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Strengthening National Comprehensive Agricultural Public Expenditure in Sub-Saharan Africa

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Agriculture Public Expenditure Review 2000-2013

Botswana

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CAADP

Currency Equivalents

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Government Fiscal Year

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Metric System

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ABBREVIATIONS AND ACRONYMS

AgPER	Agriculture Public Expenditure Review
BMC	Botswana Meat Commission
CAADP	Comprehensive Africa Agriculture Development Programme
CEDA	Citizen Entrepreneurial Development Agency
COFOG	Classification of Functions of Government
FMD	Foot and Mouth Disease
FY	Fiscal Year
GABS	Government Accounting and Budgeting System
GDP	Gross domestic product
IMF	International Monetary Fund
ISPAAD / ISPAADD	Integrated Support Programme for Arable Agriculture (and Dairy) Development
LIMID	Livestock Management and Infrastructure Development [Programme]
LITS	Livestock Identification and Traceback System
MFDP	Ministry of Finance and Development Planning
MMEWR	Ministry of Minerals, Energy and Water Resources
MOA	Ministry of Agriculture
NDP	National Development Plan
NEPAD	New Partnership for Africa's Development
NFTRC	National Food Technology Research Centre
PDSF	Public Debt Service Fund
PFM	Public Finance Management
RSF	Revenue Stabilisation Fund
TEC	Total Estimated Cost (multi-year ceiling for NDP projects)

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EXECUTIVE SUMMARY

Introduction

1. **This Botswana Agriculture Public Expenditure Review (AgPER) is one of a series of similar studies undertaken in over a dozen countries in sub-Saharan Africa** under the framework of a program coordinated by CAADP, supported by the Bill & Melinda Gates Foundation and the CAADP Multi-Donor Trust Fund, and implemented by the World Bank.

2. **The AgPER presents data about actual expenditure for the period 2000 to 2013, with an outlook on the following two years.** It presents public expenditure on agriculture structured by various dimensions and classifiers such as institutional, recurrent versus investment and capital, by sub-function and subsector and by spending unit. It analyzes expenditure levels, patterns and trends and compares expenditure patterns with policy objectives and strategies.

3. **Finally, it draws conclusions and recommendations** in areas where future decisions could benefit from a clear view of an analysis of past spending or where it is deemed useful to support imminent policy formulation and decisions with a clearer understanding of the financial implications.

4. **This Botswana AgPER stands out from similar studies in other countries because growth in agriculture is particularly constrained by natural conditions, while public spending on agriculture is unusually high in relation to the small size of the sector.** Public spending on agriculture absorbs a low share of the national budget, but the sector is also very small. The potential for growth is very limited, essentially for climatic reasons and because few options for expansion of irrigation are left. As a result, the government spends rather little of its budget on agriculture, but at the same time large amounts compared to the value added of the sector.

5. **The benchmark of the Maputo Declaration of 2003 documents the commitment of African Heads of State to increase public expenditure on agriculture to ten percent of the budget.** The question whether this target is a reasonable objective for Botswana, with low potential for sector expansion and an already high intensity of public spending on a small sector is examined at various points in the report.

6. **The analysis and recommendations provided in this Study are meant to support policy formulation and debates about appropriate strategies and instruments.** Imminent events include the formulation of the 11th National Development Plan and the preparation of a CAADP compact and investment plan for Botswana.

Country Context: Overview

7. **The economy of Botswana has been growing regularly over the past decades, driven essentially by mineral wealth and good governance.** Poverty has declined to 19 percent. However, the growth in other sectors in combination with only very modest growth in the agricultural sector has led to a constant decline of agriculture's share in GDP. It now represents a mere 2.7 percent of GDP (2012). The average composition of agricultural GDP for the period 2010-12 was 64 percent for livestock, 10 percent for crops and 26 percent for "others" (mainly horticulture). Beef is the main agricultural product exported, yielding some $100 million per year in export revenues (with fluctua-

tions). Despite its diminished role in the macro-economy, the agricultural sector still retains strong rural and sectoral linkages.

8. **State revenues are dominated by sources over which Government has little control.** Revenues from minerals and the transfers from the SACU customs pool make up 60 percent of the total. Efforts to improve tax collection are under way but cannot possibly replace these two sources. Projections assume that revenues from minerals and mining will no longer grow in the near future, and the revenue sharing formula of SACU is under discussion and might be revised to the detriment of Botswana. Thus, public funds will not be as readily available as in the past.

Sector Context: Agriculture

9. **Agriculture in Botswana is dominated by the traditional sector which, by definition, operates on communal land.** Commercial farmers cultivate less than 10 percent of agricultural land and own and manage less than 15 percent of cattle. There are no large company-owned holdings (as in Zambia) and no significant foreign investment. Commercial crop production is, however, the source of most sorghum produced in Botswana (commercial farmers contribute about two-thirds), while traditional agriculture produces virtually all the maize. Beef exports continue to rely mainly on cattle held by traditional holders on communal land.

10. **Productivity indicators in the traditional sector are significantly worse than in commercial farming and livestock.** The reasons, however, are structural, and it is difficult or even impossible to close the gap. Commercial arable farming is dominated by the Pandamatenga area in the North-East of the country. This area is characterized by a particular type of soil ("black cotton soil", with a high clay content), still-reasonable rainfall and large highly mechanized farms with 500 hectares or more. There also pockets of large-scale crop farming in the southern parts of the country. Commercial livestock holdings have exclusive grazing rights and fenced pastures and can therefore manage their herds. Death rates and losses are significantly lower than in the traditional sector and offtake rates significantly higher.

11. **Another salient feature of traditional farming and livestock holdings is the age of the farmers.** Slightly over 50 percent of cattle are held by persons of 60 or more years of age. Women represent a third of this group, but often because the husband died rather than by choice or design.

12. **Data from selected comprehensive annual agricultural surveys indicate that less than 15 percent of farmers in the traditional sector sell their crops.** An overwhelming majority (over 80 percent) are net buyers of grain, especially maize and sorghum. Traditional crop agriculture is essentially subsistence agriculture. Production is not very sensitive to market prices, which have little bearing for farmers who do not market their output. Similarly, cattle slaughter is rather insensitive to prices.

13. **Botswana has very limited potential for irrigation largely because of erratic rainfall and few perennial rivers.** Ground water is already depleted faster than it is replenished. About 2000 hectares are currently under irrigation, but data on area from different sources vary considerably. Irrigated areas are almost exclusively used for the production of horticultural products and fruits. There is, however, potential irrigable land in Chobe District in the north of the country.

14. **While Botswana is self-sufficient in beef, goat meat and recently broiler meat and eggs, most of the other agricultural products are imported, mainly from South Africa.** Domestic maize production falls far short of consumption needs, and virtually all maize for the chicken industry is imported.

15. **Since 1991, Botswana's agricultural policy has pursued the objective of food security, which has replaced the previous objective of food self-sufficiency.** Since trade restrictions and price support schemes would only work to the detriment of consumers when local production is not particularly price-sensitive and far short of satisfying domestic demand, the policy relies on open markets and relatively unrestricted trade for the main agricultural products. South African provides almost all of the food imports into Botswana.

Institutions in Agriculture

16. **The Ministry of Agriculture (MOA) is responsible for almost all public services for the sector.** Support to the sector is not fragmented and almost all functions are concentrated under MOA. The Ministry is represented in all districts and down to the local level. Services are deconcentrated, not decentralized.[1] In early 2014, MOA had a total staff of 7,226 spread reasonably across the country. The number includes staff at the Department for Agricultural Research, which is a normal department of the Ministry (i.e., not autonomous). About 1,210 staff are technical or professional staff with diplomas or degree in agriculture. At this staffing level, there are about 20 people employed in the agricultural sector (mainly self-employed, also workers) per MOA staff. The number of farmers and farm workers per technical or professional staff is about 120. Of course, only some of these are assigned to directly advise farmers through training or extension work.

17. **A significant part of MOA activities relates to animal health (e.g. vaccinations) and control and registration of cattle movements.** Disease pressure on cattle is high, particularly because the foot-and-mouth disease (FMD) is transmitted by wild buffaloes which, however, are immune to the virus themselves. Cordon fences and the definition of zones declared FMD free and other zones where cattle are vaccinated have allowed Botswana to export to the rewarding EU markets. Culling of cattle is the reaction to FMD outbreaks in FMD free zones.

18. **Market mechanisms and private enterprises ensure marketing of agricultural inputs and produce, but two big parastatals also play a significant role.** The Botswana Agricultural Marketing Board (BAMB) is a buyer of grains and beans of last resort and publishes prices for delivery to depots. The prices follow the principle of import parity pricing. BAMB also maintains the national strategic grain reserve and sells agricultural inputs to farmers. The Botswana Meat Commission (BMC) operates three slaughterhouses and has a monopoly for beef exports. The growing local market is served by private abattoirs and butcheries.

Pattern and Management of Public Expenditure on Agriculture

19. **Putting together public spending data for the sector is rather straight-forward since almost all expenditure goes through the Ministry of Agriculture.** An electronic accounting and payment system (called GABS) is easily accessible by financial staff in the ministries and allows to retrieve spending data for as far back as about 2005. Bilateral aid and international agricultural institutions do undertake occasional studies, but do not finance projects or other costs on a significant scale; therefore, off-budget expenditure by donors is not a problem. Loans provided by the African Development Bank pass through the system and the related expenditure is therefore captured in principle. In order to capture data on the agricultural sector in the definition by functions of government (COFOG classification) that is the basis for the CAADP delimitation of the sector, only the Botswana College of Agriculture (which is classified under education in the COFOG classification

[1] Local agricultural offices respond to the Ministry of Agriculture, not to heads of local governments. They get their budgets through the central ministry, not through districts.

scheme) needs to be subtracted from total MOA spending as shown in budget documents. Fishing and forestry are part of the CAADP definition of sector scope, but insignificant in Botswana, and so is public expenditure on these subsectors. Support to game farming and activities like bee-keeping is part of the responsibilities of MOA and therefore covered.

20. **Expenditure on extension services cannot be measured accurately because the functions of field staff also cover regulatory tasks.** Extension services are fully integrated into other functions of the departments dealing with crops and livestock, respectively. Since district offices of MOA do not appear separately in budgets and financial reports, the regional distribution of spending and benefits and possible regional disparities in public spending cannot be assessed.

21. **Revenues and other spending are not significant.** Public spending also occurs through the Citizen Entrepreneurial Development Agency (CEDA), which provides loans to emerging and commercial farmers at subsidized, but still meaningful interest rates. Some of these loans were cancelled and should therefore be considered as public spending, but CEDA could not provide data on cancellations by industry; therefore, this component could not be captured. The cost of the interest rate subsidy is too small to make any significant difference in the analysis.

22. **Overall public expenditure has more than tripled from P451 million in FY 1999/2000 to P1,549 million in FY 2012/13, of which P297 million is a treasury loan to the Botswana Meat Commission (BMC) and thus an exceptional expenditure. Despite this growth, agriculture still attracts only approximately 3.0 to 3.6 percent of the overall budget, which is much less than the 10 percent benchmark of the Maputo Declaration.** The more typical figure for annual spending is about P1,300 million. Growth is less if spending is expressed in US Dollars, since the Pula was losing value over the period of this review. In constant prices, public expenditure on agriculture has been remarkably stable, without either growth or decline.

23. **Public expenditure on agriculture amounts to approximately between $170 million and $200 million annually in the most recent years.** Fluctuations occur because of drought and disease response expenditure, the periodic need to inject funds into BMC to cover its losses, and the stage of implementation of big development projects.

24. **Just over half of the recurrent spending is on livestock.** This is due to the large share of the livestock subsector and the high recurrent cost for providing public goods such as veterinary services, recording of animal movements and maintenance of cordon fences. Crops (including horticulture) absorb 13 percent of MOA's non-personnel recurrent expenditure and 25 percent of personnel costs. Spending on research accounts for roughly 10 percent of the recurrent budget.

25. **Crops and horticulture absorb 70 percent of development expenditure; only 24 percent of development spending is on livestock.** The high weight of crops in development spending is mainly due to high spending on the ISPAAD component of the project "Agricultural Support Schemes". The share for crops is expected to grow even further from 2013/14 onwards because of large capital spending on the Pandamatenga area, Chobe District in the north of the country, for drainage and roads, and the planned development of new irrigation areas of up to 35,000 hectares using water from the Zambezi river.

26. **The development budget, which also contains all support schemes and disease response expenditure, represented about a third of total expenditure up to FY 2012/13.** According to planned budget figures (not actual expenditure), it will be 44 percent of the total expenditure in FY 2014/15. The increase is due mainly to the Pandamatenga project and a provision for animal disease control. Actual development spending has increased sharply from FY 2008/09 onwards. The support schemes, especially for crops, and emergency disease control measures show their impact on spending. Note that the disease control project includes compensation to farmers when animals need to be

culled because of an outbreak of infectious diseases, with particular importance of the foot-and-mouth disease.

27. **Personal Emoluments (PE) make up roughly 60 percent of the recurrent budget (including research) of MOA.** Travel costs, materials and training absorb about 30 percent. The share of funds for non-personnel items may be on the low side, but not alarmingly so.

28. **The weight of the two agricultural support schemes - ISPAAD (for crops and horticulture) and LIMID (for livestock) - is high.** The overall envelope for the support schemes for the period of the current National Development Plan (NDP 10) was increased over time and represents almost 50 percent of the authorized development expenditure over the seven years from period FY 2009/10 through 2015/16. Four projects absorb 94 percent of the Total Estimated Cost (TEC) of NDP 10 projects over the period 2009-2016. Support schemes absorbed 70 percent of actual development expenditure over the period FY 2009/10 to 2012/13.

29. **The spending of funds that are approved in the budget process is generally not limited by liquidity constraints at treasury level in Botswana.** Thus, budgets are a rather robust basis for preparing detailed plans at spending unit level. The execution rates of the recurrent budget are not far off the 100 percent mark, but a comparison between initial budget estimates and actual expenditure shows weaknesses in budget preparation. Research is the only component of the recurrent budget where actual spending on non-personnel items has always been lower than initial budget estimates. The worst execution rate over the last five years, however, was still 82 percent.

30. **Differences between initial estimates and actual expenditure are significant with regard to development expenditure.** Actual expenditure was significantly higher than the original budget in most years. In some cases, this is a sign of flexibility rather than a constraint to project implementation. Part of the variations have specific explanations such as a late start of a major construction project or emergency relief expenditure that were not planned. The Support Schemes project has a strong tendency to spend more than was initially approved.

31. **Two essentially good practices should be mentioned.** First, the Government typically presents several supplementary budgets to the parliament in a year. Thus, spending is authorized. The downside of this practice is that additional expenditure items can go through parliamentary approval when the focus is more on specific projects' need than on balance between subsectors and types of intervention. Second, MOA generally receives additional funds as and when emergencies occur. It does not have to "scrounge for money" from on-going projects in order to finance the response. This permits projects to work on a predictable budget.

Prospects for Growth and Role of Public Spending

32. **Although agriculture absorbs only 3-4 percent of the budget, public spending is high in relation to the size of the sector.** Agriculture accounts for between 2.5 and 2.9 percent in total GDP. The share grew slightly since 2005. This may, however, be due to quite some extent to the industrial chicken production which is included in the statistics under agriculture but not promoted by public spending. Public expenditure on agriculture stands at roughly 50 percent (with fluctuations) of agriculture's value-added.

33. **A comparison with other African countries shows that this is indeed very high and unusual; 10 to 15 percent would be more typical for African economies.** The implication is that government spends P50 for every P100 of income from agriculture. However, this is the average rate and also reflects overheads. It does not necessarily imply that additional government spending of

P50 will result in additional agricultural income by P100, nor does it imply that if the sector expands by P100, governments needs to spend an additional P50.

34. **Public expenditure is high in relation to the sector's size, and there are no major flaws in the way the funds are spent.** Agriculture does not appear to be constrained by low availability of public goods (with research as a possible exception). Restrictive marketing arrangements and price distortions are the exception and therefore not constraining agricultural development in a significant way.

35. **Yet, growth in agriculture has occurred only in special subsectors.** Apart from the fast development of industrial chicken production, which was promoted by trade restrictions and not by public expenditure, only the horticulture sector shows clear signs of growth. Public investment in irrigation has no doubt contributed to this. But Botswana's potential for irrigation is more or less exhausted except for the Zambezi scheme (see further down) and, on a smaller scale, the use of effluent waters for irrigation purposes.

36. **In crops and livestock, production and productivity have not improved.** Production statistics show enormous variability for crops, but no discernible trend. Per-hectare yields in traditional agriculture have remained very low. The commercial crop sector continues with far better yields, but remains a small player. For livestock, productivity indicators like death and offtake rates have fluctuated but not improved. Targets defined in national development plans and sector strategies have generally not been met.

37. **The main factors behind this are instructive. First, it is questionable whether the natural conditions under which agriculture operates in semi-arid Botswana are conducive to sustained growth.** Public expenditure can at times mitigate natural constraints by, for instance, building irrigation schemes or facilitating the use of fertilizer to permit the cultivation on nutrient-deficient soils. But the scope for this type of action is very limited.

38. **Second, crop farmers have been advised to use row planting since many years in order to improve yields, and the technique has been shown to improve productivity in a research environment. However, most farmers did not accept the method.** In spite of the provision of free land preparation and planting and free seeds, yields did not improve. Fluctuations may hide trends, though, and monitoring of ISPAAD is not sufficiently developed to provide more clarity. It is suspected that the technologies and techniques promoted by extension agents do not fit into the economic and social environment of small-scale farmers.

39. **With regard to cattle, the low productivity of traditional cattle holders operating on communal land is the result of the type of land and extensive pastures with low feed supplements,** which would need to be imported and transported to the cattle areas. Extensive pastures make beef production in Botswana profitable, but low offtake rates and high losses and death rates are inherent to the production system.

40. **At the same time, particularly the livestock sector in Botswana is public-goods intensive.** Vaccinations, maintenance of fences, registration of cattle movements and compensation of farmers whose herds are destroyed because of disease control measures are essential public goods, yet expensive. Recurring subsidies to keep BMC afloat in spite of droughts and periodic export bans add to the cost of simply maintaining the usual production levels.

41. **Public spending without growth in the sector does not necessarily indicate ineffectiveness.** A part of public spending is on public goods required to sustain a given production level. If this expenditure would be reduced, the sector would decline. The other part of public expenditure is meant to initiate and facilitate growth by way of generating and transmitting new technologies or

expanding available infrastructure required by agriculture. Botswana has been quite successful with regard to the provision of public goods for sustaining agriculture. It has not been successful with regard to public spending designed to expand the physical and technological production and productivity frontier.

Relevance of the Maputo Target

42. **The Maputo Declaration of 2003 stipulates that African governments should spend ten percent of their overall budget on agriculture.** For Botswana, expenditure on agriculture would need to triple to reach the target. Is this a reasonable target for Botswana? Is production currently constrained by under-provision of public services to the sector? Would a significantly higher level of public spending on agriculture prompt the sector to "take off"?

43. **This report's conclusion is two-fold.** First, a significant and lasting increase in public spending on agriculture of the magnitude required to reach the Maputo target would not be a wise measure. Given the natural constraints and the physical and financial ability of Botswana to import food from its neighbors (South Africa, Zambia and Zimbabwe, who are more efficient agricultural producers with much better climatic conditions), it is difficult to find areas where additional spending makes economic sense.

44. **At the same time, there are a number of smaller steps to gradually improve the effectiveness of public services that may be useful.** They relate, among others, to the research-extension-farmers link, mobility of extension agents, the cattle identification and trace-back system, and increasing usage of existing irrigation facilities. If they require additional funds, they should be made available provided that the measures are economically beneficial.

45. **Apart from the small and gradual steps, two big projects are under way or planned which could have a significant impact on commercial agricultural production:** the on-going development of the Pandamatenga area and the plan to irrigate 35,000 hectares with water drawn from the Zambezi river. This Report's recommendation is to ensure that the schemes have a good prospect for economic viability under the current market oriented price regime. If they are not viable, the Maputo target should not necessarily lead to decisions to go ahead anyway.

Big Capital Investments

46. **There are four large-scale investments in sector expenditure plans. Phase 1 of the Pandamatenga infrastructure project is on-going with completion expected in 2014.** Phase 2 has been tendered, but no contract yet awarded (as per end of May, 2014). The main contribution of the project is the construction of controlled drainage of the area in order to avoid flooding and water-logging. A roads component, serving the area's internal transport network, is included to improve access. While Pandamatenga is an area of large commercial farms, development of a limited area for small-scale farmers is also planned. The project benefits from loan funding by the African Development Bank. A feasibility study was undertaken, with positive results. This project reduces the variability of agriculture in the Pandamatenga area and improves access. The project will and should be brought to completion.

47. **Second, Botswana has secured a quota of Zambezi River water of 495 million m³ per year, with which it is envisaged to combine an irrigated agricultural area with processing industries.** Current plans are based on pumping 345 million m³ to be used to irrigate 35,000 hectares about 120 kilometers south of the catchment, west to the Pandamatenga area. The remainder is to be used for supplying drinking water especially to the southern parts of the country. A first feasibility

study was rejected, a new comprehensive one for the irrigation component is under way and will be completed by November 2014. The Ministry of Minerals, Energy and Water Resources will develop the main pumping and water transport to the site, along with the pipes to Selebi Phikwe to feed 150 million m³ into the existing north-south water carrier that can also supply Gaborone with drinking water. The development of the agricultural area is under the Ministry of Agriculture, as a project called the "Zambezi Integrated Agro-Agricultural Irrigation Project".

48. **If 35,000 hectares of irrigated land can actually be developed and operated profitably, the project would have an almost revolutionary impact on crop and vegetable production.** However, several aspects require particular attention:

- Population density in the planned area is low. It will require attracting workers, and wages above the current agricultural wages will be required for that.
- The cost of pumping water up from Kazungula to the project area is bound to be very substantial. Water has to be lifted by approximately 180 meters. A rough calculation on the basis of an electricity rate of 10 US-cents per kWh comes to 5,500 Pula per hectare just for pumping the water up to the area, which is almost the sales revenue farmers can realize from two tons of sorghum. The use of the area to produce commodity grains may not be economically viable.
- For horticultural products, which give a higher income per hectare, the distance to markets is important. However, the site is quite far from Gaborone, the major market. And much less than 35,000 hectares would be required to satisfy local demand for horticulture products that can be cultivated in Botswana.

49. **The Government should not be tempted to go ahead with this project if the economic viability without subsidies is questionable.** Farmers need to assume the full cost of pumping through water charges. The project will not provide income to existing farmers, and the investment cost per direct job created is likely to be high. Therefore, social objectives would not justify subsidization.

50. **In order to facilitate offtake of cattle for slaughter and increase the rate, a major road and infrastructure project in the main grazing areas was proposed in 2008.** It was not implemented at that time because of the high cost, then estimated at P5.5 billion. The economics may have changed in the meantime, and it may be possible to design a more restricted version of the concept. It may be useful to reconsider it in order to improve the profitability of traditional livestock production. However, it should be verified that improved transport facilities can be expected to reduce death rates, increase offtake rates and transform the traditional cattle sector to a more market-oriented activity. Other, maybe more important constraints could also be at play, some structural which cannot be removed through public expenditure.

51. **Finally, MOA is implementing and investigating further the use of effluent waters in the vicinity of towns and cities with piped waste water systems so that water can be purified and used for irrigation purposes.** In fact, this is, apart from the Zambezi project, presumably the last unexploited source of water for irrigation that exists in Botswana. The direction of the endeavor makes sense if hygienic problems can be kept under control and aspects of resistance of consumers against food produced with treated waste water can be overcome.

Gradual improvements

52. **A number of smaller improvements in the type and delivery of public goods and services was identified**; some of the following points have already been raised and solutions suggested prior to this Report.

- The **links between research, extension and farmers** would benefit from systematic and institutionalized strengthening. A National Research and Development Council has been proposed elsewhere; this study would reiterate the point. The need arises from the observation that key innovations developed by researchers are apparently not accepted by farmers because they do not fit into their social and economic and high-risk environment. This hints at the need to strengthen the feedback from farmers to research, to involve farmers and farmer associations in the definition of research priorities and to step up on-farm trials with a particular focus on the economic benefits under the conditions of traditional farmers.
- Farmers complain that **extension agents** are not seen as often as desirable because they **lack means of transport** and also because they are few. Investing in staff mobility at the local level should be considered. Extension staff on the other hand complain of undertaking non-core/administrative responsibilities which takes time away from their core functions.
- **Existing irrigation schemes are reported to be under-utilized, but evidence is only derived from particular field visit reports and therefore not systematic.** It is suggested to study this phenomenon and analyze whether higher land user fees could prevent that irrigable land is not used.
- For successful horticulture, a **focus on the requirements of markets** in terms of quality and timing is essential. Extension staff for horticulture could usefully expand their role to also being facilitators of value chain development and cooperation between farmers in the same area. The focus on value chains is required for all extension work, but especially critical with regard to horticulture.

Support Programs and Subsidies

53. **The ISPAAD program, which consumes about P200 million per year, was evaluated in 2012 with devastating results.** In a nutshell, the impact on production and income was not visible and essentially non-existing. The cost of the subsidy was and is far higher than the market value of all crops produced by traditional farmers. The study identified several flaws in the implementation and the scheme might work better if they were solved. A rough calculation in the context of this Report shows that the cost was even in excess of the production value of all maize and sorghum produced by the traditional sector.

54. **Apart from the operational flaws, the scheme suffers from the problem of multiple and not clearly defined objectives.** Judging by the benefits provided to farmers, the revealed objectives are:

a. Increase the subsistence level of poor traditional farmers;

b. Reduce the financial loss of small farmers in case of crop failure;

c. Transform agriculture by creating larger and presumably more efficient units through clustering and cooperation among farmers;

d. Increase productivity by providing modern inputs at subsidized prices in order to reduce the risk of change and overcome financing constraints; and

e. Reduce production costs of small and big crop farmers so that they can “stay in business” in spite of adverse market conditions.

55. **This Report** recommends to review the ISPAAD approach**.** In particular, the rationale for objective (d) should be clarified and the acceptable cost should be calculated. The review should also investigate why the incentives (like all inputs for free for small farmers) do not seem to have an impact. A possible reason is that technical recommendations, supported by subsidies, are not adequate for the social and economic environment of traditional farming in Botswana. Better monitoring of results is required. The support schemes should provide only temporary support for measures aiming at pushing technology adoption.

56. **This Report concludes with 12 recommendations / suggestions in the last chapter.** Four highlights stand out because of the potential impact:

1. With regard to the **Maputo Declaration**, increasing public spending on agriculture to reach 10 percent of the overall budget on a regular basis is not a reasonable target in Botswana's context. Funds should be made available for viable and promising actions; public goods to complement private expenditure for maintaining existing agricultural activities should continue to be provided. However, the target should not lead to a situation where economic viability criteria are pushed aside just because the required funds are still within the 10-percent window.

2. The planned **Zambezi irrigation and agro-industrial project** should be considered carefully. The costs of elevating water from Kazungula to the project area by some 180 meters is a major cost item, which should be assumed by the water users and preferably not subsidized.

3. **Two elements of the current policy should continue.** These are, first, the objective of food security rather than food self-sufficiency and restraint in responding to calls for import restrictions and price support for agricultural produce. Second, the practice of allocating additional funds to the Ministry of Agriculture in case of emergencies should continue, since it permits efficient project implementation independent of the need for funds to address drought or disease outbreaks.

4. **The research-extension-technology chain should be looked into critically and improved**. The currently weak areas are mobility of extension staff, involvement of farmers and extension agents in the definition of the research agenda, and probably not fully adequate consideration of risk, social and economic constraints in traditional farming with regard to new technologies and practices. An independent review of the chain is recommended.

1. INTRODUCTION

57. **This Botswana Agriculture Public Expenditure Review (AgPER) is one of a series of similar studies undertaken in over a dozen countries in sub-Saharan Africa** under the framework of a program supported by the Bill & Melinda Gates Foundation and the CAADP Multi-Donor Trust Fund. The program is implemented by the World Bank.

58. **The AgPER involves three steps.** First, it presents detailed data on public expenditure on the agricultural sector covering the period from 2000 onwards. It takes expenditure from all sources into account and includes also expenditure made by institutions other than the Ministry of Agriculture where it is relevant and done to promote the sector. The sector definition covers crops, livestock, fisheries and forestry in principle, but fisheries and forestry are negligible in Botswana. Loans to agricultural holdings are not considered as public expenditure. The data collection involves actual rather than budgeted expenditure, but it also looks at possible variations between budgets and actual spending.

59. **The data are structured and presented by various dimensions**, including institutional classification which extends to the department level, by economic classification (type of goods and services procured, with special emphasis on the broader categories of salaries, current goods and services, and capital items), by the budget categories recurrent and development expenditure, by subsector (livestock, crops etc.) and by sub-function or service (like extension, research, overheads).

60. **The second step involves an analysis of the match (or mismatch) between policy priorities and spending patterns.** It also includes a broad assessment of the effectiveness of spending.

61. **Finally, the AgPER makes suggestions and recommendations** with regard to measures that could increase the effectiveness of spending, relating to structure and level of expenditure as well as to procedures for budgeting and expenditure management.

62. **The AgPER is not a new analytical instrument, but the Maputo Declaration of 2003 prompts renewed interest in spending issues with regard to agriculture.** In 2003, African Heads of State, assembled under the umbrella of the African Union and the NEPAD initiative, resolved that members would increase public expenditure on agriculture to at least ten percent of total public spending in order to facilitate accelerated growth of the sector by six percent annually. The growth target is motivated by considerations of food security and poverty reduction. The Comprehensive African Agriculture Development Programme (CAADP) was adopted at the same meeting and represents a framework for absorbing and effectively utilizing the expected increase of resources.

63. **The AgPER for Botswana stands out from the AgPER studies for other countries because Botswana is a somewhat special case.** The potential for growth of agricultural production is very limited for natural reasons – low and irregular rainfall, the general absence of rivers that could be tapped for irrigated agriculture and low availability of water for livestock are constraints that can hardly be removed. The agricultural sector is comparatively small and has been stagnant for the last 20 years in both the livestock and crops subsectors, with strong fluctuations across years. It only contributes less than 3 percent to GDP. Public expenditure on agriculture is also low as percentage of overall budget resources, and well below the 10 percent benchmark stipulated in the Maputo Declaration.

64. **Yet, public expenditure on agriculture amounts to about 50 percent of agriculture's contribution to GDP, the highest ratio found in sub-Saharan Africa.** Although input subsidies are

being paid to farmers, the amounts involved are not overwhelming and do not explain the high ratio. Agricultural products are not subsidized for the benefit of consumers.

65. **This raises a number of questions,** such as the following:

- What explains the very limited development of the sector in spite of substantial public spending in relation to its size?
- Is the Ministry of Agriculture providing the public goods and services required to sustain agricultural activities at the current level and permit growth where it is possible in view of the climatic conditions of the country?
- Have support schemes had a positive impact on growth of production, modernization of agriculture and possibly income derived from agricultural activities in a sustainable way?
- Would growth in the sector accelerate if public spending increased? Where can additional public resources allocated prompt modernization and transformation?

66. This study looks into these issues and provides elements to develop answers and inputs into the policy formulation and debate. Up-coming occasions for taking this Report's findings into account are the preparation of the 11th National Development Plan and the preparation of a CAADP compact and investment plan.

Structure of the Report

67. The report is structured as follows: The next chapter (Chapter 2) sets the scene by first looking at the macroeconomic position of Botswana in terms of drivers of growth and overall budget parameters. Descriptions of the structure of the agricultural sector and of the institutions responsible for regulating and promoting the sector follow.

68. Chapter 3 is about public expenditure for agriculture. Expenditures are presented by institutional classification, budget categories, type of expenditure and function and subsector. It also looks at the relevance of budgets and its alterations during a fiscal year. An attempt is made to classify expenditure by whether they finance public goods or provide subsidies and private goods which could, in principle, be procured through markets.

69. Chapter 4 looks at prospects for growth and the role of public expenditure to make it possible and promote growth and transformation. The chapter looks at frequently mentioned objectives and attempts to assess to what extent targets, which have often been missed, make sense in the context of physical and cultural / sociological constraints. This is followed by a discussion of spending perspectives and priorities in Chapter 5. It takes up plans and ideas for priority spending and examines the implications and potential benefits.

70. The final Chapter 6 summarizes conclusions and recommendations that appear in the previous chapters.

71. A review of statistics about production and productivity trends is attached as Annex 1. The benefits and conditions of the major current support schemes are summarized in Annex 2.

2. COUNTRY AND SECTOR CONTEXT

2.1 Economic Situation and Public Finance

2.1.1 Economic Growth and its Drivers

72. **Botswana is one of the richest nations in sub-Saharan Africa.** With a per-capita income of $7,238 in current dollars, it ranks only slightly below South Africa. Measured in current PPP-dollars, GDP per capita in Botswana is $16,105 compared to $11,255 for South Africa.[2] Poverty levels have fallen in the last decade. According to the most recent household survey (2009/10), 19.3% of the population live below the national poverty line; this is down from 30.6% as of the previous household survey of 2002/03. The currency, the Botswana Pula, is convertible, international currency reserves are comfortable. Ever since independence in September 1966, elections were held regularly and assessed as free and fair. According to the Corruption Perception Survey by Transparency International, where Botswana occupies rank 30 out of 175, it is the least corrupt country in Africa.[3]

73. **Annual real GDP growth has been 4.1 percent over the period 2000-2012.[4] Diamonds and other mining resources are the main contributor to what appears to be an African success story.** At independence, agriculture was the key activity, providing most jobs and income. In the semi-arid environment, agricultural activities concentrated (and still do) on cattle rearing combined with fragile subsistence agriculture. Exports were dominated by beef and live cattle. The discovery and subsequent exploration of diamonds (the first diamond mine began operating in mid-1971)[5] changed the economic fundamentals. Mining activity and earnings have increased at a high rate since.

74. The growth in income from mining has prompted considerable expansion of other sectors; noteworthy in particular are the growth rates of general government services and the services sector (hotels and restaurants, transport, financial services), as shown in Figure 1.

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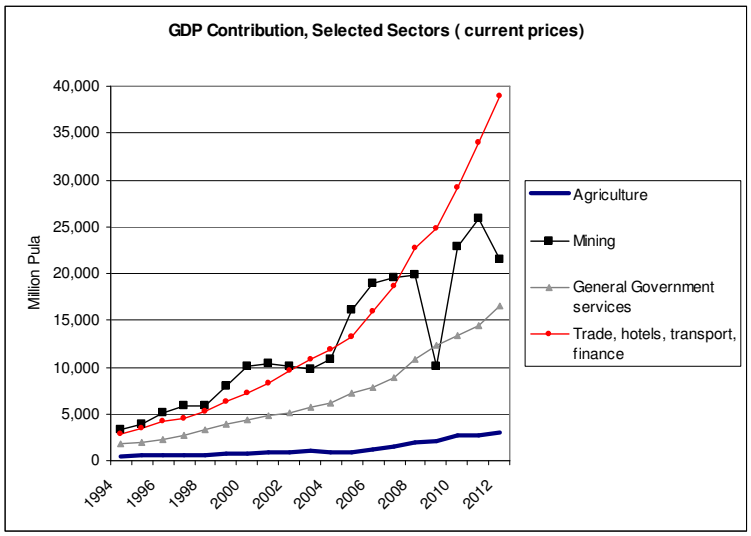
2 Data from Google Data, which are based on data from the World Bank. Access via search for "botswana GDP".

3 See http://cpi.transparency.org/cpi2013/results/.

4 Based on GDP series in real values of Statistics Botswana.

5 See http://en.wikipedia.org/wiki/Orapa_diamond_mine, accessed 27 January 2014.

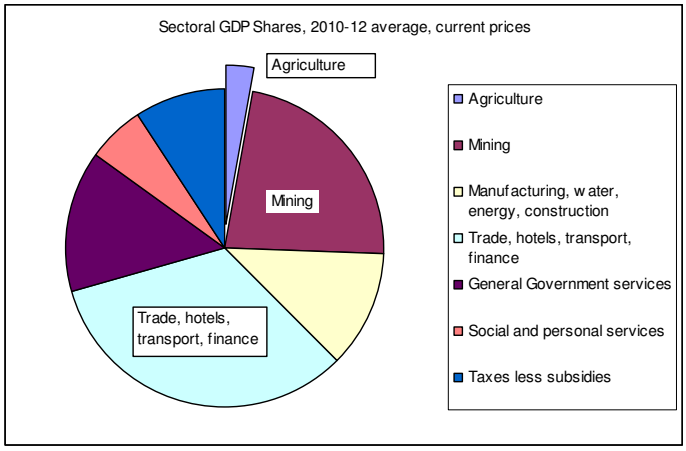
Figure 1: GDP Contributions, Selected Sectors – Current Prices



Source of data: Statistics Botswana.

75. **The agricultural sector, the main economic activity of Botswana at independence, has been losing importance.** It now presents only 2.7 percent of GDP (average 2010-12, current prices), compared to 22.9 percent for the mining sector. This loss of significance is primarily a reflection of rapid growth of the mining sector and the spill-over effects to the trade, finance and government sectors.

