technical assistance for agricultural sector agents collectively
- K. Training – public expenditures financing agricultural training
- L. Extension/technology transfer – public expenditures financing provision of extension services
- M. Inspection (veterinary/plant) – public expenditures financing control of quality and safety of food, agricultural inputs and the environment
- N. Agricultural infrastructure - public expenditures financing off-farm collective infrastructure
  - N1. Feeder roads - public expenditure financing roads mainly dedicated to agricultural activity
  - N2. Off-farm irrigation - public expenditure financing irrigation infrastructure
  - N3. Other off-farm infrastructure - public expenditure financing agricultural infrastructures that are neither feeder roads or irrigation infrastructures
- O. Storage/public stockholding – public expenditures financing public storage of food and agriculture products
- P. Marketing – public expenditures financing assistance in marketing of food and agriculture products
- Q. Other general support to the food and agriculture sector – other transfers to agents in the food and agriculture sector collectively for which there is insufficient information to allocate them into the above listed categories.

II. AGRICULTURE-SUPPORTIVE EXPENDITURE – public expenditures that are not specific to agriculture, but which have a strong influence on agricultural sector development

R. Rural education – public expenditures on education in rural areas

S. Rural health – public expenditures on health services in rural areas

T. Rural infrastructure - public expenditures on rural infrastructure

T1. Rural roads - public expenditure financing roads dedicated to rural development

T2. Rural water - public expenditures financing rural water and sanitation facilities

T3. Rural energy - public expenditure financing rural energy

T4. Other rural infrastructure - other public expenditures on rural infrastructures benefiting agricultural sector development for which there is insufficient information to allocate them into above listed categories

U. Other support to the rural sector – other public expenditures on rural areas benefiting agricultural sector development for which there is insufficient information to allocate them into above listed categories.

III. TOTAL PUBLIC EXPENDITURE IN SUPPORT OF THE FOOD AND AGRICULTURE SECTOR, EXCLUDING ADMINISTRATIVE COSTS (POLICY TRANSFERS) - sum of agricultural-specific and agricultural-supportive expenditures.

IDENTIFIABLE ADMINISTRATIVE COSTS - administration costs include costs of formulation, implementation and evaluation of agricultural policies. They are not policy transfers as such. However, when support is provided via services, e.g. Extension, training, research or inspection, expenses associated with delivery of the services, e.g. Salaries of extension advisors, salaries of inspection officers or researchers should be included in this category.

TOTAL PUBLIC EXPENDITURE IN SUPPORT OF THE FOOD AND AGRICULTURE SECTOR, INCLUDING ADMINISTRATIVE COSTS (PEA) - Sum of policy transfers and identifiable administrative costs.

Source: FAO, 2015.

Annex 2. Other tables and figures

Table 6. Mapping of PEA across categories of the MAFAP classification table, actual spending, millions of RWF.

	2011/2012	2012/13	2013/14	2014/15	2015/16
I. Agriculture-specific expenditures	70,548	70,361	58,502	88,310	106,101
I.1 Payments to agents in the food and agriculture sector	22,198	37,478	21,151	22,260	26,450
I.1.1. Payments to producers	22,198	37,478	21,151	22,260	26,450
A. Production subsidies based on outputs	-	-	-	-	-
B. Input subsidies	22,176	37,454	21,127	22,227	26,416
B1. Variable inputs	4,928	25,444	18,674	19,129	21,595
B2. Capital (including on-farm irrigation and infrastructure)	3,054	11,286	1,697	2,056	3,044
B3. On-farm services	14,193	724	755	1,041	1,776
C. Income support	-	-	-	-	-
D. Other payments to producers	22	24	25	33	35
I.1.2. Payments to consumers	-	-	-	-	-
E. Food aid	-	-	-	-	-
F. Cash transfers	-	-	-	-	-
G. School feeding programmes	-	-	-	-	-
H. Other payments to consumers	-	-	-	-	-
I.1.3. Payments to input suppliers	-	-	-	-	-
I.1.4. Payments to processors	-	-	-	-	-
I.1.5. Payments to traders	-	-	-	-	-
I.1.6. Payments to transporters	-	-	-	-	-
I.2 General support to the food and agricutlure sector	48,350	32,884	37,350	66,050	79,650
I. Agricultural research	10,522	1,870	1,727	3,287	1,763
J. Technical assistance	7,125	3,172	3,531	3,827	5,058
K. Training	671	893	1,610	1,818	1,645
L. Extension/technology transfer	1,020	1,128	1,116	8,661	4,715
M. Inspection	1,528	31	39	27	213
N. Agricultural infrastructures	21,548	22,351	27,755	47,935	61,653
N1. Feeder roads	-	-	-	649	19,348
N2. Off-farm irrigation	20,886	19,471	21,985	40,399	33,154
N3. Other off-farm infrastructure	662	2,880	5,769	6,886	9,151
O. Storage/public stockholding	5,455	2,611	1,465	384	1,991
P. Marketing	480	83	104	108	78
Q. Other general support to the food and agriculture sector	1	745	4	3	2,534
II. Agriculture-supportive expenditures	898	6,179	758	25	54
R. Rural education	-	-	-	-	-
S. Rural health	0	16	7	4	3
T. Rural infrastructure	898	6,163	751	2	1
T1. Rural roads	-	491	750	-	-
T2. Rural water and sanitation	-	2,206	1	2	1
T3. Rural energy	-	3,467	-	-	-
T4. Other rural infrastructure	898	-	-	-	-
U. Other support to the rural sector	-	-	-	20	50
Policy transfers (I.1+I.2)	71,447	76,540	59,260	88,335	106,154
Administrative costs	7910	7554	7853	7992	9783
Total public expenditures in support of food and agriculture (PEA) (policy transfers + administrative costs)	79,357	84,094	67,113	96,327	115,937

