THE NATURE OF PUBLIC AGRICULTURAL SPENDING IN SOUTHERN AFRICA

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ABSTRACT

This paper sets out to analyses and present trends in investments in agriculture in the SADC region. In pursuing this goal the paper empirically highlights the importance of disaggregating expenditure data when examining its links to measures of productivity and poverty. This is important because not all types of expenditure have the potential to positively impact on productivity and poverty. In order to pursue the goals set out in this paper, analysis focused mainly on data on agricultural public expenditure for Angola, Botswana, the Democratic Republic of the Congo, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, South Africa, Swaziland, Zambia and Zimbabwe. Trend analysis leads to the following main findings: Various countries have tended to invest in their agricultural sectors differently across time, but investments have been limited and volatile, while the quality of spending has also gone down. There is also public agricultural expenditure bias towards crops at the expense of other sectors. The major implication is that there is need for more concerted efforts in the SADC to ensure more and better-targeted agricultural growth enhancing investments

1. INTRODUCTION

The paper's focus on investments in the agricultural sector is based on the understanding that investments in agriculture are essential for enhancing productivity in this sector as well as in other sectors, and can therefore facilitate the achievement of the agreed goals set under CAADP and the SADC-RISDP in all countries in the region. The World Development Report (2008) identified agricultural growth as having the largest impacts on poverty, thus cementing the rationale for more productivity enhancing investments in agriculture. Moreover, the positive impact on poverty reduction of sustained agricultural investment together with increased productivity is well documented. The results and experience from the Green Revolution in Asia and other

areas attest to this positive contribution to poverty reduction (see Hazell and Haggblade, 1993; Hazell, 2008; Diao et al., 2012; Tsakok, 2011). The agricultural sector reduces poverty mainly through income and consumption linkages. By creating additional productive employment for households, workers and others, the sector generates income, whilst through a reduction in food prices via sustained productivity gains and growth, agriculture reduces the share of the food budget in each household. Many poor households and low-income workers spend a high proportion of their disposable income on food; hence, an increase in agricultural productivity, other things being equal, helps to reduce food prices.

Although governments have taken steps to align their economic policies with the CAADP framework since 2003, detailed studies on the nature and magnitude of the investments they have made are scant, and there are gaps in our understanding of how countries have made progress towards greater investments in the agricultural sector. Against this background this paper, seeks, firstly, to analyse trends in investments in the agricultural sector in the Southern African region and, secondly, to examine in detail the nature and magnitude of such investments made by selected countries in agriculture and its sub-sectors focusing mainly on Angola, Botswana, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, South Africa, Swaziland, Zambia and Zimbabwe.

In pursuing the goals set out, the paper discusses issues of what constitutes investments in agriculture considering that public as well as private spending, which in some cases has been the default measure of investment, include other components of spending that cannot be considered as investment. This is followed by a discussion of the data, its sources and the methodology that has guided our analysis. We thereafter analyse inter-temporal trends in public expenditure, concentrating more on investment-spending, especially as a proportion of total national expenditure or allocations and as a share of agricultural GDP (AgGDP) in order to bring out the agricultural orientation of investments while at the end of the paper we include provide major findings and a conclusion. This paper is based on Matchaya et al., (2013)

2. DATA SOURCES AND METHODOLOGY

Measures of public investment

Given that investments in agriculture are important for stimulating the much needed poverty reducing economic development, it is pertinent that policy makers and analysts have an appropriate understanding of what constitutes investment and what does not. A simplistic approach would be to consider all government spending as investment but, as we know from the literature, that is too crude a position for most purposes and it is more useful to separate public consumption from public investment (Mankiw, 2003). Although the definitions of investments vary widely, for purposes of this paper we adopt two simple but practically important definitions. The first argues that investments constitute any goods and services purchased for future use (for example expenditure on research and development (R&D) and extension) (see Mankiw, 2003). The importance of this definition for agricultural development rests in its ability to look forward. From this perspective, government spending that improves an institution's ability to make gains in the future can be considered investment. This can be differentiated from consumption spending and from transfers of money which may, for example, simply involve reallocation of funds, for instance the transfer of money for social security.

The second concept that has guided how we identify investments in the agricultural sector in this paper contends that public investment refers to public expenditures that provide various public goods, such as R&D, infrastructure, and education (Zhang and Fan, 2004). Put differently, these are expenditures that generate future fiscal benefits (Easterly, Irwin, and Servén, 2008). Fan and Pardey (1998) give extension and irrigation as other examples of public expenditure that can be considered as public investments. Other studies (Fan and Brzeska 2010; de la Croix and Delavallade, 2009; Mogues et al., 2012) give additional examples of public investment including expenditures on health, housing, fuel, energy, mining and manufacturing, and transport, and other economic activities. On the other hand, non-investment spending would include direct ongoing production by the public sector. The World Bank (2002) defines public investment as public expenditure that adds to the physical stock and to knowledge.