Figure 2: Sector Shares in GDP, Average 2010-12



Source of data: Statistics Botswana.

76. **While other sectors grew fast, agriculture's contribution to GDP was stagnant until about 2005 and is growing quite modestly since.** While the sector did neither grow nor shrink from 1994 to 2005, some growth has taken place since 2006. The average annual value-added of the sector for 2006-12 in constant prices is about 27 percent higher than the average for 1994-2005 (Table 1).[6]

[6] The figures should be interpreted with caution, though, because of the intricacies of constant-price series in general and the pronounced drop from 2010 to 2011, followed by only a slight recovery. The drop in 2011 was due to disease outbreaks and a drought year; but it may be more pronounced in the series than it actual-

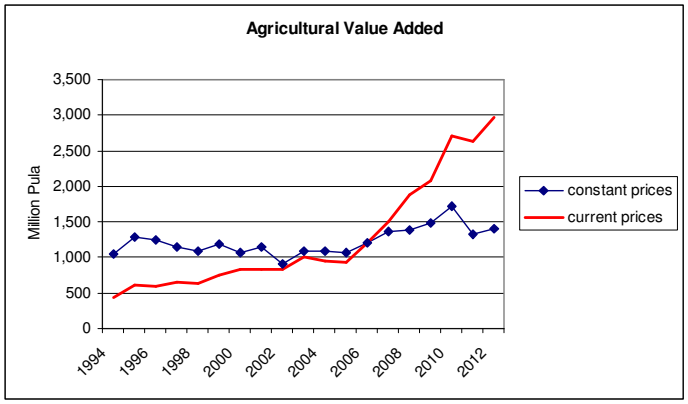
Table 1: Total and Agricultural GDP, Current Prices

Million Pula

Year	Agriculture Value-Added	GDP at Market Prices	% Agriculture	Agriculture	Average
	Current Prices			Constant Prices	
1994	430	11,435	3.8%	1,056	
1995	608	13,114	4.6%	1,283	
1996	595	16,115	3.7%	1,241	
1997	649	18,328	3.5%	1,155	
1998	641	20,244	3.2%	1,097	
1999	758	25,361	3.0%	1,191	1,116
2000	825	29,531	2.8%	1,063	
2001	831	32,066	2.6%	1,142	
2002	835	34,416	2.4%	908	
2003	1,012	37,182	2.7%	1,091	
2004	950	42,037	2.3%	1,096	
2005	928	50,752	1.8%	1,068	
2006	1,211	59,107	2.0%	1,206	
2007	1,505	67,153	2.2%	1,359	
2008	1,887	75,867	2.5%	1,386	
2009	2,071	72,316	2.9%	1,474	1,419
2010	2,717	93,390	2.9%	1,720	
2011	2,636	104,573	2.5%	1,326	
2012	2,963	110,511	2.7%	1,461	

Source of Data: Statistics Botswana

Figure 3: Agricultural Value Added, Current and Constant Prices



Source of data: Statistics Botswana.

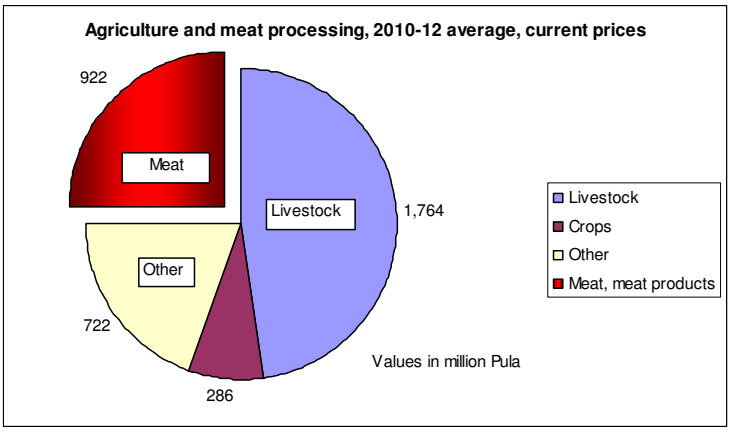
77. The bulk of agricultural value added is derived from livestock. Depending on the year, crops represent between 1.2 percent (1998) and 11.5 percent (2011) of nominal value added of the agriculture sector.

78. The average for the period 2010-12 was 64 percent for livestock, 10 percent for crops and 26 percent for "others" (mainly horticulture).

ly was. The figures in series in nominal Pula show a different trend, the difference between the two series is not entirely plausible.

79. The presentation in the following chart (Figure 4) includes the meat processing industry as well. This is the only subsector of food industries shown separately in statistics; it is presented in order to show the importance of downstream activities that depend on the livestock sector.[7]

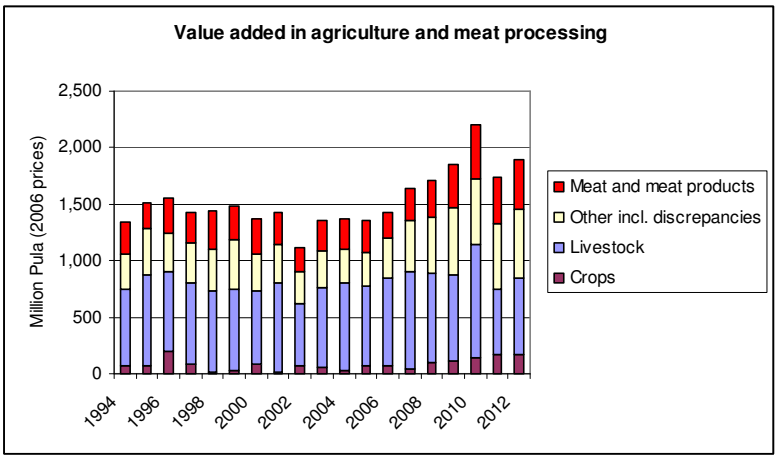
Figure 4: Composition of Agricultural Value Added, Average 2010-12



Source: Authors based on data provided by Statistics Botswana.

80. Looking at a longer time span, it becomes apparent that subsector weights have not substantially changed (Figure 5).

Figure 5: Agricultural Value Added: Trends in Constant Prices



Source of data: Statistics Botswana.

81. **Together with other minor minerals (copper and nickel), mining products now account for 78 percent of exports.** Livestock products and tourism are the only additional export products / services of significance. Coal was discovered recently in large quantities and is likely to become another major contributor to foreign exchange earnings in a few years provided sufficient water is

[7] There are other agro-processing industries in Botswana such as grain, dairy, leather and vegetable oil value-addition industries that also have a role to play in the economy, However, they are smaller and not shown explicitly in GDP statistics.

found to clean the mineral.[8] Most food and industrial products are imported, mainly from South Africa. Botswana is a member of the South African Customs Union SACU, which facilitates trade with South Africa. Exports of beef by value is shown below (Table 2).

Table 2: Beef Exports

	US$ mn	Pula mn	% of total merchandise exports
2003	53.7	260.2	1.7%
2004	60.1	284.0	1.6%
2005	59.9	309.9	1.4%
2006	60.9	363.2	1.4%
2007	96.3	592.3	1.9%
2008	79.0	530.3	1.6%
2009	68.8	480.1	2.0%
2010	127.6	868.8	2.8%
2011	68.3	462.4	1.0%
2012	68.3	522.9	1.1%
2013	117.5	996.0	1.6%

Source: Central Bank of Botswana: Botswana Financial Statistics.

82. **Although agriculture is of minor importance as a contributor to national income and exports, its relevance for employment remains high.** According to a study based on the 2009/10 household survey (HBS), agriculture constitutes the principal activity for 26.5 percent of all who are employed, or 153,000 people.[9] Of these, 39,300 are in paid employment, 91,800 worked in own lands and cattle posts, 19,500 did unpaid work in family activity.[10]

83. Interestingly, at national level (i.e., including cities/towns and urban villages), agriculture provides work for 30.9 percent of the male, but only 21.4 percent of the female with wage or non-wage employment. Respective totals are 96,500 men and 56,600 women in agriculture.

84. When digging deeper, though, data become puzzling. In the previous survey (2002/03), only some 96,000 people were found to be working in agriculture. Why this spectacular growth assuming that the figures provide a correct picture of reality? The agricultural season 2002/03 was a drought stricken, bad season for traditional crop producers, while 2009/10 was reasonable.[11] In 2009/10, ISPAAD, an agricultural support scheme, had started, and 105,000 people benefited from plowing and planting in that year according to the ISPAAD administration at the Ministry of Agriculture. Possibly, occasional employment in agriculture, for instance youth just out of school, stated in

[8] However, the coal found in Botswana is of low quality and therefore mainly usable for electricity generation. This coal can be exported, but railways either to the Namibian cost or to Mozambique still need to be built. The prospects for generating coal-based electricity for export to South Africa are uncertain, given that South Africa itself plans to build new thermal power plants that would close the currently existing generation gap.

Mining requires substantial amounts of water, coal in particular requires washing.

[9] World Bank: Botswana Labor Market Dynamics: 2003-2010. Forthcoming. The estimated total national labor force was 699,000 people, of which 579,000 were employed (the remainder unemployed).

[10] Statistics Botswana (2013): Botswana Core Welfare Indicators Survey 2009/10, Table 17. Gaborone.

[11] See in particular the series about area harvested in the traditional sector (Figure 4) in Annex 1.

2009/10 that they were working in agriculture, while they would have said to be without employment in 2002/03.[12]

2.1.2 Public Finance

85. **The generally prudent use of the wealth has saved Botswana from the "resource curse" so far.** The State receives a significant share of the resource revenue through taxes and royalties and has used it to step up expenditure on social sectors (health and education) in particular, and also on infrastructure.

86. **In view of the availability of public funds, civil service salaries have increased, and so has the number of public employees.** This has led to some loss of budgetary flexibility. Personal Emoluments currently absorb about 40 percent of recurrent expenditure (excluding debt service), and about 30 percent of combined recurrent and development expenditure. In response to the fiscal crisis in the period 2008-10, however, civil service salaries have largely been frozen.

87. **The vulnerability of public finance due to concentration of revenue sources outside the Government's control is evident from Figure 6 below.** Revenues from the SACU customs pool[13] and from minerals represent slightly above 60 percent of State revenue, with roughly equal shares of the two. Both sources are uncertain or subject to fluctuations. Mineral revenues, derived from the mineral tax, royalties and dividends, may fluctuate according to international demand for diamonds in particular. Although the volatility of diamond prices is low, quantities fluctuate.[14] A drop in demand and sales can quickly reduce Botswana's fiscal revenue from this source, as happened in 2008 during the global financial crisis and may happen again when a major economic crisis occurs in the rich world. New producers of diamonds are pushing into the market, which could eventually lead to increased price competition.

88. **Projections suggest that the revenue derived from minerals will not necessarily fall in the near future, but that growth will level off.** Known diamond fields are fully developed. They are not yet nearing depletion, but rationing of mining of fields that come closer to it may soon become a reality.

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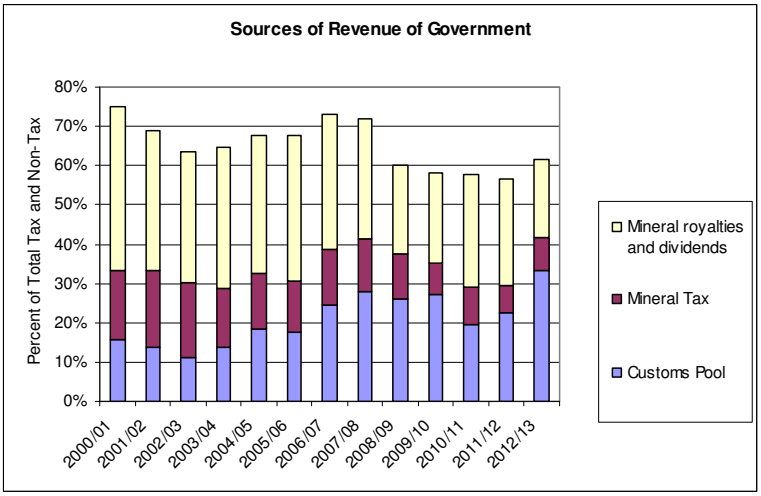
[12] This is a recurring phenomenon. Whenever there is an agricultural subsidy scheme that provides free seed distribution, draft power and fertilizers, the number of people who engage on crop farming generally increases including those who normally do not plow and cultivate. ISPAAD is one such scheme. Previous drought-relief programmes in crop farming also attracted more crop farmers than would normally take place. See BIDPA. (2011): Do Public Transfers Discourage farmer Participation in Subsistence Crop Production? Empirical Evidence from Botswana, Gaborone, Botswana.

[13] Under the Customs Union agreement, revenues from SACU external tariffs are pooled and shared according to a defined formula.

[14] The dominating producers usually store surplus diamonds in case of a drop of demand, rather than entering into price competition.

Figure 6: Weight of Selected Sources of Revenue of Government



Source: Authors on the basis of data from the Ministry of Finance and Development Planning.

89. **Revenue from the SACU customs pool fell significantly in fiscal 2009/10 but have recovered since.** The decline was due to the global economic crisis in 2008 in the aftermath of the Lehman Brothers bankruptcy, which had led to a slowdown of growth and imports in the SACU area. The existing arrangement and revenue sharing formula imply that a reduction of customs collection of the SACU group affect transfers to member states with a two-year delay. While such drop is predictable, other changes are looming. SACU is reviewing the revenue sharing formula, and this might lead to a general reduction of Botswana's share. The current formula, last revised in 2002, gives a disproportionally high share to the smaller countries of the Union (Swaziland, Lesotho, Namibia and Botswana). The outcome of discussions is open, but it may well lead to a permanent reduction of revenue flows from this source to Botswana.[15]

90. **Other internal revenues from taxes and non-tax sources have grown in the past years, both in absolute terms and as a share of total revenue.** The potential to increase revenues through more efficient tax collection exists, and the Government of Botswana is making efforts to close the collection gaps on income and value-added tax.

91. **In view of the prospect of slower growth of revenues, the Government of Botswana is examining ways to streamline public expenditure.** In the period of fast revenue growth, the value for money of expenditure items was often not a main criteria for fund allocation. This is changing. Under review are the efficiency of the many existing parastatals, the efficiency of the public service, salary levels, the effectiveness of sector policies in general and subsidy schemes in particular. Expenditure on agricultural services is no exception, and possibly a prime candidate for review because a substantial part is spent on support schemes of which the effectiveness has not been proven.

[15] Although it is called a revenue sharing formula, the underlying issues go deeper. A small and relatively less developed country which joins a custom union is likely to lose because of diversion of trade from low-cost suppliers outside the union to higher-cost suppliers inside because of the effect of discriminatory customs treatment. The potential for gaining from trade creation and intensification of competition is low because the small national market is insufficient to represent a locational advantage. There, the so-called revenue sharing arrangements is designed to also compensate for high-cost purchases from other members of the customs union, even though customs revenues are not generated at the common external borders.

2.1.3 Public Expenditure on Agriculture: Overview

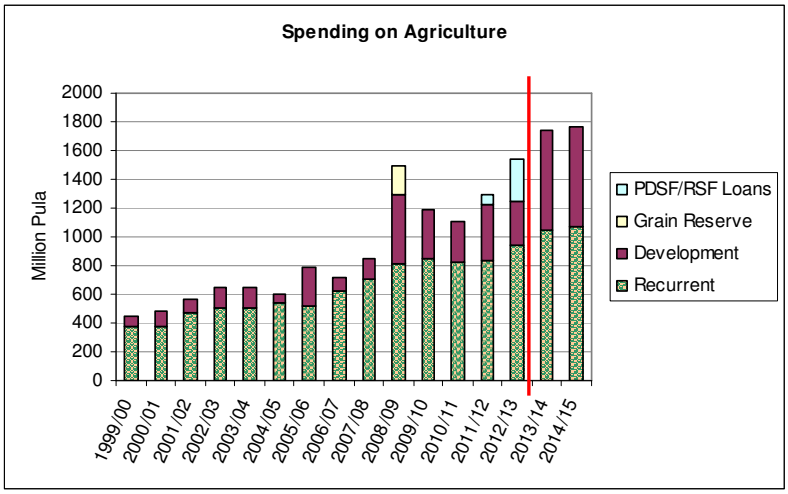
92. **Expenditure on agriculture is shown in national budget documents in a supporting table which classifies expenditure by COFOG functions.** The "Classification of Functions of Government" (COFOG) is an international standard designed to group expenditure in a way that does not depend on different organizational structures in different countries and changes within a country over time. The COFOC function of agriculture appears under "Economic Services" and covers crops, livestock, forestry and fisheries.

93. **The budget and expenditure reports for Botswana are essentially structured by spending unit.** The breakdown by function is achieved through a reference table, which goes down to individual lines of the very detailed budget. There are no major omissions in the allocation of spending units to function in the case of agriculture. The Botswana College of Agriculture, which is included in the budget of the Ministry of Agriculture, is correctly added to education and not included in agricultural spending. Spending on irrigation is included. Not included in the definition of the sector that underlies the table in the budget documentation are rural roads and the provision of residential buildings to agricultural field staff.

94. **Actual nominal spending on agriculture stood at P1.5 billion FY 2012/13 ($202 million), of which P940 million are recurrent expenditure.** Development expenditure amounted to P300 million. In addition, P297 million were provided as a loan at favorable conditions to BMC.

95. Recurrent expenditure includes vaccines and maintenance of the fences in grazing areas. When animal feed is made available to livestock holders in case of drought through the Livestock Advisory Centres (LACs); the cost appears in the recurrent budget.[16] All support schemes as well as emergency measures for disease control (compensation for animals culled) appear as development expenditure.[17] Substantial increases are planned for fiscal years 2013/14 and 2014/15, particularly in the category of development spending.

Figure 7: Spending on Agriculture (COFOG Definition) by Capital / Recurrent



Source of data: Table VI of budget documentation.

[16] There is a budget line for "Materials for Re-sale" under the Department of Veterinary Services which operates the LACs.

[17] More details and breakdowns and analysis of trends appear in the following Chapter 3.

Notes:

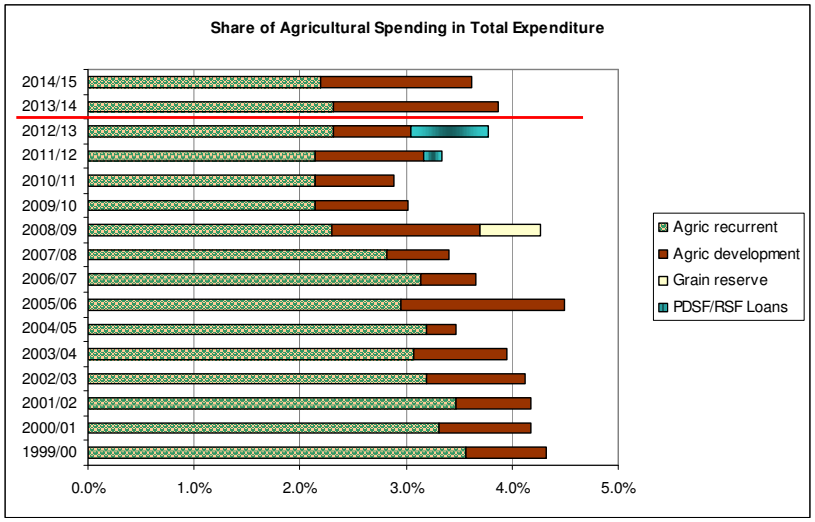
Figures up to FY 2012/13 refer to actual expenditure, 2013/14 to revised estimates and 2014/15 to the budget proposal submitted to the parliament in February 2014.

The red line signifies where the series switches from actual to planned expenditure.

See Chapter 3 for the reasons to highlight the spending on the strategic grain reserve in FY 2008/09.

96. **The share of agricultural spending (according to the functional classification) in total government spending has fluctuated over the period 2000/01 through 2012/13, but was consistently in the range between 3 and 4.5 percent.** Excluding the loans ("PDSF/RSF funds"), Agriculture absorbed just about 3 percent of total public expenditure over the last four closed years (Figure 8). Public spending was and is significantly below the ten-percent commitment of the Maputo Declaration.

Figure 8: Share of Agricultural Spending in Total Expenditure

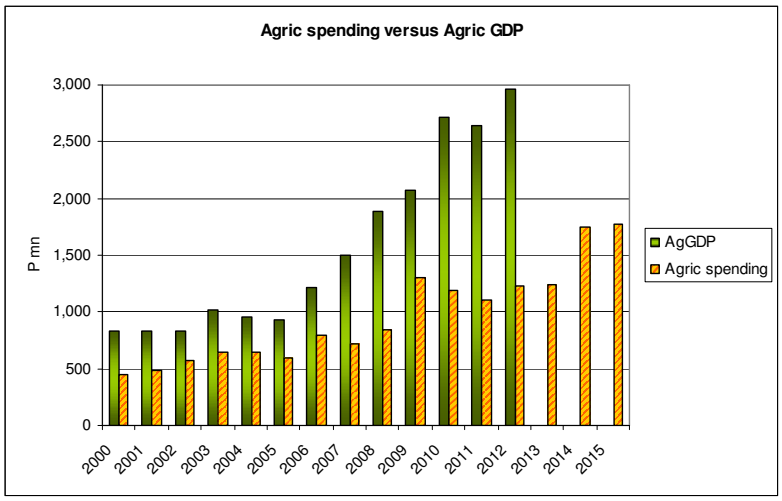


Notes and source: see notes below Figure 9.

97. **While the share of agricultural in total spending is low, spending is high in relation to the sector's contribution to GDP.** The State spends about P50 on agriculture for every P100 of value-added produced in the sector.[18]

[18] Note that this ratio is based on average data. It does not automatically imply that an additional P50 spent by the State would result in an additional P100 of income derived from agriculture. Furthermore, it does not mean that autonomous growth in agriculture by P100 would require an additional P50 as public expenditure. Marginal rates and elasticities have to be used for this type of argumentation.

Figure 9: Comparison of Public Spending on Agriculture and Agricultural GDP



Source of data: Botswana Statistics (GDP) and budget documentation (expenditure by function)

Notes:

P201 million, used for the establishment of a national grain reserve, were subtracted from the 2008/09 expenditure as reported by MOFDP.

Years mean (example: 2010): GDP 2010, which reflects the agricultural season 2009/10, and spending in Fiscal Year 2009/10 (which presumably had more impact on the agricultural production than the 2010/11 budget).

Expenditure for the budgets 2012/13 (actual), 2013/14 (budget) and 2014/15 (proposal) is shown for illustration. Detailed GDP data for these years are not yet available.

AgGDP data refer to nominal value-added of the agricultural sector.

98. The reasons for the high ratio of agricultural public spending to agriculture's contribution to GDP will be analyzed in more detail in Chapter 3. **But the big picture is clear already: Government spends significant amounts on a small sector.** Other countries' agricultural spending typically amounts to between 3.5 and 9 percent of agriculture's contribution to GDP.[19]

99. **Is public expenditure on agriculture in Botswana ineffective and possibly wasteful?** Would anyone support a call for higher spending before current allocations are shown to have a positive effect on production and income that is commensurate to the amount of public spending? Would higher spending increase production and income? These questions will be looked into in the following chapters.

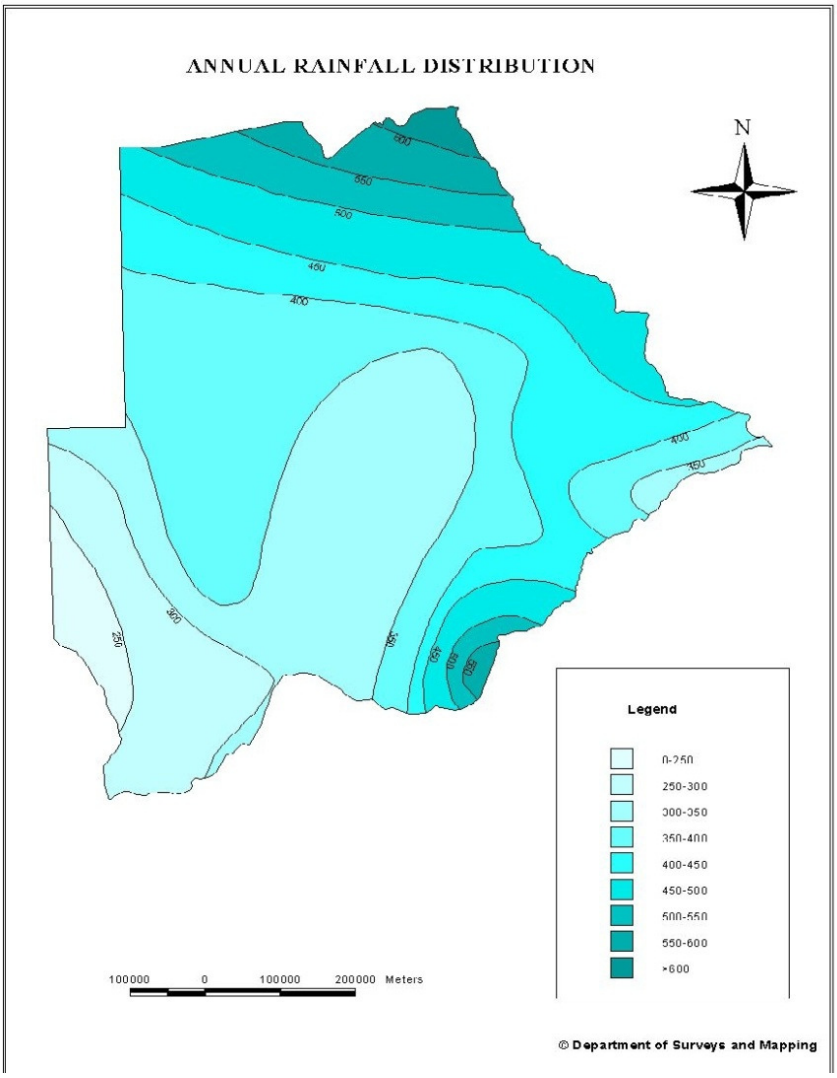
2.2 Key Features of the Agricultural Sector in Botswana

2.2.1 Overview

100. **Less than 5 percent of the territory of semi-arid Botswana is suitable for arable farming.** Rain-fed crop production takes place mainly along the northern border with Namibia (Caprivi Strip) and the eastern border with Zimbabwe and South Africa. The scope for irrigation is limited. Water availability is the main constraint (Map 1).

[19] See Chapter 4 for more detailed comparative data.

Map 1: Rainfall Distribution



Source: MOA 2014

101. **Large parts of the country are suitable for extensive livestock farming, especially cattle.** Sustainable land management mechanisms, however, are required to ensure sustainability, as over-grazing is common in open communal areas.

102. **Periodic droughts affect all agricultural activities, and government interventions are frequent in order to sustain the livelihood of farming households and to facilitate recovery after a drought period.** The prevalence of animal diseases is high; in particularly, foot-and-mouth disease (FMD), which is transmitted by wild buffaloes which carry the virus without being affected, is recurring, disruptive and costly. Vaccinations can curtail this disease, but only meat from non-vaccinated cattle can be exported to Europe.[20] Zoning, cordon fences and regulation of the movement of cattle are measures put in place in order to keep the animal diseases under control.

[20] Vaccinations prevent distinction between infected animals and those that are only vaccinated.

103. **Agriculture in Botswana is therefore associated with substantial risks.** Most available irrigable land is already utilized. The availability of suitable soils and water, both scarce resources in Botswana, largely limit irrigation development. Intensification and reduction of risk are the main areas of potential development.

104. **Botswana is well integrated into the regional economy.** South Africa and Zimbabwe are highly efficient producers of most agricultural commodities. Due to its membership in SACU, no import duties are levied on imports from South Africa. SACU external rates apply to imports from Zambia and Zimbabwe, but with preferential rates for the SADC area.

105. **The guiding principle of agricultural, social and trade policies in Botswana is food security rather than self-sufficiency.** Being a small country in a region with limited agricultural potential but good transport infrastructure, food self-sufficiency is therefore not a reasonable target for Botswana. It has been abandoned as a policy target since 1991.

2.2.2 Commercial and Traditional Farms

106. **For the purpose of statistics and agricultural surveys, distinction is made between commercial and traditional holdings, solely on the basis of the criteria of type of land ownership regime.** Commercial farmers are defined as those who operate on freehold, leasehold or Tribal Grazing Land Policy (TGLP) farms or ranches. These operations are used solely for producing for markets. Traditional sector farmers operate on "communal land mainly for subsistence purposes".[21] Although crop farmers on communal land do indeed grow mainly for subsistence consumption, livestock farmers in communal areas may very well produce for both household and market consumption on a regular basis.

107. **Mixed farming systems are in use in the traditional as well as the commercial sector** – holders engage simultaneously in crop farming (mainly maize and sorghum) and livestock (mainly cattle and goats). Sorghum is used for human consumption as well as for local brewing of beer. Wheat, soya or cassava are not grown in Botswana.

108. **The traditional sector is by far the most important section,** as shown in the series below. The weight of the commercial sector in overall production indicators fluctuates across years.

109. **One can discern a trend of increasing heads of cattle and increasing number of holdings in the commercial sector over the years.** Still, the commercial segment remains small against the traditional sector, with only about 12-15 percent of total number of cattle in Botswana being owned / held by commercial farms.

[21] Statistics Botswana: 2011 Annual Agricultural Survey Report, Appendix III: Basic Concepts and Definitions. Gaborone 2013.

Table 3: Weight of Commercial Farming in Livestock

Commercial heads as % of total heads

	2003	2004	2006	2007	2008	2009	2010	2011	2012
Cattle	7.7%	10.0%	6.9%	7.8%	12.4%	13.5%	15.4%	11.5%	11.7%
Goats	0.3%	2.1%	1.4%	1.5%	2.0%	2.3%	2.7%	1.9%	2.1%
Sheep	8.2%	4.8%	5.2%	4.1%	7.1%	7.1%	10.7%	4.3%	6.0%

Commercial heads

	2003	2004	2006	2007	2008	2009	2010	2011	2012
Cattle	156,099	214,893	143,248	138,736	275,128	326,054	408,983	294,102	262,298
Goats	3,914	31,881	22,759	24,062	38,187	42,284	51,718	33,800	34,173
Sheep	18,016	11,734	11,910	10,264	21,456	20,906	30,085	12,819	17,643

Commercial holdings

	2003	2004	2006	2007	2008	2009	2010	2011	2012
Cattle	415	742	535	527	900	879	1,105	659	809
Goats	247	402	321	346	560	554	1,221	441	521
Sheep	169	239	187	181	327	327	405	251	309

Source: Statistics Botswana, Agricultural Surveys, various years.

110. **Commercial farms produce only about 2.5 percent of the maize harvest, but 72 percent of sorghum (average 2004-2012).** Variations across years are substantial. Average total production during this period was approximately 12,000 tons of maize and 26,000 tons of sorghum. More detailed statistics on crop production by commercial and traditional holdings are shown in Chapter 4.

111. The following Table 4 provides some indicators for the main products for three selected and typical years.[22]

Table 4: Key Agricultural Indicators, Selected Years

INDICATORS	2000			2006			2012		
	Traditional	Commercial	TOTALS	Traditional	Commercial	TOTALS	Traditional	Commercial	TOTALS
CATTLE									
Total Cattle Holdings	57,759	117	57,876	68,622	497	69,119	72,116	809	72,925
Total Cattle	2,020,459	78,110	2,098,569	1,927,766	143,248	2,071,014	1,985,595	262,298	2,247,893
Offtake Rate (%)	10.6	1.6		7.7	10.7	7.9	6.9	11.9	7.4
Birth Rate (%)	51.3	33.2		56.9	46.5	56.2	53.7	48.6	53.1
Death rate (%)	6	2.6		9.8	4.3	9.5	9.9	3.3	9.1
GOATS									
Goat Holdings	69,458	52	69,510	79,020	321	79,341	81,655	521	82,176
Total Goats	1,571,635	4,340	1,575,975	1,607,083	22,759	1,629,842	1,615,442	34,173	1,649,615
Offtake Rate (%)	6.9	7.1		7.5	12.1	7.5	6	8.7	6.1
Birth Rate (%)	45.3	42.1		42.5	42.6	42.5	41.4	39.9	41.4
Death rate (%)	22.4	17.2		22.1	22.3	22.1	21.8	23.5	21.9
MAIZE									
Holdings Planted	60,327	1	60,328	60,062	19	60,081	68,392	33	68,425
Area Planted (ha)	123,298	15	123,313	77,884	148	78,032	140,937	385	141,322
Total Production (Mt)	19,962		19,962	14,896	260	15,156	7,450	227	7,677
Yield Per hectare Planted (KG)	162		162	191	1,757	194	53	590	54
Yield Per hectare Harvested (KG)	257	0	257	247	2,063	251	134	718	137
SORGHUM									
Holdings Planted	48,363		48,363	43,878	21	43,899	34,976	35	35,011
Area Planted (ha)	106,386		106,386	58,484	5,833	64,317	51,795	11,223	63,018
Total Production (Mt)	5,354		5,354	12,369	29,124	41,493	7,461	16,560	24,021
Yield Per hectare Planted (KG)	47		47	211	4,993	645	144	1,476	381
Yield Per hectare Harvested (KG)	118		118	266	5,030	795	308	1,478	678

Source: Authors on the basis of data from Statistics Botswana: Agricultural Survey Reports. Gaborone: various years.

[22] Note that annual fluctuations are high and that these three years alone should not be used to assess trends.

112. **One of the commercial farming areas, Pandamatenga, has a special position.** Most of commercial grain production and virtually almost all Sorghum production takes place here (Table 5). The soils (Black Cotton Soils) in this area require heavy machinery to prepare the land and plant. The fields are occasionally water-logged, harvests then fail or are very low.

Table 5: Area Planted in Commercial Grain Production

Year	Total Area			Maize			Sorghum		
	Total	Pandamatenga		Total	Pandamatenga		Total	Pandamatenga	
	ha	ha	%	ha	ha	%	ha	ha	%
2004	16,574	16,160	97.5%	615	385	62.6%	11,835	11,707	98.9%
2006	8,739	8,552	97.9%	148	95	64.2%	5,833	5,752	98.6%
2008	21,347	20,912	98.0%	176	40	22.7%	9,931	9,869	99.4%
2010	23,465	22,412	95.5%	139	10	7.2%	15,525	15,468	99.6%
2011	26,974	26,608	98.6%	325	38	11.7%	6,489	6,489	100.0%
2012	18,999	17,488	92.0%	386	93	24.1%	11,223	11,120	99.1%

Source of Data: Botswana Statistics: Agricultural Survey Reports, various years.

113. The approximately 50 farmers operating in the Pandamatenga area are mostly of Zimbabwean or South African origin.[23] Land is leased for fifty years renewable, but sub-leases among farmers are apparently common. Thus, the number of holdings and land area available (total of land left fallow and cultivated) fluctuate significantly.

Table 6: Areas planted in Pandamatenga Area

Year	No of land holdings	Total land area (ha)	Area planted (ha)	Area harvested (ha)
2012	47	18,957	17,487	17,493
2011	51	28,738	26,653	26,121
2010	42	18,108	15,736	15,570
2008	18	24,388	21,202	16,272
2006	18	8,741	8,633	8,533

Source of data: Statistics Botswana, Agricultural Surveys, various years, Table 11.1.

114. **Traditional farmers grow mainly maize, sorghum and beans.** Recently, production of sorghum on traditional farms has declined because of the high labor demand for bird scaring. Farmers prefer crops like maize which are not susceptible to bird damage.

115. **Foreign-owned farms, large farming operations owned by big corporations or absentee farm owners are almost irrelevant in Botswana.** Owners typically live on their farm. Most farming is done by Botswana citizens. However, a significant and growing number of cattle found at cattle posts is owned by people living in urban areas who are relatively better-off.[24]

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[23] Information from a MOA staff.

[24] "Slowly but surely the livestock husbandry system changed from a hands-on management system with elements of transhumance to a sedentary, largely absentee-owner, cattle-post system, concentrated around boreholes with exclusive or shared syndicated water rights. The day-to-day management fell to herd boys with little knowledge and limited resources to manage the cattle beyond providing them with water. The absentee owners visit the cattle post or farm a few times each year to take stock of their cattle and to instruct the herd boys." Anton van Engelen et al. (2013): Botswana Agricultural Value Chain Project – Beef Value Chain Study. FAO and Ministry of Agriculture, Botswana. p. 8.

A background note prepared in the context of a World Bank study in about 2009, without author and date, estimates the share of cattle in the traditional sector owned by absentee owners as 50 percent.

116. **Land tenure is secure in both communal and freehold land.** The security of tenure is guaranteed by the country's constitution. To date, there are no major reported cases of conflicts about land rights.

117. **Farmers on communal land only enjoy user rights. In other areas, only improvements can be sold, not the land itself.** Formal land markets for communal land do not exist. Under the Tribal Land Act, users of land can only sell development and not the land itself. There is, however, a need to develop a formal land market in the tribal areas for farmers to engage in sale, purchase or lease based on legal provisions and regulations that protect both parties.