Source: authors, 2017.

Table 7. Disaggregation of PEA across major projects and programmes coordinated by MINAGRI, RAB and NAEB. Amounts are in billions of RWF, actual spending. Percentages give the relative size of the programme within total PEA.

	2011/2012	2012/13	2013/14	2014/15	2015/16	Average 11/12-15/16
Non-attributed	51.0	20.7	16.2	25.8	49.4	
	64%	25%	24%	27%	43%	36%
CIP	0.0	18.4	9.8	8.4	11.1	
	0%	22%	15%	9%	10%	11%
ETI	0.0	0.0	0.0	1.4	0.0	
	0%	0%	0%	1%	0%	0%
FEEDER ROADS	0.0	0.0	0.0	0.2	14.2	
	0%	0%	0%	0%	12%	2%
GFI	0.2	8.5	5.1	4.6	0.0	
	0%	10%	8%	5%	0%	5%
GWLM	0.0	1.0	1.5	13.1	0.0	
	0%	1%	2%	14%	0%	3%
KWAMP	8.2	5.0	9.8	6.0	1.9	
	10%	6%	15%	6%	2%	8%
LISP	0.0	2.4	5.4	2.3	3.6	
	0%	3%	8%	2%	3%	3%
LWH	0.0	8.5	0.2	8.9	10.3	
	0%	10%	0%	9%	9%	6%
PADAB	7.0	2.6	1.6	0.0	0.0	
	9%	3%	2%	0%	0%	3%
PAIGELAC	0.0	5.7	0.0	0.0	0.0	
	0%	7%	0%	0%	0%	1%
PAIRB	3.2	0.6	2.7	3.8	4.2	
	4%	1%	4%	4%	4%	3%
PAPSTA	0.0	0.7	2.4	2.6	1.2	
	0%	1%	4%	3%	1%	2%
PASP	0.0	0.0	0.0	6.2	2.4	
	0%	0%	0%	6%	2%	2%
PDCRE	0.2	0.0	0.0	0.0	0.0	
	0%	0%	0%	0%	0%	0%
PRICE	0.0	1.7	4.6	4.0	7.4	
	0%	2%	7%	4%	6%	4%
Sericulture	0.8	0.2	0.1	0.1	0.0	
	1%	0%	0%	0%	0%	0%
RSSP	8.8	8.2	7.7	9.0	10.3	
	11%	10%	11%	9%	9%	10%

Source: authors, 2017.