Obviously, where researchers choose one proxy over another for purposes of approximating reality, there will always be some difficulty associated with any one proxy. Despite the definition given above it is still hard, in some cases, to decide which government expenditures should count as public investment. For example, while the purchase of office buildings, roads, military equipment, education and healthcare for the youth may be considered as investment, it may be debatable whether the same can be said about the purchase of healthcare for senior citizens in the last days of their life. Within the agricultural sector, while payments to staff may be considered less of an investment, such payments have the potential to complement capital through incentives and hence improve total factor productivity (TFP) in the long run. That aside, other forms of investment in agriculture include investments in silos, contract farming, agro industry, farm equipment, human capital, and pre-processing at the farm gate.

The theory and evidence about public expenditure/investment and growth offers mixed predictions about the importance of public agricultural expenditure (PAE) (see Devarajan et al., 1993). Moreover there is little empirical work on how public expenditure should be undertaken. This is partly a problem of data availability and a reflection of the lack of context-specific knowledge. For the SADC region, where agriculture is vital, this is a much under-explored issue, yet SADC is probably one of the regions in Africa where fiscal policy needs to be thoroughly used to benefit agriculture owing to the high proportion of the population (70%) that relies on agriculture for a living. Understanding the levels of expenditure, and how different types of expenditure affect agricultural or economic growth is important. In this regard, economic growth studies that do not consider the composition of public expenditure are less useful when considering prioritisation of resources across different and, more often than not, competing public investment options in agriculture and other sectors of the economy (Johnson et al, 2011). This point is also clear in Barro (1990), who discusses the role of public expenditure in economic growth through a simple endogenous growth model.

To conduct the analysis required to achieve the goals set in this paper we used data drawn mainly from the ReSAKSS-SA database, constituting data collected from the countries under study in 2012, the Food and Agriculture Organization of the United Nations Statistical

Database (FAO, 2012), the World Bank's World Development Indicators (WDI) (World Bank, 2012), and the Statistics of Public Expenditure for Economic Development (SPEED) database (IFPRI, 2012).

The analysis is conducted at various levels, namely regional and in a few cases at country level. Within countries, the analysis also covers agricultural sub-sectors and disaggregated expenditures, namely recurrent and capital expenditures. The results are presented at aggregate level for the SADC region and for the three economic groupings of SADC: excluding South Africa, SADC middle-income countries, and SADC low-income countries. The grouping by income levels partitions countries into low and middle income groups following the World Bank classification of economies based on gross national income (GNI) (Table 2-1). Aggregation for the SADC and the economic subgroups is based on a weighted sum approach where the share of the country's value of the indicator is used as a weight. The low income countries are characterised as agriculture based economies, although some of these countries have significant mining activities. On the other hand, some of the middle income countries have significant mining sectors and some are small countries with significant amounts of tourism such as the Seychelles and Mauritius. Nine of the 15 SADC countries were classified as middle income countries by December 2012. They include Angola, Botswana, Lesotho, Mauritius, Namibia, Seychelles, South Africa and Swaziland. The low income countries are the DRC, Malawi, Tanzania, Zambia,[1] Zimbabwe, and Mozambique. The middle income countries for which we have data and which are included in the analysis are Angola, Botswana, Lesotho, Mauritius, Namibia, South Africa, and Swaziland, while the low income countries are Madagascar, Malawi, Mozambique, Zambia, and Zimbabwe.

The region's middle and low income countries have interesting characteristics with respect to the role of agriculture. For instance the importance of agriculture in the national economies drops systematically as we move from the low to the middle income countries implying that agriculture plays a more significant role in poor countries relative to those that have attained higher standards of living. Of course, that does not imply that agriculture is unimportant in the other countries where agricultural GDP (AgGDP) to total GDP ratios are lower. In fact South

[1] Although Zambia was reclassified as a low middle income country last year, we treat it as a low income country for purposes of this analysis because the data under consideration was all generated before its reclassification.

Africa, which has one of the lowest AgGDP to total GDP ratios, is the largest producer of agricultural goods and commodities for the region. It should be noted that whilst countries like South Africa have a lower AgGDP to total GDP ratio compared to low-income countries, given the high value added in the sector through processing, financial and other services as well as direct and indirect income and employment linkages, the sector's role in the macroeconomy is higher than the this ratio suggests. The sizes of the agricultural economies in the middle income countries relative to the entire SADC region vary substantially (Figure 2-1).