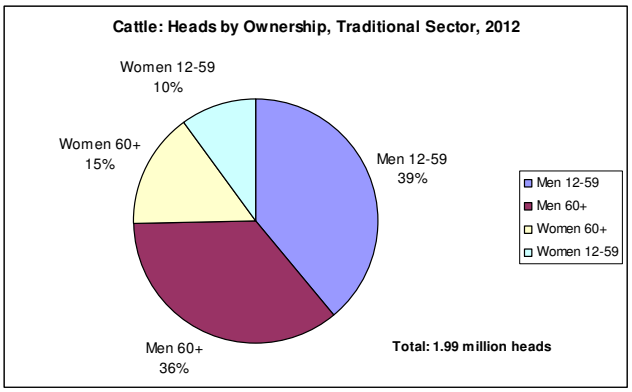
2.2.3 Gender, Age, Subsistence

118. **All production systems – commercial and traditional, crops and livestock – are dominated by men.** However, female owners or holders still account for some 30 percent of cattle producers and similar percentages in other subsectors.[25]

119. **The rural population engaged in agriculture is relatively old.** At least 60 percent of agricultural land holders are aged 50 years and above. Further, wages in farming are lower than in other sectors. According to the Labour Force Survey 2005/06, agricultural wages amounted to only about 25 percent of the monthly average earning of most other sectors or 15 percent of national monthly average earnings (Labour Force Survey 2005/06, CSO, 2008). Thus, farming is not attractive for young people.

120. **Figure 10 illustrates the combined effect for the year 2012: half of traditional cattle is owned by people of 60 years of age and above.** About a quarter is owned by women, of whom 60 percent are 60+ years of age. Most likely, many of them have inherited the animals from deceased husbands. The age distribution is typical for most agricultural activities in the traditional sector, except maybe for horticulture.

Figure 10: Cattle: Heads by Ownership, Traditional Sector, 2012



Source of Data: Statistics Botswana, Agricultural Survey Report.

121. **The age structure has consequences for the dynamics of the sector:** labor is scarce, it is difficult to find someone for the very hard work, and business is usually less dynamic, technologies less innovative when owners and players are over-proportionally old.

[25] See Statistics Botswana: Agricultural Survey Reports. Various years.

122. **Data from selected comprehensive annual agricultural surveys indicate that less than 15 percent of farmers in the traditional sector sell their crops.** An overwhelming majority (over 80 percent) are net buyers of grain, especially maize and sorghum (Agricultural Survey 2004; Agricultural Survey 2006; Agricultural Survey 2009 and 2010; Agricultural Survey 2011). This means for the majority of crop farmers in the traditional sector, production is mainly for local/household consumption and not for selling on the market.

123. Table 7 below shows the percentage of farmers who sell grains/crops and those that purchase food.

Table 7: Percentage of farmers who sell and purchase food/grains

Year	Traditional crop farmers who sold food crops	Traditional farming households who purchased food/grain
2004	5%	79%
2006	13%	96%
2009	1%	79%
2010	1%	81%
2011	13%	86%

Source: Authors' calculations on the basis of agricultural survey results.

2.2.4 Irrigation

124. **Botswana has very limited potential for irrigation largely because of erratic rainfall and rivers carrying water only during short periods of the year.** Dams currently established are mainly for human and industrial use with very limited allocation for irrigation. Approximately 40,000 hectares are suitable for irrigation in the whole country according to recent interviews, including 35,000 hectares that could be irrigated using waters from then Zambezi river. Figures vary according to sources, though. Availability of water is a more binding constraint than the suitability of soils.

125. **About 2000 hectares are currently under irrigation, but data from different sources vary considerably.** A recent World Bank study on water accounting in Botswana made an attempt to put data together, and concluded that 4,012 ha of irrigated land is allocated, of which two thirds are developed. Only 2,209 hectare are cultivated in 2012/13. Data from another source led to an estimate of only 942 hectare of cultivated irrigated land.[26]

126. The Waves study estimates that of 18.9 trillion cubic meters used for crop production, 10.2 trillion are taken from rivers, 7.2 from groundwater and only 1.38 trillion cubic meters from dams.

127. **With plans to utilize water from the Zambezi River in the north of the country, an additional 35,000 hectares of land will be brought under irrigation to produce cereals, vegetables and fruits.** A regional agreement with other riparian states has been reached to allow Botswana

[26] Waves Botswana Programme: Environmental-Economic Accounting for Water in Botswana: Detailed Accounts for 2010-11 and 2011-12 and General Trends 1993-2010. October 2013. See in particular Appendix 4: Detailed findings of irrigation study.

access water from the Zambezi River. Higher use of water from the Okavango River is not an option because of environmental, tourism and wildlife considerations.[27]

128. **The high cost of developing irrigation infrastructure (dams, conveyance canals/pipes, power, etc) and the economic viability of irrigating low-value crops constitute policy challenges in developing this production system.** After adopting a food security objective as opposed to food self-sufficiency, it is in the long-term interest of Botswana that economic and environmental sustainability coupled with competitiveness are always taken into account in agricultural investment.

2.2.5 Trade and Self-Sufficiency

129. **While Botswana is self-sufficient in beef and goat meat, and almost self-sufficient in chicken meat, imports satisfy most of the demand of other agricultural products.** Estimated self-sufficiency rates are shown below (Table 8).[28]

Table 8: Self-Sufficiency Ratios of Key Agricultural Products in Botswana

Commodity	Self-Sufficiency Ratio
Maize	13%
Sorghum	46%
Fruits (Oranges)	33%
Vegetables	33%
Beef	100%
Goat meat	100%
Chicken meat	98%
Fresh milk	5%

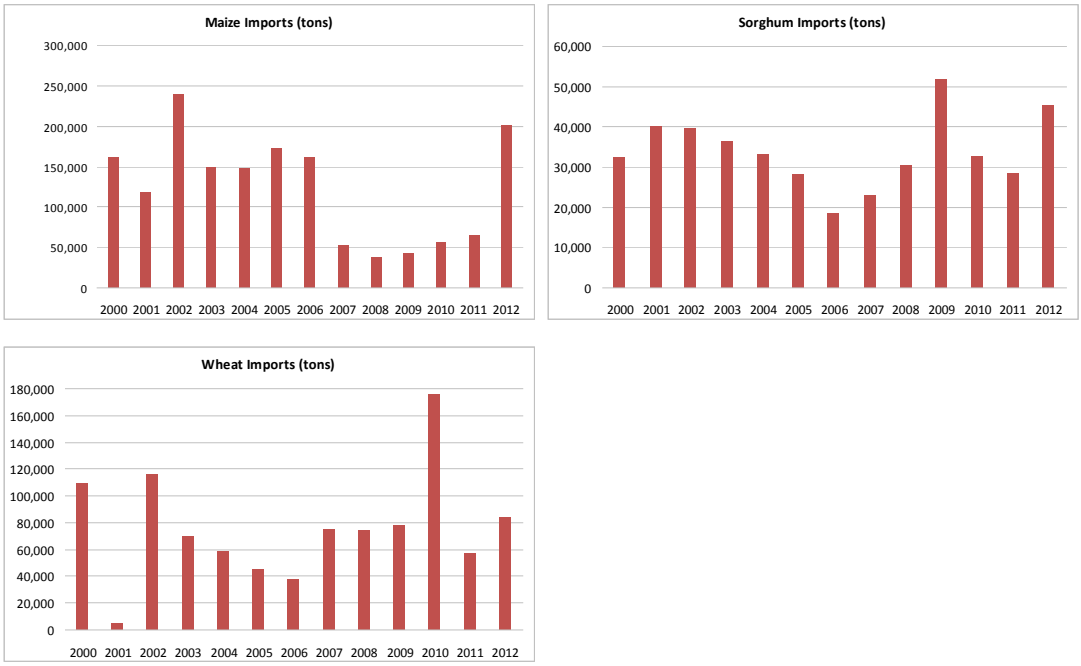
Source: Ministry of Agriculture: Early Warning System. 2014

130. **Statistics on imports of major grains show annual variations so large that they may point to problems with statistics.** Re-exports to Zimbabwe, in particular, may also influence the amounts imported. They are reproduced below because they provide a rough idea about the magnitudes involved.

[27] The Okavango River feeds the Okavango Delta, which is a unique inland ecosystem where waters evaporate. The Delta is famous for its wildlife and has become a UNESCO World Heritage Site in 2014.

[28] Annual rates fluctuate because of local weather conditions, and they are difficult to determine exactly because import statistics show substantial variations across years which cannot readily be explained. Here, only the order of magnitude is relevant.

Figure 11: Imports of Major Grains



Source of data: BURS (Botswana Unified Revenue Service)

Note: The reasons for the low amount of maize imports in the period 2007-2011 in the statistics could not be found. It definitely was not because of growing domestic production of maize and import substitution.

131. **In principle, trade within the area of the South African Customs Union SACU (South Africa and Botswana, Namibia, Swaziland and Lesotho) is free of import duty regardless of the country of origin.** Duties on goods with origin outside the SACU area are levied at the first entry point, which is normally South Africa.

132. Thus, the trade regime does not inhibit imports of foodstuff and agricultural products, but with two notable exceptions:

- Imports of chicken are banned, with some exceptions (seasonal and special cuts).
- The issue of import licenses for horticultural products is handled selectively in order to protect local producers.

133. Additional restrictions on food imports are meant to protect local processing industries rather than agriculture. These are:

- UHT milk is subject to an import duty of 40 percent from within SACU, but there is no duty on raw / fresh milk; the duty on UHT milk therefore benefits only dairies, not dairy farmers (milk producers).
- Wheat mills benefit from a ban on the import of wheat flower. Wheat is not grown in Botswana because of climatic factors.

2.2.6 Markets and Price Policy

134. **Markets of agricultural product are ruled by market forces in principle and open to the private sector. However, two State-owned Enterprises, both accountable to the Ministry of Agriculture, operate in the sector.** The Botswana Meat Commission (BMC) operates slaughter-

houses in Lobatse, Francistown and Maun, and has a monopoly in exports of beef and also live cattle. The export monopoly of BMC is being looked into already since several years.

135. **The second parastatal is the Botswana Agricultural Marketing Board (BAMB).** It is responsible for managing the strategic food reserve and acts as a buyer of last resort for grains and beans. BAMB also sells inputs and implements for agriculture and has a high degree of presence in farming areas.

136. **BMC and BAMB are avoiding to distort prices.** BAMB buys produce from farmers at import parity prices (i.e., what it would cost to deliver equivalent imported prices in Botswana and at the depot in question). BMC pays prices to cattle holders that are derived from export parity prices. They are not designed to tax or gain income from farmers.

137. **The sale, purchase and distribution of seeds, fertilizer, pesticides, equipment and other inputs are undertaken freely by the private sector.** Cooperatives also participate in input trade. Veterinary requisites are also provided by the private sector. However, for strategic diseases like foot and mouth, anthrax, or black quarter, the government provides vaccines for free and the vaccination is compulsory.

138. **BAMB is not necessarily crowding out private investment as most of grain trade is through the latter due to financial strength and efficiency.** Besides public veterinary services, there are private players in the vaccination against disease and sale of drugs/vaccines. However, as most vaccines are generally provided by government at subsidized prices through Livestock Advisory Centres (LACs), the public sector is the dominant player in the industry.

2.2.7 Productivity

139. **Productivity in all segments of farming in Botswana is low by international and regional standards.** As expected, it is consistently lower in traditional farming than on commercial farms. However, the gap is particularly large in Botswana. Furthermore, production is very volatile, related to the cycles of good and dry years and outbreaks of (mainly animal) diseases.

140. Government policy aimed at increasing productivity was and is focused on

- for crops: the provision of subsidized plowing, row planting, and provision of seeds and chemical fertilizer
- for livestock: loans for the purchase or construction of water supply for animals, vaccinations, sustainable range management in communal grazing areas, and disease control through zoning, control and maintenance of cordon fences and regulation of movements of animals.

141. **Low productivity can be interpreted as a challenge and an opportunity to increase production** by way of closing the productivity gap between the reality of agriculture in Botswana and productivity indicators achieved in research environments and neighboring countries. Can it be closed and which government measures would contribute to this? Chapter 4 will provide some elements for an answer, additional statistical information the size of the gap is presented in Annex 1.

2.3 Agricultural Sector Administration

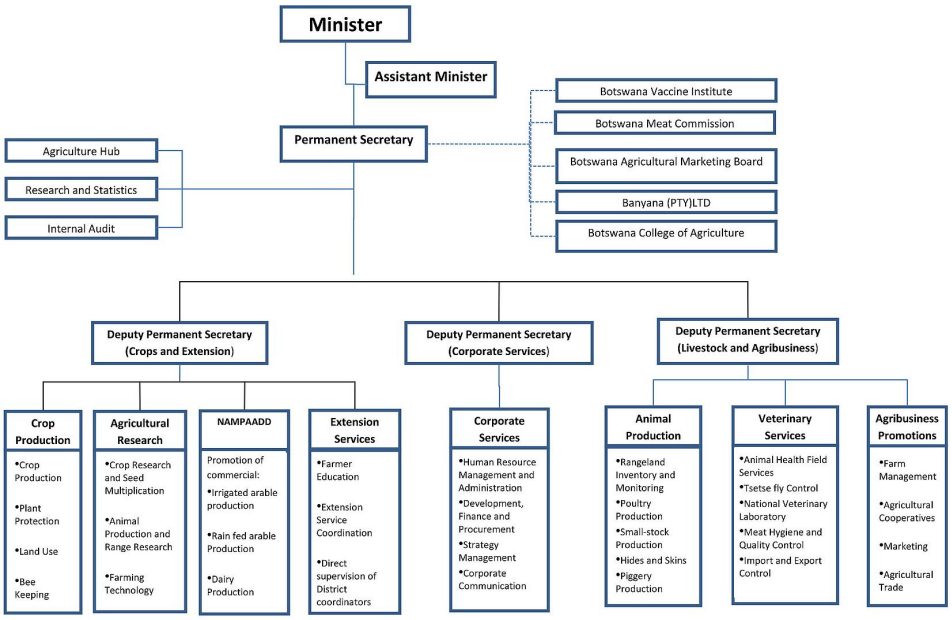
142. The sector is regulated and supported mainly by the Ministry of Agriculture and its local structures. Some parastatals play a significant role in their respective subsectors as well.

2.3.1 Ministry of Agriculture

143. **The Ministry of Agriculture (MOA) has its headquarters in Gaborone and representation in each of the 26 districts of Botswana.** The organizational structure of headquarters during most of the period under review is shown in Figure 12.

144. Of three deputy permanent secretaries, one is responsible for crops, one for livestock, and the third for technical, support and corporate services. Below the deputy permanent secretaries are the technical departments, each headed by a director. Major changes in the past decade include the split of the former Department for Animal Health and Production into two separate departments. The Department for Extension Services Coordination existed for several years, but has recently been dissolved; staff and functions went back to the departments for crop production and to technical services.

Figure 12: Organizational Structure MOA



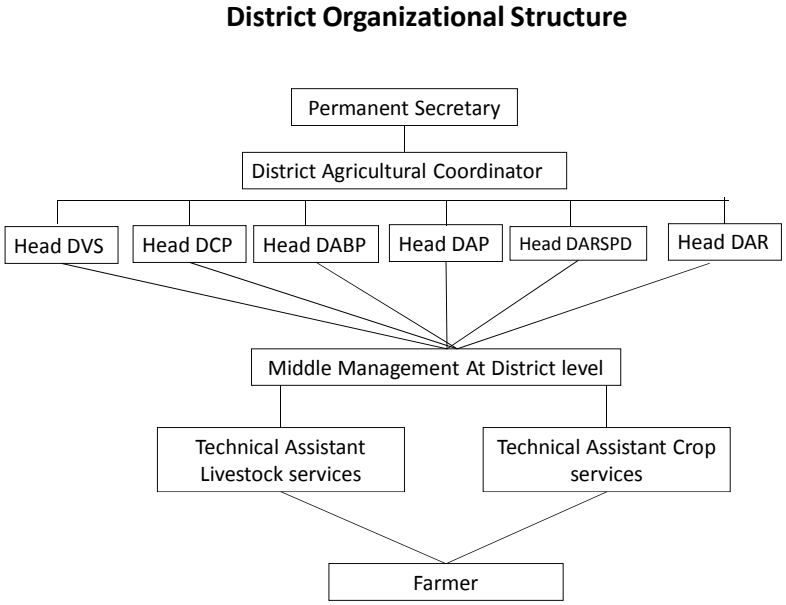
Source: MOA

145. This organogram shows the structure as it was during most of the period under analysis. Recent changes – the promotion of the Division for Research and Statistics to a department and the extinction of the Department for Extension Services – are not yet reflected in the chart.

146. **District offices are located in major villages where local chiefs and local government staff (district commissioners, education, health, council personnel, etc) are also based.** The district office is headed by a District Agricultural Coordinator (DAC) responsible for supervision of technical departments and representing MOA in various committees at the district level, such as the Councils, District Development Committees or Land Boards.

147. District offices basically mirror the ministry's departments at headquarter level.

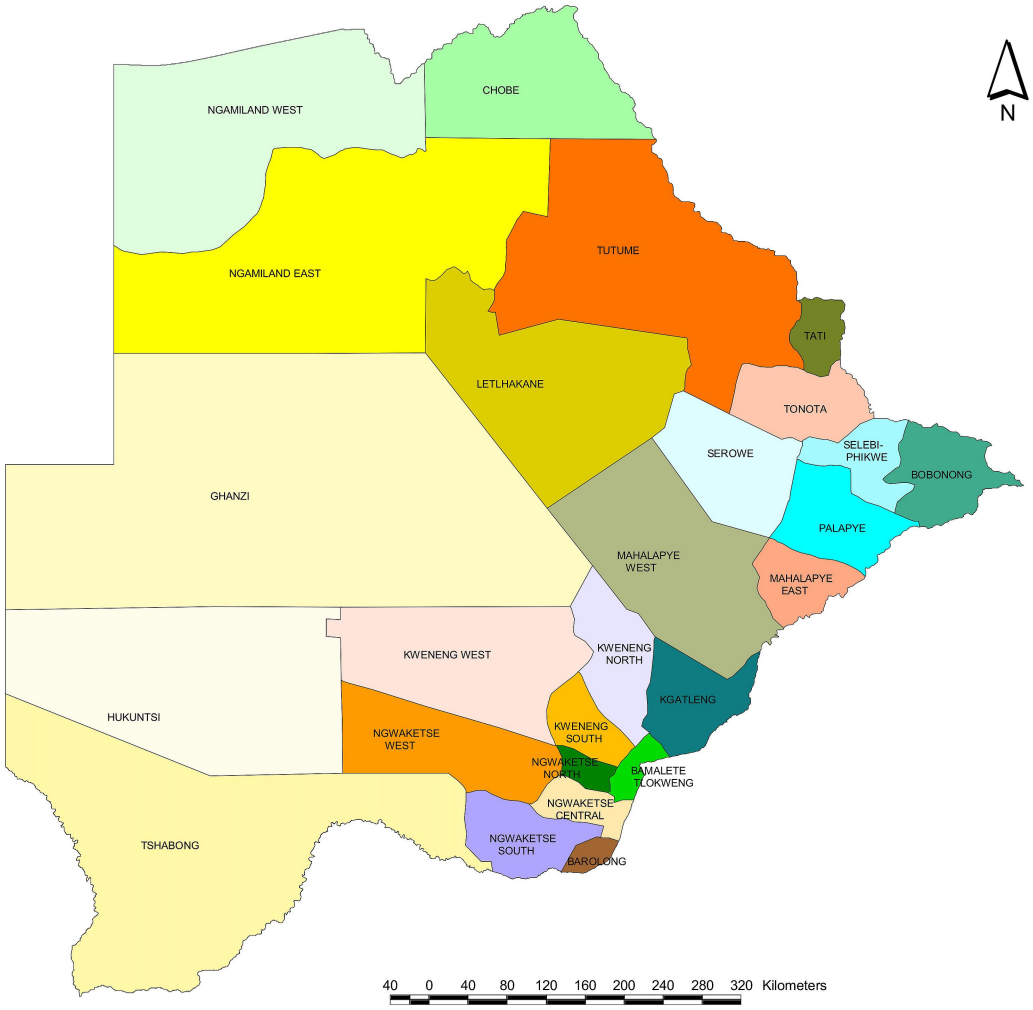
Figure 13: District Organizational Structure of MOA



Key:
DVS= Department of Veterinary Services
DCP= Department of Crop Production
DABP= Department of Agri-business Promotions
DAP= Department of Animal Production
DARSPD= Division of Agricultural Research, Statistics and Policy Development
DAR= Department of Agricultural Research.

148. **The different district departments are not always located/housed in the same office block but rather operate from different places in the same district or major village.** Historically, district offices for various departments were established independently. Through the Ministry of Local Government, integrated office blocks in the district were intended to bring together government departments including those of the Ministry of Agriculture. This has not been possible to accommodate most the departments mainly due to budget constraints.

Map 2: Agricultural Districts



Source: MOA

149. **The Department of Veterinary Services (DVS) operates Livestock Advisory Centres (LACs) in all the districts.** LACs sell vaccines, feed and other livestock requisites to farmers at subsidized prices. When there is drought declared by government, livestock farmers access subsidized animal feed and feed supplements through LACs. The cost appears in the recurrent budget classified as "Purchase of Materials for Resale".

150. **Agricultural Service Centres have also been established in various parts of the country to assist farmers with tractors to cultivate and plant.** The Centres also provide agricultural inputs to farmers. In general, the Centres have not been effective to reach many farmers and budgetary constraints have also made it difficult to purchase adequate tractors to allow all farmers to plant on time.

151. **Districts are subdivided into extension areas or geographic units** through which village/area level technical staff are stationed to meet and interact with farmers and other key stakeholders more frequently. Each village/area level extension staff covers about 300- 400 farmers. The number of extension areas in each district depends on the size and farming population. The bigger the district and farming population and its density, the more extension areas. However, with limited

means of transport available, it may not be easy for the village/area level extension officer to meet farmers more regularly. Due to limited transport resources, farmers have regularly expressed concern over the infrequent visits by field extension staff. Access to mobile phones has partly assisted communication between farmers and extension staff. An area/farm level extension officer has at least a certificate in general agriculture or animal health.

152. **The two extension staff at village level (the crops and the livestock extension worker) do not share offices.** They stay at different places within the same village or extension area in houses provided by government through the Ministry of Housing and have offices in their respective houses. Note that they typically have the same clients, since almost all traditional farms are mixed farms engaged in livestock as well as crop activities.

2.3.2 MOA Establishment

153. **MOA has about 7,226 staff (February 2014), of whom only about 1,200 (17 percent) are professional and technical people** trained in various agricultural disciplines (animal, crop, agricultural engineering, soils, veterinary, land use, irrigation, agricultural economics, extension) (Table 9). Support staff constitutes about 83 percent of the Ministry's total establishment and is dominated by industrial workers. Industrial workers, who account for 67 percent of the total establishment, cover personnel who patrol the cordon fences to control animal diseases (see map 5 above), drivers, messengers, cleaners, etc. The ratio of one professional to support staff is 1:11.

Table 9: MOA Establishment by Job Category and Area

Job Group	District/Area									
	Central	Chobe	Ghantsi	Kgalagadi	Kweneng	N/East	N/West	S/East	Southern	Total
Admin	93	28	19	26	34	41	33	280	76	637
Artisan	176	28	24	22	53	40	40	108	81	572
Industrial	1,530	174	121	209	407	451	515	675	727	4,809
Technical	136	31	12	27	40	46	50	163	70	575
Professional	115	27	17	39	29	40	35	268	62	633
Total	2,050	289	193	323	563	618	673	1,494	1,016	7,226
% Professional and Technical	6%	9%	9%	12%	5%	6%	5%	18%	6%	9%

Source: Data from Ministry of Agriculture, February 2014.

Notes:

Professional = with a university degree; Technical = with certificates and diplomas; Industrial = fence patrols, drivers, messengers, cleaners

MOA Headquarters are included in the South East District.

Numbers include the Department for Agricultural Research.

154. The Central District (28 percent) followed by South East District (21 percent) and the Southern District (14 percent) has the largest staff establishment of the Ministry of Agriculture. The Central District holds the largest number of livestock (cattle and goats) in the country.

155. Staff of MOA Headquarters are included in the figures for the South East District. This district – presumably mainly MOA Headquarters – employs 21 percent of all staff, 42 percent of professionals, and 28 percent of all technical personnel. The proportion of headquarter to field staff seems reasonable.

156. Staffing numbers for the Department for Agricultural Research are available as of the year 2010. The Department had a total staff of 247, of which 38 with a PhD or Master's Degree qualification.

Table 10: Staffing of Research Department

Qualification/ type	Male	Female	Total
PhD	7	1	8
MS	21	9	30
BS	45	12	57
Technician	31	14	45
Admin Staff	13	19	32
Others	45	30	75
Total	162	85	247

Source: Howard K. Sigwele: Exploring Strategic Priorities for Regional Agricultural R&D Investment in Southern Africa – A country study for Botswana. September 2010.

2.3.3 Major Support Programs

157. **MOA is carrying out the typical functions to provide public goods to the agricultural sector.** In particular, it provides vaccinations, builds and maintains cordon fences and regulates livestock movements in order to control diseases, and engages in research through the Department for Agricultural Research. Decentralized staff provide technical advice to farmers. MOA builds and often operates irrigation schemes.

158. Important for agriculture, but not under the Ministry of Agriculture are the construction of roads and of housing for government officers.[29]

159. **In addition to the routine public functions, MOA also maintains special support schemes, which are briefly characterized below.** The support schemes provide private goods[30] to farmers and consist mainly of subsidies or free distribution and provision of inputs.

Integrated Support Programme for Arable Agriculture Development (ISPAAD)

160. **ISPAAD is the largest of the support programs of the Ministry of Agriculture.** It aims at modernizing crop agriculture and providing assistance to subsistence crop farmers in order to reduce poverty. The promoted technologies include the use of hybrid seeds, fertilizer, weeding, row planting, primary and secondary tillage. Subsidies of up to 100 percent are the prime instrument.

161. **ISPAAD covers traditional as well as commercial farmers.** After the revision of ISPAAD rules in 2013, farmers are now categorized into three groups:

- **Subsistence Farmers:** this group cultivates up to 16 hectares of arable land and accounts for the majority of crop farmers in the country. Subsistence farmers are entitled to 100 percent

[29] MOA has financed the construction of some access roads, though, and the infrastructure component of the Pandamatenga project is also under the MOA.

[30] In public finance, one makes a distinction between public and private goods. A short explanation of the concept is as follows: Public goods are generally provided by governments because their use by individual A does not exclude the use by individual B, or it is not possible to exclude those who are not willing to pay for the goods. Therefore, they cannot be provided by profit oriented private enterprises, or it would be a loss to national welfare if those who don't pay are excluded. Private goods are those where consumption by individuals is competing and where it is possible to limit their use to those who pay. Thus, they can be offered and procured through market mechanisms. "Goods" always refers to goods and services.

subsidy to cultivate, row plant and apply fertilizers for 5 hectares. Seed is also supplied freely.

- **Emerging Farmers:** this group plants between 16 hectares and 150 hectares and is entitled to 35 percent of fertilizer, hybrid seed and herbicides covering up to 150 hectares, and
- **Commercial farmers:** these farmers cultivate over 150 hectares and enjoy a 30 percent subsidy on hybrid seed, fertilizers and herbicides covering up to 500 hectares.

162. ISPAAD also assists individual and groups of farmers with grants to access fencing materials as well as potable water.

163. **For farmers to benefit from packages under ISPAAD, they register with their area extension officer or technical assistant for crops (see district organizational structure).** There are guidelines for ISPAAD that cover service providers (fertilizer and seed suppliers, draft power providers, etc.) and farmers. Service providers who do not abide by the guidelines can be sanctioned by district staff or their payment rejected. For instance, those who cultivate and plant farmer's fields are expected to meet standard seedbed preparation, row planting, etc, outlined in the guidelines whilst farmers are also expected to abide by recommended crop husbandry practices such as timely weeding, harvesting, etc.

164. **The District extension staff monitors adherence to ISPAAD guidelines and provides reports on the implementation of the program and achievements towards its objectives – in principle.** In reality, the objectives of the program lack clarity, monitoring is not systematic.

165. **The current ISPAAD has several and potentially conflicting policy objectives.** Previous programs were characterized by low-technology adoption and high dependency on public funding. Low and almost stagnant agricultural productivity has, despite continued public financial support, remained a major policy and economic challenge for Botswana since independence in 1966. ISPAAD is a new attempt to improve productivity and enhance production. But it also provides a cushion to small farmers against the financial consequences of climatic risks, and it is often mentioned as an instrument to reduce poverty in rural areas.

Livestock Management and Infrastructure Development (LIMID) project

166. **LIMID is another big project in the Ministry of Agriculture implemented by the Department of Animal Production (DAP).** The objectives of LIMID are:

- Promoting food security through improved productivity of cattle, small stock and Tswana chickens;
- Improve livestock management;
- Improve range resource utilization and conservation;
- Eradicate poverty; and
- Provision of infrastructure.

167. **Under LIMID, resource-poor farmers receive grants of up to 90 percent** to access small stock (goats and sheep) and indigenous chicken breeds (Tswana chicken) in order to improve income and food security. For small stock and chicken up to 10, the beneficiary enjoys a 100 percent subsidy whilst for 10-20 goats/sheep or chicken, the grant is 90 percent. The beneficiary pays 10 percent of the total cost if a grant of 90 percent is received. There are, like under ISPAAD, guidelines for implementing LIMID. The guidelines include the requirement that beneficiaries attend

livestock management courses, have guaranteed water supply for the animals, and have ownership of some few animals.

168. **Besides assisting resource-poor farmers with animals, LIMID also provides grants for establishing kraals, crushes, and for drilling and equipping boreholes.** The grant coverage depends on whether the applicant/beneficiary is alone or is a member of group/community. Individuals are entitled to a grant of 20 percent whilst group of more than 10 members can receive up to 70 percent of costs as grant on the LIMID infrastructural component.

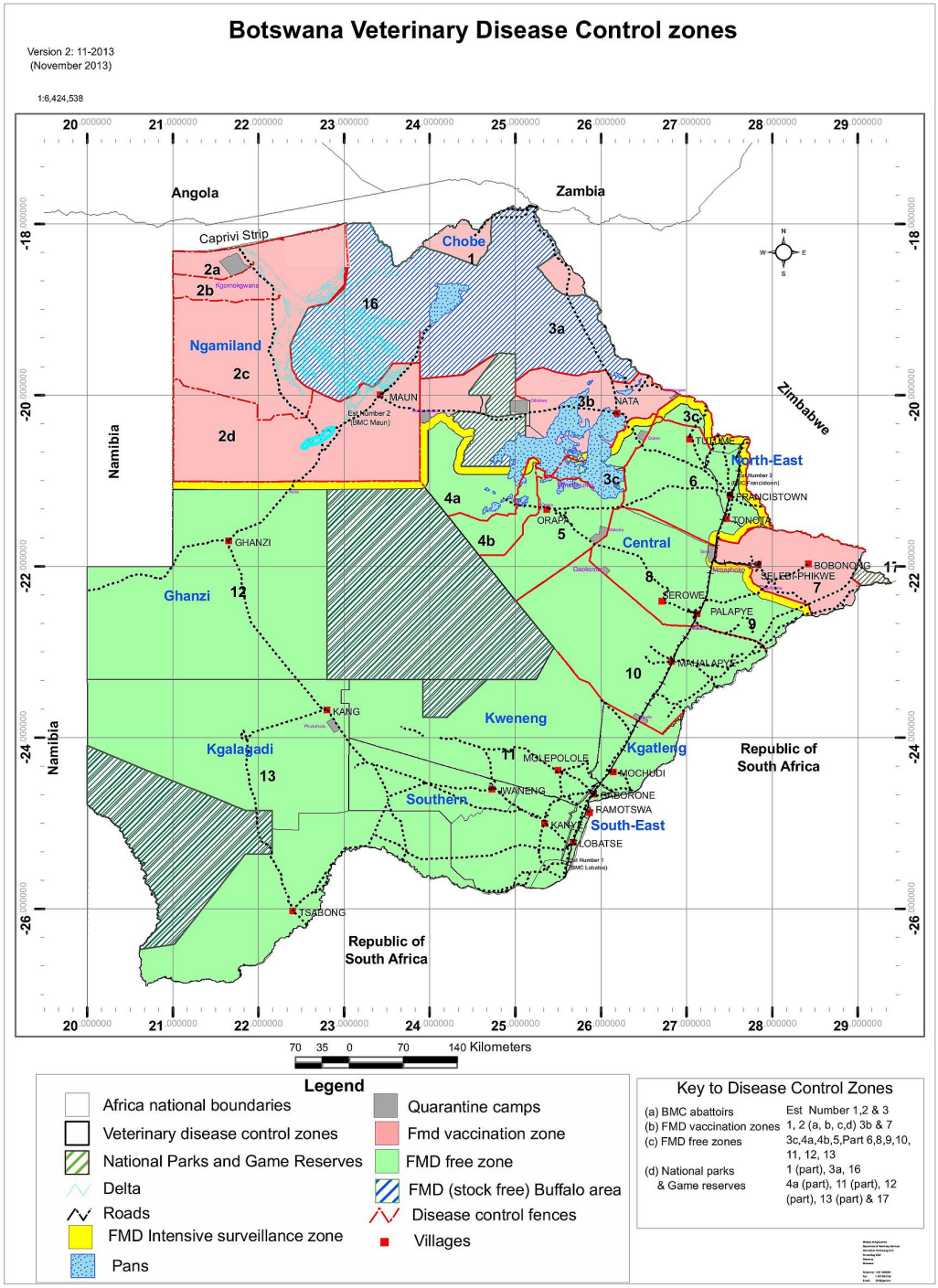
169. To qualify for LIMID assistance packages, farmers submit their applications with all relevant documents including an Identity through the area extension officer or technical assistant for livestock (see district organizational structure). Upon approval by the Ministry staff, beneficiaries are expected to comply with the requirements/guidelines of the program. The District staff through area extension personnel monitors the implementation of LIMID.

Foot and Mouth Disease (FMD) Control Project

170. **The Ministry has divided the whole country into disease-control zones through fences in order to prevent the spread of foot and mouth.** Foot and mouth disease (FMD) is generally common in areas where buffaloes can easily mix with livestock especially cattle. These areas include zones 1 and 2a-2d (see map 2). However cases of FMD have been identified in goats and cloven-animals. Map 5 shows the FMD control zones in the country. Beef from cattle in areas with high potential for FMD like those in the North where buffaloes are found is not eligible for the EU market, the country's largest beef export market since 1977.

171. **Over the past few years, there have been periodic outbreaks of FMD in the north-east, north-west and eastern part of the country** (see zones 2a- 2d, 6 and 7 on the map on disease control). In areas where FMD is prevalent, cattle are vaccinated against the disease. In 2010 in Zone 6, an outbreak of FMD took place and cattle in this area were either destroyed or exported live to Zimbabwe and government decided to compensate farmers in this area. As a policy practice, an FMD control project for the area was established to compensate farmers.

Map 3: Botswana Veterinary Disease Control Zones



172. This FMD control project accounts for 93 percent of the total development budget of the Department of Veterinary Services and 27 percent of the Ministry's total capital budget (NDP 10, 2009). Funds from the FMD control project compensated farmers through the purchase of cattle to restock the area or as compensation in cash. Further, funds from the project were also used to establish additional cordon fences in zone 6 (see map) to control the disease**.**

173. **Livestock farmers benefit from the FMD restocking project by working with livestock technical assistants and others in the Department of Veterinary Services.** A register of farmers to be compensated is kept by DVS staff and the area is regularly monitored by animal health staff to ensure that outbreaks do not occur. For instance, when cattle in zone 6 were culled or exported as part of FMD control in 2010, it was later realized that goats had symptoms of the disease. Goats were culled and their owners were also compensated.

2.3.4 Parastatals

174. Four parastatals (state-owned enterprises) have been in existence since a long time, and continue to provide services in areas of commercial activity.[31]

175. The **Botswana Meat Commission (BMC)** is responsible for the purchase, sale, slaughter, marketing and export of livestock and livestock products.[32] Specifically, BMC buys cattle from farmers for slaughter to sell to both the domestic and external markets such as the EU, South Africa and Norway. The Commission enjoys a monopoly on the export of beef. BMC has currently three operating slaughter plants, one in Lobatse, the Head Quarters, one in Francistown in the north, and one in Maun in the north-west of the country. Two plants are accredited to export beef to the EU. Accreditation was suspended during parts of 2011 and 2012 because of failures of the cattle tracing system; it is again exporting now (2013/14). BMC buys and sells livestock products based on export parity prices.