Table 8. Funding gaps across components and sub-components of PSTA3, in USD thousands

	Planned			Actual			Gap		
	2013/14	2014/15	2015/16	2013/14	2014/15	2015/16	2013/14	2014/15	2015/16
Programme 1: Agriculture & Animal Resource Intensification	133,326	141,426	131,122	64,815	93,618	106,066	51%	34%	19%
Sub-Program 1.1: Soil Conservation and Land Husbandry	20,519	21,852	22,424	2,420	31,533	13,793	88%	-44%	38%
Sub-Program 1.2: Irrigation and Water Management	56,280	59,958	61,630	39,567	36,881	66,666	30%	38%	-8%
Sub-Program 1.3: Agricultural Mechanisation	10,016	10,330	8,573	880	287	1,202	91%	97%	86%
Sub-Program 1.4: Inputs for Soil Fertility	18,186	24,026	16,103	16,535	16,110	14,550	9%	33%	10%
Sub-Program 1.5: Seed Development	13,874	10,536	7,336	35	868	1,530	100%	92%	79%
Sub-Program 1.6. Livestock Development	14,451	14,724	15,056	1,587	5,047	5,550	89%	66%	63%
Unallocated to Sub-Programmes	NA	NA	NA	3,791	2,892	2,774	NA	NA	NA
Programme 2: Research, Technology Transfer, Advisory	12,157	15,646	18,059	4,063	12,894	9,117	67%	18%	50%
Sub-Program 2.1: Research and Technology Transfer	7,154	7,263	7,453	387	144	4,441	95%	98%	40%
Sub-Program 2.2: Extension & Proximity Services	3,837	7,129	9,247	82	57	-	98%	99%	100%
Sub-Program 2.3: Farmer Cooperatives & Organisations	1,166	1,254	1,359	3,593	12,693	2,543	-208%	-912%	-87%
Unallocated to Sub-Programmes	NA	NA	NA	-	-	2,133	NA	NA	NA
Programme 3: Value Chain Development	65,075	70,046	74,914	17,816	21,346	26,879	73%	70%	64%
Sub-Program 3.1: Private investment	600	914	625	628	1,181	521	-5%	-29%	17%
Sub-Program 3.2: Priority Value Chains: Food Crops	14,500	14,722	15,107	154	-	9,378	99%	100%	38%
Sub-Program 3.3: Priority Value Chains: Export Crops	16,650	16,905	17,347	6,936	13,866	9,603	58%	18%	45%
Sub-Program 3.4: Priority Value Chains: Dairy and Meat	1,200	1,218	1,250	20	-	-	98%	100%	100%
Sub-Program 3.5: Priority Value Chains: Fisheries	250	254	260	-	-	-	100%	100%	100%
Sub-Program 3.6: Priority Value Chains: Apiculture	120	122	125	-	-	-	100%	100%	100%
Sub-Program 3.7: Agricultural Finance	1,195	1,213	1,245	-	-	-	100%	100%	100%
Sub-Program 3.8: Market-oriented infrastructure	30,560	34,698	38,955	10,077	6,299	7,377	67%	82%	81%
Programme 4: Institutional Development & Cross-Cutting	18,830	20,186	21,079	1,014	403	419	95%	98%	98%
Sub-Program 4.1: Institutional Capacity Building	1,615	1,742	1,683	5	-	-	100%	100%	100%
Sub-Program 4.2: Decentralisation in Agriculture	1,065	1,437	1,683	19	15	14	98%	99%	99%
Sub-Program 4.4: Legal and Regulatory Framework	100	305	365	31	4	19	69%	99%	95%
Sub-Program 4.4: Communication & statistical Systems	1,400	1,421	1,459	946	380	369	32%	73%	75%
Sub-Program 4.5: Gender and Youth in Agriculture	320	325	333	13	2	15	96%	99%	95%
Sub-Program 4.6: Environmental Mainstreaming	115	117	120	1	1	2	100%	99%	99%
Sub-Program 4.7: Nutrition and Household Vulnerability	14,215	14,839	15,436	-	-	-	100%	100%	100%
Unallocated to Sub-Programmes	NA	NA	NA	-	1	-	NA	NA	NA
Unallocated to Programmes	NA	NA	NA	10,718	10,140	9,269	NA	NA	NA
Total PEA	229,388	247,304	245,174	98,426	138,401	151,750	57%	44%	38%

Source: authors using MINAGRI (2013b) and the MAFAP PEA database.

Note: the "Planned" column amounts were obtained from the ASIP2 (p. 57 – see MINAGRI, 2013b). The "Actual" column amounts were obtained from the MAFAP database (both policy transfers and administrative costs were considered) and converted into dollars using exchange rates obtained from the World Bank World Development Indicators database (https://data.worldbank.org/data-catalog/world-development-indicators). Percentages express the share of initial planned amount which was missing for the selected component/year. "Unallocated" rows contain amounts from the PEA database which could not be mapped to programmes or sub-programmes (information gaps).