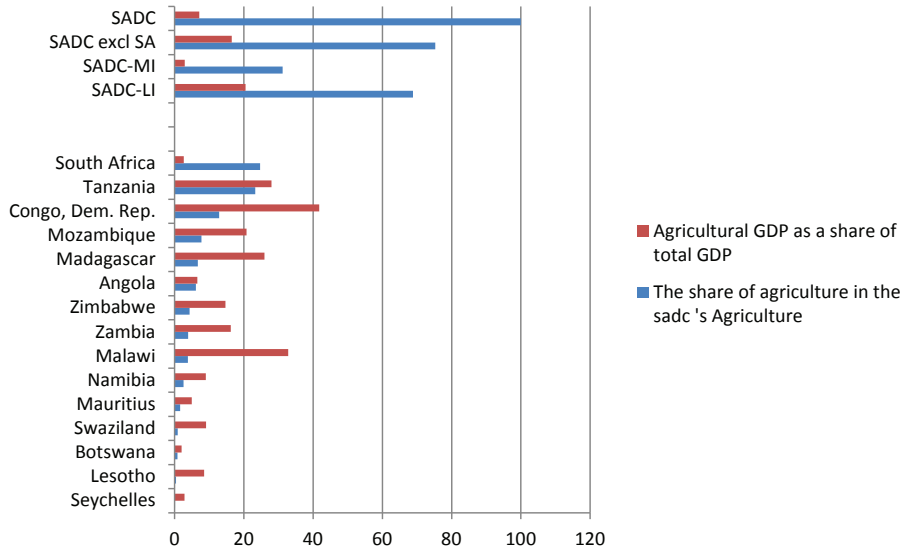
Table 2-1 World Bank classification of SADC economies, 2009 (GNI per capita)

Low income $995 or less	**Lower middle income** $996-$3945	**Upper middle income** $3946-$12195
Congo, Dem. Rep	Angola	Botswana
Madagascar	Lesotho	Mauritius
Malawi	Namibia	Seychelles
Mozambique	Swaziland	South Africa
Tanzania		
Zambia		
Zimbabwe		

Source: World Bank (2011)

Over the period 2000–2012, South Africa, Tanzania and the DRC stand out among the countries in the sample as the three countries with the largest shares in SADC agriculture, accounting for about 25%, 23% and 13% of SADC AgGDP respectively (see Figure 2-1). For the purposes of this paper, countries are assigned to low and middle income groups (following the World Bank classification presented in Table 2-1), the latter being a composite of low and upper middle income countries. Figure 2-1 shows that AgGDP makes up a larger share of total GDP in the low income countries than in the middle income countries. The analysis that follows often highlights this economic divide and also pays attention to the distinct nature of South Africa among the SADC countries as by far the biggest economy in the region and indeed in Africa. Figure 2-1 shows that agriculture contributes 21% to the GDPs of the low income SADC countries.

Figure 2-1 Share of agricultural GDP in individual countries in the SADC region (2000–2012 annual average)



Source: Authors' calculation based on ReSAKSS Data collected from Countries

3. TRENDS AND PATTERNS IN AGRICULTURAL INVESTMENTS IN SOUTHERN AFRICA

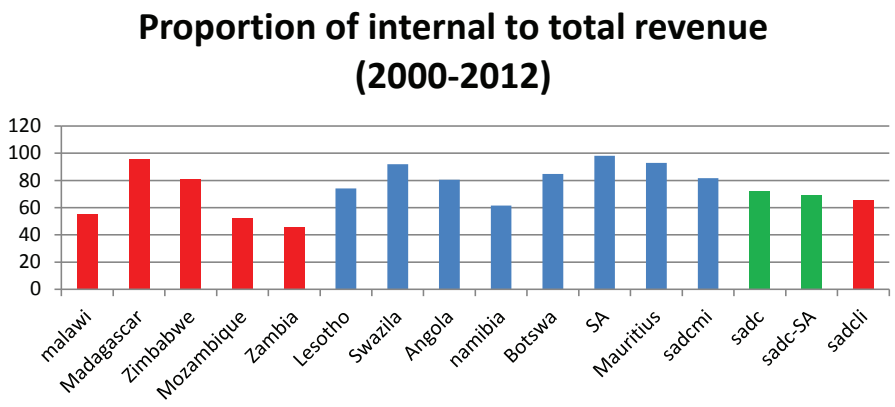
In order to achieve the targets set out in CAADP, the SADC RISDP and MDG1, investments in agriculture are important across all of CAADP's four pillars namely:

- extending the area under sustainable land management and reliable water control systems
- improving rural infrastructure and trade-related capacity for market access
- increasing food supplies and reducing hunger and
- agricultural research and technology dissemination and adoption.

Since the Maputo Declaration in 2003, countries have made investments in the agricultural sector but it is not entirely clear how such investments have changed over time and how they have been made. It is thus pertinent to show the trends in such investments over time in order to understand whether countries need more and renewed efforts towards donor mobilisation or domestic revenue collection.