176. The **Botswana Vaccine Institute (BVI)** manufactures, sells and exports several vaccines both domestically and globally. The vaccines cover diseases such as foot and mouth, anthrax, contagious bovine pleuropneumonia, black quarter, etc. BVI only operates at its headquarters in Gaborone. Farmers buy vaccines through Livestock Advisory Centres (LAC) that are operated by the Department of Veterinary Services. LACs are located in many parts of the country. Vaccines produced by BVI are being exported.

177. The **Botswana Agricultural Marketing Board (BAMB)** buys and sells crop produce, seeds and fertilizers. Crop produce includes maize, sorghum, cowpeas, sunflower, cotton, groundnuts. The Board has several depots/centers in the country where farmers can sell and buy crop products and farm inputs. BAMB applies import parity prices to buy crop produce from farmers.

178. **Banyana PTY (LTD) is a big government-owned farm established in 1998.** Its mandate is breeding/rearing good quality beef cattle to supply breeding stock to farmers and finished stock to BMC and local butcheries.[33]

179. **BMC is loss-making and requires regular subsidies and payments for recapitalization** in times when exports of beef are banned because of disease outbreaks. The drain of BAMB on the budget is small; BVI does not get subsidies from the budget, but has a secured market with the Ministry of Agriculture. Banyana PTY never does not appear in the budget.

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[31] Often, the Botswana College of Agriculture is mentioned as the fifth parastatal, but since it does not generate revenues on a significant scale, it should be considered as a training institution with financial and administrative autonomy rather than a parastatal.

[32] BMC is actually a cooperative owned by cattle holder associations, but was created by Act of Parliament. In practice, it receives instructions from Government.

[33] See Website of the Ministry of Agriculture, www.moa.gov.bw.

180. **The transfers of public funds to BMC are substantial.** Under the heading of "BMC Restructuring", it received P231 million mainly in fiscal year 2005/06 and a small part in 2006/07 and, recently, another P47 million in 2013/14 for the Francistown abattoir. In 2011/12 and 2012/13, BMC received treasury loans amounting to P360 million on soft terms with a generous grace period. In mid-2014, Government provided a guarantee amounting to P300 million to allow BMC to contract loans from local commercial banks. Outstanding Treasury loans as shown in the Central Bank's statistics amount to P254 million by the end of the calendar year 2012 (Table 11).

Table 11: Outstanding Treasury Loans to BMC

Million Pula

	2007	2008	2009	2010	2011	2012
Amount end-of-year	1.2	0.7	240.5	192.4	-	253.6

Source of data: Bank of Botswana: Botswana Financial Statistics, February 2014.

2.3.5 Farmers' Associations

181. **Farmers have formed several commodity associations to represent their interests.** The Associations have members across the country (see district map). These associations work closely with district staff and field/area level extension staff to provide input into the design, monitoring, review of programs and trade matters following which the information is submitted through departments to the Ministry HQ. Noteworthy is that Botswana does not have an umbrella association, like a farmers' union or farmers' bureau, which exist in neighboring countries.

3. PATTERNS OF PUBLIC EXPENDITURE ON AGRICULTURE

3.1 Concepts and Data Sources

182. **In this study, the definition of "spending on agriculture" follows the approach recommended by the AU and NEPAD to assess expenditure against the Maputo Target,** which stipulates that ten percent of total public expenditure should be allocated to this sector.[34] The definition of the agriculture sector covers crops, horticulture and fruits, livestock, fisheries and production forestry. It follows the definition of the agriculture sector according to the international COFOG classification.[35] Not included are downstream activities like food processing or transport, or general infrastructure like roads, power supply or communications. The AU and NEPAD Agency have updated the 2005 Guidance Note, addressing some of the challenges around the definition of agriculture spending and inclusion of downstream activities by expanding the COFOG classification to include relevant public expenditure from other relevant sectors which have a direct impact on rural and agriculture development (based on the application of clear criteria and apportionment percentages).

Box 1: What Counts Against the Maputo Declaration Commitment?

Extract from the 2003 Maputo Declaration:

> *"[The Heads of State] Resolve to: IMPLEMENT, as a matter of urgency, the Comprehensive Africa Agriculture Development Programme (CAADP) and flagship projects and evolving Action Plans for agricultural development, at the national, regional and continental levels. To this end, we agree to adopt sound policies for agricultural and rural development, and commit ourselves to allocating at least 10% of national budgetary resources for their implementation within five years; …"*

The 2003 Maputo Declaration has prompted renewed discussions around what constitutes public expenditure in the agriculture sector. In terms of establishing a continental benchmark against which country-level spending could be compared, the Maputo target of 10% has resulted in efforts to improve the definition, methodological and guiding principles that should go into calculating what public expenditure should count towards to Maputo target. To this end, the AU and NEPAD Agency published a Guidance Note in 2005 which offered guidance on sector definition and measurement methodology, based on the COFOG definition and functions for agriculture.

The diversity of country, public administration structures and agriculture sector characteristics across Africa has shown that there is no strict "one-size fits all" methodological framework to measure country progress against the 10% target. Indeed, it has highlighted the need for a methodological framework that is flexible enough to allow cross-country applicability, yet precise enough to promote harmonized approaches to expenditure tracking which fully reflect country specificities. In addition, it has stressed the importance of improving the transparency, methodological rigor and mutual accountability around public expenditure in agriculture in order to allow sound cross-country comparability.

[34] African Union / NEPAD: Guidance Note for Agriculture Expenditure Tracking System in African Countries. September 2005.

[35] COFOG, which stands for Classification of Functions of Government, is an international standard used by the IMF and the UN, which allows to group all expenditure for a given purpose regardless of the institutions responsible for this part of the budget. It allows a consistent analysis over time and across countries even though the attribution of responsibilities to institutions changes over time or is different in different countries.

The tracking of country progress against the Maputo target has raised the question of whether to include non-agricultural sector (based on the COFOG definition of agriculture functions) public expenditures which may result in direct rural and agriculture development, such as rural infrastructure, health, education and natural resources. In this sense, the FAO project MAFAP (Monitoring and Analysing Food and Agricultural Policies) introduced the term "agriculture-supportive" expenditure, which includes non-agriculture sector expenditure in rural infrastructure (including roads), health, education and natural resources. MAFAP monitors interventions and expenditure in these agriculture-supportive areas, but does not stipulate that this expenditure should count against the Maputo target.

The Botswana Ministry of Finance and Development Planning recently presented a calculation which includes all expenditure by the Ministry of Local Government as eligible expenditure in the spirit of the Maputo Declaration. With this modification, Government "has spent on average 16.41 percent of the national budget on agriculture and rural development in line with the Maputo Resolution", the Permanent Secretary claims.[36] A similar statement was made in 2014 to the National Assembly. The Ministry of Local Government's budget covers, among others, expenditure for the maintenance of schools, health centres and rural roads, but also for the running expenses of councils with garbage collection, function of administration of urban centres and villages. It is important to note that this report takes only the direct expenditure on agriculture in the strict COFOG definition into account when measuring expenditure against the Maputo benchmark, therefore excluding all local government expenditure.

Regarding this question of what to count against the Maputo target, the AU and NEPAD Agency have updated the 2005 Guidance Note to include clearer orientations regarding the definition of agriculture public expenditure as well as the calculation of relevant expenditure from non-agriculture sector spending, with impacts to rural and agricultural development. This forthcoming Guidance Note addresses some of these methodological challenges by expanding the COFOG definition of agriculture, and recommending the application of apportionments with regards to public expenditures in rural infrastructure, health, education and natural resources based on data availability, disaggregation criteria and transparency principles. In addition, it offers methodological clarifications regarding the inclusion of directly relevant local government expenditure in rural areas, it does not go as far as to include all local government expenditures, regardless of their direct (and apportioned) relevance to rural and agriculture development.

183. **The focus is on actual rather than planned expenditure, but differences are of interest if they are substantial and systematic.** The public finance management (PFM) system of Botswana provides reliable data on actual spending in a very detailed breakdown. Data on actual spending are reported at the same level of detail as the budget documentation on the basis of which the parliament approves the annual budget.

184. **An electronic web-based accounting and payment system, referred to as "GABS", has been in operation since FY 2004/05 and allows easy retrieval of most data** by a ministry on its own budget and spending. Data for earlier years are available in print. Data refer to payments.

185. **For this study, data were assembled for the period starting with FY 1999/2000.** Actual expenditure data are available up to FY 2012/13. For the following two years, approved estimates (for FY 2013/14) and proposed estimates (FY 2014/15) were used. In designated places, figures for FY 2013/14 refer to provisional actual expenditure, which is then mentioned explicitly.[37]

[36] Letter from the Permanent Secretary of the Ministry of Finance and Development Planning, dated 18 February 2015.

[37] Provisional but complete spending data for the Ministry of Agriculture became available at the very end of this study, but actual data for the whole of government were not yet ready until closure of the report. Actual expenditure for FY 2013/14 was therefore used only for some detailed tables, in particular when the difference between planned and actual expenditure was significant.

186. **The PFM system provides data on spending by institution and department.** Expenditure is attributed to the spending unit that manages and accounts for budget allocations, typically a department of a ministry.

187. **A classifier for territorial classification is not used in most line ministries' expenditure.** Where responsibilities are not decentralized, allocations and expenditure appear as central-level spending. The regional pattern of spending can only be seen when funds are allocated to district councils. The agricultural administration is not a decentralized function and therefore appears only at central level.

188. **Like many other African countries, Botswana uses a dual budgeting system.** There is a recurrent and a development budget, which are prepared in separate processes.[38] The recurrent budget is broken down by detailed economic classification, often referred to as "line items". The development budget is structured by projects and components, but does not provide further details about the type of expenditure.[39]

189. **The development budget must not be confounded with a capital budget.** Although it contains all major capital expenditure, it also includes large amounts of current items, i.e., items that are not durable or not directly related to the construction or acquisition of durable goods. In the case of agriculture, all support schemes and expenditure for emergency response to animal disease outbreaks (including compensation of farmers for culled animals) appear in the development budget. The development budget does not contain personnel costs in principle (except consultancies), but does contain some spending on per-diems and overtime of regular staff.[40]

190. **The distinction reflects essentially different techniques for budgeting and decision-making:** while items in the recurrent budget typically also appear in the next budget with similar values, special planning and approval procedures are applied to the development budget. Furthermore, the development budget relates to annual slices of expenditure for approved projects which are contained in the National Development Plans (NDPs).

191. **The budget documentation also provides expenditure data by functions according to the COFOG classification.** The respective tables show estimates for the current years and actual expenditure for past fiscal years. The tables (they appear as "Table VI" in the budget books) are prepared manually on spreadsheets. Reference tables are used to construct the tables by function; the reference tables exclude certain budget lines from the main responsible ministries and add some lines from other spending units which spend some funds on the pertinent function. The rules for calculating spending by function of government used by MFDP are shown below in Box 2.

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[38] Dual budgeting has advantages, but the recurrent costs resulting from investments are often not taken into account in full. See the PEFA report and the World Bank Public Expenditure Review of 2009, included in the Bibliography, for a detailed discussion of this issue.

[39] In GABS, distinction is made by different components of a project, the designation of which allows to guess whether they involve recurrent or capital expenditure. Apart from that, expenditure is not broken down further by economic classifiers.

[40] An exception to this rule is being introduced beginning 2013 with regard to ISPAAD. After complaints about extension staff being distracted from advisory tasks by ISPAAD-related administrative work like measuring fields and assisting farmers in filling in application form, ISPAAD started to recruit additional staff for this work.

Box 2: Institutional Versus Functional Classification

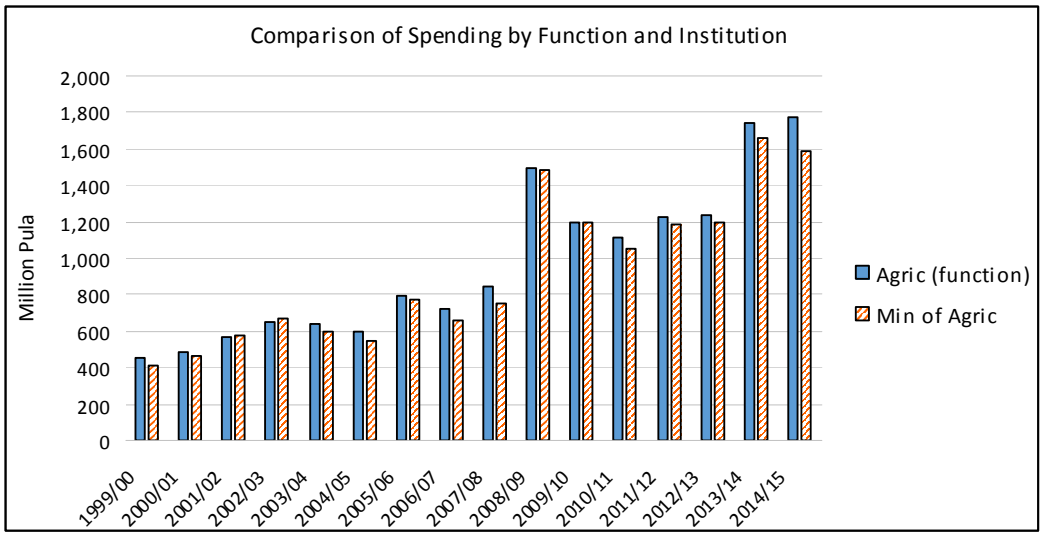
The definition of spending on agriculture by the functional classifier used by the MFDP uses MOA spending as a starting point and then makes the following adjustments:

Added	Subtracted	Not adjusted
Environment: • Department of Forestry and Range Resources • Department of Environmental Affairs • Projects on rural Fisheries Investigation & Development; Afforestation; and Natural Resources Management Finance and Development • Agricultural Credit Guarantee Scheme	Botswana College of Agriculture (recurrent block grant and projects)	Included in MOA expenditure but not agriculture function: • Debatable: Subsidies to BMC • Constitution of a National Grain Reserve Spending by other ministries not included: • Treasury loans to BMC with uncertain prospect of being repaid • CEDA loans to farmers that are non-performing and therefore effectively a subsidy

192. **The main area where the Ministry of Agriculture (MOA) spends funds that are outside the function "agriculture" is the Botswana College of Agriculture** – according to the COFOG classification and replicated in the Guidelines of CAADP, this is spending on education and not to be included under "agriculture". Expenditure added to the remaining MOA spending refers to production forestry and fisheries under the responsibility of the Ministry of Environment. These amounts, however, are quite small.

193. **For all practical purposes, one can equate MOA spending, after elimination of the cost of the College of Agriculture, with "spending on agriculture" where agriculture is defined along functional lines.** Spending by MOA without the transfers to and projects of the Botswana College of Agriculture accounts for almost all spending on agriculture according to the spending on agriculture as shown in Table VI in the budget. The other items added to MOA spending as applied by MFDP are of negligible significance (Figure 14).

Figure 14: Comparison of Spending by Function (Agriculture) and Institution (MOA)



Source of data: Financial Statements and budget documentation

Notes:

Ministry of Agriculture spending excludes grants to and projects of the Botswana Agricultural College.

Expenditure shown is actual expenditure, except for 2013/14 (approved Estimates) and 2014/15 (proposal).

The series "Agric (function)" excludes the expenditure on "PDSF/RDF loans".

194. **Although spending on fisheries and commercial forestry is part of "spending on agriculture" according to the COFOG-based classification scheme used by NEPAD, it was not added because of the insignificance of spending.** The Ministry of Environment and Tourism is responsible for fisheries and forestry. But there are no active projects on fishing, which only takes place on small scale for subsistence, unregulated and unsupported. Commercial forestry does not exist in Botswana for climatic reasons.

195. **There are, however, two other items in the MOA budget that do not clearly fall under the category "agriculture" of the COFOC classification scheme.**

196. **In 2008/09, MOA, through its development budget, spent P201.2 million on the establishment of a Strategic Grain Reserve.** This is the only year in which such expenditure occurred. Although classified as functional-agriculture expenditure by the Ministry of Finance and Development Planning (MFDP), we eliminated this amount from what is referred to as "adjusted MOA spending" in the following. This amount is not considered as spending on agriculture because it is not benefiting agriculture or farmers. Given the low degree of self-sufficiency in grains, the grain reserve cannot function as a buffer to stabilize prices in good years when market prices are low. The purpose of the reserve is to ensure availability of grains to consumers in case of short-term supply problems. Therefore, related spending should not be considered as spending on agriculture.

197. **Subsidies and capital injections into the Botswana Meat Commission (BMC) appear in the expenditure tables of MOA repeatedly, at times with quite significant amounts.** BMC, a state-owned organization, operates abattoirs and has a monopoly for beef exports. The existence of BMC as a monopoly is justified because of the high hygienic standards and traceability demanded by the European Union for imports of beef. However, BMC is periodically hit hard whenever there is an outbreak of a disease (mainly Foot-and-Mouth Disease) and exports to Europe are banned.

Without export markets, BMC cannot cover its costs and is therefore kept afloat by subsidies and capital injections.

198. **Although slaughtering and first-level processing of beef is not part of agriculture according to the COFOG functional classification, we consider the BMC subsidies as spending on agriculture** because of its importance for the livestock sector in Botswana. We therefore did not make any adjustments for this.

199. **Loans and grants provided by multilateral organizations are captured in the budget and in expenditure reports.[41] Bilateral aid plays virtually no role in Botswana**, apart from financing the few occasional studies, and NGO support to agriculture is very limited, so these have little impact on sector expenditure. Data on bilateral aid and NGO spending were therefore not collected and not added on.

200. **The Ministry of Agriculture collects some revenues,** and these should in principle be shown and deducted from gross expenditure. However, the amounts are very small.[42] The additional effort to collect and account for the revenues was therefore not considered worth the result for the purposes of this Report.

201. **Government operates a credit scheme called CEDA (Citizen Entrepreneurial Development Agency), which provides loans to farmers at subsidized but still significant interest rates.** Special conditions and support are available to young citizens who start businesses in agriculture. CEDA operates like a bank. Over the years since its creation in 2001, loans granted to agricultural undertakings amount to a total of P575 million. The main subsectors were horticulture (P119 million, 21 percent of total lending to agriculture), beef (P196 million, 34 percent of total lending)and dry-land crops (P56 million, 10 percent of total). Annual loans approved peaked in 2010/11 with P115 million for agriculture. Loans granted to the agriculture sector amount to roughly 20 percent (by value) of all loans provided by CIDA.

202. **The loans themselves would not be considered as public expenditure. However, repayment rates of CEDA were initially low, a number of loans were rescheduled or cancelled.** For all sectors (also non-agriculture), P259 million were cancelled between FY 2006/07 and FY 2008/09, and a further P11 million in later years up to 2013/14. Over the period FY 2006/07 and 2013/14, CEDA collected repayments amounting to P1,130 million.[43]

203. The amounts written off should, in principle, be considered as subsidies and should be included as part of public expenditure. Unfortunately, CEDA was unable to provide data about the write-offs related to agricultural lending. The imprecision, however, is small and can be accepted.[44]

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[41] There was, however, an error with regard to the ADB loan for the Pandamatenga infrastructure project. It was an omission, not a systemic or conceptual weakness of the PFM system.

[42] Between FY 2004/05 and 2014/15, revenues of MOA were less than 4 percent in most years, and still only 5.5 percent in 2011/12 due to exceptional revenue from sale of cattle to Zimbabwe. They represent less than 1 percent for FY 2012/13 and the two following budgets.

[43] Data provided by CEDA in March 2014 upon special request.

[44] Even assuming that 40% of the cancellations relate to loans to the agricultural sector (double of the weight of agriculture in lending), one would be talking about P108 million spread over several years. This is small in relation to total spending on agriculture. Write-offs in recent years were of very low value, less than 1 percent of repayments received by CEDA.

204. **The interest on CEDA loans is subsidized.** Depending on the size of the loan, CEDA lends at 5.0 or 7.5 percent. The difference between CEDA's lending rate and the prime rate is claimed from the Ministry of Finance. The interest rate differential is, in principle, public spending on agriculture. However, CEDA was unable to provide data on outstanding loans to the agricultural sector by year. Thus, it is impossible to assess the subsidy element.

205. **Thus, the omission of the interest rate subsidy element resulting from unavailability of data from CEDA is only a minor omission, though.** In order to assess the possible error by omitting the interest rate subsidy, our Team assumed that all loans granted are disbursed in the year of approval and repaid in full five years later. Furthermore, we assumed that all loans attract the low interest rate of five percent. The resulting annual subsidy was between P12.6 million and P22.9 million. CEDA provided data on loans to all sectors outstanding for the last five years. Even assuming that 40 percent of outstanding loans refer to agriculture (it is presumably less than that), the amounts are smaller than in our calculation. Therefore, the amount of between P13 and P23 million of subsidy per year is most probably the upper limit for the expenditure not captured with regard to CEDA subsidies on interest.

206. **Loans to agricultural holdings from the National Development Bank were not considered, either.** Only the subsidy element would be considered as public expenditure, and does most probably not constitute a significant amount. The information available does not allow to disaggregate NDB lending by sector.

Box 3: Classifiers for Public Expenditure

The following categories are used in this report to structure public expenditure and capture its different dimensions:

Classifier	**Definition and use**
Institutional	By spending unit, i.e., the organizational unit within the public administration that manages and accounts for the funds. In practical terms, spending units are departments of ministries which appear in the budget book and spending reports.
Economic	Refers to the type of items bought. Broad categories are current expenditure (personal emoluments, goods and services, transfers and subventions) and capital expenditure (expenditure on durable goods). Capital expenditure also covers current items bought and consumed in direct connection with the construction of capital items.
Functional	Classification by the international COFOG classification. It refers to the area of public intervention and the purpose of the expenditure, irrespective of the institutions responsible in the specific country or period of time.
Sub-functional or Service	Refers to categories which are an extension of the functional dimension as defined by COFOG and relates to the type of service provided. Examples are irrigation, extension, agricultural research, animal health control, support schemes or overheads. In many cases, a breakdown by sub-function is not available directly; sub-functional classification is therefore often derived from the institutional classification.
Recurrent / Investment Budget	Refers to budget techniques. In Botswana, the recurrent budget is structured and controlled by type of expenditure (economic classification) and contains items that are required for the day-to-day operations of the spending unit. Recurrent budgets are typically prepared using incremental budgeting techniques; the previous year's budget is the starting point. The investment budget is structured by projects and components. Projects are defined and approved in the National Development Plans. Ceilings for total expenditure over a project's life time are referred to as "Total Estimated Costs" (TEC ceilings); the distribution into annual slices generally follows operational criteria.

Classifier	Definition and use
Subsector	Used to attribute expenditure to the main subsectors crops, livestock and horticulture. This classification is sometimes used in parallel with a breakdown by sub-function when more detailed information about the sub-function are not available. The classification by crops, livestock, research and overheads can easily be derived from institutional classification and grouping of departments.
Territorial	This classifier is not used. It indicates the administrative level of spending (central or district) and possibly the region. All spending on agriculture is, however, shown under the ministry's budget head. The PFM system does not take note of where the staff is located or where the expenditure is made. Decentralization has not reached agricultural services so far. District administrations do not spend on agriculture.

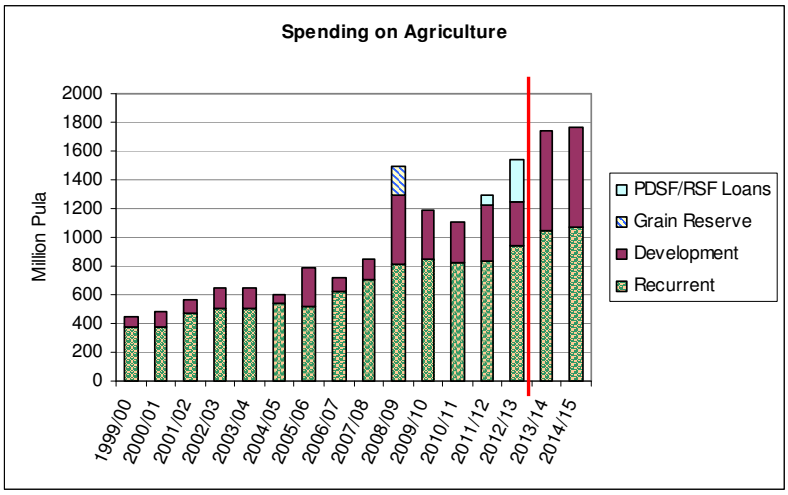
Note that in this report, "spending on agriculture" refers to spending according to the COFOG definition. Data on spending on agriculture are preferably taken from the Table VI of the budget presentation, i.e., expenditure by function. As noted in the text, the difference between COFOG functional spending on agriculture and adjusted spending of MOA (after elimination of budget lines referring to the Botswana College of Agriculture and the mentioned strategic grain reserve) are almost identical.

3.2 Spending on Agriculture as of Total Expenditure

207. **Less than four percent of total public expenditure is on agriculture.** Yet, public spending on agriculture has more than tripled over the past 15 years when expressed in current Pula (Figure 15). From FY 2008/09 onwards, the share of development expenditure in total spending increased substantially. In 2013/14 and 2014/15, development expenditure has again virtually doubled compared to the period 2008/09 to 201213.

208. In FY 2011/12 and again in 2012/13, treasury loans were given to BMC on generous terms with a long grace period. These appear as "PDSF/RSF Loans" in charts and tables.

Figure 15: Spending on Agriculture, Current Pula

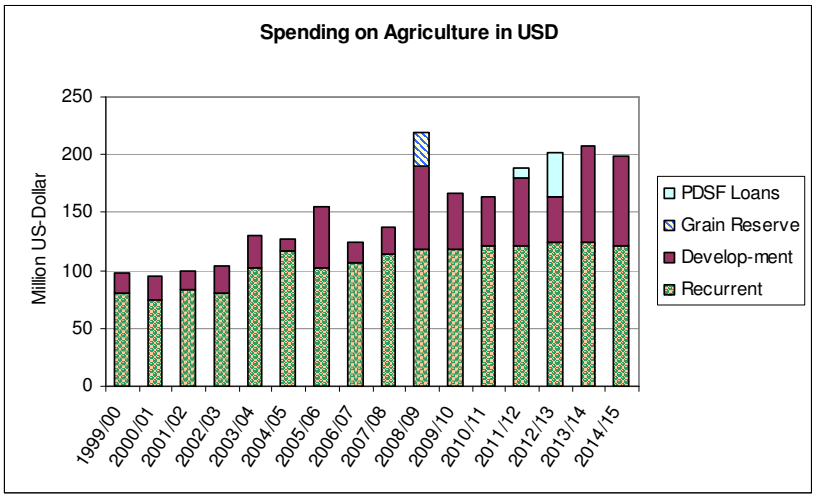


Source of Data: Spending reports and budget documents, tables by functional classification (Table VI).

Note: The category PDSF (Public Debt Service Fund) and RSF (Revenue Stabilisation Fund) refers to treasury loans.

209. **Expressed in US-Dollars (converted at the ruling exchange rate of each year), growth is lower, while the profile remains similar.** The total has only doubled over the period (Figure 16). The Central Bank holds the Botswana Pula at a rather stable exchange rate against the South African Rand, as most imports originate from South Africa. As the Rand has been losing value against the Dollar, the trend looks different depending on whether values are expressed in Pula or in Dollar. As the Euro has been gaining value against the US-Dollar over the period, growth is even less if the series is expressed in Euro.

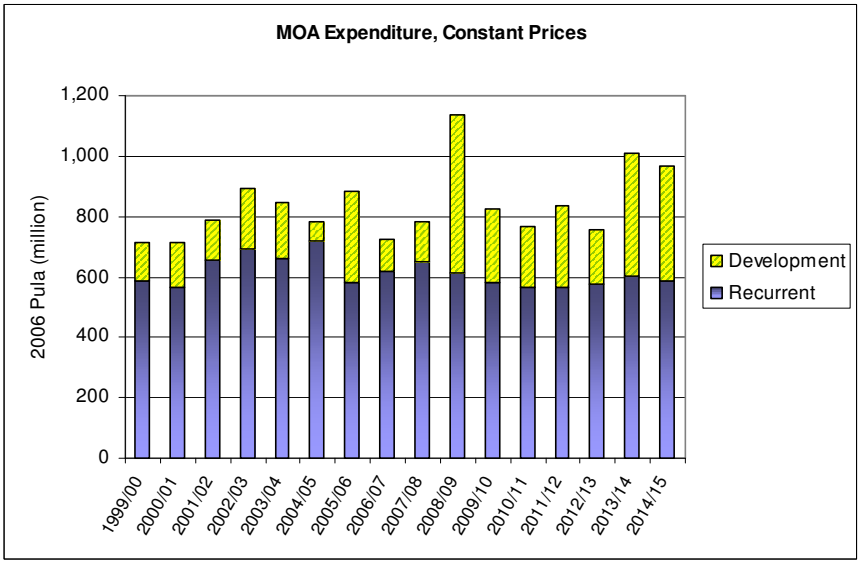
Figure 16: Spending on Agriculture in USD



Source of data: see Figure 15.

210. **An attempt to calculate expenditure on agriculture in constant prices yielded the result shown in Figure 17.** According to this chart, recurrent expenditure remained more or less at the same level over the whole period; development expenditure fluctuates, but has increased since 2008/09.

Figure 17: Spending on Agriculture, Constant 2006 Pula

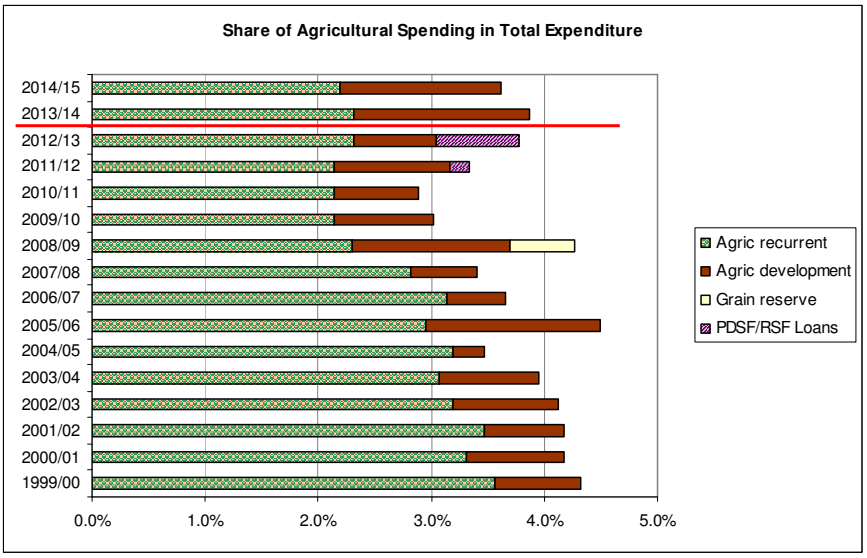


Source of data: Table VI of budget documentation (expenditure by function), without spending on Strategic Grain Reserve, without Treasury Loans to BMC. See text for deflator calculation.

211. **However, since the methodology of deflating expenditure is a rough approximation at best, these figures should be interpreted with caution.** Statistics Botswana does not explicitly publish a deflator for government services. Our calculation therefore had to be based on an implicit deflator calculated by relating the GDP series for general government services in current and in constant prices, respectively. Information about how the GDP data on government services are deflated was not sought. Since the share of goods and services in total expenditure differs across sectors, the correct deflator for development expenditure may be different from that for recurrent expenditure, dominated by spending on personnel.

212. **In spite of the nominal increase, the share of agricultural spending in total expenditure remains low.** Total spending on agriculture stands at between 3.0 and 3.8 percent (Figure 18). As the volume of the budget increased, thanks to fast growth of revenue, other sectors benefited more. While spending on agriculture stood at around 4 percent between FY 1999/00 and 2003/04, its share has declined. Since FY 2004/05, spending on agriculture surpassed the four percent mark only in 2005/06 and 2008/09 because of special factors.[45]

Figure 18: Share of Spending on Agriculture as of Total Expenditure



Source of data: see Table 12.

[45] Substantial amounts were spent on BMC restructuring of the Botswana Meat Commission (BMC) in 2005/06 and on creating a strategic grain reserve in 2008/09.

Table 12: Spending on Agriculture and Comparison to Total Expenditure

Million Pula

	Agriculture					Total budget	Agriculture as a share of total budget	Agriculture Total in million USD
	Recur-rent	Deve-lopment	Grain Reserve	PDSF/RSF Loans	Total			
1999/00	372	80			451	10,428	4.3%	97.6
2000/01	382	100			482	11,536	4.2%	94.6
2001/02	474	96			570	13,632	4.2%	99.6
2002/03	502	146			648	15,710	4.1%	103.6
2003/04	500	142			642	16,276	3.9%	130.7
2004/05	547	48			594	17,113	3.5%	127.0
2005/06	522	271			793	17,632	4.5%	155.2
2006/07	619	103			722	19,737	3.7%	123.8
2007/08	701	143			843	24,822	3.4%	137.0
2008/09	811	487	201		1,499	35,151	4.3%	219.1
2009/10	844	348			1,191	39,489	3.0%	166.8
2010/11	822	287			1,109	38,417	2.9%	163.2
2011/12	829	397		63	1,290	38,667	3.3%	188.6
2012/13	943	298		297	1,539	40,736	3.8%	202.0
2013/14	1,043	701			1,744	45,039	3.9%	207.7
2014/15	1,073	697			1,770	48,857	3.6%	199.4

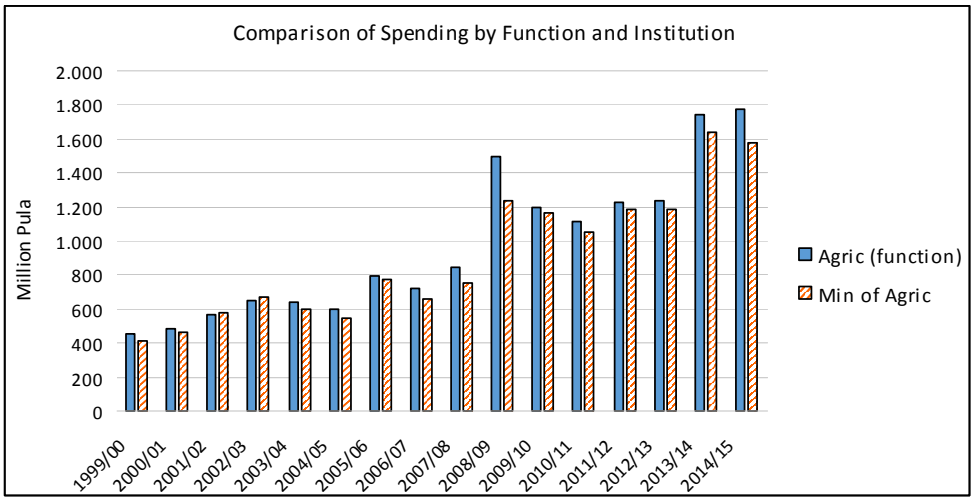
Source: Budget documentation, Table VI, detailed spending tables from GABS and Financial Statements for various years

Note: Data refer to actual expenditure, except for 2013/14 (approved Estimates) and 2014/15 (proposed Estimates).

3.3 Spending by Subsector

213. **From here on, the analyses are based solely on data relating to the Ministry of Agriculture because the tables grouping expenditures by spending unit provide considerably more detail than the functional tables in the budget documentation.** Since about 95 percent of spending on agriculture goes through the Ministry of Agriculture, the omitted spending on agriculture by other ministries would not make much. However, the analysis of this study continues to follow the approach of defining agriculture by function. Therefore, spending on the Botswana College of Agriculture and on the Strategic Grain Reserve are consistently not included in the data reported as MOA spending in the following charts and tables.

Figure 19: Comparison of Spending by Function (Agriculture) and Institution (MOA)



Source of data: Financial Statements and budget documentation

Notes:

Ministry of Agriculture spending excludes grants to and projects of the Botswana Agricultural College. It also excludes spending on the strategic grain reserve of P201 million in 2008/09.

Most of the difference between the two series in 2008/09 is presumably due to the expenditure on the grain reserve, presumably included in the series for agriculture according to COFOG definition as presented by the Ministry of Finance, but eliminated from our presentation the MOA series.

Expenditure shown is actual expenditure, except for 2013/14 (approved Estimates) and 2014/15 (proposal).

Box 4: Subsectors, Spending Units and Institutional Classification

Spending by subsector is derived from the organic structure of the Ministry. The organizational structure changed over time, but departmental responsibilities allow for a reasonably consistent mapping of departments to subsectors. Changes occurred in FY 2008/09 when the Department of Animal Health and Production was subdivided into a Department for Animal Production and a Department of Veterinary Services. All clearly belong to the livestock subsector. The responsibility of these departments includes beef cattle, poultry, small ruminants, game farming and dairy cattle.

A Department for Cooperative Development existed until FY 2004/05. Furthermore, a Department for Extension Services Coordination existed between FY 2008/09 and 2011/12. Both are considered as part of the crops subsector here. The Department of Crop Production and Forestry is responsible for grains, horticulture products, fruits and bee keeping.

A Department for Business Promotion appears from FY 2008/09 onwards. In FY 2013/14, the Department for Research, Statistics and Policy Analysis became a budgetary spending unit. Both were treated as parts of the general service function and, together with "Headquarters", grouped as "Headquarters and others".