Table 9. Composition of PEA across PSTA3 programmes and sub-programmes, planned and actual shares

	Planned			Actual			Gap		
	2013/14	2014/15	2015/16	2013/14	2014/15	2015/16	2013/14	2014/15	2015/16
Programme 1: Agriculture & Animal Resource Intensification	58%	57%	53%	66%	68%	70%	8%	10%	16%
Sub-Program 1.1: Soil Conservation and Land Husbandry	9%	9%	9%	2%	23%	9%	-6%	14%	0%
Sub-Program 1.2: Irrigation and Water Management	25%	24%	25%	40%	27%	44%	16%	2%	19%
Sub-Program 1.3: Agricultural Mechanisation	4%	4%	3%	1%	0%	1%	-3%	-4%	-3%
Sub-Program 1.4: Inputs for Soil Fertility	8%	10%	7%	17%	12%	10%	9%	2%	3%
Sub-Program 1.5: Seed Development	6%	4%	3%	0%	1%	1%	-6%	-4%	-2%
Sub-Program 1.6. Livestock Development	6%	6%	6%	2%	4%	4%	-5%	-2%	-2%
Unallocated to Sub-Programmes	NA	NA	NA	4%	2%	2%	NA	NA	NA
Programme 2: Research, Technology Transfer, Advisory	5%	6%	7%	4%	9%	6%	-1%	3%	-1%
Sub-Program 2.1: Research and Technology Transfer	3%	3%	3%	0%	0%	3%	-3%	-3%	0%
Sub-Program 2.2: Extension & Proximity Services	2%	3%	4%	0%	0%	0%	-2%	-3%	-4%
Sub-Program 2.3: Farmer Cooperatives & Organisations	1%	1%	1%	4%	9%	2%	3%	9%	1%
Unallocated to Sub-Programmes	NA	NA	NA	0%	0%	1%	NA	NA	NA
Programme 3: Value Chain Development	28%	28%	31%	18%	15%	18%	-10%	-13%	-13%
Sub-Program 3.1: Private investment	0%	0%	0%	1%	1%	0%	0%	0%	0%
Sub-Program 3.2: Priority Value Chains: Food Crops	6%	6%	6%	0%	0%	6%	-6%	-6%	0%
Sub-Program 3.3: Priority Value Chains: Export Crops	7%	7%	7%	7%	10%	6%	0%	3%	-1%
Sub-Program 3.4: Priority Value Chains: Dairy and Meat	1%	0%	1%	0%	0%	0%	-1%	0%	-1%
Sub-Program 3.5: Priority Value Chains: Fisheries	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sub-Program 3.6: Priority Value Chains: Apiculture	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sub-Program 3.7: Agricultural Finance	1%	0%	1%	0%	0%	0%	-1%	0%	-1%
Sub-Program 3.8: Market-oriented infrastructure	13%	14%	16%	10%	5%	5%	-3%	-9%	-11%
Programme 4: Institutional Development & Cross-Cutting	8%	8%	9%	1%	0%	0%	-7%	-8%	-8%
Sub-Program 4.1: Institutional Capacity Building	1%	1%	1%	0%	0%	0%	-1%	-1%	-1%
Sub-Program 4.2: Decentralisation in Agriculture	0%	1%	1%	0%	0%	0%	0%	-1%	-1%
Sub-Program 4.4: Legal and Regulatory Framework	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sub-Program 4.4: Communication & statistical Systems	1%	1%	1%	1%	0%	0%	0%	0%	0%
Sub-Program 4.5: Gender and Youth in Agriculture	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sub-Program 4.6: Environmental Mainstreaming	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sub-Program 4.7: Nutrition and Household Vulnerability	6%	6%	6%	0%	0%	0%	-6%	-6%	-6%
Unallocated to Sub-Programmes	NA	NA	NA	0%	0%	0%	NA	NA	NA
Unallocated to Programmes	NA	NA	NA	11%	7%	6%	NA	NA	NA
Total PEA	100%	100%	100%	100%	100%	100%	NA	NA	NA

Source: authors using MINAGRI (2013b) and the MAFAP PEA database.

MONITORING AND ANALYSING FOOD AND AGRICULTURAL POLICIES [MAFAP]

The Monitoring and Analysing Food and Agricultural Policies (MAFAP) programme seeks to establish country owned and sustainable systems to monitor, analyse, and reform food and agricultural policies to enable more effective, efficient and inclusive policy frameworks in a growing number of developing and emerging economies.

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