Analysis of trends shows that throughout the 2000–2012 period the proportion of internal and external government revenue as a proportion of total revenues has varied from one year to another. Not surprisingly, except in the cases of Zimbabwe and Madagascar, low income countries appear to have relatively higher dependence on external finance compared to middle income countries. For example, Figure 3-1 shows that the ratio of internal revenues to total revenues for the low income SADC countries over the period under study was 65% compared to 82% for the middle income countries. This of course points to the well-known finding that low income SADC countries have a relatively higher dependence on external revenues than middle income countries.

Figure 3-1 Internal revenues as a share of total revenues



Data source: Computations by the authors based on ReSAKSS-SA data collected from individual countries

In other words, as we present patterns of public investments, it is important to also bear in mind that external finance is of paramount importance for the low income countries and reducing aid would have detrimental effects in poor countries as national sources would be insufficient to run all government functions.

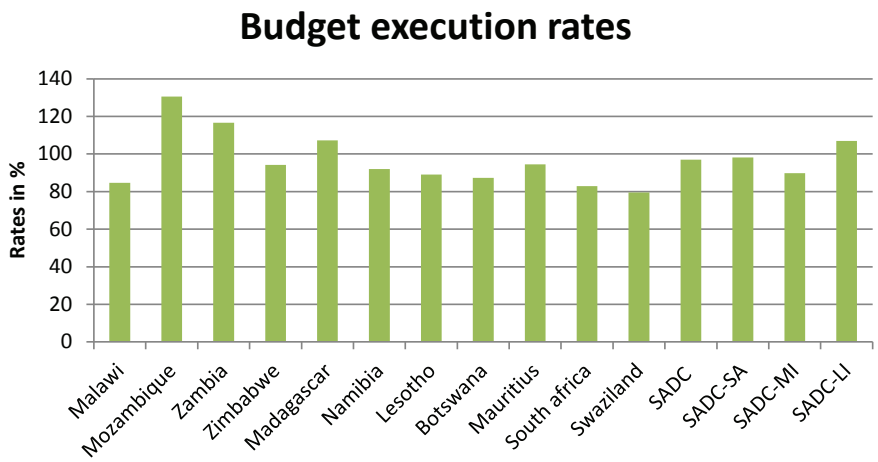
Agriculture budget execution rates

Figures 3-2 show patterns in budget execution rates for SADC countries. These are measured as the percentage of the total agricultural budget allocation spent on agriculture. In general, actual expenditures tend to fall short of budget allocations, although there are some cases where expenditure exceeds allocation. Figure 3-2 shows that agriculture budget execution rates of all eight countries presented, with the exception of

Mozambique, Madagascar and Zambia, averaged below 100%. Existing studies suggest that, among other factors, shortfalls between expenditure and allocation could be due to imperfect projections of government tax collection, the under reporting of actual spending channelled through externally supported funds, and limited capacity to spend released funds (Zavale et al., 2011).

Where spending levels exceed allocation levels it could imply that additional funds were injected into the agriculture sector by the government and/or development partners and were not registered in the agricultural budget allocation.

Figure 3-2 Total budget execution rates over time for SADC and for individual countries (2000–2012 annual averages)



Data source: Computations by the authors based on ReSAKSS-SA data collected from individual countries

In most years the budget execution rates are below 100%. Poor budget execution rates may suggest that governments need to enhance their spending capacities. This is important because it does not make development sense for cash strapped economies to underutilise the few resources available for implementing government programmes. Of course specific implications depend on the country context as the reasons for poor execution rates could differ across countries. If one of the reasons is the inability of development partners to release funds in a timely manner, then this consolidates the need for countries to reduce donor dependence.

Table 3-1 Public expenditure across sectors in 2005 International Dollars (Billions annual averages)

	Agriculture	Education	Health	Defence	Social protection	Transport and telecoms
SADC 1980–2002	0.127	0.308	0.126	0.131	0.091	0.120
SADC 2003–2007	0.148	0.627	0.335	0.201	0.160	0.094
SADC-LI 1980–2002	0.150	0.259	0.134	0.145	0.078	0.106
SADC-LI 2003-2007	0.190	0.380	0.222	0.197	0.076	0.026
SADC-MI 1980–2002	0.107	0.341	0.118	0.118	0.099	0.129
SADC-MI 2003–2007	0.123	0.776	0.403	0.204	0.211	0.134

Source: SPEED data covering Malawi, Mozambique, Zimbabwe, Zambia, Botswana, Lesotho and Mauritius

Table 3-1 shows that annual public expenditures across most sectors went up for all categories (SADC, SADC-LI, SADC-MI) from the 1980–2002 to the 2003–2007 period. This increase was more pronounced in the low income SADC countries across all expenditure streams (agriculture, education, health, defence, social protection, transport and telecommunications). SADC's agricultural expenditure increased substantially from the 1980–2002 total of US$0.127 Billion to US$0.148 Billion for 2003–2007, with and even greater increase when only the low income countries are considered. Over the 1980–2002 period to the 2003–2007 period, agricultural expenditure increased from US$0.150 Billion to reach US$0.190 Billion. These agricultural expenditure patterns appear promising although further analysis below reveals that the rates of increase have differed across the SADC countries over time.