Imprecision remains, though, principally because the overheads group ("HQ and other") contains high amounts of spending which benefits the livestock subsector. In the three years FY 2001/02 to FY 2003/04, a large part of the Headquarter development spending was on the establishment of a Livestock Identification and Traceback System (LITS), shown under the project "MOA Computerisation".[46] In FY 2005/06, P230 million were

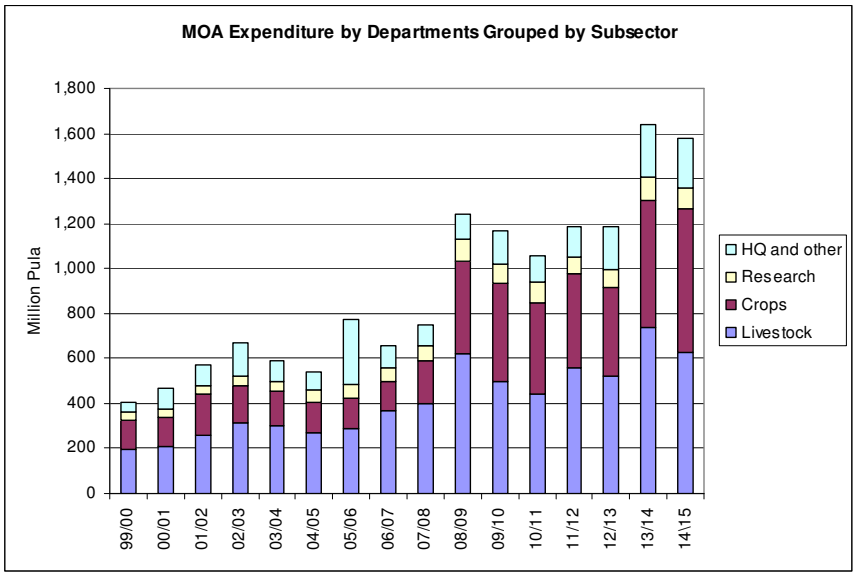
[46] The requirement for LITS was prompted by the appearance of the Mad Cow Disease and the subsequent efforts by the EU to identify the origin of beef and cattle. LITS consists of a central database and mechanisms for local staff to feed data on cattle sales, movements and slaughter into a central database. This has to be done rather quickly and therefore constitutes a substantial challenge with regard to logistics and IT infrastructure.

spent on BMC restructuring, shown under the project "MOA Consultancies" under Headquarters. Headquarter spending includes aids to BMC in several subsequent years as well.

214. Figure 20 shows the resulting combined recurrent and development spending by subsector in nominal terms. Similar amounts are allocated to crops and livestock, respectively, particularly when taking the imprecisions mentioned in the previous paragraph into account.

215. **Three periods can be distinguished:** FY 1999/2000 through 2007/08 was a period with some growth initially, then variations, but without a clear trend in the second half. The second period is from FY 2008/09 through FY 2012/13, when spending is much higher. The last two years in the chart, FY 2013/14 and FY 2014/15, are years with significantly higher spending again, surpassing all historic spending levels by a considerable margin.

Figure 20: MOA Spending by Subsector



Source of data: Financial Reports and Budget Estimates.

Note: Excluded are the Botswana College of Agriculture and the spending on the establishment of a Strategic Grain Reserve in FY 2008/09.

"Crops" includes horticulture.

Table 13: MOA Spending by Subsector

in Thousand Pula

	99/00	00/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14\15
	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Approved	Proposal
Livestock	197,210	208,838	258,628	311,334	304,082	269,549	290,724	366,731	399,426	617,623	497,481	439,652	561,282	523,592	735,357	626,495
Recurrent PE	103,574	105,116	130,828	144,099	150,345	179,301	170,427	190,779	213,677	278,245	296,081	290,498	286,628	311,695	327,336	296,166
Recurrent other	77,016	81,116	90,670	93,734	104,920	81,274	105,128	117,123	122,507	131,294	141,537	124,086	130,934	133,072	152,087	135,109
Development	16,620	22,607	37,131	73,501	48,817	8,973	15,170	58,829	63,242	208,084	59,863	25,068	143,720	78,825	255,934	195,220
Crops	127,407	128,572	182,154	169,442	150,539	135,753	135,065	133,444	188,034	413,752	435,369	408,846	414,171	393,672	568,493	636,312
Recurrent PE	58,969	63,405	76,735	84,125	77,680	79,350	79,820	88,342	92,995	116,801	124,208	126,859	133,232	141,819	148,367	139,748
Recurrent other	29,667	34,459	51,535	45,241	44,712	48,746	47,208	39,652	47,572	49,299	41,578	35,960	33,196	33,633	32,779	28,342
Development	38,771	30,707	53,885	40,077	28,147	7,656	8,037	5,451	47,467	247,653	269,582	246,027	247,742	218,220	387,347	468,222
Research	38,962	36,307	38,402	40,983	43,302	54,131	57,717	61,645	67,762	96,746	88,309	90,244	76,503	78,883	100,104	97,024
Recurrent PE	15,676	17,656	21,795	22,895	23,626	27,892	32,412	35,226	37,156	50,246	54,458	50,738	50,752	57,418	62,820	57,700
Recurrent other	10,495	12,126	14,799	16,288	14,148	20,914	23,740	24,630	24,843	30,433	27,610	24,021	21,666	20,245	24,389	25,324
Development	12,792	6,525	1,807	1,799	5,528	5,325	1,564	1,789	5,763	16,067	6,241	15,485	4,085	1,221	12,895	14,000
HQ and other	44,402	92,422	94,842	147,943	94,880	83,938	293,589	93,164	94,436	114,051	144,900	115,468	130,682	187,146	236,654	216,927
Recurrent PE	15,563	16,453	19,871	22,681	14,943	19,120	20,738	24,047	28,712	43,119	48,693	52,176	58,818	65,114	72,353	76,035
Recurrent other	13,128	18,238	26,214	31,566	19,762	28,048	25,867	33,754	35,600	48,236	48,424	56,790	67,666	96,649	103,091	108,334
Development	15,712	57,731	48,756	93,696	60,174	36,770	246,983	35,363	30,124	22,697	47,782	6,502	4,198	25,382	61,210	32,558
Total MOA adjusted	407,981	466,139	574,025	669,703	592,803	543,371	777,095	654,984	749,658	1,242,172	1,166,058	1,054,210	1,182,637	1,183,292	1,640,608	1,576,758
Recurrent PE	193,781	202,630	249,229	273,800	266,595	305,664	303,397	338,393	372,539	488,411	523,440	520,270	529,430	576,046	610,876	569,649
Recurrent other	130,306	145,939	183,218	186,830	183,542	178,983	201,943	215,158	230,523	259,261	259,150	240,857	253,462	283,598	312,346	297,109
Development	83,895	117,570	141,579	209,073	142,666	58,724	271,755	101,433	146,596	494,501	383,468	293,082	399,745	323,648	717,386	710,000

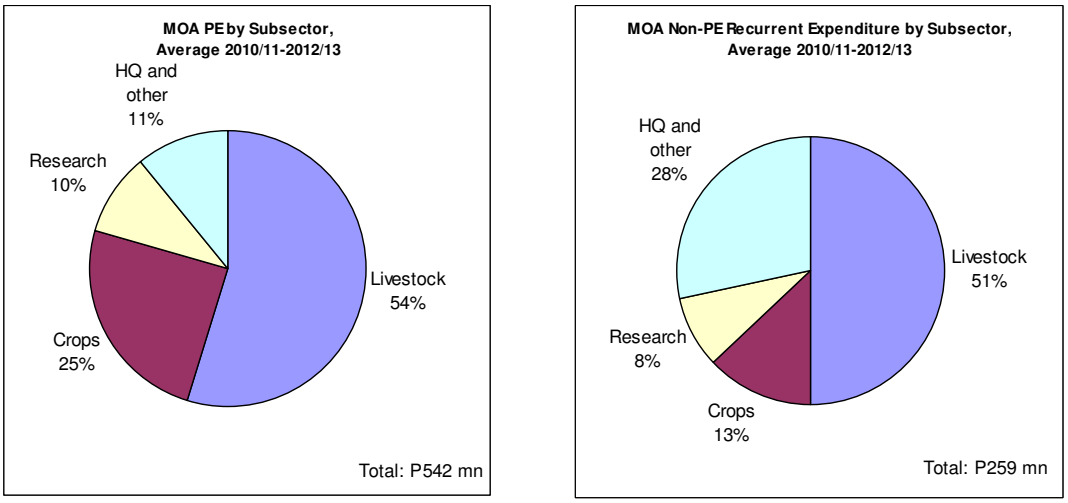
Source of data: GABS, Financial Reports and Budget Estimates.

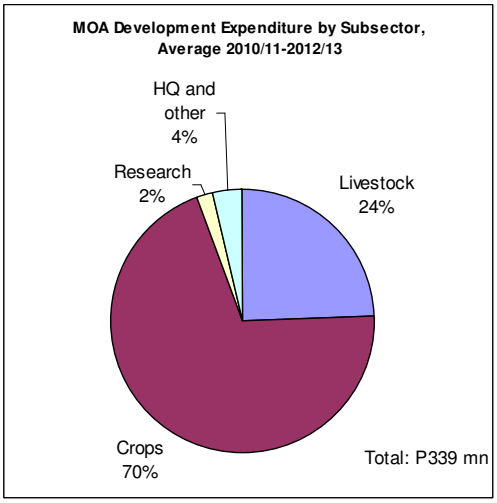
216. **Although crops and livestock have about equal weight in total MOA expenditure, their respective shares are quite different for different types of expenditure (economic classification)** (Figure 21). Livestock dominates with regard to personnel as well as non-personnel recurrent spending. However, about 70 percent of development expenditure is on crops, compared to only 28 percent on livestock.

217. **This pattern is what would be expected.** Expenditure on livestock consists mainly in veterinary services and routine disease control through vaccinations, maintenance of cordon fences, and the control and registration of livestock movements. All of these are recurrent and routine in nature and costly. Livestock appears in the development budget only with livestock support schemes and emergency disease controls. For crops, on the other hand, routine expenditure is relatively low, consisting mainly of regulation and extension services. Investment in irrigation for horticulture and the extensive support schemes for crops appear as development expenditure because they are organized in projects.

218. Note that for calculating these figures, the LIMID part of the project "Agricultural Support Schemes" was allocated to the livestock subsector. In the budget documents, the entire project, with all of its components, appears under the Department of Crop Production and Forestry.

Figure 21: Expenditure by Subsector





219. **Expenditure on research and development and on extension is of particular interest** since it is focused on modernization, technological advances and expenditure incurred in order to bring innovation in its various aspects, from production technologies up to market orientation, to farmers. Expenditure on research can be assessed easily because the sub-function "research" corresponds to expenditure by the Department for Agricultural Research, which the PFM system defines as a spending unit.

220. A small correction was made with regard to seed purchases by the Research Department in the table below (Table 14). The Research Department contracts farmers to produce seeds, which are either given or sold to farmers. The cost is included in the budget for the Research Department, under a separate code, and can therefore be deducted from other recurrent departmental charges (RDCs). The line also includes small amounts of other purchases subsequently sold to farmers.

221. The indicator "Research Intensity" was then calculated by relating the remaining expenditure of the Research Department to agriculture's contribution to value-added (designated as AgGDP in the table). The figures used for AgGDP are on the high side because they include the chicken industry to which research makes hardly any contribution.

222. **Research Intensity stood at about 5 percent in FY 2004/05 and 2005/06, but has fallen since and stands at only 2.4 percent in 2012/13** (expenditure in FY 2012/13 compared to AgGDP in 2012). The decline is the result of stagnating expenditure on research, even in nominal terms, and growth of nominal value-added in agriculture.

Table 14: Expenditure on Agricultural Research and Research Intensity

FY	Personnel	RDC excl. materials for resale	Develop-ment	Total Research Expenditure	AgGDP	Research Intensity *	Memo: Materials for Resale
	P '000	P '000	P '000	P '000	P mn	%	P '000
04/05	27,892	13,452	5,325	46,668	950	4.9%	7,462
05/06	32,412	15,546	1,564	49,523	928	5.3%	8,194
06/07	35,226	15,731	1,789	52,746	1,211	4.4%	8,899
07/08	37,156	22,794	5,763	65,712	1,505	4.4%	2,050
08/09	50,246	20,725	16,067	87,038	1,887	4.6%	9,708
09/10	54,458	20,144	6,241	80,843	2,071	3.9%	7,466
10/11	50,738	16,056	15,485	82,279	2,717	3.0%	7,965
11/12	50,752	16,557	4,085	71,393	2,636	2.7%	5,109
12/13	57,418	13,473	1,221	72,111	2,963	2.4%	6,772
13/14**	57,470	18,477	12,895	88,842			7,609
14/15**	57,700	19,687	12,568	89,954			5,638

Source of data: GABS (expenditure 2004/5 thru 2013/14), Budget Estimates (proposal) for 2014/15; Statistics Botswana (GDP by sub-industries)

Notes:

Research Intensity is defined as the ratio of research expenditure over agriculture's contribution to total value added.

Expenditure data for 2013/14 refer to actual expenditure (rather than planned expenditure in most other tables in this report).

223. **Since FY 2010/11, the National Food Technology Research Centre (NFTRC, formerly "Food Technology Research Services") receive an annual block grant of P20.7 million per year budgeted in the recurrent budget of MOA Headquarters.** A merger of the Research Department and the Centre is planned. If this amount is added to expenditure on agricultural research, the intensity in FY 2012/13 would increase from 2.4 percent to 3.1 percent. However, food technology is somewhat beyond the agricultural research function as it is commonly understood.[47]

224. The Botswana College of Agriculture also carries out some agricultural research. The relevance of their research for practical agriculture and the amount of funds spent on agricultural research was not assessed during this Study. Therefore, it does not appear in the table above.

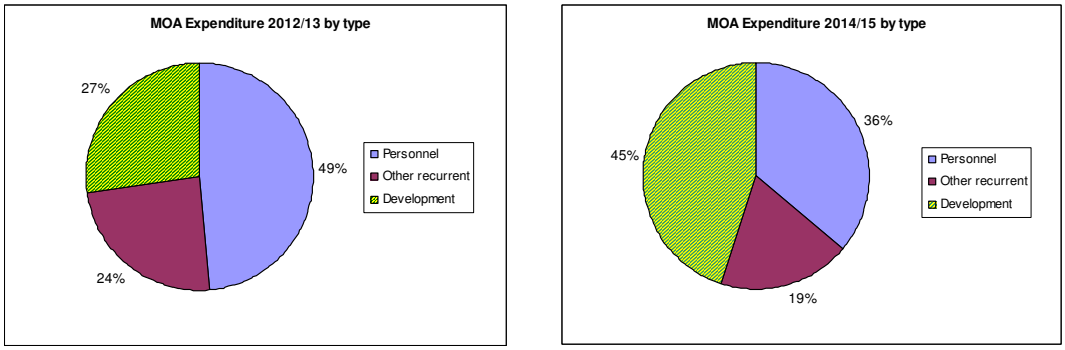
225. **Expenditure on extension cannot be assessed.** Extension services in Botswana are intimately mixed with regulation and control tasks. Staff located in extension areas is executing all functions that require presence at farm level. Budgets and actual expenditure for regulation, control and advice are therefore not separately available. Our Team was not provided with data on staff placed in extension areas, close to the farmers, neither their numbers nor the related expenditure.

3.4 MOA Spending by Detailed Economic Classification

226. **In FY 2012/13, about half of the overall MOA expenditure was on personnel.** About a quarter each is for non-personnel recurrent and development expenditure (Figure 22).

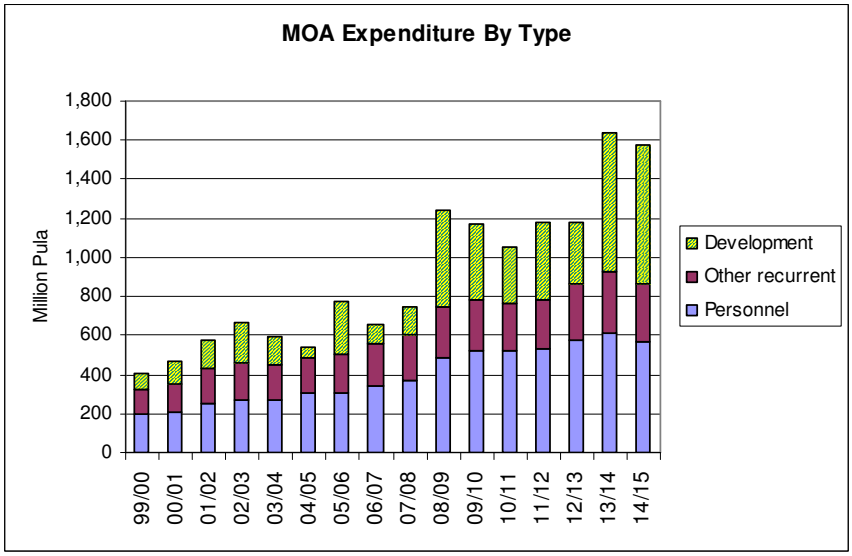
[47] See http://www.naftec.org/ for a description of their structure and activities.

Figure 22: MOA Expenditure by Type, FY 2012/13 and 2014/15



227. **Figure 23 reveals the components of expenditure growth and shows that development expenditure increased particularly over the last two periods for which data are available.** Development expenditure stood at P731 million in 2013/4 (revised estimate) and is planned to amount to P710 million in 2014/15 (proposal).

Figure 23: MOA Expenditure by Type

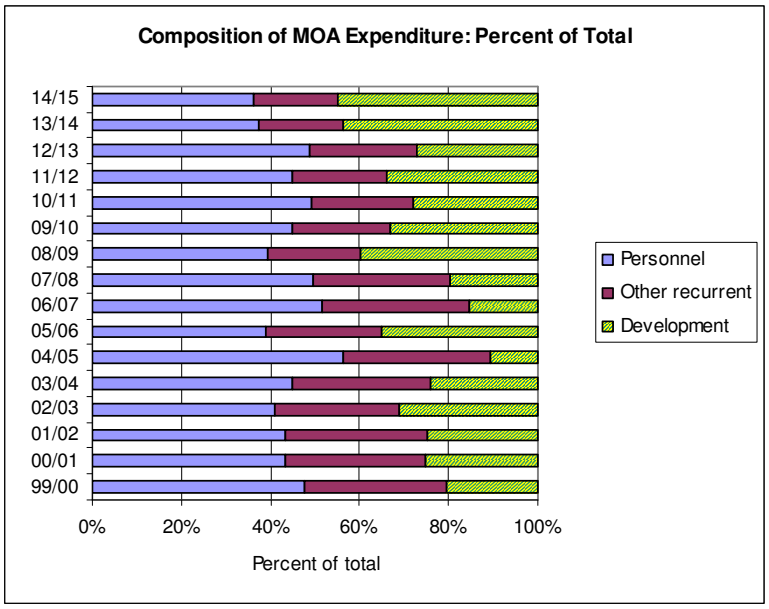


Source of data: Budget documents and GABS

Note: P201 million for the establishment of a strategic grain reserve, which appears in expenditure reports under MOA development expenditure, not included.

228. **The percentages of broad expenditure-type categories vary across years related to the size of the development budget** (Figure 24). The share of personnel costs in total MOA expenditure falls to about 35 percent in FY 2013/14 (revised estimate) and FY 2014/15 (proposal). The factors underlying the growth of the development budget are explained further down in more detail; but the quickly growing expenditure for agricultural support schemes is the main factor.

Figure 24: Composition of MOA Expenditure by Type (Percentages)



Source of data: Budget documents and GABS

3.4.1 Recurrent Expenditure

229. **Over the last four years, personal emoluments (salaries and similar) absorbed approximately 61 percent of MOA total recurrent expenditure** (Figure 25). Travel and transport and recurrent departmental charges (RDCs) not specified in other categories ("not elsewhere specified") account for 31 percent.

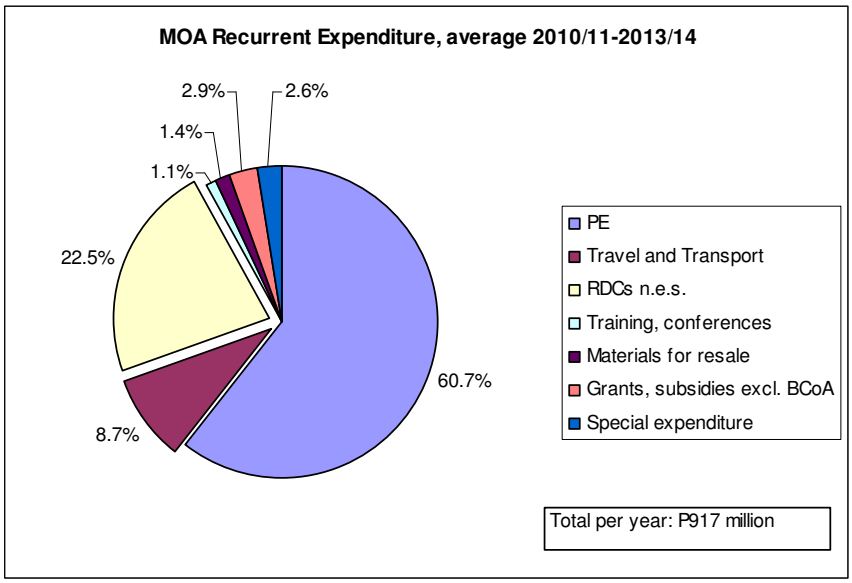
230. **Whether the ratio between Personal Emoluments (PE) and funds for operations is still adequate is debatable.** That the effectiveness of extension staff is constrained because of lack of access to means of transport was mentioned repeatedly in interviews and is also mentioned in some evaluation documents.[48]

231. **Additional funds for overtime and per-diems are available through the development budget in the context of agricultural support schemes.** This is not an anomaly, but follows the logic of projects. The project budgets contain additional expenditure for a defined and time-bound purpose. If ISPAAD, for instance, requires additional funds for overtime and transport of regular MOA staff, this additional current expenditure is included in the project budget. Note that there are no salaries, neither for permanent nor for temporary staff, in the development budget.

232. **Other categories of recurrent spending do not show surprises or abnormal items.** The share spent on materials for resale, which would generally be items that field officers sell to farmers at subsidized prices, is low. Special expenditure, which refers to items too small to be part of the development budget and non-recurring in nature, does not show any peculiarities when detailed budget data are examined.

[48] One such occasion was the Stakeholder Workshop held on February 2014 in the context of this AgPER.

Figure 25: Composition of MOA Recurrent Expenditure by Type of Expenditure, average 2010/11 to 2013/14



Source: Budget documents and GABS

Notes:

Data for 2013/14 refer to "warranted expenditure", earlier years to actual expenditure.

The block grants to the Botswana College of Agriculture are not taken into account.

233. **Spending on personnel as a share of total recurrent expenditure has increased slightly over the past ten years, but not much** (Figure 26). In nominal Pula terms, non-PE expenditure has steadily grown, albeit moderately (Figure 27). Expenditure on feed and feed supplements for live-stock in drought years, administered by the Department for Veterinary Services and distributed through the LACs, is included in the non-PE expenditure. The expenditure item only appears in some years and has never surpassed P10 million per year.

Figure 26: Composition of MOA Recurrent Expenditure: Time Series

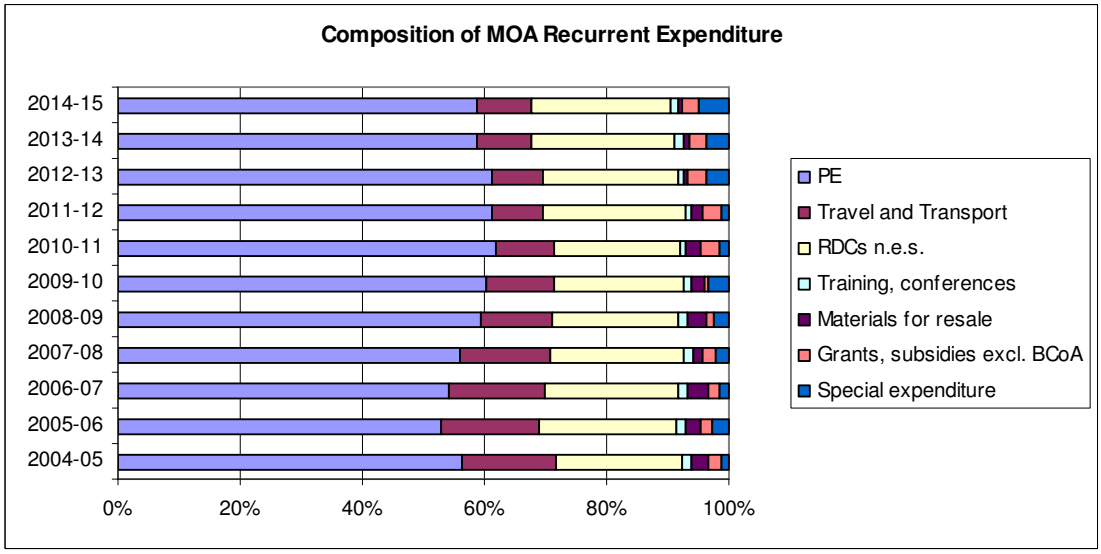
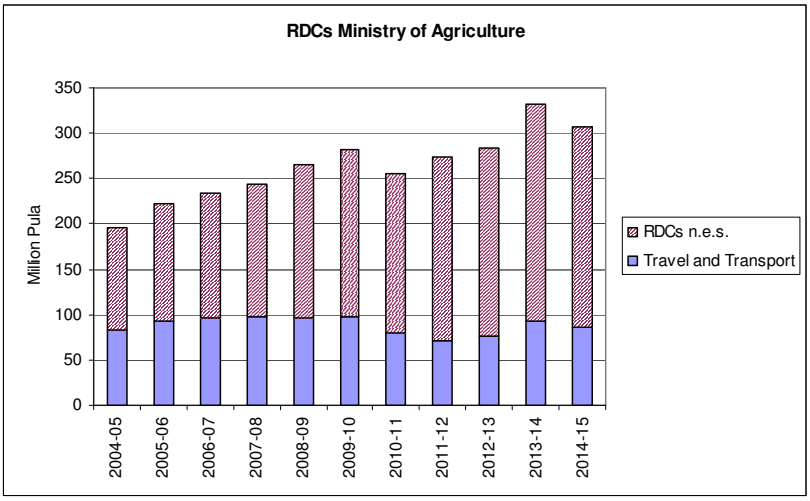


Figure 27: MOA Spending on Recurrent Departmental Charges



3.4.2 Development Spending

234. **Development expenditure is shown in a separate set of tables in the annual budget documentation, classified by spending unit, project and component.** A breakdown of spending by detailed economic classification is not available; from the budget tables and information available in GABS, it is not possible to determine the amount of capital expenditure contained in projects.[49]

235. **The projects are defined in the National Development Plan, where each project is explained in so-called Thumbnail Sketches.** Ceilings, referred to as TECs (Total Estimated Cost) are defined for each project for the duration of the plan; for NDP 10, these values cover the period April 2009 through March 2016. The initial values as they appear in the NDP 10, however, essentially covered the first 3-4 years only. Ceilings were then updated as needed. For this purpose, the annual budget books (the "Estimates") contain updated Thumbnail sketches, which are approved by the parliament together with the budget.

236. **Some projects and components in the development budget refer to normal investment expenditure for facilities of the MOA structure.** One finds projects for vehicles, construction of office blocks or IT hard- and software. The project "MOA Consultancies" serves to finance studies of various sorts for the use of the ministry. These, however, are only a minor part of development expenditure. The bulk is related to specific activities.

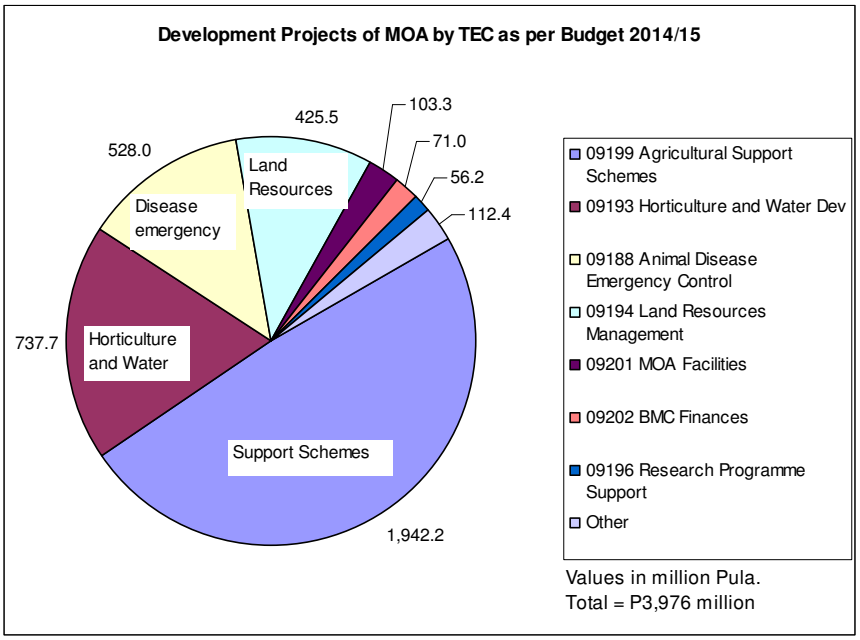
237. **By far the biggest project in recent years is designated as "Agricultural Support Schemes", with ISPAAD and LIMID as its main components.** The composition of the investment budget by projects according to the most recently proposed TECs (i.e., total expenditure authorized over the period 2009/10 through 2015/16) is shown below (Figure 28 and Table 15). The four big projects are:

- Support schemes: ISPAAD and LIMID

[49] Project expenditure is broken down by components, but not by economic classification.

- Horticulture and water: mainly the Zambezi Integrated Agro-Industrial Project
- Disease emergency control: mainly food-and-mouth disease, large share of compensation to farmers
- Land Resources Management: exclusively Pandamatenga farming block

Figure 28: Biggest MOA Development Projects Sorted by TEC 2009/10 – 2015/16



Source of data: FY 2014/15 Budget Estimates (proposal)

Table 15: Active MOA Development Projects and Evolution of TECs

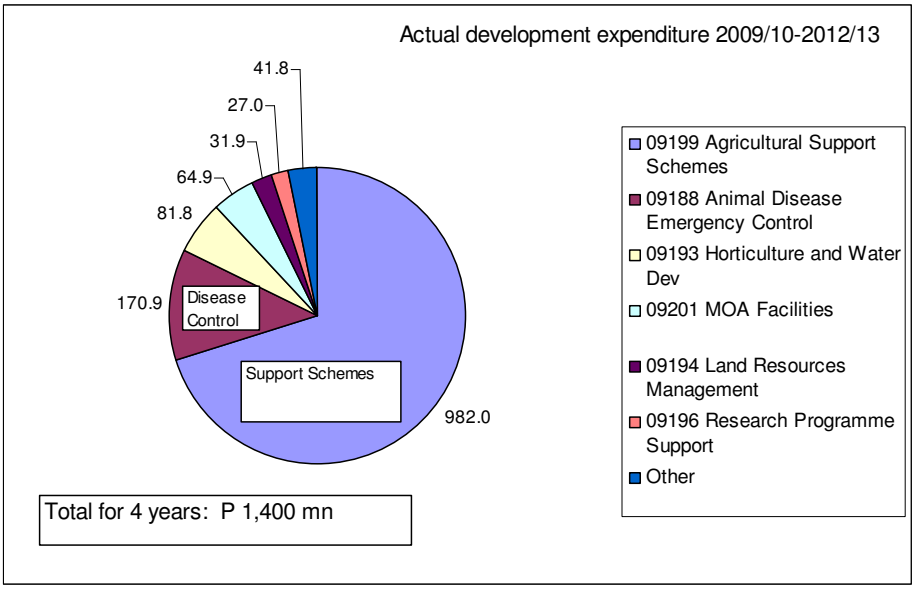
	Initial TEC	Revised TEC in Million Pula				Actual Expend.
		As per budget documentation of year			2014-15 %	2009/10-
Project Code, Name	2009-10	2012-13	2013-14	2014-15	cum.	2012/13
09199 Agricultural Support Schemes	645.0	1,213.0	1,408.2	1,942.2	48.8%	982.0
09193 Horticulture and Water Dev	85.6	85.6	137.7	737.7	67.4%	81.8
09188 Animal Disease Emergency Control	18.0	254.0	352.0	528.0	80.7%	170.9
09194 Land Resources Management	456.2	456.2	425.5	425.5	91.4%	31.9
09201 MOA Facilities	58.0	82.8	92.3	103.3	94.0%	64.9
09202 BMC Finances	0.0	0.0	0.0	71.0	95.8%	0.0
09196 Research Programme Support	21.1	49.2	50.5	56.2	97.2%	27.0
09195 Development of Extension Services	25.7	25.7	34.1	34.1	98.0%	7.4
09183 MOA Consultancies	0.6	0.6	0.6	19.6	98.5%	0.0
09181 MOA Computerisation	11.0	11.0	11.0	14.8	98.9%	6.7
09192 Crop Production and Protection	11.0	11.0	11.0	11.0	99.2%	5.8
09186 Livestock Development	11.1	11.1	10.9	10.9	99.4%	4.0
09185 NAMPAADD Implementation	10.5	10.5	10.5	10.5	99.7%	9.4
09189 Poultry Development	5.7	5.7	8.8	8.8	99.9%	5.7
09184 Dairy Improvements	2.7	2.7	2.7	2.7	100.0%	2.7
09134 HIV/AIDS Programme	0.0	0.0	0.0	0.0	100.0%	0.0
Total	1,362	2,219	2,556	3,976		1,400

Source of data: Budget Estimates and GABS tables.

238. **On the basis of the authorized TEC envelope, three projects alone make up 81 percent of the entire development budget.** Almost half of development funds go to the project "Agricultural Support Schemes". The second-largest is "Horticulture and Water Development", but only after its TEC was increased from P138 million to P738 million in the 2014/15 budget proposal, mainly to cater for studies and the first investments for the Zambezi Integrated Agro-Commercial Development Project. Animal Disease Emergency Control comes next, followed closely by the project "Land Resources Management". This latter project relates to the Pandamatenga agricultural area (where drainage canals are planned) and the construction of an irrigation scheme for use of the Zambezi waters.

239. **However, the weights change when the list is assessed on the basis of actual expenditure over the first four years of the NDP 10 from April 2009 to March 2013.** Seventy percent of all development expenditure during this period was on support schemes. Another 12 percent was for animal disease emergency control. Only 6 percent of the development expenditure was on horticulture and irrigation so far. The Pandamatenga project only spent 2.3 percent of its TEC in the first four years of NDP 10 – it has not seriously started yet as of March 2013.

Figure 29: Biggest MOA Development Projects According to Actual Spending 2009/10 – 2012/13



Source of data: Budget Estimates and GABS tables.

240. **Thus, the high weight of the TECs for the Pandamatenga ("Land Resources Management") and the Zambezi ("Horticulture and Water Development") projects is the result of plans and not yet of actual spending.** The Horticulture and Water Development Project, in which the use of Zambezi water for irrigation has a major share, did spend close to its revised TEC in FY 2012/13 (P138 million), but the increase to P738 million in 2014/15 is a provision for the first construction work in the irrigation scheme using Zambezi waters; this amount is to be spent in from FY 2014/15 onward.

241. **For the remaining three years of NDP 10 from April 2013 up to March 2016, the share still available is 65 percent of the total revised TEC total, equivalent to P860 million per year.** Contrary to the first four years of NDP 10, development expenditure will be dominated by capital expenditure on irrigation and drainage in infrastructure development for commercial farming areas – at least if the planned spending on these projects (Zambezi Integrated and Pandamatenga) will actually take place.

242. **From the project list in Table 15, the amount of capital expenditure in the development budget can be estimated.** Projects with a high content of capital expenditure are:

- Horticulture and Water Development (small dams and the Zambezi project),
- Land Resource Management (Pandamatenga development and drainage),
- MOA Facilities (offices), and
- MOA Computerization (hard- and software).

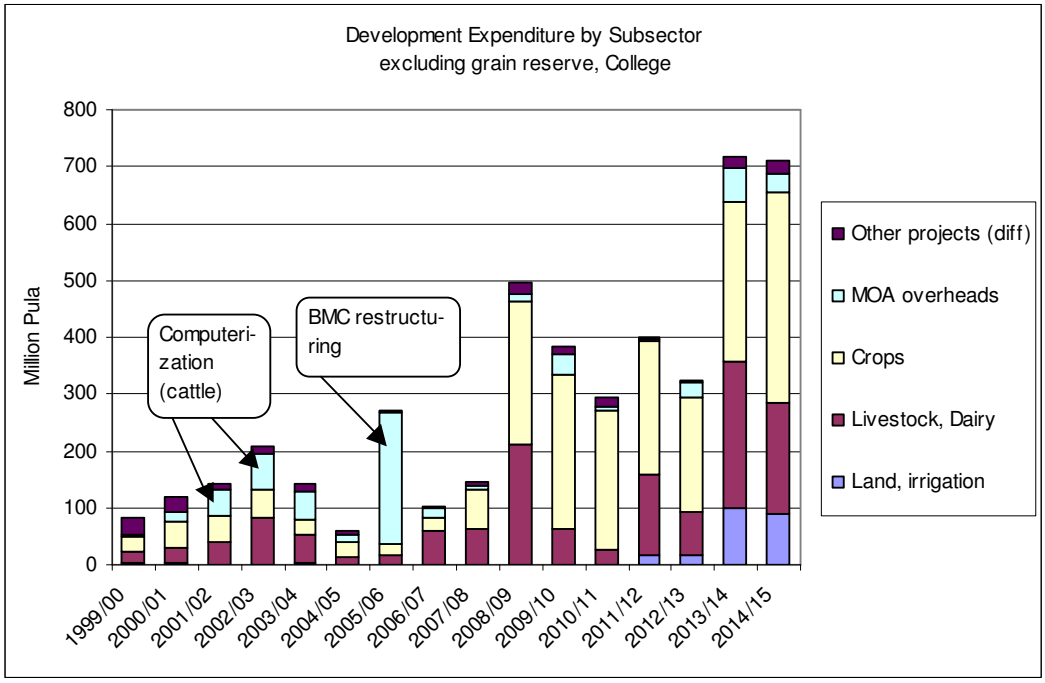
243. **The project "Agricultural Support Schemes" involves mainly subsidies on private goods in the crop sector.** In the livestock sector, through the LIMID component, the project also provides subsidies, but related mainly to investment expenditure incurred by farmers.

244. **The Animal Disease Emergency Control project is not really a "development" project.** Rather, it contains current emergency expenditure that occurs in the case of disease outbreaks and

includes compensation to farmers whose animals are culled to contain a disease outbreak. The expenditure relates to normal expenditure on public goods which occurs repeatedly, but with large fluctuations across years.

245. **The trends of development spending and its structure by subsector and similar categories are shown in Figure 30.** In this chart, projects were grouped by their purpose rather than the department responsible for its management. The project "Agricultural Support Schemes" is shown under the crops department in budget tables, but it contains a significant component for the LIMID scheme, which focuses on livestock. For purposes of creating the chart, the LIMID component was attributed to livestock, while the rest of the project spending was left with crops.

Figure 30: Trends and Structure of MOA Development Expenditure



Source of data: Financial Reports and GABS; Budget Estimates for 2013/14 and 2014/15.

Notes:

Values refer to actual expenditure, except 2013/14 and 2014/15 when revised estimates or proposed budget were used, respectively.

It was assumed that the share of LIMID in the Agricultural Support Schemes in FY 2014/15 will be similar to what it was in 2012/13, where 18.6% of the project's funds were attributed to the livestock support program LIMID.

The new project "BMC Finance" was left under MOA Overheads for consistency reasons, because financial support to BMC had been classified previously in the same way, but not always separated from normal MOA Headquarter project spending.

246. **Some observations** about Figure 30:

a) Up to 2006/07, development spending on crops was low or even very low in relation to spending on livestock. This has changed dramatically since 2008/09. In this year, spending on livestock was exceptionally high because of foot-and-mouth disease control and has fallen since.

b) Development spending overall grew significantly in 2008/09 essentially because of the spending on crops. The inception of the ISPAAD support scheme is the main factor.

c) Expenditure is set to make another major jump in 2013/14 and 2014/15. Although the figures used for these two years refer to planned rather than actual expenditure, nothing indicates that the higher amount would not be spent as planned in 2013/14.

d) Spending on Land and Irrigation is becoming significant from 2013/14 onwards. This spending relates mainly to the Pandamatenga area, used mainly for crop production.

3.5 Predictability and Relevance of the Budget

247. **Predictability of the amounts made available during a year is crucial for efficient spending.** Spending units have to micro-manage their funds over the year and set priorities within the framework of the main parameters of the budget. To verify whether budget allocations are predictable, a comparison between the initial approved estimates and actual spending serves as evidence.

248. **Governments can often reallocate funds between spending units within a ministry and across types of expenditure, with stricter limits imposed with regard to spending on personnel.** This practice is useful for allowing spending units to meet unforeseen situations and to compensate for a certain degree of weaknesses in the budgeting process. However, if in-year alterations are significant, the authority of the legislature could be undermined. The comparison also allows us to assess to what extent the general focus of the budget initially approved by the legislature is adhered to.

249. **For recurrent expenditure in Botswana, the difference between the initial budget and actual expenditure is not a cause of great concern in most of the years.** Actual spending was below 90 percent of the initial authorization in FY 2004/5, FY 2005/06 and again in FY 2009/10, and fairly close in the other years (see Table 16 further down). There is no indication of systematic underspending.

250. **For development expenditure, however, the deviations are substantial,** and actual expenditure surpassed the initially approved estimate in four out of the six years for which data were available. The reasons include delays in project implementation and higher expenditure than initially planned especially on support schemes.[50]

251. **In this context, it is important to mention that excess expenditure for the whole of a ministry is always approved by the parliament through supplementary budgets.** Government regularly submits supplementary budgets, the first of them usually in July, four months into the fiscal year. Parliamentary oversight is not violated formally because requests for additional expenditure are always submitted. However, the degree of scrutiny may be lower for supplementary budgets than it is in the context of the main budget debates because parliamentarians would be tend to focus on the items for which additional expenditure authorization is sought, and lose sight of the overall balance of the budget.[51]

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[50] When support schemes are not limited in volume and the up-take is unexpectedly high, this is the inevitable result. In a way, this is a positive aspect because it indicates that benefits are not rationed (which could lead to windfall profits and invite corrupt practices). But it also indicates weaknesses in cost estimation and budgeting.

[51] This phenomenon is by no means specific to Botswana. “Salami tactics”, which means that the salami is presented in slices while the size of the sausage remains vague, can be observed in many countries’ budget processes.

3.5.1 Recurrent Expenditure

252. **The following Table 16 shows the execution rates of recurrent allocations for personnel and non-personnel expenditure since 2004/05.** The choice of the spending units (Departments) highlights those which are significant and of particular relevance for providing services to farmers. Headquarters is included because it is a major spender. Execution rates, defined as "actual / approved estimate", which are below 90 percent or above 110 percent are highlighted.

Table 16: Comparison Between Approved Budget and Actual Expenditure in Detail

Million Pula

Department / Year	Total Recurrent			Personnel			Non-personnel recurrent		
	Estimate	Actual	Execution rate	Estimate	Actual	Execution rate	Estimate	Actual	Execution rate
Total MOA									
2004-05	566.7	542.5	96%	296.8	305.7	103%	269.9	236.8	**88%**
2005-06	672.2	574.3	**85%**	355.4	303.4	**85%**	316.7	270.9	**86%**
2006-07	647.8	623.9	96%	345.2	338.4	98%	302.7	285.5	94%
2007-08	695.3	665.1	96%	389.5	372.5	96%	305.8	292.6	96%
2008-09	801.1	822.3	103%	462.4	488.4	106%	338.6	333.9	99%
2009-10	913.1	869.4	95%	515.9	523.4	101%	397.2	346.0	**87%**
2010-11	849.7	842.5	99%	531.7	520.3	98%	318.0	322.2	101%
2011-12	890.9	864.2	97%	552.3	529.9	96%	338.6	334.3	99%
2012-13	963.0	939.5	98%	603.8	576.0	95%	359.2	363.5	101%
Research									
2004-05	52.7	48.8	93%	29.2	27.9	96%	23.5	20.9	**89%**
2005-06	70.2	56.2	**80%**	37.8	32.4	**86%**	32.3	23.7	**73%**
2006-07	67.8	59.9	**88%**	35.4	35.2	100%	32.4	24.6	**76%**
2007-08	75.2	62.0	**82%**	41.8	37.2	**89%**	33.4	24.8	**74%**
2008-09	80.9	80.7	100%	47.2	50.2	107%	33.7	30.4	90%
2009-10	91.6	82.1	**90%**	57.8	54.5	94%	33.8	27.6	**82%**
2010-11	82.0	74.8	91%	57.5	50.7	**88%**	24.5	24.0	98%
2011-12	77.2	72.4	94%	52.7	50.8	96%	24.5	21.7	**89%**
2012-13	79.4	77.7	98%	54.9	57.4	105%	24.5	20.2	**83%**
Headquarters									
2004-05	100.1	105.0	105%	20.8	19.1	92%	79.3	85.9	108%
2005-06	124.7	115.5	93%	24.1	20.7	**86%**	100.6	94.8	94%
2006-07	128.7	128.1	100%	26.5	24.0	91%	102.3	104.1	102%
2007-08	135.0	126.4	94%	30.5	28.7	94%	104.5	97.7	93%
2008-09	177.6	147.7	**83%**	63.1	29.8	**47%**	114.6	117.9	103%
2009-10	180.9	161.1	**89%**	40.6	33.0	**81%**	140.3	128.2	91%
2010-11	173.2	165.9	96%	41.0	35.4	**86%**	132.2	130.5	99%
2011-12	182.0	182.6	100%	42.1	40.2	96%	139.9	142.4	102%
2012-13	203.9	207.2	102%	43.8	37.8	**86%**	160.1	169.5	106%
Crops									
2004-05	132.7	127.1	96%	77.6	78.3	101%	55.1	48.7	**88%**
2005-06	141.9	127.0	**90%**	86.8	79.8	92%	55.1	47.2	**86%**
2006-07	141.1	128.0	91%	85.8	88.3	103%	55.2	39.7	**72%**
2007-08	149.7	140.6	94%	94.5	93.0	98%	55.2	47.6	**86%**
2008-09	83.0	93.2	**112%**	56.5	64.4	**114%**	26.5	28.9	109%
2009-10	80.3	92.7	**115%**	53.6	66.7	**124%**	26.6	25.9	97%
2010-11	72.9	90.5	**124%**	53.6	70.9	**132%**	19.3	19.5	101%
2011-12	130.2	106.0	**81%**	110.9	79.0	**71%**	19.3	27.0	**140%**
2012-13	154.5	147.5	96%	135.2	114.1	**84%**	19.3	33.5	**174%**
Livestock									
2004-05	281.2	260.6	93%	169.3	179.3	106%	112.0	81.3	**73%**
2005-06	335.4	275.6	**82%**	206.7	170.4	**82%**	128.7	105.1	**82%**
2006-07	310.3	307.9	99%	197.5	190.8	97%	112.8	117.1	104%
2007-08	335.4	336.2	100%	222.6	213.7	96%	112.8	122.5	109%
2008-09	360.2	409.5	**114%**	233.5	278.2	**119%**	126.7	131.3	104%
2009-10	441.0	437.6	99%	282.4	296.1	105%	158.6	141.5	**89%**
2010-11	406.4	414.6	102%	289.8	290.5	100%	116.6	124.1	106%
2011-12	433.9	417.6	96%	304.2	286.6	94%	129.6	130.9	101%
2012-13	455.7	444.8	98%	326.0	311.7	96%	129.6	133.1	103%

Source of data: GABS tables.

Note: "Livestock" includes the departments for Animal Health and Production, Animal Production and Veterinary Services and is therefore consistent in spite of internal reorganizations.

253. **Some comments and highlights:**

- Actual spending is close to what was allocated in the initial approved budget, except for one year (2005/06).

- The non-PE allocation to the Department for Crop Production and Forestry declined over the period. However, execution rates were low in the first four years, but often far higher than the initial allocation during the more recent years.
- Non-PE execution rates for the Department for Agricultural Research did not increase, and execution rates were consistently well below 100 percent.
- The size of the non-PE allocation to Headquarters is quite significant. Allocations have been growing consistently over the nine years shown in the table.
- Deviations between approved estimates and actual expenditure for personnel expenditure are amazingly high at the department level at times, but not very significant for the ministry as a whole.

254. **Cash availability is not a constraining factor in Botswana.** Due to its comfortable financial position, spending units usually do get the cash to back up approved budgets as and when required. Whether underspending on non-personnel budget lines is due to budget cuts during the year or inability of spending units to make use of allocated funds cannot be answered from this table. In general though, underspending in non-personnel budget lines is normally associated with limited implementation capacity in Botswana. Delays in procurement caused by, inter alia, inordinate tendering procedures, limited technical skills and supervision, procedures to be followed to access assistance by farmers, etc contribute to low implementation capacity. Budget reviews and project monitoring reports, commonly cover areas hampering timely and optimal utilization of public resources.

3.5.2 Development Expenditure

255. **Actual development expenditure deviates significantly from initial annual estimates.** In most years, the initial estimate for development expenditure was increased; under-spending against the initial estimate occurred only in FY 2012/13 (Table 17).

256. **Deviations occur in particular due to response to disease outbreaks, since the emergency measures are accounted for as expenditure under the project "Animal Disease Emergency Response", which is are part of the development budget.** Table 17 shows the execution rates for the whole ministry and the significant distance between initial estimates and actual expenditure.

Table 17: Execution Rates of Overall MOA Development Budget

Million Pula

Year	Original Budget	Actual Expenditure	Execution Rate
2008/09	208.9	534.5	256%
2009/10	317.7	412.4	130%
2010/11	295.4	293.1	99%
2011/12	308.8	399.7	129%
2012/13	407.0	338.6	83%
2013/14	628.2	690.5	110%

Source of data: Approved Estimates from overview table of development expenditure in Estimates Book; Actual Expenditure from GABS tables, Statements 6 or 6A.

Notes:

Data include development expenditure for construction by the Botswana College of Agriculture.

The figures shown for 2008/09 do not include the P201.2 million spent for the Strategic Grain Reserve (not considered as expenditure on agriculture).

257. The adjustments are even more significant at project level. The Agricultural Support Schemes project, of which ISPAAD is the main component, over-spent in FY 2008/09 by P240 million, and by another P148 million in the following FY 2009/10 (Table 18). Initial estimates became more reliable in recent years. Note that FY 2008/09 was a special year because of the surge of world food prices and subsequent government actions. It was also the first year of ISPAAD, and farmers' uptake of the scheme may have been higher than expected and therefore budgeted.

258. The Animal Disease Emergency Control project shows variations which, in this case, are to be expected. This project is initially budgeted only with payments known and outstanding at the time of budget preparation. When an emergency occurs, the budget is reinforced during the year. Therefore, variations are unavoidable and reflect flexibility rather than poor planning.

259. At the same time, the projects relating to expansion of administrative infrastructure typically underspend significantly. These projects – the projects on research, MOA facilities and extension services – generally have small allocations to begin with; actual expenditure tends to be less than these amounts by significant margins.

Table 18: Variations in the Development Budget by Major Projects

Million Pula

Code	Project		2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
09199	Support Schemes	Initial budget	25.0	110.3	200.0	225.6	250.0	320.0
		Actual expenditure	265.9	258.6	230.1	247.2	246.1	323.2
		Execution rate (%)	1063%	234%	115%	110%	98%	101%
09188	Animal Disease Emergency Control	Initial budget	4.0	14.7	2.0	20.0	83.7	118.0
		Actual expenditure	134.5	18.1	0.3	118.9	33.6	188.8
		Execution rate (%)	3362%	123%	15%	595%	40%	160%
09194	Land Resources (Pandamatenga)	Initial budget	3.0	2.5	45.0	30.0	30.0	102.5
		Actual expenditure	0.0	0.2	0.7	15.8	15.2	85.6
		Execution rate (%)	0%	7%	1%	53%	51%	83%
09196	Research	Initial budget	22.0	24.0	14.4	3.8	1.5	15.2
		Actual expenditure	16.1	6.2	15.5	4.1	1.2	12.6
		Execution rate (%)	73%	26%	108%	108%	81%	83%
09291	MOA Facilities	Initial budget		36.8	6.0	20.0	20.6	28.3
		Actual expenditure		34.6	3.0	1.9	25.4	10.3
		Execution rate (%)		94%	50%	10%	123%	36%
09195	Extension Services	Initial budget	12.5	30.0	4.1	5.0	6.2	14.3
		Actual expenditure	3.8	5.1	0.4	0.3	1.5	7.9
		Execution rate (%)	30%	17%	10%	7%	25%	55%
09198	College	Initial budget	20.0	14.0			15.0	3.0
		Actual expenditure	40.0	29.0			15.0	3.0
		Execution rate (%)	200%	207%			100%	100%
	Other	Initial budget	122.4	85.4	23.9	4.4	0.0	27.0
		Actual expenditure	74.3	60.7	43.1	11.4	0.6	59.3
		Execution rate (%)	61%	71%	180%	259%	#DIV/0!	220%
	Total MOA (excl. Grain Reserve)	Initial budget	208.9	317.7	295.4	308.8	407.0	628.2
		Actual expenditure	534.5	412.4	293.1	399.7	338.6	690.5
		Execution rate (%)	256%	130%	99%	129%	83%	110%

Source of data: Annual Estimates (for initial budget) and GABS Statements 6 and 6A (for actual expenditure)

260. **Although the systematic under-spending of projects designed to improve reach and effectiveness of the services can be a reason to be concerned, the larger parts of the observed budget variations are probably not a major problem:**

a. For planning purposes, the TEC is more relevant than the annual estimates; the TEC is binding, while the estimate at project level is not. Therefore, predictability of the envelope available in the medium-term is ensured in principle. It has been shown before (see Table 15) that the TEC is often revised upwards, hardly ever downwards.

b. The emergency response is financed mainly through additional funds made available by the Ministry of Finance and Development Planning if an agricultural emergency is diagnosed.

261. On a technical note, it was noticed that data on budget allocations per project vary considerably across sources. The statements retrievable from GABS show a column entitled "Approved Estimate" for each project and each component, followed by another column for "Warrented Provision", and actual expenditure next. The first column is more detailed than the printed Estimates (which only provide figures by project, not by component), but is often very different from the authorized data of the original Estimates. It is possible that this first column is updated whenever the Parliament approves a supplementary budget, but there does not seem to be consistency across projects and years. The annual Estimates show the previous year's figures in an additional column for each project. The figures are often different from the initial Estimates and may reflect authorized in-year budget changes. However, it is not clear which is the cut-off date and whether the figures include only changes approved by the Parliament or also administrative virements.

3.6 Spending Patterns in Relation to Policy and Priorities

262. **Since 1991, when the central objective of food self-sufficiency was replaced by that of food security, agricultural policy in Botswana has not undergone any significant changes.** The "Sector Policy Objectives" stated in that policy are:

i) improve food security and household and national level,

ii) diversify the agricultural sector production base,

iii) increase agricultural output and productivity

iv) increase employment opportunities

v) provide a secure and productive business environment,

vi) Conserve scarce agricultural and land resources.

263. Later additions, which appear in a draft revised policy presented in May 2014 for discussion, relate to poverty reduction, gender and employment for persons living with disabilities.

264. **The shift to the food security objective in 1991 implied two major changes.** First, it led to the dismantling of import restrictions, abolition of trade monopolies (BAMB in particular) and discontinuation of price support for agricultural products. It states explicitly that "government adopts a policy of import parity prices to determine the prices of crops" and that "prices of livestock and livestock products will continue to be determined by market forces".[52]

265. **Second, the policy required the discontinuation of general subsidies while allowing targeted subsidies.** The objectives of and conditions for targeted subsidies, however, were not clearly specified. The call for efficient use of resources threads through the policy statement, though. It says that "Farmers should be encouraged to produce profitable crops (both food and non food) to initially reduce and eventually eliminate government subsidies".[53] The concept of exit strategies, however, is not at all mentioned.

[52] Republic of Botswana (1991): National Policy on Agricultural Development. February.

[53] *ibid.,* para. 137.

266. Further principles which the 1991 policy defines are:

- Free and compulsory vaccinations for nationally important animal diseases and control of movement of animals.
- Construction of dams and canals will be considered as capital development paid for by government; users will pay for the usage of irrigation water and cover operational costs.

267. **The importance of technology is mentioned in several places.** However, no hints are provided with regard to the actual strategy to achieve this. It is silent about the expected role of commercial farming and does not differentiate between traditional and commercial farming with regard to targeted changes of technology or production patterns.

268. **The policy does not define priorities between the different subsectors and does not mention spending.** National development plans are more specific with regard to strategies and projects. The cost estimate for projects shows preliminary spending priorities, but since project ceilings over the plan period are revised from year to year, the initial weight of subsectors and functions changes over the years.

269. **In broad terms, the principles of the agricultural policy have been respected in spending except for the principle of granting only targeted subsidies.** As will be shown later, ISPAAD contains significant spending for subsidies. A smaller part of them is clearly untargeted because virtually all crop farmers can benefit. For the larger part, subsidies are granted with the intention to either assist poor and small subsistence farmers or meant to facilitate technological change by reducing the risk farmers are taking by trying and applying them. The structure of spending also reflects efforts and costs of disease control measures.

270. **Diversification was promoted by spending on irrigation and development of horticulture, in line with the policy.** It is not clear, though, whether the principle that users should assume the operational cost of irrigation facilities through water charges has been adhered to. One neither finds substantial revenues from water charges in expenditure reports nor significant costs for operation and pumping of irrigation schemes.

271. **Increasing production and productivity has been all along also a factual objective of strategies and spending.** However, the policies have not been very successful on both counts. Spending may not have resulted in improvements as planned, but spending did follow policy.

4. PROSPECTS FOR GROWTH AND ROLE OF PUBLIC SPENDING

272. **The review of the volume of spending on agriculture, expenditure patterns by various dimensions and the comparison between initially budgeted and actual expenditure lead to three conclusions, namely:**

1. Public expenditure on agriculture amounts to only 3-4 percent of total public expenditure. This is way below the Maputo target of 10 percent.

2. However, Botswana spends a lot of public funds on a small sector. Spending on agriculture may be small in terms of the share of the budget, but it is very high with regard to the sector's contribution to GDP.

3. No major flaws in the structure or process of public expenditure for agriculture are apparent. Although there is room to improve, the planning and execution process and the structure of expenditure are such that one would expect a fair degree of effectiveness.

273. **However, growth of the sector in terms of value-added, production and productivity was at best very limited.** This raises two questions. First, has expenditure really been ineffective? In order to provide an answer to this, it is necessary to look at the role of public institutions in providing public goods to complement efforts of the private sector on one hand, and efforts and expenditure to facilitate growth on the other hand.

274. **The second question is whether it would be recommendable that Botswana increases expenditure on agriculture under these conditions.** Can areas be identified where public expenditure can get the sector out of stagnation onto a path of sustainable growth? This is related to the expenditure target of the Maputo Declaration, where governments made a commitment to increase expenditure on agriculture to ten percent of overall public spending in order to permit and facilitate growth of at least six percent. How would production and income derived from agricultural activities react if such volume of funds are spent in a focused manner? Which programs and activities could absorb these funds and have the prospect of high impact on income, food security and poverty?

275. **This chapter looks first at the facts which confirm the statement that expenditure has been high and growth virtually absent.** It then attempts to explain why expenditure has not lead to more visible growth. Finally, it presents suggestions and proposals about what could be an adequate spending strategy for Botswana in view of the Maputo target.

4.1 Level of Expenditure, Expenditure Structure and Growth Indicators

4.1.1 Expenditure Relative to GDP in Agriculture

276. **It was mentioned in Chapter 2 that public expenditure on agriculture in Botswana is high in relation to the size of the sector.** Table 19 below shows that this has been an on-going

feature in Botswana. Budgets for the three years 2012/13 to 2014/15, which make provision for increased expenditure on agriculture, suggest that the ratio will not be significantly lower.

277. **The ratios shown, of roughly 50 percent, mean that for every 1000 Pula of income obtained from agricultural activities,** the government assumes costs amounting to roughly 500 Pula. If these inputs were private rather than public goods and producers would have to assume the cost, their income as well as agriculture's contribution to GDP would be reduced to half.

Table 19: Agricultural GDP Compared to Public Spending on Agriculture – Botswana

Million Pula

Fiscal Year	Calendar Year	Agric Expenditure	Ag GDP	Agric Expenditure / Ag GDP
1999/00	2000	451	825	55%
2000/01	2001	482	831	58%
2001/02	2002	570	835	68%
2002/03	2003	648	1,012	64%
2003/04	2004	642	950	68%
2004/05	2005	594	928	64%
2005/06	2006	793	1,211	65%
2006/07	2007	722	1,505	48%
2007/08	2008	843	1,888	45%
2008/09	2009	1,298	2,071	63%
2009/10	2010	1,191	2,717	44%
2010/11	2011	1,109	2,636	42%
2011/12	2012	1,226	2,963	41%

Sources of data: Budget documentation and GDP Statistics from Statistics Botswana.

Note: Agricultural Expenditure ("Ag Expend") refers to actual expenditure.

The data shown in this table is identical to the data underlying Figure 9 in Chapter 2. Spending data for 2008/09 do not include the outlay for the Strategic Grain Reserve. Data for 2011/12 do not include the treasury loan to BMC.

All data are in current prices.

278. **Comparative data for other countries show that the level of expenditure on agriculture in Botswana is indeed very high in view of the small size of the sector.** The ratio between agricultural spending and agricultural GDP varies considerably across countries and depends, of course, on the policy on subsidies. Different sources show significantly different figures and ratios for some countries, which are likely to be related to different definitions of "agriculture" in GDP and classification of public spending.

Table 20: Agricultural Expenditure in Relation to Agricultural GDP – Regional Comparison

	AgSpend / AgGDP (%)				AgGDP / Total GDP (%)		
	Year	SPEED Database	Year	Resakss Map	WDR (2006)	Resakss Year	Resakss Map
Benin	2008	3,21	2008	4,88	32	2005	32,2
Botswana	2009	48,62	2010	55,19	n/a	2010	2,5
Burkina Faso	2010	8,00	2010	8,27	n/a	2010	22,8
Côte d'Ivoire	2009	1,79	2009	2,60	21	2010	22,8
Kenya	2010	4,97	2010	5,67	28	2010	25,1
Madagascar	2008	5,72	2008	16,92	28	2009	29,1
Malawi	2009	20,56	2009	21,90	36	2010	30,1
Mozambique	2010	3,73	2010	6,62	22	2010	31,9
Namibia	2006	13,77	2006	11,34	11	2010	7,5
Rwanda	2010	6,34	2010	6,12	41	2010	32,2
South Africa	2010	6,47	2010	24,57	3	2010	2,5
Tanzania	2009	7,85	2009	8,68	45	2010	28,1
Uganda	2010	3,12	2010	3,36	32	2010	24,2
Zambia	2009	8,91	2009	9,22	16	2010	20,4

Sources of data:

IFPRI/Resakks database accessible at http://www.resakss.org/map/, accessed April 2014

SPEED database: File received from World Bank

World Bank: World Development Report 2006, Annex Table 4.

Note: The two sets of data sometimes show quite different values for the same year. They could be related to the treatment of subsidies which benefit consumers but appear in agricultural budgets, or be due to different operational definitions of the agricultural sector in GDP or spending data. We did not dig deeper to find the exact reasons.

279. **However, it is evident that Botswana still spends more than twice the maximum amount that can be seen in other countries,** and has done so consistently over the past dozen years. This is not due to high public investments, not due to overboarding support schemes and subsidies. The main factors are high recurrent expenditures and a high wage bill, and low agricultural production and productivity.

4.1.2 No Major Flaws in Expenditure Structure and Procedures

280. **No serious mismatches or inefficiencies became apparent in the analysis and public spending on agriculture in Chapter 3.** On the contrary: a number of aspects which tend to be problematic in other countries present themselves in a quite positive way in Botswana:

a) Budget allocations are relevant in the sense that cash is always available if and when needed to spend the budget allocation. The budget is not systematically underspent when actual expenditure is compared to the initial budget for the year (i.e., before supplementary budgets).

b) The ratio of non-salary expenditure items to personal emoluments could be higher, but is not disturbingly low.

c) Agricultural research receives roughly 10 percent of the total expenditure on agriculture; the share could be higher, and probably should be higher, but research is not being starved and crowded out.

d) The percentage of staff of the Ministry of Agriculture assigned to districts and to places other than ministerial headquarters appears reasonable. Although information about the actual num-

ber of extension staff, who would transmit technology to farmers, is not available[54], a sufficient number of staff appears to be stationed in districts; whether they are available and qualified for extension work is another question. Yet, the central wing of the ministry is not overly "heavy".

f) The part of the development budget spent on capital expenditure is generally low at present, but probably quite adequate in view of the country's low potential for additional irrigation schemes.

g) Virtually the entire amount of spending on agriculture is shown in the budget of the Ministry of Agriculture. Spending is transparent, as there aren't any significant amounts of extra-budgetary funds going to the sector. Donor spending is very low and on-budget. Thus, the bases for conscientious planning and resource allocation exist.

h) Botswana spends increasing amounts on support schemes, which essentially imply subsidies and the free provision of goods to farmers that can be provided by the private sector. However, the volume of subsidy packages (P246 million in 2012/13 out of total expenditure of P 1,183 million, or about 20 percent) does not appear to crowd out expenditure on other functions that have been shown to be key to sector development, such as research and extension.[55]

i) Emergency funds for drought relief and expenditure for compensation of farmers in case of disease outbreaks are made available as additional funds through supplementary budgets or presidential decrees when the situation occurs. Thus, Botswana is avoiding situations where funds would have to be taken from on-going projects or recurrent expenditure for this purpose.

4.1.3 Absence of Significant Growth

281. One might therefore expect that the consistently high level of public spending combined with favorable financial management procedures and efficient public service delivery would have a substantial impact on growth and development of the sector. **However, not much growth is visible in overall statistics on agricultural production, productivity and value-added.** But different indicators produce different trends. Growth rates reported for a short period (say, five years) depend critically on the reference year, i.e. whether it was a good or a bad year. More details and detailed analysis are shown in Annex 1.

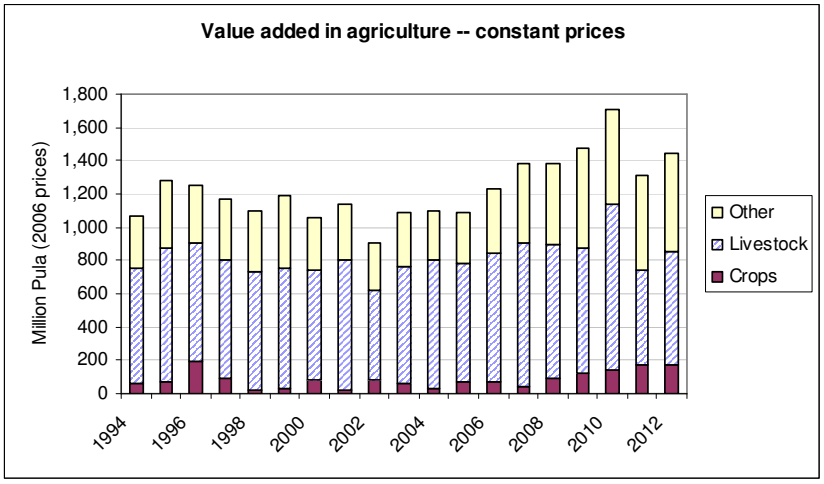
282. **A first indicator to sustain this assertion is the agricultural sector's contribution to GDP, measured as the sector's value-added (reflecting income originating from agricultural activities).** Although real value-added is a good indicator of growth in principle, data provide only a broad picture in practice because of the possible errors than can be introduced into such series by the way the series in constant prices are calculated – see Annex 1 for further information about this important aspect.

[54] Extension is not budgeted under a separate heading and available data on personnel at local level do not distinguish between the roles of administration, regulatory control, disease control and liaison to farmers.

[55] A great number of publications about the history of and factors behind agricultural growth in countries with strong growth in agriculture point to the importance of technology and the crucial role of agricultural research and extension as a transmission belt of innovations to farmers.

283. **The general picture evolving from looking at real value-added is that value-added, or income derived from economic activities in the sector, has not changed much overall,** although the development since 2008 may suggest an upward trend (Figure 31).

Figure 31: Evolution of Real Agricultural Value-Added



Source of data: Statistics Botswana

Note: Values do not include adjustments for imputed financial services. See Table 21.

Table 21: Value-added in Agricultural Subsectors, Constant 2006 Prices

Constant Million Pula

Year	Livestock	Crops	Other	Discrepancy	**Total Agriculture**
1994	689.5	64.9	314.5	-12.9	1,056.1
1995	800.3	70.6	412.2	-0.4	1,282.6
1996	712.2	191.9	341.8	-4.7	1,241.2
1997	716.3	91.7	360.1	-13.0	1,155.1
1998	714.2	19.4	366.1	-2.7	1,097.1
1999	720.6	33.2	432.5	5.2	1,191.5
2000	661.5	80.0	314.9	6.5	1,062.9
2001	783.2	18.2	339.0	1.4	1,141.8
2002	546.7	77.3	282.2	1.7	907.9
2003	703.8	56.3	329.4	1.0	1,090.6
2004	778.1	27.5	295.2	-5.1	1,095.8
2005	711.6	70.6	309.7	-23.6	1,068.3
2006	771.4	76.2	387.6	-29.1	1,206.1
2007	862.3	37.8	486.1	-27.3	1,358.9
2008	798.6	94.7	494.0	-1.8	1,385.6
2009	760.3	118.4	598.2	-3.0	1,473.9
2010	998.1	142.1	564.7	15.3	1,720.2
2011	573.7	170.5	566.1	16.1	1,326.5
2012	683.6	169.1	593.2	15.4	1,461.3

Source of data: Statistics Botswana

Note: The "Discrepancy" relates to imputed charges of financial intermediation, which Statistics Botswana applies only to the total of agriculture and not to its components. They are shown in this table for completeness.

284. **Agricultural GDP in constant prices has stagnated between 1994 and 2005, then increased from 2006 to 2010.** The drop in 2011 and 2012 is entirely due to the livestock sector, caused mainly by outbreaks of foot-and-mouth disease and a drought in 2011. Agricultural GDP grew from about P1,100 million around the year 2005 to an average of P1,500 million for the years 2009-12. There was clear, albeit modest growth in the crops and the "other" subsector (a large part of "other" is horticulture).

285. **A closer look at GDP and production statistics (see Annex 1), which provides details about the subsectors and distinguishes between commercial and traditional agriculture, allows further differentiation.** The picture is more mixed than the summary chart above might suggest, but growth has definitely been neither strong nor robust. The conclusions with regard to the period between the years 2000 and 2012 are as follows:

1. Growth and development are clearly visible in the horticulture subsector.

2. There was also growth in local chicken meat production, but this sector received only very modest public support through the Ministry of Agriculture.[56]

3. Production of grain crops fluctuates, variations across years are substantial. However, no upward trend is visible in any of the efficiency related variables like area planted, ratio of harvested to planted area, or yield per hectare.

4. In the livestock sector, the situation is similar. The number of animals remained essentially the same over the last 20 years, with fluctuations. The death rate, a particular problem in the traditional sector, remained high in that sector. The offtake rate, which reflects death rates and management practices, has not improved. The weight per carcass continues to be around 200 kg, while 220 kg is said to be what international markets prefer.[57] The livestock sector's contribution to GDP in constant prices has remained virtually unchanged over the period 2000 to 2012.

286. **Production has, by and large, not kept pace with population growth.** The degree of self-sufficiency has declined. With the exception of horticulture and poultry meat production (the latter debatable because of the high cost of protection to the consumer), agriculture did not contribute to the diversification of the economy on any significant scale.

4.2 The Link Between Public Expenditure and Growth

287. **The apparent absence of significant growth does not automatically imply lack of effectiveness of public expenditure, though.** Policy and spending have two objectives that need to be distinguished here:

a) Provision of public goods that are required for the sector to function, and

[56] The poultry industry benefited from quantitative trade restrictions which result in an almost complete elimination of import competition in normal times. It has no significant backward linkages to the local agricultural sector.

[57] The average carcass weight depends on the nutritional status of animals and genetic factors of different breeds in particular.

b) Investments (like for irrigation) and support for the formation of capital stock by the private farming sector (like subsidies for fencing and wells), and improvements of farming methods, usually through the introduction of new technologies in production, product innovation and marketing.

288. **While the agricultural services in Botswana have broadly succeeded with regard to the first set, little results can be seen with regard to measures designed to promote growth, employment, poverty reduction and diversification.**

289. The following section looks closer at the two sets of services and activities.

4.2.1 Conceptual Framework

290. **The first set of services aims at maintaining production levels.** The set includes disease and pest control measures, quality controls to assure food safety and standards required by export markets, and also a certain amount of agricultural research required in order to introduce new crop varieties as the existing ones may become obsolete because of adaptation of carriers of pests and diseases.