Figure 3-3 shows the progress countries in the Southern African region have made towards the CAADP target of allocating 10% of their total budget to the agricultural sector. The first observation is that apart from Malawi which reached the 10% target a number of times after 2003, the other countries with substantial allocations to the agricultural sector as a proportion of the total budget are Zambia and Madagascar. Zambia surpassed the 10% target from 2009 through to 2012. The general trend, however, is that most countries are not reaching the 10% target. The 10% allocation, however, needs to be understood in context. For instance, highly industrialised countries may not be expected to allocate 10% of their budgets to agriculture because of the limited role that agriculture plays in their economies (e.g. South Africa). Furthermore, it should also be understood that owing to differences in AgGDPs, a less than 10% allocation to agriculture in some countries can still amount to

substantial agricultural expenditure relative to the size of the sector (e.g. Botswana), whereas an allocation of more than 10% in other countries could represent less agricultural expenditure relative to the size of the sector (e.g. Malawi and Zambia) and such countries may still need to mobilise more resources to bring about substantial changes in their agricultural sectors (Fan et al., 2010).

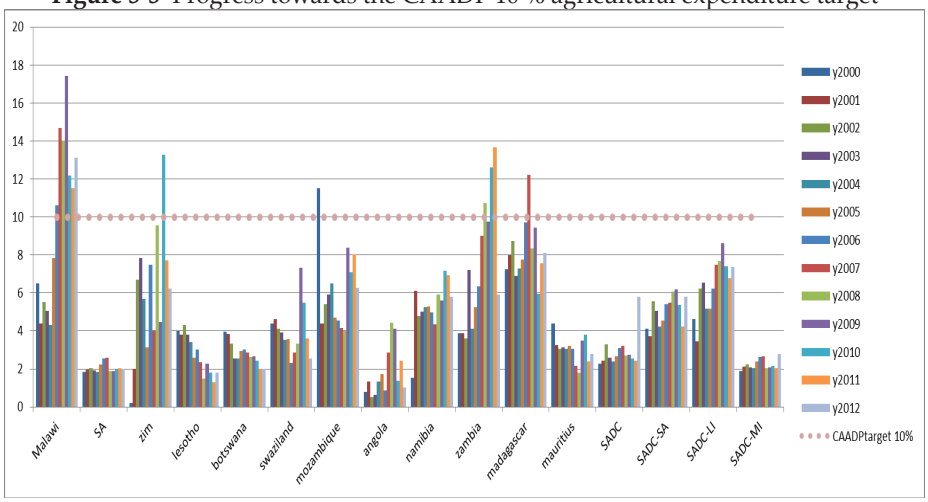
Against this background, it is pertinent to consider the results based on the SADC economic groups of middle income countries (SADC-MI) (which are usually mineral rich and where the manufacturing sector has a larger share) and low income countries (SADC-LI) (which are generally characterised by good agricultural lands, but have limited minerals under exploitation at present). Ideally, low income countries would be expected to find the 10% allocation more important. Figure 3-3 shows that actually the SADC-LI countries as a group are allocating more than 7% of their budgets to agriculture, just 3% less than the 10% target. Although this figure falls below the 10% target, it is much higher than the average allocation in middle income countries. Over the 2000–2012 period the middle income countries only allocated about 2% of their budgets to agriculture. These figures should be seen in the contest of yearly variations in allocations by both middle and low income countries.

The findings above carry a message of hope because, although the 10% target has not been consistently achieved, the trend has been upward/positive in some countries such as Malawi, Mozambique and Zambia, and to some extent Zimbabwe, although there are also reasons to believe that in a number of countries public expenditure on agriculture as a share of total expenditure is declining (more evident in Lesotho, Angola and Mauritius). Of course the variations over time of individual countries in expenditure on the agricultural sector require thorough analysis. For example, it would be informative to probe the factors that yield those decisions in order to find ways of encouraging investments in the sector, but this issue goes beyond the objectives of this paper and hence is not given any in-depth analysis.