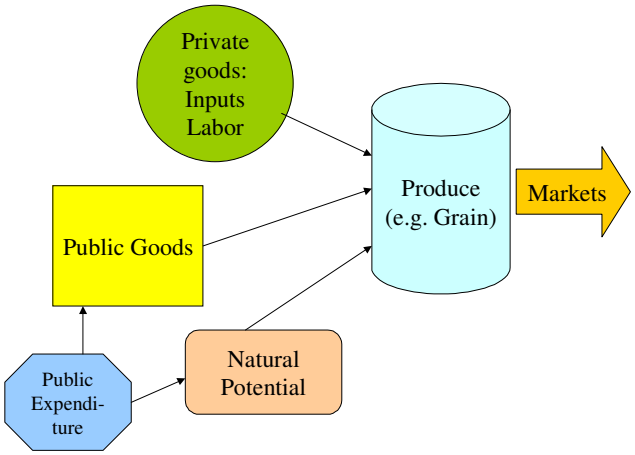
291. **These public goods provided by government are a necessary <u>complementary</u> input into the production process led by private operators.** A certain amount of public goods is required for each unit of agricultural produce. If the required public goods are not available, production will remain below potential. Where areas and production levels are increasing, the provision of public goods of this set needs to expand. Without these public goods, the existing potential cannot be used to its full extent.

292. **Public goods and normal inputs with the characteristics of private goods are complements, not substitutes.** The ratio between required public and private goods is relatively fixed for a given situation characterized by production technology and organizational structure of the sector. Further increases in the provision of these public goods will not lead to higher production. The "law of diminishing returns" applies: gains of income and output for additional expenditure on public goods will become less and less if the provision exceeds the optimal combination.[58]

293. **In addition to public and private goods, there is a group of input factors which refer to natural and also, to some extent, cultural conditions.** Where such factors inhibit further growth, neither additional private investment nor additional public expenditure would result in additional growth. These natural boundaries to growth in agriculture are important in Botswana and are dictated by the semi-arid climate, low and irregular rainfall and the scarcity of water resources potentially available for irrigation.

[58] This can be compared to the construction of additional roads in an area with already reasonable coverage and no major congestion. While the lack of roads would slow down growth and income, building more roads in an already well-served area will have very little impact and represent a waste of funds.

Figure 32: Factors Determining Agricultural Production



294. **To some extent, the constraints imposed by limited "Natural Potential" can be reduced through private and public investment.** Irrigation serves to make the provision of water more reliable and to expand the area suitable for agriculture. Wells and boreholes are required to make use of grazing areas where natural supply of water for animals is not available. The combination of the production factors is subject to technological advances which can be brought about by private as well as public efforts.

4.2.2 Provision of Public Goods

295. **Public spending and agricultural policy have made it possible to more or less maintain agricultural production at the usual levels. This alone must be seen as an achievement.**

296. **The expenditure required for providing needed current public goods in Botswana is high,** and significantly higher than in other countries in the region, for several reasons:

- The high pressure of animal diseases and the transmission of FMD via wild buffaloes push the cost of disease control up. Additional sophistication is required for exporting to the European markets, and this as well requires public funds.
- Droughts, which are a recurring and frequent phenomenon in Botswana, make insurance schemes indispensable; without them, livestock holders as well as crop farmers would take too long to recover from the drought effects. Government provides this "insurance" by way of providing emergency feed for animals and starter kits for crop farmers during and after a drought. Where old people's savings are invested in livestock, this generation would otherwise need to take on particularly great losses.[59]
- Farming areas are dispersed, the cost of agricultural extension is therefore higher than in densely populated farming areas in many other countries.

297. **Public expenditure on capital items that open natural potentials, however, was not very significant since there is only limited scope for this type of expenditure.** Investment in irrigation

[59] See Annex 1 for details of the age structure of holders of traditional livestock.

facilities, partly borne by the budget and partly by private farmers, has allowed to increase production of horticultural products.

4.2.3 Agricultural Technology

298. **Policy and expenditure were much less successful with regard to introducing advanced technologies and transforming the structure of the sector.** Data from the agricultural surveys show that advances in land productivity have hardly taken place; productivity indicators in the traditional sector remain very low. The use of fertilizer remains at a very low level as well. Indicators of the productivity of livestock holdings show no upward trend.

299. **Transformation of the sector would involve a gradual transition from traditional farming for subsistence, with only occasional sale of surpluses to markets, to farming as a business with sales being the main objective of holdings.** Although the number of commercial farmers has increased slightly over time, the weight of commercial production is significant only in horticulture and the production of sorghum. New crop varieties have been introduced continuously, these may have played a role in allowing to maintain production levels. But the effects on productivity remain insignificant. Mechanization has been on the agenda since many years and is being emphasized more in recent years. Mechanization may have allowed to maintain production levels in spite of relatively high average age of farmers.

300. **But it has not visibly led to production increases by way of higher per-hectare yields or areas harvested.** Whether this is due to low levels of expenditure on technology generation and dissemination or whether this is due to "hard" natural constraints is not immediately clear and will be discussed further down.

301. Row planting is a particularly vexing issue. Since many years, MOA has been advocating row planting of grains and, in particular, maize as a key technology to increase per-hectare yields. The ISPAAD support scheme offers free fertilizer to small farmers if they plant in rows.

302. **Yet, it appears that farmers continue to broadcast seeds, the uptake of the fertilizer subsidy by small farmers was low.** Our team tried to understand why this is the case. Tentative responses are two. First, small farmers typically intercrop grains with legumes in order to spread the risk and, possibly, to improve soil fertility. Intercropping can be done in rows, but it is traditionally done by way of mixing seeds. Secondly, the planting season is often very short and depends on when the first rains fall. Planting has to be done within one week after the first rains while the soil still contain some moisture. The number of available row planters is not sufficient to ensure planting during this short and unpredictable period. As a result, farmers prefer to broadcast seeds rather than missing the planting period while waiting for row planters to become available.

303. It may not be economically rewarding to increase the number of row planters if they can be put to use only during a very short time. Thus, calling for the acquisition of more row planters may not be a reasonable solution.

304. **The reason why few small farmers use fertilizer although it is available for free is possibly to be explained by the unpredictability of rainfall.** Fertilizers have positive effects if rains are adequate, and are particularly effective in combination with hybrid seeds. However, when precipitation is low or not adequately spread over the growing period, hybrids perform worse than traditional varieties and the application of fertilizer risks to reduce rather than increase yields.

305. **In a nutshell, it transpires that the main technology packages advocated are of questionable benefit to small farmers.** Rainfall is the constraining factor.

306. **The Research Department, confronted with the question of possibly inadequate testing of innovation packages in real life settings, responded that they lack economists to analyze on-farm trials.** Although this may be true, the question why the Research Department does not cooperate with the Botswana College of Agriculture, which is located next door, remains unanswered.

4.2.4 Experience With Support Schemes

307. **Expenditure on agricultural support schemes has risen tremendously since 2008, also because the NDP 10 placed more emphasis on these than previous plans and policies.** An assessment of the schemes needs to take into account that they have more than one objective. In the crop sector, their design includes elements of facilitating the adoption of modern technologies through enhanced use of improved seeds, fertilizer and more effective cultivation methods facilitated by mechanization. In the livestock sector, the schemes support better methods of range management through fencing off parts of traditional land and sinking boreholes to water the animals, which is an important measure for reducing the impact of periodic droughts as well as opening up grazing areas.

308. **The schemes also have social objectives and contain elements of a focus on small livestock holders and subsistence farmers.** By providing highly subsidized inputs to subsistence farmers who do not and will not produce sufficient quantities to sell, farmers' welfare is improved even if the additional output does not yield additional cash income that could buy the inputs in the following season. The subsidies also reduce climatic risk in that they limit financial losses in case of crop failure.

309. **The main instrument to introduce technological improvements into the crop sector is the ISPAAD component of the "Agricultural Support Schemes" project.** It provides mechanized plowing, planting, seeds, fertilizer and herbicides to smallholders who plant up to 5 hectares for free. Fertilizer is provided only for farmers who plant in rows. Annex 2 provides a full description of the benefits and conditions.

310. **ISPAAD rules changed effective from the 2013/14 planting season.** A categorization of farms into subsistence / emerging and commercial was introduced. While the original scheme gave benefits mainly to small farmers (only subsidies on seeds for food crops had no limit), emerging and commercial farmers can now also access subsidized fertilizer and herbicides. The subsidy rate for seeds for emerging and commercial farmers was lowered from 50 percent to 30 or 35 percent for large and emerging farmers, respectively. Herbicides are now included in order to avoid discrimination against conservation farming methods like minimum tillage, which requires the application of herbicides on fields that were not plowed.

311. **The objectives are mentioned in the original 2008 guidelines:**

- "Increase grain production
- Promote food security at household and national levels,
- Commercialize agriculture through mechanization,
- Facilitate access to farm inputs and credit and
- Improve extension outreach."[60]

[60] Ministry of Agriculture (2008): Guidelines for Integrated Programme for Arable Agriculture Development (ISPAAD). Gaborone.

The objectives no longer appear in the new guidelines. The social objectives – reduce rural poverty by supporting subsistence farmers and create jobs – appear prominently in discussions and political discourse, but are not explicitly mentioned in the Guidelines.

312. **Explicitly mentioned expectations or targets** are that small farmers shall produce 1 ton per hectare, emerging farmers 1.5 tons per hectare and commercial farmers 2.5 tons per hectare.

313. **By providing a full package for virtually free for small farmers and at highly subsidized prices for farmers with somewhat larger areas, ISPAAD aims at reducing the risk for farmers who adopt modern farming methods** – if they had to pay the full cost of inputs and possibly take loans to finance these, the adoption rates would be far lower when farmers mistrust new methods that are not proven from their point of view.

314. **In the years 2009/10 through 2012/13, ISPAAD (for crops) and LIMID (for livestock) absorbed about P250 million per year, equivalent to about 20 percent of total expenditure of the Ministry of Agriculture.** Support Schemes (ISPAAD and the much less costly LIMID) make up 70 percent of development expenditure in this period (see Section 3.5.2). In FY 2013/14, the amount of P266 million was spent on ISPAAD, P56 million on LIMID. Thus, the volume of expenditure on these support schemes is significant.

Table 22: Actual Expenditure on Support Schemes

million Pula

FY	ALDEP & ISPAAD	LIMID I & II	Total
2007/08	16.6	8.0	24.6
2008/09	234.1	31.8	265.9
2009/10	221.1	37.1	258.2
2010/11	209.1	21.0	230.1
2011/12	223.2	24.0	247.2
2012/13	200.9	45.2	246.1
2013/14	266.0	55.5	321.5

Source of data: GABS, Statements 6.

Note: Data shown for 2013/14 refer to provisional actual expenditure.

315. **However, the results derived from ISPAAD are disappointing.** Neither production quantities nor yields have significantly improved. According to an Economic and Social Impact Evaluation[61], press reports and feedback obtained from stakeholders during the AgPER Workshop in February 2014, ISPAAD has suffered from a number of implementation problems. Among the implementation flaws were:

- The lack of input packages adapted to local conditions; ISPAAD provided "one-size-fits-all" packages;
- Free plowing led to farmers plowing and planting more than they could weed and harvest; it is also possible that more marginal land was plowed and planted than farmers would prepare if they had to assume at least part of the cost;
- ISPAAD administrative tasks executed by extension services are said to have weakened the effectiveness of extension services.

[61] BCA Consult (2012): Consultancy for the Poverty and Social Impact Analysis of the Integrated Support Programme for Arable agriculture Development (ISPAAD) – Final report. Gaborone, November 2012

316. **The value of total traditional crop production clearly remained below the cost of ISPAAD.** At current BAMB prices[62], the annual spending of ISPAAD, some P200 million per year, could buy 83,000 tons of Grade 1 white maize, 119,000 tons of Grade 2 white maize, or 68,000 tons of Grade 1 sorghum. Production of the traditional sector reached a maximum of 35,000 tons in the peak year 2011, and between 13,600 and 20,900 tons in the other years of the period since 2008. Assuming that traditional farmers produce only Grade 1 white maize, the production of 35,000 tons would fetch P84 million when sold to BAMB. This is far below the cost of ISPAAD.

317. Comparison of data on area and production, shown in Table 23 below, also shows that the target of one ton of grains per hectare was completely missed. Admittedly, not all farmers had taken up the subsidy, but the majority did. Admittedly, many farmers did not row-plant (for various reasons) and therefore did not qualify for subsidized fertilizer. Yet, the distance between the target and reality is striking.

Table 23: Traditional Sector Production of Grains (Maize plus Sorghum), Selected Years

Year	Planted (ha)	Harvested (ha)	Production (tons)
1993	222,350	88,748	13,773
2004	107,668	81,540	17,804
2006	136,368	106,715	27,265
2007	70,229	15,140	3,085
2008	151,662	83,943	13,627
2009	187,742	129,438	20,944
2010	170,881	109,417	16,721
2011	214,884	143,767	35,016
2012	192,732	79,966	14,911

Source of data: Statistics Botswana: Agricultural Survey Reports, various years.

318. **Looked at from the micro perspective, ISPAAD paid roughly P1,200 per hectare for plowing, planting and seeds and fertilizer.** In the case of Grade 1 white maize, this is equivalent to the value of 500 kg. Yields should have increased by this amount. But in reality, total yield was well below this figure for most of the farming areas.

319. **According to internal ISPAAD data, the number of beneficiaries of the subsidized plowing and harvesting was typically about 100,000.** Assuming that all traditional farmers took the subsidy, the average grain harvest per beneficiary then amounted to a maximum of 350 kg per beneficiary in 2011 and only about 160 to 200 kg for the other years in the period since 2008.

320. **The implementation of the ISPAAD scheme had flaws.** Maybe, results would have been visible if ISPAAD rules and implementation practices had been better. However, it seems unlikely that streamlined rules and better organization could have increased average harvests to about 600 kg per beneficiary.

321. **Unfortunately, detailed monitoring of ISPAAD at farm level appears was not done.** It would be valuable to learn from case studies where ISPAAD supplies available in time, taken up and put to use, in order to see what the effect under good circumstances could be.

[62] Prices of BAMB, the buyer of last resort for grains and beans, for the 2013/2014 marketing season were per metric ton: for sorghum: P2,950 for Grade 1, P2,065 for Grade 2; for white maize P2,400 for Grade 1, P1,680 for Grade 2. Source: BAMB website www.bamb.co.bw.

322. **Production is most probably constrained by factors beyond the availability of machine power, seeds, fertilizer and access to seasonal credit.** These factors relate to remaining labor constraints for weeding and harvesting or the natural conditions of the areas where traditional farmers grow crops.

323. **Furthermore, it is questionable whether a policy that aims at transforming traditional arable agriculture into a market-oriented business can be successful in Botswana.** The main constraint is the high variability of rainfall and therefore of yields, which make commercial arable agriculture too risky to be run as an enterprise in most circumstances and most areas where traditional farmers operate.

4.3 Commercial Farming Achievements as Target for Traditional Agriculture

324. **Yields per hectare are much higher in commercial crop farming, particularly with regard to sorghum, but also for maize** (Table 24). In the cattle / beef subsector, commercial farms achieve lower death rates and higher offtake rates than traditional cattle holders. The productivity gap between traditional and commercial farms tends to be seen as an indication of a potential for growth and development in the traditional sector, and policies aim to upgrade traditional farming to productivity levels achieved in the commercial sector.

325. **Is this realistic, and is commercial farming a useful reference for the traditional sector?** Can public services provided to traditional farmers achieve that the gap be narrowed? Is the lack of public support services and maybe infrastructure for traditional farmers a crucial constraint which keeps productivity levels low?

326. **There are a number of reasons to question the comparability of the two subsectors.** In **crop production**, yields per hectare in the commercial sector are five to ten times higher in the commercial sector than they are in the traditional sector (see Table 24).

Table 24: Crop Production and Yields, Traditional Versus Commercial Sector

	Traditional					Commercial					Total	
	Planted (ha)	Harvested (ha)	Production (tons)	Yield / planted (kg/ha)	Yield /harvested (kg/ha)	Planted (ha)	Harvested (ha)	Production (tons)	Yield / planted (kg/ha)	Yield /harvested (kg/ha)	Production (tons)	
Maize												
1993	83,956	22,186	2,976	35	134	1,301	1,198	1,278	982	1,067	4,254	
2004	63,214	42,804	7,223	114	169	615	586	313	509	534	7,536	
2006	77,884	60,289	14,896	191	247	148	126	260	1,757	2,063	15,156	
2007	40,253	8,048	1,830	45	227	422	404	328	777	812	2,158	
2008	88,437	48,533	8,416	95	173	176	130	553	3,142	4,254	8,969	
2009	120,727	82,461	13,040	108	158	281	249	230	819	924	13,270	*
2010	109,792	65,184	10,540	96	162	324	239	239	738	1,000	10,779	*
2011	151,164	101,107	29,070	192	288	325	318	165	508	519	29,235	*
2012	140,937	55,735	7,450	53	134	385	316	227	590	718	7,677	
Average 2004-12	99,051	58,020	11,558	112	195	335	296	289	1,105	1,353	11,848	
Sorghum												
1993	138,394	66,562	10,797	78	162	5,924	5,821	5,730	967	984	16,527	
2004	44,454	38,736	10,581	238	273	11,835	11,832	1,175	99	99	11,756	
2006	58,484	46,426	12,369	211	266	5,833	5,790	29,124	4,993	5,030	41,493	
2007	29,976	7,092	1,255	42	177	3,139	2,935	10,519	3,351	3,584	11,774	
2008	63,225	35,410	5,211	82	147	9,931	7,504	18,421	1,855	2,455	23,632	
2009	67,015	46,977	7,904	118	168	11,686	11,684	21,475	1,838	1,838	29,379	
2010	61,089	44,233	6,181	101	140	15,525	14,521	25,145	1,620	1,732	31,326	
2011	63,720	42,660	5,946	93	139	6,489	6,059	26,645	4,106	4,398	32,591	
2012	51,795	24,231	7,461	144	308	11,223	11,203	16,560	1,476	1,478	24,021	
Average 2004-12	54,970	35,721	7,114	129	202	9,458	8,941	18,633	2,417	2,577	25,747	

* Numbers estimated; original figures contained clear errors in one commercial block.

Source of data: Botswana Statistics: Annual Agricultural Survey Reports, Table 2.3. Various years.

327. **The authors of this Report have not come across any study looking specifically into the factors behind low land productivity that remain after the factors of access to inputs, mechanization and credit are removed.** Research institutions do conduct on-farm trials, but may not focus sufficiently on cost and risk factors in the traditional sector and special constraints in traditional farming such as:

- Lack of manpower particularly for weeding;
- Small size of holdings, which results in the need for parallel employment and constraints with regard to the availability of time and less focus on developing the farm which remains just one of several sources of income.
- Particularly in the case of sorghum: the need to invest excessive amounts of time to scare birds during the ripening period of the crop.

328. **Soil conditions and rainfall patterns are different in commercial and traditional farming areas.** This may affect the possibilities to prepare the land and plant and the economics of investing in machinery and fencing in particular.

329. **A substantial part of commercial crop farming takes place in the Pandamatenga block under particular conditions.** The soil conditions, the special type of experience of the farmers in that area, availability of heavy machinery and a high concentration of farm land point to conditions which are not comparable to the situation in which most small-scale traditional farmers operate. Therefore, yields in the commercial sector may not be indicative of what small-scale farmers could achieve with the right inputs and support.

Table 25: Total Areas Planted and Harvested for Maize and Sorghum, by Traditional / Commercial

				Hectares
	Planted		Harvested	
	Traditional	Commercial	Traditional	Commercial
1993	222,350	7,225	88,748	7,019
2004	107,668	12,450	81,540	12,418
2006	136,368	5,981	106,715	5,916
2007	70,229	3,561	15,140	3,339
2008	151,662	10,107	83,943	7,634
2009	187,742	11,967	129,438	11,933
2010	170,881	15,849	109,417	14,760
2011	214,884	6,814	143,767	6,377
2012	192,732	11,608	79,966	11,519

Source of data: Statistics Botswana: Agricultural Survey Reports, various years.

330. **With regard to livestock, numbers of heads for cattle, goats and sheep have been stagnant over the past 20 years, with fluctuations that can be discerned in statistics and charts, but are not drastic.** All grazing areas are being used, the risk of over-grazing is and has been a constant issue in Botswana. Low precipitation does not allow larger herds. The system of control of foot-and-mouth disease in Botswana through zoning and cordon fences is working quite well most of the time.

331. **Offtake rates in the traditional livestock sector, which accounts for about 90 percent of all cattle, are significantly lower than in the commercial livestock sector.** Low offtake rates in the traditional sector reflect primarily high death rates. The sum of offtake and death rates is similar in the traditional and the commercial sector. Any strategy to improve offtake must therefore aim at reducing death rates in the traditional cattle sector. High death rates for traditional livestock, however, are related to the dispersion of the animals on communal lands. This makes them more susceptible to drought and disease outbreaks.

332. **Regulations on cattle identification and tracing, which need to be met in order to export to EU and increasingly other markets, are more difficult to comply with by traditional livestock holders.** Animals have to be at one location for 90 days prior to slaughter, a condition that traditional farmers can only meet if there are feedlots in the vicinity of abattoirs or the possibility to transport cattle by trucks. Poor roads in the vast grazing areas and consequently high transport costs make this a difficult condition. Cattle movements need to be authorized and centrally registered. The system of identification with boluses (a large soft pill containing a RFID chip which remains in the animal's rumen) requires RFID chip readers which traditional farmers do not usually have. It is estimated that some 400,000 heads cannot be exported because of flaws in movement control and also technical flaws of the central registration system and transfer of data to it.[63] Substitution of the bolus system by ear identification tags is on-going.

333. **Earnings and offtake rates could be improved through various measures:** range management methods that avoid over-grazing of communal lands; construction and maintenance of roads that would permit transport of cattle to abattoirs by truck (required for being able to access

[63] "The BMC estimates that there are 400,000 cattle in communal grazing areas that do not have bolus data in LITS and which are therefore shut out of the export market completely." Anton van Engelen et al. (2013): Botswana Agricultural Value Chain Project – Beef Value Chain Study. FAO and Ministry of Agriculture, Botswana, p.94.

European markets); a higher level of enforcement of mandatory vaccinations; changes in the way the LITS is implemented in order to facilitate traditional cattle holders to meet the requirements.

334. **Yet, it is unlikely that the gap between traditional and commercial livestock can be reduced significantly.** Furthermore, improving efficiency in the traditional livestock sector has not really been delayed because of lack of public funds, with the possible exception of transport infrastructure in traditional grazing areas.

335. **Two messages transpire from the above:**

a) There is no grand solution to raise productivity of traditional crop farming and livestock holding to anywhere close to the productivity of commercial farms, that has not been put into place due to lack of funds for enhanced public services. Solutions in small steps are required.

b) Natural resource conditions under which the traditional sector operates are distinctly different from those of the small commercial sector. Even with advanced management and larger scale production units, the productivity gap would remain.

5. SPENDING PERSPECTIVES AND PRIORITIES

336. **The conclusions from the analyses presented in the previous chapters are, in short, that many aspects of the allocation and management of public expenditure for agriculture in Botswana are quite positive.** In particular, budgets are relevant and thus facilitate planning and micro-management of expenditure, budgets and expenditure data transparent and generally reliable, the level of non-captured off-budget expenditure is very low, the split between recurrent and development expenditure is reasonable. There is, however, room for improvements, particularly with respect to research and extension, support schemes and the big investment schemes that are in the pipeline.

337. **But the analysis also shows that public spending, although low in terms of the overall budget, is substantial compared to the small size of the agricultural sector.** Potential for increasing production is very limited, mainly because of lack of water, and that production is volatile.

338. **The Maputo Declaration and the associated target of spending 10 percent of the budget on agriculture implies, if it is followed in Botswana, a very substantial increase of spending on agriculture. Would this be a reasonable target?** Where can adjustments of spending level and structure improve the outcome in terms of food security, income generated by agricultural activities, diversification and poverty reduction? This chapter presents the Team's views, based on the analysis carried out.

5.1 The Maputo Target and its Relevance for Botswana

339. **It is highly questionable whether the Maputo benchmark of spending ten percent of the budget on agriculture is useful and relevant for Botswana.** In view of the already high level of public spending on agriculture in relation to the small size of the agricultural sector in Botswana and the quite limited potentials for increasing agricultural output and income derived from agricultural activities, public expenditure is not the critical constraint to agricultural development.

340. **The Maputo Declaration is a pertinent call to pay more attention on food supply, food security and income in rural areas for combating rural poverty.** It represents a concerted effort of African countries to ensure that public goods and promotion programs for agriculture receive an adequate share of the budget resources so that lack of public goods does not hold back agricultural production and efforts are made to develop and disseminate technological innovations to the sector. The ten-percent benchmark may be seen as a simple rule based on the assumption that in most countries, ministries responsible for agriculture would easily be able to think of areas where additional funds could be spent effectively to support higher production levels and speed up the uptake of innovation and technology. It can also be seen as a call to make more efforts to transform small-scale agricultural holdings to market-oriented businesses which make the most of the available resources.

341. However, the assessments presented in this report suggest that, in Botswana, following this target by the letter would be unwise, for the following reasons:

a) While in many countries, one can easily identify areas that could be developed into productive agricultural areas with higher amounts of transport infrastructure and irrigation, this is not the case in Botswana. Rainfall and low potential for irrigation are the two major and binding constraints.

b) Often, it can safely be assumed that public institutions involved in promoting agriculture and providing public services for the sector would easily come up with constructive ideas and design programs that increase productivity and lead to increased production. This does not hold true for Botswana over and above projects that are already in the planning and expenditure pipeline.

c) Public expenditure is already at high levels compared to the small size of the agricultural sector in Botswana. Programs that can be shown to be beneficial and economically viable have generally received budgetary allocations for their implementation.

342. **Therefore, this Report recommends that the Maputo Declaration be taken as an expression of an overall strategy, but not as a fixed benchmark and commitment.** Government should not renew a blanket commitment to spend 10 percent of its budget on agriculture. However, it should consider additional spending when and where it can be effective and economic.

343. **This conclusion does not challenge or question the Government's efforts to engage in the CAADP process and prepare a compact.** Rather the opposite is the case. Complaints about ineffective communication channels between the agricultural administration and policy makers on one hand and the farming community on the other were voiced repeatedly. A CAADP compact which involves joint target setting and joint monitoring is, in fact, an adequate response.

5.2 Suggested Spending Priorities

Budget Speech for 2014/15 budget, paragraph 44:

"Madam Speaker, another sector with potential for growth and employment creation is Agriculture. Unfortunately, the performance of this sector has been dismal due to inadequate rainfall and recurring drought. This has presented a great challenge to growth of this sector, which by nature, is a highly labor intensive undertaking with potential to absorb a majority of the unskilled to semiskilled unemployed citizens. Despite the challenges of constrained growth associated with natural disasters such as drought and diseases, Government continues to assist the agricultural sector."

344. **The task for Botswana then is to identify areas where more public spending would contribute to higher income and more agricultural produce.** Some suggestions and observations are presented in the following.

345. **A number of these suggestions relate to changes in approach and focus.** They may require additional funds, but there is also potential to streamline programs and organize interventions in a more efficient way. An examination of the economic feasibility and attention to the cost of providing public services is necessary.

5.2.1 Big Investments

346. Some big investments are planned and partly budgeted. These projects are:

a) The use of effluent (waste) water from towns for irrigation purposes

347. The approach to use effluent water for irrigation is, apart from the Zambezi project (see below) the only significant way in water-scarce Botswana to reduce the vulnerability of crop production to fluctuations of rainfall. Irrigable areas, located close to urban areas, can be used for increasing horticultural production, maybe in rotation with grain crops.

348. The economic viability should, however, be examined in detail before starting implementation of irrigation facilities in identified areas. The viability depends largely on the present system of sewage collection and the availability of fertile land in areas to which these waters can be channeled, the availability and cost of water treatment technology and consumer acceptance of products grown under these conditions.

b) Drainage of the Pandamatenga Area

349. **The project, included in NDP 10, involves building a drainage system to prevent occasional water logging of Botswana's principal area for commercial grain production.** It also involves the construction of roads and development of a smaller area suitable for small farmers. The **project is the only major agricultural projects in Botswana with external financing.** The Appraisal Report of the African Development Bank (AfDB) dates back to June 2006.[64] The report concludes that "The project is technically feasible, economically viable and socially desirable."[65] The AfDB loan amounts to $60 million, an additional $8.9 million are expected to be financed from internal budgetary resources.

350. The first expenditure from the loan was in late 2009. The first main construction contract (Phase One) is expected to be completed in July 2014. A tender for Phase Two, which involves additional drainage, was put to tender in January 2014, but the contract has not yet been concluded (as per end of May, 2014). Close to $24 million from the AfDB loan were spent up FY 2013/14. For FY 2014/15, the budget proposal makes a provision of P90 million for total expenditure of the year, of which P60 million from AfDB.[66] [67]

Actual expenditure amounted to P85.6 million in FY 2013/14, P90 million are budgeted for FY 2014/15, including the contribution by AfDB. The remaining balance of the TEC for 2015/16 is shown as P211 million, but taking the under-reported expenditure in FY 2011/12 and 2012/13 into account, the real balance is probably only P104 million. To complete the project and construction work, additional funds may be required over the next years.

351. The Pandamatenga area is also planned to receive some water from the Zambezi (see below) and would then be the main agricultural area in Botswana with reliable water supply and adequate drainage. So far, the area is not irrigated.

352. **The project makes sense, and the funds should be made available assuming a correct assessment of economic viability and given that construction of important components of the project are already nearing completion.** The project makes sense in particular because it aims at reducing the volatility of production by way of drainage in wet years and the option to irrigate in years with inadequate rainfall.

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64 African Development Bank. 2006. Botswana – Pandamatenga Agricultural Infrastructure Development Project: Appraisal Report. June.

65 *ibid*, page iv.

66 See article by Bashi Letsididi: Panda farms to get drainage system. Botswana Guardian, 24 January 2014. Retrieved at http://www.botswanaguardian.co.bw/latest-news/798-panda-farms-to-get-drainage-system.html on 23 May 2014.

67 Due to a specific omission, expenditure financed by the AfDB was not captured in GABS, the accounting system, up to FY 2012/13 and is therefore not included in the charts and tables in this report. Development expenditure was actually higher than shown; the additional amounts are P49 million in FY 2011/12 and P58 million in FY 2012/13. The problem was corrected in the FY 2013/14 reports.

c) Zambezi Integrated Agro-Commercial Development Project

> Budget Speech 2014/15 paragraph 45:
>
> "Meanwhile, the design of the main water conveyance pipeline from Chobe/Zambezi to the Zambezi Agro-commercial Project site was completed in October 2013 and construction is expected to commence during 2014/15 financial year. Upon completion, the project will contribute significantly to irrigated agriculture particularly horticulture. Government assistance is aimed at encouraging production in the agricultural sector, but most importantly, to graduate more farmers into commercial entities capable of creating decent jobs for Batswana."

353. **Botswana has secured an allocation of Zambezi waters amounting to 495 million m³ per year.[68]** The quota represents just 1.3 percent of the annual flow of the Zambezi river at Victoria Falls and has been found environmentally sustainable.[69] In order to keep the quota valid, construction of facilities for its use must have started before the end of 2015.

354. **The project has been under study and preparation since several years and undergone some significant changes.[70]** Competing demands for water were considered, particularly between agriculture and human consumption. The currently favored concept is to use 150 million m³ to feed into the North-South-Carrier, an existing water pipeline running from Selebi Phikwe in the center-east of Botswana to Gaborone. The remaining 345 million m³ would irrigate a new agricultural area west of and adjacent to the existing Pandamatenga area of a size of 35,000 ha. The pipeline and water infrastructure will be implemented by the Ministry of Minerals, Energy and Water Resources. The Ministry of Agriculture would develop the irrigation area.[71] Although initially conceived as an irrigation project, the current view is that Botswana does need the water and the pipeline urgently and primarily for human consumption; the irrigation component became a secondary benefit.

355. **An initial feasibility study, prepared some years ago, was rejected.** A new study for the irrigation component has started in early 2014 and is expected to be ready by November. The Terms of Reference as mentioned in the tender look exhaustive. An environmental impact study has also been commissioned. The feasibility study will also make proposals about appropriate financing arrangements. An engineering study for the pipeline and related pumping stations and reservoirs was tendered in July 2014, proposals are to be received by mid-September. Since the main objective now is the provision of city water and water shortages evident, the construction of the pumping and piping element will not wait for the conclusion of the feasibility study on the agricultural component. Water is expected to be available at the Pandamatenga area in the year 2020.

356. **The project is enormous, and so could be the cost.** The quota amounts to pumping 16 m³ per second if water is withdrawn continuously over the entire year; the design capacity of the pipeline is 23.3 m³ per second. One single pipe, with a diameter of 3.5 meters, to transport the water (for both the human consumption and the irrigation component) will be put underground. The pumping system from Kazungula to Pandamatenga is planned to be built for the whole quantity of the quota

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[68] See Republic of Botswana, World Bank and WAVES Partnership (2013): Environmental-Economic Accounting for Water in Botswana: Detailed accounts for 2010-22 and 2011-12 and general trends 1993-2010, p.60. Unpublished draft report.

[69] Interview with staff of the Agricultural Hub. Annual flow of the Zambezi at Victoria Falls is 3.9 billion m³. An environmental impact study was conducted.

[70] In the initial concept, the entire amount was to be used for irrigation. The location of the area planned to be irrigated was moved for environmental reasons.

[71] See article "Zambezi Agro-project relocated" in Mmegionline dated 23 May 2014. Retrieved at http://www.mmegi.bw/index.php?aid=33683 on 23 May 2014.

at once rather than in stages because the pipe goes through ecologically sensitive areas (wildlife corridors), which shall not be disturbed repeatedly by moving in heavy earth moving equipment.

357. An old posting, still available at the MOA website but dated 2008, speaks of $450 million for the design, supply and implementation of infrastructure, and another $300 million to be provided by private investors do develop and irrigate the first about 18,700 ha. An updated cost estimate could well be significantly higher.

358. **The project is reflected by an allocation of P20 million in the 2013/14 budget (of which only P9.4 million were spent), and another of P110 million in the budget proposal for FY 2014/15.** The overall cost for the project (09193 Horticulture and Water Development) over the NDP 10 period was increased from initially P138 million to P768 million in the most recent 2014/15 budget. From this envelope, P380 million remain to be spent in FY 2015/16, the final year of NDP 10.

359. **The agricultural part is expected to create 4,000 direct jobs.** The majority of these workers, however, will have to be attracted to the area and settled. Wages need to be attractive enough to motivate migration to the area, and the labor unit cost will presumably have to be higher than the current average wage in agriculture. The project concept also covers processing industries and production of pigs and poultry in the same area.

360. **Pumping costs, the main item of recurrent costs, are significant and could make the scheme non-viable.** Our rough estimate of pumping cost for just lifting the water from the Kazungula altitude (920 m) to that of Pandamatenga (1080 m plus reservoir water levels) comes to about P5,500 per irrigated hectare. But this amount is very sensitive to the cost of electricity, the efficiency of the pumps and whether the earmarked 345 million m³ are actually required to irrigate the envisaged area of 35,000 hectares.[72] Generation capacity of 33 MW is required just for uplifting the irrigation water assuming that the pumps operate throughout the year, day and night. In reality, the required capacity is higher and amounts to approximately half of the capacity of one of the four Morupule B blocks (each produces 150 MW). Note that this calculation covers only the power required for lifting the water and does not include energy needs for transporting water over level pipes and power consumed to operate the irrigation system itself and lifting water again so that gravity can push the water into irrigation pipes.

361. **The economic viability of the project is not evident at all, even though the scheme requires only a catchment area and not a big dam.** Pumping costs for elevating the water to the irrigated area, without energy needs for in-area pumping, alone is equivalent to the price that can be obtained for about 2 tons of Grade 1 sorghum.

362. **Since large investments are required, ensuring the economic viability and sustainability is crucial.** Critical aspects are the cost to the budget for the general investment, the realism of the planned investment of private farmers in on-field irrigation equipment and land development, the speed of construction and the possible need to divert water from agricultural to non-agricultural use

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[72] Assumptions were: Energy price of 0.10 USD/kWh, 180 meters elevation differential from Kazungula to the irrigation area, pump efficiency factor of 0.75. Total pumping costs for irrigation then comes to $22.5 million or P194 million per year. Divided over 35,000 hectares, the cost per hectare amounts to P5,530 just for pumping water from the Zambezi to Pandamatenga. It costs about P0.60 to lift one cubic meter from Kazungula to the altitude of Pandamatenga.

Spreading 345 million m³ over 35,000 ha is equivalent to 9,850 m³ of irrigation water per hectare, which is about what is generally assumed to be required for drip irrigation (7,500 to 10,000 m³/ha, see Waves report p.72). No losses or evaporation were taken into account.

during the lifetime of the project which is typically assumed in feasibility studies (20-25 years). Critical is also the financial feasibility for private investors who are expected to develop the farming areas. How farmers will contribute to the general operating cost and amortization of the general irrigation infrastructure cost remains to be defined.

363. **The projected mix of products to be grown in the new irrigation area and their market prospects are important determinants of the revenue side of the profitability equation.** Horticulture products provide higher income per hectare and also per cubic meter of water than grains. However, a critical and realistic look at potential markets is required. Just a minor part of the planned irrigation area would be sufficient to saturate the Botswana vegetable market, where products from existing irrigation schemes already provide about half of the supply. Prospects for vegetable exports need to be clarified. At the moment, Botswana does not export horticulture products and it is unclear whether such exports could be competitive, also because the new area is quite far away from centers of consumption of fresh products.