An important point to be made about the data above relates to the kinds of expenditure involved in each of the countries under study. One implicit assumption made by proponents of increased agricultural expenditure is that such expenditure would eventually create the much needed

agricultural capital stock that will dictate the pace and magnitude of long term agricultural and economic growth. Nevertheless, whether governments will end up allocating budgets to investment spending is an empirical question at present, given that there is no clear cut theory or practice on how governments should allocate their spending within the agricultural sector, and given the importance of country specific contexts. The following section presents trends in government expenditure at national level and within the agricultural sector in order to understand how expenditure is distributed within the sector. In so doing, depending on data availability, we have endeavoured to disaggregate expenditure based on whether it is recurrent or capital expenditure, and whether it is for research and development, infrastructure, irrigation, extension and so on. Within the agricultural sector we have also endeavoured to show the distribution of expenditure between forestry, crops, livestock and fisheries.

Figure 3-3 Progress towards the CAADP 10 % agricultural expenditure target



Data source: Computations by the authors based on ReSAKSS-SA 2012 data collected from individual countries

Evolution of spending in SADC (2000–2012)

Table 3-2 shows average expenditure on various functions for specific periods as shares of total expenditure. It is clear from the table that recurrent expenditures account for the greater share of all expenditures across almost all functions. The evidence also shows that countries falling under the middle income category employ more (67–71%) resources under the recurrent expenditure category than under the capital expenditure category where the allocation has been about 29–

33% over the period under study. Lower income countries appear to be associated with a small bias towards capital expenditures, spending about 40–46% on them. By definition, recurrent expenditures do not result in the acquisition or enhancement of assets, therefore, the finding that low income countries are investing more in capital, is a good step forward in the quest for solutions that should develop the region. Again, across time, capital allocations appear to have increased by 6 % in low income countries from 40% in the 1995–2002 periods to 46% in the 2003–2012 periods. Total capital allocation in the middle income countries declined by about 4% over the same period implying that middle income countries have tended to spend more on consumption.

The economic functions that enjoyed more funding over the periods under study in descending order are education, health and agriculture; although in some countries such as Malawi, social security programmes also took considerable shares of expenditure in some years. An analysis of expenditure shares (as a ratio of total agricultural value added) over the same period for the low income countries reveals that the decline in infrastructure expenditure and the decrease in investments across other functions in the post 2003 period was due to a fall in the low income countries. Efforts should, therefore, be made to encourage policies favouring infrastructure, R&D and irrigation in those countries as these functions still remain limited/inadequate and yet they are paramount for agricultural development in the region. Within the middle income countries, irrigation expenditures, as a share of agricultural GDPs, increased from 4.3% to 5.8% in the post 2003 period. Expenditure on the different streams under study as a share of total agricultural expenditure show a similar pattern in that various countries have invested their agricultural expenditures differently from one period to another across the expenditure streams (Table3-3). In Malawi for example, out of the total expenditures in agriculture, over 50% was used to finance farm input subsidy programmes, whereas extension, at 26.8% had the second largest share over the 2000–2012 period. Over the same period, Malawi's expenditure on irrigation and other infrastructure, as a share of total agricultural expenditure, was about 15%. Except in a few cases, extension enjoyed by far the most investment/expenditure averaging 33%, followed by irrigation and R&D, in the other countries. The ordering is similar when looking at the SADC countries as a whole rather than in terms of income groups.

Table 3-2 The share (%) of recurrent and capital expenditures in total expenditure across sectors (1995–2002 and 2003–2012 annual averages)

		Agriculture	Agriculture	Education	Education	Health	Health	Transport	Transport	Total	Total
		Recurrent	Capital	Recurrent	Capital	Recurrent	Capital	Recurrent	Capital	Recurrent	Capital
Zimbabwe	1995-2002	5.6	1.2	8.2	2.9	7.8	1.5	0.0	0.0	**85.2**	**12.9**
	2003-2011	6.8	7.0	8.6	2.1	10.9	1.8	2.8	2.7	**77.2**	**22.8**
Madagascar	1995-2002	1.7	7.6	13.5	3.9	6.0	2.2	1.2	9.9	**63.5**	**36.5**
	2003-2011	1.4	3.4	16.9	3.5	4.7	2.6	0.9	10.1	**66.6**	**33.4**
Malawi	1995-2002	5.6	2.4	5.4	2.1	3.3	2.1	0.9	4.2	**30.3**	**69.8**
	2003-2011	6.4	2.0	4.3	1.7	4.0	1.8	1.4	4.2	**32.1**	**67.4**
Mozambique	1995-2002	1.3	4.6	13.4	5.3	5.7	4.7	0.3	7.1	**59.5**	**34.5**
	2003-2011	0.5	2.3	8.7	4.3	3.0	3.3	0.1	2.4	**39.1**	**28.0**
Swaziland	1995-2002	2.4	0.8	12.6	0.7	4.0	0.4	2.2	4.7	**48.2**	**17.5**
	2003-2011	2.5	1.4	14.7	0.7	5.9	1.2	2.9	3.9	**60.2**	**17.1**
Botswana	1995-2002	4.3	1.6	10.0	3.5	5.2	0.5	0.7	1.5	**67.3**	**32.7**
	2003-2011	2.1	1.0	11.4	1.8	3.1	3.0	1.4	1.2	**72.6**	**28.4**
Mauritius	1995-2002	2.8	0.8	5.9	1.5	5.7	0.4	0.5	2.3	**84.9**	**15.2**
	2003-2011	2.4	0.3	2.8	1.5	7.6	0.8	2.1	1.6	**88.5**	**12.8**
Lesotho	1995-2002	2.6	3.5	7.6	4.7	4.9	2.8	2.7	0.2	**80.2**	**20.3**
	2003-2011	2.5	1.1	5.5	2.0	5.8	2.1	1.0	0.2	**82.7**	**16.0**
SADC	1995-2002	3.3	2.8	9.6	3.1	5.3	1.8	1.1	3.7	**63.1**	**36.9**
	2003-2011	3.1	2.3	9.1	2.2	5.6	2.1	1.6	3.3	**62.2**	**37.8**
SADC-LI	1995-2002	3.5	4.0	10.1	3.5	5.7	2.6	0.6	5.3	**59.6**	**40.4**
	2003-2011	3.8	3.7	9.6	2.9	5.7	2.4	1.3	4.8	**53.7**	**46.3**
SADC-MI	1995-2002	3.0	1.7	9.0	2.6	5.0	1.0	1.5	2.2	**66.6**	**33.4**
	2003-2011	2.4	1.0	8.6	1.5	5.6	1.8	1.9	1.7	**70.8**	**29.2**

Source: Author's computations based on SPEED DATA

Table 3-3 Agricultural expenditure by function as a share of agriculture GDP and as a share of total agricultural expenditure

	Expenditure as a share of total agricultural expenditure (2000–2012 annual averages) (%)						Expenditure as a share of agricultural GDP (2000–2012 annual averages) (%)					
	R&D	Extension	Irrigation	Infra-structure	Grants/ subsidies	Other	R&D	Extension	Irrigation	Infra-structure	Grants/ subsidies	Other
Malawi	6.0	26.8	14.8	0.0	52.4	0.0	0.2	1.2	0.5	0.0	5.6	0.0
Mozambique	19.8	8.4	3.1	**38.9**	**0.0**	29.7	0.5	0.3	0.1	1.1	0.0	0.7
Zambia	6.9	33.5	0.0	0.0	59.6	0.0	0.2	1.2	0.0	0.0	2.1	0.0
Zimbabwe	7.9	10.9	11.3	9.2	26.0	34.7	0.8	3.1	1.7	0.9	6.4	10.3
Madagascar	17.0	28.8	18.8	24.4	11.1	0.0	1.1	2.1	1.2	1.8	0.8	0.0
Namibia	15.5	26.5	3.3	13.7	0.0	41.0	0.6	1.0	0.3	0.6	0.0	1.7
Lesotho	2.7	34.3	0.0	19.3	0.0	43.6	0.7	9.3	0.0	6.2	0.0	12.4
Botswana	12.6	83.8	0.1	0.1	3.4	0.0	4.6	32.2	0.0	0.0	1.3	0.0
Swaziland	10.8	48.1	18.3	18.3	4.4	0.0	1.1	6.5	2.2	2.2	0.4	0.0
SADC	11.0	33.9	7.8	13.6	17.5	16.3	0.6	3.1	0.7	1.4	1.7	2.7
SADC-MI	10.4	48.2	5.4	12.9	2.0	21.1	0.7	5.0	0.6	2.3	0.1	3.5
SADC-LI	11.5	22.0	9.7	14.2	30.4	12.3	0.6	1.5	0.7	0.8	3.0	2.1
SADC 2000-02	14.1	36.7	10.8	19.0	7.6	11.8	0.5	2.1	0.4	1.3	0.2	1.4
SADC 2003-12	10.1	33.0	6.8	12.0	20.4	17.6	0.7	3.4	0.8	1.5	2.1	3.1
SADC-LI 2000-02	16.4	26.3	16.5	23.8	12.2	4.8	0.4	0.7	0.5	0.7	0.3	0.1
SADC-LI 2003-12	10.0	20.8	7.7	11.5	35.5	14.4	0.6	1.8	0.8	0.8	3.7	2.7
SADC-MI2000-02	11.4	48.8	4.3	13.4	2.2	19.9	0.7	3.7	0.3	1.9	0.1	2.9
SADC-MI2003-12	10.1	48.0	5.8	12.7	1.9	21.5	0.7	5.4	0.7	2.4	0.2	3.7

Data source: Computations by the authors based on ReSAKSS-SA (2012) data collected from individual countries. For countries where 'other' and infrastructure equals zero, there is no data available in that category for that country.

Over time, though, it is pertinent to note that expenditure shares as a proportion of total agricultural expenditure have generally fallen in the SADC low income countries. The R&D function, for example, has seen a decline from 16.4% to just 10%. This is a significant decline and threatens the ability of the sector to generate specific technologies to

support long term agricultural growth. Considering that investments in R&D have the potential to raise agricultural value and rates of return in Africa by some 22% (Thirtle et al., 2003), and that such expenditure on R&D has high returns in labour productivity (Fan et al., 2010), such a decline in investments is potentially detrimental. The same can be said about any fall in infrastructure (especially on feeder roads), which has also been found to increase returns on labour productivity.

The situation in the low income countries is similar for the extension stream, which has seen a decline in expenditure share from 26.3% to 20.8% from the 2000–2002 period to the post 2003 period. There has also been a decline in the infrastructure and irrigation streams. A decline in the share of expenditure on extension services is undesirable because investments in agricultural extension facilitate technology adoption, and many studies have shown that investments in extension have positive impacts on agricultural productivity and incomes. Extension services, through technology demonstration centres and extension visits for example, can raise the demand for technology from farmers (Sun, 2011). Of course, TFP does not depend on current levels of R&D expenditures but rather on usable stocks from past R&D expenditure (Alston and Pardey, 2011).

The only stream/function that has seen an increase in expenditure share is grants/subsidies. The share of subsidies in the low income countries more than doubled in the 2003–2012 period from the initial figure of 12.2% in 2000–2002 to an overwhelming 35.5% in the post 2003 period. This trend has at least two key messages, namely that owing to rising input prices, erratic rainfall and unreliable, albeit increasing aid flows, low income countries are perhaps realising that administering subsidies to the agricultural sector is inevitable. Unfortunately, this is happening at the expense of other equally important functions within the agricultural sector. Subsidies, by their nature appear to target addressing the short term needs of the agricultural sector, for example, the supply of short term inputs. Unless more finance can be channelled into the other sections of the agriculture sector, generating the much needed infrastructure and technology for long term growth of the agriculture sector will be very difficult for these countries.

In Table 3-4 it is clear that not only has the crops sector had the highest expenditure share over the period under study, this expenditure share

has been increasing over time. For instance, SADC's crops expenditure shares in total agricultural expenditure rose from 42% in the pre-Maputo declaration (2000–2002) period to 52% in the 2003–2012 period. Within SADC, lower income countries spend more on crops and they also saw the highest increase in the share of expenditure in the 2003–2012 period at more than 25%. The increase in crops expenditure shares in the SADC middle income countries between the 2000–2002 and 2003-2012 was far smaller at less than 1%.

Table 3-4 Distribution of expenditure as a share of agricultural expenditure across major components of SADC's agriculture (2000–2002 & 2003–2012, %)

	Expenditure crops	Expenditure livestock	Expenditure fisheries	Expenditure forestry
SADC 2000–2002	41.79	20.01	14.31	23.88
SADC 2003–2012	52.05	20.36	11.32	16.27
SADC-LI 2000–2002	37.37	10.50	14.62	29.82
SADC-LI 2003–2012	62.63	12.94	9.20	15.23
SADC-MI 2003–2012	43.95	26.32	12.87	16.86
SADC-MI 2000–2002	43.55	25.26	13.17	18.01

Data source: Computations by the authors based on ReSAKSS-SA data collected from individual countries (2012)

Expenditure shares in fisheries and forestry for low income countries declined over the period under study, while livestock expenditure shares only marginally increased. The bottom-line from these figures is that the largest shares of expenditure in SADC's agriculture still remain in the crops sub-sector, whilst less and less expenditure has gone to fisheries and livestock. Depending on the comparative advantage of each SADC country, there appears to be an urgent need to explore the potential of sub-sectors such as livestock and fisheries to improve nutrition. The sections that follow present details of expenditures within the four major branches of crops, livestock, fisheries and forestry which together constitute agriculture.

Conclusion

Various countries have tended to invest in their agricultural sectors differently across time and so far investments in the agriculture sector have been limited and volatile in the region and the quality of spending has been low, in some cases favouring private goods at the expense of public goods. Moreover, significant donor dependence coupled with low budget execution rates call for improvements in revenue collection and budget processes . A bias exists in public agricultural expenditure bias towards crops at the expense of other sectors . In view of all these,

a more and better-targeted agricultural growth enhancing investments are needed in the SADC's agricultural sector if the many livelihoods now in poverty are to be uplifted.

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