364. **A situation may arise where the project is not or only marginally profitable at prevailing prices and without subsidies or other forms of support.** Should MOA and the Government go ahead with the project with the argument of its contribution to food security? According to current policy, it should not. **Full pumping costs should be charged to farmers by way of water charges.** Furthermore, the cost of energy should be calculated under realistic parameters and without cross-subsidization between groups of consumers; the scheme should not be subsidized through abnormally low electricity rates.

365. One may argue that food prices are expected to increase in the medium run and that the Pula may lose value when revenues from minerals and from diamonds in particular decline. Should the case occur, the underlying assumptions of this alternative scenario and the resulting cost to the budget should be assessed clearly. Furthermore, rather than subsidizing energy with long-term recurring implications for the budget, government could also consider to only partially recover investment costs from farmers. This second option would not weigh on the budget once the scheme is completed.

366. **The various conceivable rationales for subsidizing the construction and operation of the scheme need to be regarded with caution.** Food security, which may be invoked to advocate subsidies and only partial cost recovery, in Botswana is not greatly improved by growing vegetables for domestic consumption or exports. To sustain the job creation argument, it is recommended to calculate the investment and subsidy cost per job and reconsider the argument. Sensitivity analyses run over farm gate prices would help to form an opinion whether break-even prices can in fact expected to prevail by the time the scheme is operational.

d) Improved transport infrastructure in grazing areas

367. **One of the reasons for the low offtake rates in the traditional livestock sector lies in difficulties to transport cattle to abattoirs for export.** EU rules for tracing back the history of cattle require that the animals are transported by truck or railway rather than driven in treks for many days. The transport of cattle to abattoirs is currently hampered by high transportation cost over roads of poor quality, limited water and food availability along trek routes and limited market and price information. An agricultural infrastructure study undertaken in 2009 proposed to develop in particular roads and infrastructure in cattle areas; the estimated cost was about P5.5 billion. The proposal was not implemented at that time, which coincided with the global crisis and a temporary shortage of public funds for Botswana.

368. This price of P5.5 billion is equivalent to more than four times of total public spending on agriculture in 2012/13, and almost the triple of value-added of the livestock sector (which includes the poultry industry) in 2012. This does not necessarily mean that it would not be economically viable, but highlights the need for a thorough economic analysis.

369. **Today, the economics of the project may look different,** and it may be worth having another look at a possibly more selective, smaller and phased version of the road construction project that can lead to higher offtake rates in selected areas.

5.2.2 Gradual Improvements

370. **Although no major flaws in the allocation and management of public funds for agriculture were identified, a number of areas with some potential for improving efficiency were identified.** Some of the following proposals require additional funding, while others relate to variations of the respective approaches rather than additional activities and additional spending.

371. **The question of whether there is potential for increasing production and what government would need to do to permit and facilitate it was raised at a stakeholder workshop held in the context of this AgPER study in February 2014.** The general response was that yes, there is potential. A number of interesting observations were presented. However, groups tended to say that there is potential because national demand currently satisfied through imports is high. They also often referred to the constraint of low prices and high costs, which indicates that domestic production may be technically possible, but not economically viable.

Box 5: Observations from Stakeholders

Recurring themes

- Strengthen research and extension link.
- Ensure mobility of extension staff.
- Improve qualifications for extension staff in horticulture and small stock.
- Government should listen more frequently to farmers. "[There are] too many workshops without private sector input."
- Provide infrastructure: electricity, water, roads, telecommunications

Support schemes

- Focus on farmers with proven track record rather than just anybody. "The right members of society [should] be targeted, not opportunists." Government support should be staggered.
- Increase focus on commercial farmers.
- Align ISPAAD with agro-zones.
- Service centers: are dysfunctional, equipment is broken, should be privatized.
- Services are often disorganized / erratic, e.g. seeds, fertilizers.

Specific to subsectors

Horticulture

- Create a BMC-like marketing organization.
- An irrigation policy and strategy is lacking.
- Imports should be charged duty, which will then be used for sector development, rather than restrict imports.

Cereals, Crops

- Government should buy land and lease to farmers who want to plow instead of fencing fields which end up not utilized.
- Need to give land for potential farmers

Small livestock

- There should be artificial insemination for small stock.
- Government should facilitate exporting of small stock.

Dairy farming

- Fodder production and transport are often the missing elements in the value chain.
- Government should develop dairy farms and lease them to small farmers.
- Need for timely subsidy payment in case of drought.

e) Link Between Research, Extension and Farmers

372. **Comments from farmers and farmer organizations who participated in a workshop in February 2014, the analysis of indicators of agricultural production and productivity, and available documentation suggest that the links between the research organizations and the farmers are not working satisfactorily.** It transpires from statistics that yields from improved crop varieties in a research environment are most often not replicable on-farm in the traditional sector. The question whether and why new technologies produced by the research institutions are not successful under real world conditions remains largely unanswered. The situation is similar with regard to the reasons for the high death rates and low offtake rates of traditional cattle holders.

373. **Research priorities are currently set by the staff of the Research Department without much interaction with extension staff and the farming community.** An established forum for selecting research issues in the light of needs of farmers is no longer in existence.

374. **It is suggested to review and evaluate the effectiveness of the research-and-extension system, to make it more responsive to farmers' needs and to involve farmers in the definition of research issues and programs.** The creation of a National Research Council for agricultural research and mechanisms to allow for feedback from extension services to the research institutions was suggested and merits to be given renewed attention.[73] The proposal also figures in a transitional strategy document which is not official, but said to be guiding policy at present.[74]

375. The review should be in the form of an independent study and not an internal exercise. This recommendation follows concerns, raised in interviews, that an internal study would easily entail a "blame game" among the different departments and sections of the administration concerned.

376. **In this context, it should be ascertained that allocations to research are sufficient to finance research programs that appear promising** and have the prospect of leading to economically viable innovations. The endowment of research institutions with funds for recurrent non-

[73] Sigwele, H.K. (2010). Exploring Strategic Priorities for Regional Agricultural R&D Investments in Southern Africa, Country Agricultural Research and Development Study to ReSAKSS-SA.

[74] TRANSTEC and BIDPA (2009): Botswana Agriculture Sector Review: Agricultural Strategy 2010-2016. June.

personnel expenditure should be reviewed, as it may be too low at the moment. However, the definition of meaningful research areas and priorities which respond to needs of the farming community are a necessary pre-conditions for additional funding.

377. **More co-operation between the Research Department and the (adjacent) Botswana College of Agriculture for improving capacity for analyzing the economics of suggested innovations and technology packages is recommended.** Lack of economists and inability to retain qualified staff in this area was mentioned by the Research Department as one reason why the economic benefits of suggested technology packages may not be sufficient to make them attractive to farmers. Co-operation with the College could fill the gap.

f) Mobility of Extension Staff

378. Extension staff is not as effective as it could be because of lack of transport.

379. Wherever possible, agricultural offices at districts should have full access to the internet in order to facilitate on-line research for solutions to specific problems. More investment in staff mobility is recommended.

g) Staffing Level of the Ministry of Agriculture

380. **The Ministry of Agriculture currently employs around 7,200 staff to cater for between 100,000 and 150,000 farmers.**[75] This means a ratio of about 20 people employed[76] in agriculture per MOA staff. Salaries currently absorb about 60 percent of MOA's recurrent budget. The absolute amount of personal emoluments has grown sharply from P300 million to P520 million between FY 2005/6 and FY 2009/10; expansion was only moderately since.

381. **However, only 1,208 of the total of 7,226 staff (16.7 percent) have a technical or professional qualification.** The number of farmers per technical/professional staff stands at between 83 and 124 farmers per staff. Only some of these staff are in regular contact with farmers and thus in a position to be able to inform about technology and innovations. Availability of qualified staff on the ground to advise farmers is said to be less than optimal, although no hard data are available to confirm this conclusion.

382. As was mentioned in Chapter 2, high staffing levels for auxiliary positions is a general phenomenon in Botswana's civil service. The solution towards a smaller, leaner and more effective civil service lies primarily outside the Ministry of Agriculture. Still, it may be possible to use existing personnel more effectively, possibly also by relocating some staff within the ministry.

h) Improving Usage of Irrigation Schemes

383. **There are indications that existing irrigation schemes are not fully used although the land has been allocated and water is available.** The reasons are not clear. Anecdotal evidence points to the possibility of speculation (land is held for possible use at a later stage), lack of rewarding markets, logistical problems associated with transporting horticultural products to markets, and a combination of high input prices and low sales revenues.

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[75] Numbers from the two most recent household surveys; see Chapter 2.

[76] "Employed" refers to self-employment as well as wage employment. Most of it is self-employment.

384. **It would be useful to conduct studies in irrigation areas where low usage is a significant factor.** Usage could be increased by assisting farmers in identifying rewarding markets and helping to set up links between farmers, traders, processors and markets and shops in view of improving the efficiency of value chains and product innovation (like product presentation, packaging, quality standards and timing).

5.3 Support Schemes and Subsidies

385. **Agricultural support schemes are appealing to governments who want to show their commitment to improve the living conditions for the rural population.** Direct support may be less effective than an enabling environment and facilitation of technological improvements; but it is more visible. The preference is problematic because expenditure leading to more sustainable growth may be crowded out by the financial requirements of support schemes, and because subsidy programs are often politically difficult to phase out.

386. **In Botswana, support schemes for agriculture absorb a substantial share of the agricultural budget, while effectiveness has to be seriously doubted.** Expenditure in FY 2013/14 was as high as P322 million (see Table 22 in Section 4.2.4). Seventy percent of development expenditure during the period FY 2009/10 to 2012/13 was on support schemes. The impact of the largest component ISPAAD, which absorbed P266 million in FY 2013/14 and about P220 million on average in the years 2008 through 2012/13, on crop production and productivity, was either non-existent or very small (see Section 4.2.4 earlier in this Report).

387. **In order to assess whether support schemes are a reasonable way to spend public funds for agriculture, it is useful to distinguish different types of support schemes. The first type consists in contributions towards private investment.** Related subsidies, associated with either subsidized interest rates or a grant towards investment expenditure, are normally targeted towards specific investments, and support is granted for a limited amount of time. There is no need for an explicit exit strategy.

388. **In Botswana, several programs follow this approach:**

- CEDA provides concessional loans for commercial farmers for investment and initial working capital.
- LIMID provides funds for livestock-related investment in, among others, fencing and water supply for animals.
- The cluster component of ISPAAD pays subsidies as contribution towards investment in cluster fencing and supply of drinking water for humans for the members of the cluster.
- The horticulture component of ISPAAD subsidizes the acquisition of irrigation equipment and the initial cost of inputs for up to three years.

All these schemes require a participation of beneficiaries, who also have to present an analysis of the economic and, if applicable, the environmental sustainability. This prevents investments that are not viable and unsustainable.

389. **In principle, the rationale for these programs is clear and sound.** Some of the programs, however, could benefit from better monitoring and periodic evaluation which looks in particular into the issue of whether the support was actually required. The programs would be wasteful if they would finance investment that would also have been made without the support.

390. **The other and more problematic type of support programs subsidizes current inputs. ISPAAD is the only program under which input subsidies are provided; it only applies to crops.** These components are problematic because the rationale is not clearly spelled out and objectives and expected results are vague. This leaves room for unrealistic expectations, undue criticism, but also for waste of public funds. It is important to achieve more clarity on feasible objectives and conceivable rationales (see also Box 6).

391. **Objectives for input subsidies may relate to several direct effects**. The first one is to increase the farmer's margin; in this regard, they are equivalent to price support measures, but they do not distort markets. The second effect is a reduction of exposure to risk in case of crop failure.

392. **Attempts to improve profit margins are based on the expectation that higher profitability would provide an incentive to farmers to produce more** or to continue growing crops even though current market conditions are not exactly favorable. Whatever the ultimate objective, the measure hinges on the expectation that higher level of profitability will result in increases of production.

393. **This assumption is problematic, though, because the expected production and productivity growth cannot be seen in agricultural statistics.** The reasons can only be identified through better monitoring of ISPAAD at farm level. Possible factors are that supposedly better technologies are not suitable and would not increase farm income, or that growth of production is prevented by natural constraints (lack of rainfall in particular). Subsidies would then be either wasteful (for instance, if farmers plow more than they can weed and harvest) or result in a windfall profit for farmers.

394. **The rationale for input subsidies also relates to risk mitigation.** Small and poor farmers who use purchased inputs typically have no access to crop insurance schemes. In case of crop failure, they are exposed to the risk of losing their working capital and possibly be caught in a debt trap. Input subsidies reduce their risk exposure and enable them to recover quicker.

395. **Similarly, risk considerations are likely to keep farmers from switching from low-input to higher-input technologies.** The use of tractors for plowing, the purchase of hybrid seeds and the application of fertilizer may be beneficial on average, but the risks related to crop failure are higher. Subsidies on inputs reduce the risk because the farmer needs to spend less or nothing on these inputs; thus, the farmer would suffer a reduced loss of capital. This scenario is applicable to emerging farmers in particular. For the rationale to hold, it is important that the new, more input intensive technologies do not increase the volatility of production.[77]

Box 6: Conceivable Effects and Objectives of ISPAAD Input Subsidies

1. Prevent financial disaster in case of crop failure for farmers who purchase inputs.
2. Reduce the drought-related risk that would prevent farmers to switch to more input-intensive production methods. Especially relevant to emerging farmers.
3. Sustain subsistence and part-time farming by alleviating labor constraints through subsidies on plowing and planting.
4. Reduce the incentive to migrate to urban areas by making farming sufficiently attractive for farmers to stay and continue farming.

[77] Fertilizer application is a case in point. Hybrid seeds with fertilizer tend to out-perform traditional seeds without fertilizer in years with adequate rainfall. In dry years, however, the harvest would be even less than with traditional varieties adapted to the variable climate of Botswana.

5. Alleviate rural poverty – input subsidies are meant to be an income transfer to poor farmers without expectation that they would increase production or change production methods.
6. Attain higher rates of food self-sufficiency of the country. This assumes that improved gross margins of crop farming will provide incentives to increase area and productivity and that natural constraints permit such expansion.
7. Maintain production capabilities for the times after diamonds. Variation: maintain production capacity only to the extent that farmers use adequate technologies.

396. **Objectives such as items (6) and (7) in Box 6 are problematic. It is quite debatable whether increased food self-sufficiency improves food security.** This rationale for subsidies would be based on the assumption that improved profit margins will increase production, and that this in turn improves security of supply of food items (staples in this case). Since food security is in the national interest and a factor contributing to peace and stability, the case for subsidies could be made.

397. **It was shown earlier that an impact of ISPAAD on production is doubtful. But even if production would increase, the relationship with food security is vague.** The supply of food through imports in Botswana is stable and predictable, via established trade relations. A trade conflict or political tensions which could interrupt trade flows with or through South Africa are fortunately not on the horizon. The demand of Botswana is too small to have any significant impact on supply-demand-balances of world markets for food. Export bans for food of the type that some countries have imposed in the aftermath of the price surge of world food prices in 2008 are prohibited under SACU rules.

398. **The social repercussions of the 2008 price surge remain a preoccupation. One could argue that if Botswana increases self-sufficiency rates to reach significant parts of domestic consumption, it would be in a better position to mitigate the effect.** Botswana could bend or break the rules and impose restrictions on exports; and it could subsidize imports in order to keep consumer prices affordable. The lower quantity of imports required to satisfy domestic demand, the lower would be the required import subsidy. However, given the volatility of domestic supply and the low level of self-sufficiency for maize and the full import dependence with regard to wheat and rice, it is doubtful whether this is a valid case for input subsidies to increase domestic production. The situation is somewhat different for subsistence farmers, though: higher availability of own-grown food would reduce the impact of price surges on household budgets of poor subsistence farmers.

399. **The authors of this Report maintain that there is no case for subsidies for the sake of food security.** Replacing food imports by volatile domestic production does not increase food security, and the elasticity of agricultural production with regard to profit margins is doubtful.

400. **Preparedness for the time when diamond revenues diminish could be another rationale for subsidies on crops.** The argument: the value of the Pula is currently high because of the abundance of revenues from diamond mining. As a consequence, real wages in Botswana are high compared to other countries in the region and tend to make labor in Botswana and labor-intensive industries like agriculture uncompetitive. Furthermore, the high value of the Pula results in low import parity prices for food. Thus, the profitability of agricultural activities tends to become marginal. However, diamonds are expected to be depleted in the foreseeable, although not very near future. As income from diamonds dwindles, and assuming that no significant new deposits are discovered and that income from diamond mining cannot be replaced by other mining activities, the Pula would

depreciate. Import parity prices would rise while labor costs remain stable. Although the price of fuel and imported agricultural inputs would also rise, the margins in agriculture would improve.

401. **If this scenario is considered likely, one would then argue that it is in Botswana's long-term interest to protect existing capabilities for food production and bridge the current profitability trough by way of subsidies.** The rationale assumes that policy should be more forward-looking than private entrepreneurs can be expected to be. Protecting capabilities may be costly, but so would be efforts to re-build agricultural know-how, traditions and re-claim land that hasn't been used for a longer period. A variant of this argument could be that only capabilities that are up to standard (reasonable land, adequate production technology) should be maintained.

402. **In addition, the discussion about how to feed the growing world population in 2050, combined with the prospect of climate change, points to the possibility of structurally increasing food prices.** Wouldn't this justify basing decisions on a scenario with higher prices and higher margins for crop farming and safeguard potential and capabilities until then?

403. **This argument to subsidize the maintenance of capabilities stands on speculative grounds, though.** How much of agricultural capability is threatened without subsidies? When will diamond income decline so that the impact on the real exchange rate of the Pula becomes significant? Will diamond mining really come to an end, or will new deposits be discovered? Will climate change affect crop farming in Botswana more than elsewhere? When will all this happen? The argument is legitimate in principle, but quite speculative in its application.

404. **This assessment does not conclude the discussion about conceivable arguments for input subsidies; it is intended to sharpen the debate and to promote differentiated analysis.** ISPAAD input subsidies could be a reasonable spending priority. But a number of issues have to be clarified before such a conclusion is drawn:

- Farm-level economic analysis is required in order to verify the need for subsidies to maintain profitability of existing farms. Without this information, there is a risk of spending funds on subsidies which aren't actually required and would not have significant effects on production levels.
- ISPAAD should devise mechanisms to monitor farm-level change of farming methods in response to subsidies and to assess the actual impact on production; if no response of production levels is observed, the reasons should be clarified.
- The rationale for subsidizing commercial crop farmers has, to our knowledge, never been established. This should be done. Of particular interest would be the expected impact that improved margins may have on production and whether commercial farmers would survive without the subsidy on seeds, fertilizer and herbicides that are being offered under the current rules.

405. **Emerging farmers in particular are expected to introduce new technologies, which also means that the economics of their farming activities would change.** They in particular are in need for technical advice and training in farm management and farm economics. The frequent observation that ISPAAD administrative tasks divert extension staff from their advisory role are a cause of concern.

406. **Risk reduction is a valid rationale for input subsidies in Botswana, particularly for farms that are expanding and developing.** The risk could, however, be mitigated by other, possibly less costly means as well. One possibility is to cancel loans for inputs by way of the State assuming the responsibility to reimburse banks if crops fail for reasons beyond the farmers' control.

407. **Finally, it would be advisable to introduce measures that limit plowing and planting incentives to plot sizes that small farmers can subsequently handle with regard to weeding and harvesting.** A requirement for farmers to bear a part of the total cost of plowing and planting may be sufficient to prevent waste of resources when too much land is prepared just because it is for free.

6. RECOMMENDATIONS

408. In general terms, agricultural policy and its implementation in Botswana are quite good compared to some other countries in Sub-Saharan Africa. The country "got many things right". Aspects to mention in particular are:

- transparency and comprehensiveness of budgets and expenditure reports,
- relevance of budgets and the general absence of expenditure restrictions due to liquidity constraints at the Treasury level,
- the choice to avoid price support schemes and wide-spread trade restrictions, and invest in agriculture only where it is viable, in principle,
- the reasonable distribution of staff throughout the country,
- the fact that subsidies on private goods do not yet absorb an overwhelming share of the agricultural budget, and
- a focus on risk prevention and mitigation.

409. Still, the analysis of data on expenditure and comparison of their level, composition and trends with strategic documents and studies, results in a number of suggestions and recommendations, which are presented in this chapter. Most have already been mentioned or sketched out in previous sections. and are summarized below. They are meant as suggestions to "make things even better".

410. While some recommendations are new, others can be found also in other documents and studies, some of them ten or more years old. Those with significant public finance implications are repeated when they are found to continue to be relevant and not implemented so far.

411. An Action Plan for implementing the recommendations is shown in Annex 3.

6.1 Spending Level and the Maputo Target

Recommendation 1: **Striving to reach the Maputo target (10 percent of the budget for agriculture) is not a reasonable objective for Botswana.** Although the idea of the Maputo Declaration should be taken up, focus on the target itself would involve a high risk of inefficient spending without tangible results and should therefore be avoided.

Rationale:

412. Botswana does not have much comparative advantage in agriculture, limited untapped potential for increasing area or irrigation schemes, and the potential for promoting productivity through public expenditure is limited. Also very limited is the sector's potential for creating jobs and reducing poverty.

413. Botswana already spends exceptionally high amounts of public funds in relation to the limited size and potential of the sector.[78] There are areas where additional spending would be beneficial. However, it is unlikely that drastically higher spending on public goods for agriculture would have significant effects on production. Natural constraints, most of which cannot be removed through public spending, limit production potential.

414. Tripling public expenditure on a regular basis in order to reach the 10 percent benchmark would most probably not lead to production growth of even the amount of additional public funds. Economically unsustainable and environmentally questionable projects might result if the benchmark is over-emphasized.

415. This does not invalidate the idea behind the Maputo Declaration: Botswana should allocate funds to the agricultural sector if and when there are reasons to be confident that the additional expenditure would produce positive economic benefits. The development of viable agriculture should not be constrained by a lack of public goods and public spending on these.

416. The preparation of a CAADP compact should continue. The opportunity to use the instrument in order to improve a regular dialogue between stakeholders and Government that comes with the process should be exploited.

6.2 Policy

Recommendation 2: **The current open-border policy and the general objective of food security rather than food self-sufficiency should continue.** Price support programs and supporting trade restrictions are to be avoided. Government should maintain its stand in favor of non-restricted trade within the SACU, SADC and ITO rules and avoid invoking exceptions.

Rationale:

417. Since the objective of food security has replaced that of food self-sufficiency in 1991, policy focuses on promoting and sustaining agricultural activities that are economically viable under a liberal trade regime and at farm produce prices that reflect import or export parity (depending on the case). However, there are still calls, some implicit, for protection in order to promote diversification, create jobs and improve food security. Government should resist and carry through the principles of the current policy.

418. The rationale is that, given the natural constraints, the potential supply response to higher prices in Botswana's agricultural sector is generally limited. There is little prospect that higher prices would allow local producers to capture significant market shares, nor would higher prices lead to efficiency gains over time in the direction that the argument for infant industry protection would suggest.

419. Furthermore, since most small-scale farmers are regular net buyers even of the commodity which they produce, this group is very likely to suffer a net loss if food prices were increased. This

[78] This conclusion relates to the strict interpretation of the Maputo declaration with regard to eligible expenditure, counting only direct expenditure according to the COFOG definition of expenditure for agriculture. With a broader choice of expenditure and including agriculture-supportive expenditure, public expenditure would exceed agriculture's contribution to GDP.

holds even if subsistence farmers increase production for their own consumption in an effort to avoid having to purchase food at higher prices.

420. There may be exceptions, but even the example of the poultry sector (which is closer to industrial undertakings than agriculture, with virtually no domestic backward linkages to agriculture as such) is problematic because of the high cost to consumers and doubts with regard to the sector's ability to survive if protection is lifted.

Recommendation 3: **Clarify the stand on the importance of national food production for food security and the acceptable level of costs to the budget.**

Rationale:

421. Under the current Botswana agricultural policy, food security is to be ensured through local production where it is viable, sustainable and economic, or through imports. Local production of food contributes to supply, but is not essential for food security. Yet, time and again, projects and support schemes are justified by reference to expected contributions to food security. This might easily be interpreted as a reason to undertake activities in spite of questionable economic results.

422. Abandoning food self-sufficiency as the over-arching policy goal means that domestic production should not be sustained at all cost. However, it is debatable whether it still should be promoted at some cost. There are some reasons to do just that.

- Subsistence farmers without alternative options for employment may rely on being able to produce at least some of the required food items. Subsidizing subsistence farming to carry it over periods of low economic profitability and protecting subsistence farmers against the consequences of climatic risks may be a more economic way of reducing poverty and ensuring that most citizens can share the benefit from growth driven by natural resources than other forms of income transfers.
- Government may want to maintain production potentials and knowledge for agricultural production even though it may not be economically viable at present. In view of the debate about how to feed the growing world population in 20-30 years and the prospect of climate change and its impact on world-wide food production, it may be wise to safeguard a fall-back option and prevent the loss of knowledge and infrastructure for agriculture.
- It is expected that income from mineral income might decline in the future, although this is not an immediate threat yet. When mineral income declines, an adjustment of the exchange rate will need to take place. Then, however, as imports become relatively more expensive, domestic production could become viable on a larger scale. In view of this argument, government might want to undertake investments that expand the production frontier (like the Zambezi irrigation project) even if it is not sufficiently viable under the current set of costs and prices.

423. However, promoting and sustaining agriculture of marginal viability at present conditions involves a cost. Stands on what level is acceptable may differ, just as the perception of the likelihood of significant changes of economic parameters does. Knowing the cost of policies is crucial for consensus building and rational decision making.

6.3 Big Capital Investment Projects

Recommendation 4: **Analyze the economic and financial viability of the two big planned infrastructure projects,** the Zambezi Integrated Agro-Commercial Project and further development of

the Pandamatenga area (controlled drainage). Competing demands for the water and phasing of competing demands should be taken into account.

Rationale:

424. In line with current policy, agricultural activities should be promoted only if Botswana has a comparative advantage in the area and if the activity is viable and contributes to sustainable diversification of the economy. Economic aspects should remain in the foreground and not be pushed back in the light of the Maputo target.

425. A feasibility study for the Zambezi project was completed in January 2015, and its results are currently being considered by the Government; the Terms of Reference (judging on the basis of the call for proposals) duly cover these aspects. The recommendation therefore relates mainly to the use of the results, avoidance of attributing contracts before the results of the study are fully analyzed and accepted, and an appeal to check the realism of the assumptions. This is normal government procedure; but in this case, the stakes are high and particular attention is required.

426. Since the Zambezi project involves only a catchment and water transport and not a dam, it could be viable in spite of the energy cost involved in pumping water up by about 170 meters from the Zambezi to the envisaged irrigation area. However, the financing mechanisms and the cost sharing between the budget and farmers are crucial issues. Open-ended subsidies on the variable pumping costs should be avoided.

6.4 Research and Extension

Recommendation 5: **Review the research–extension–farmers chain for improving technology, and be prepared to allocate additional funds to it.** This review should cover, inter alia, structure, administration, programs, funding, human resource development and management, and communication strategies.

Rationale:

427. Since many years, suggested technologies have not resulted in improved productivity in crop and livestock production. This appears to be due to recommendations, given by the research institutions and transmitted to farmers through extension, that are not suitable for the conditions under which traditional farmers operate.

428. Particular focus should be on mechanisms that allow feedback from farmers to research institutions and the involvement of farmers and farmers' associations in the definition of the research agenda.

429. The creation of a National Agricultural Research and Development Council, recommended in several studies and documents, should be considered again. Membership of the Council should include farmer representatives, the private sector, NGOs and government. The research institutions should increase their focus on on-farm trials with a particular view on how the suggested technologies fit into the farming households and on the economic benefits that farmers can realistically expect from the innovation. In view of the dominance of mixed farming systems, where the same holder grows crops and raises livestock, farming systems research should be intensified.

430. The suggested study should be carried out by an independent institution or by independent consultants in order to ensure objectivity and to avoid attribution of responsibility for failure among involved institutions ("blame game").

431. Research projects which may lead to results expected to be beneficial to farmers and the environment in which they operate should receive the required funding with high priority.

Recommendation 6: **Invest in the mobility of extension staff.**

Rationale:

432. Repeated complaints that the presence of extension staff at farm level is constrained by lack of means of transport suggests that the effectiveness of extension would benefit from looking again at the issue and spending additional funds on extension staff mobility.

6.5 Planning

Recommendation 7: **In the preparation of NDP 11, targets for production levels and productivity parameters should be set with more realism than in previous plans. Maintaining current production and productivity in itself is an important target.**

Rationale:

433. Time and again, targets were set which appear to have been guided by the idea that productivity in traditional crop farming and traditional livestock can be raised to levels close to what commercial farmers achieve. However, this is barely realistic in view of the very different conditions under which the two operate with regard to type of grazing areas, soil fertility, and availability of water and rainfall. These factors also impact on the risk of crop failure and animal mortality.

434. The recommendation is mentioned here for two reasons. First, agricultural activities in Botswana generally require comparatively high inputs of public goods; these are required to maintain current production and productivity levels and should not be neglected. Second, unrealistic targets tend to entail expensive support programs of which the results are weak in relation to the cost involved. This should be avoided.

6.6 Support Schemes

Recommendation 8: **Improve on monitoring and regular reviews and evaluations of the effectiveness of the schemes.** Preferably pilot new or substantially revised schemes before rolling them out to national level.

Rationale:

435. The recent Poverty and Social Impact Assessment of the ISPAAD component has not only shown the questionable impact and economic viability, but also pointed to a severe lack of disaggregated data and close follow-up of effects for a sample of beneficiaries. Given that the support schemes target different types of farmers and holdings and have multiple objectives, the monitoring data should allow to assess the results by group and by objective.

436. Monitoring would benefit from a method of selecting samples of beneficiaries for collecting and recording more detailed data, such as the type of support used, the area planted and harvested, type of crops, yields, and whether the crop was marketed. Extension agents should also provide an assessment of the impact of the support on farming methods and farm income in broad categories (like: visible change – slight improvement – not evident – negative). Where farmers do not use rec-

ommended inputs and methods, it should be noted, and attempts should be made to explain the rationale behind this behavior. This would contribute to close the gap between the current tabulation of support provided and the general, national results of agricultural surveys.

437. This recommendation gains relevance also because of the history of support schemes in Botswana, which have often had less than convincing results and still were re-introduced in only slightly modified form in the next intervention phase.

Recommendation 9: **Review the ISPAAD scheme and also ensure internal efficiency as well as coordination with advisory services and other support measures.**

Rationale:

438. As it stands, the cost of ISPAAD is higher than the market value of the entire traditional crop harvest. The scheme is clearly wasteful and merits thorough re-thinking.

439. The recommendation relates in particular to the ISPAAD component of agricultural support schemes. The recent Poverty and Social Impact Analysis provides information about areas to improve, such as the differentiation of technological packages and timely availability of inputs provided.

440. Other issues that should be resolved are:

- The apparently negative impact on the ability of the extension services to provide advice and training for farmers who adopt new technologies;
- The questionable rationale for providing subsidized seeds, fertilizer and herbicides to large-scale farmers (cultivating more than 125 ha); and
- The lack of control over plowing of fields of a size that farmers would not be able to weed and harvest; requiring at least some contribution by farmers towards the cost of plowing would limit excess plowing.

441. It is recommended to verify the rationale and define objectives and targets separately for different farm sizes, and to take conceivable alternatives for reaching the result-level objectives into consideration.

442. **Investment facilities, on the other hand, should continue to be available.** The CEDA scheme is an adequate non-directive instrument for a situation where large income from mining can only be substituted by a variety of new enterprises, also in agriculture. Horticulture farmers may benefit from improved access to credit, for example for building cooling facilities. Constructing greenhouses would increase the attractiveness of horticulture because they would allow farmers to protect their plants from mild frost in the winter and allow them to take products to markets when prices are high. Concessional loans for financing power lines to the production area can be an effective instrument of promoting horticulture and first-stage processing industries, at a far lower cost than broad subsidy schemes without an end date.

6.7 Other

Recommendation 10: **Continue with the approach that extra funds are made available for emergency relief interventions.**

Rationale:

443. Whenever an emergency (drought or disease outbreak) occurred, the Ministry of Finance has made additional funds for emergency response available from the country's general budget contingencies and reserves. This practice has ensured that on-going development projects did not have to give up part of their allocation for financing the emergency response. The reliability of budget allocations is important for efficient project implementation. Therefore, the current practice of allocating additional funds if an emergency occurs is good and should be continued even in times when finance for the budget becomes more constrained than it was in the past.

Recommendation 11: **Ensure that the on-going revision of the LITS and cattle registration methods do not discriminate against small livestock holders.**

Rationale:

444. The bolus system made it difficult for smallholders to manage the herds because an RFID chip reader was required to visualize the registration number, which few farmers had available. Ear tags would avoid that.

445. A system whereby cattle holders or associations enter data into the LITS without having to rely on staff of the Department of Veterinary Services has been proposed in an FAO study on the beef value chain. The study also discusses the option of hiving LITS off the Ministry of Agriculture to make it more efficient and credible. A decision on the way forward should take the impact on small cattle holders into account.

Recommendation 12: **Continue to search for non-traditional ways to increase irrigated areas and support horticultural farmers to engage with actors further down in the value chain.**

Rationale:

446. The development of horticulture on irrigated fields has been impressive. Local production of horticultural products has a competitive advantage because local producers can provide fresher products than South African competitors. Local producers can be assumed to have an even better advantage in the areas north of Gaborone, where transport from South Africa is more expensive and takes longer.

447. The constraining factors are marketing through supermarkets, which are dominated by South African chains, and sources of water.

448. The efforts to use effluent waters from urban areas should be continued, under the assumption that hygienic safety problems can be addressed and that resistance of consumers against products irrigated with waste water can be dealt with successfully.

449. Extension services for horticultural farmers should preferably go beyond technical advice. Extension agents also need to assume the role of brokers that facilitate cooperation and innovation along the value chain from farmers to (super-) markets. The focus on regularity of supply is essential, as market requirements are not automatically aligned to technically ideal production cycles and timing.

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Annex 1:
Production and Productivity Trends According to Available Statistics

1. Introduction

This annex presents global statistical data in an attempt to establish to what extent and in which areas development and structural changes have taken place in the agricultural sector of Botswana. It uses readily available statistical sources about value added, production and productivity.

The annex looks for trends which may be related to agricultural expenditure. Obviously, the link between production levels and growth and public expenditure is not straight-forward. Many other factors determine production and growth – climatic conditions, labor availability and markets are the most important ones. Furthermore, a substantial part of expenditure is required just to maintain production levels and provide the inputs with public goods characteristics required in the production process. However, part of expenditure was also geared towards creating growth and improvements in productivity. If growth has not taken place and productivity not improved, the success of public policy and spending needs to be questioned.

Data availability at this level is quite good. The concepts used to collect and present the data have been stable over many years, the results allow consistent comparisons over long periods. Two main sources, both from Statistics Botswana, are used:

- Reports on the results of agricultural surveys and censuses; they are based on annual post-harvest surveys for the traditional sector and on questionnaires for the commercial sector; and
- GDP statistics, which are based on separate questionnaires sent to commercial holdings, while relying on the results of the agricultural surveys for the traditional sector.

The agricultural surveys are very detailed and collect and present production and productivity as well as demographic data. The series has gaps – there are years in which the survey has either not taken place or the results were not published. But the missing years are only occasional and do not represent a serious constraint for the type of analysis required.

GDP statistics relate to the value-added of the agricultural sector, equivalent to the sector's contribution to GDP. Data are available in constant and current prices. The sector is subdivided into crops, livestock and "other". "Crops" include grains, beans and other field crops like, for instance, sunflower. "Livestock" covers all agricultural activities based on farmed animals (i.e., not hunting) and includes cattle, sheep, goats and also game farming and poultry. GDP data on livestock also cover industrial scale production of eggs and chicken meat. The category "Other" includes horticultural products, fruit production, honey, and (very small) hunting, fishing and forestry.

GDP data series are available in current and in constant 2006 prices. Series in constant prices remove the element of inflation and indicate quantitative changes in principle. However, due to the mechanics of data collection and calculation, changes in the value-added element of a sector's sales may not always be captured.

Agricultural surveys relate to the agricultural season which ended in the year indicated. GDP statistics relate to the calendar year and reflect, in the case of arable agriculture, the results of the agricultural season from year n-1 to year n, with "n" being the year shown on the title page of the publication.

It should be noted that GDP statistics are designed to provide a broad picture about economic growth and a broad indication of its drivers at the national level. Data are collected by subsector (or sub-industries, as called in this context), but the breakdown of "agriculture" into its components is not generally published; we obtained the data upon specific request from the responsible department of Statistics Botswana. For the broad picture, details do not matter so much because errors tend to cancel out when components are aggregated. Interpreting subsector data in the way presented below might sometimes be overstretching the interpretability of the data.

Both GDP and Survey series include production for subsistence agriculture.

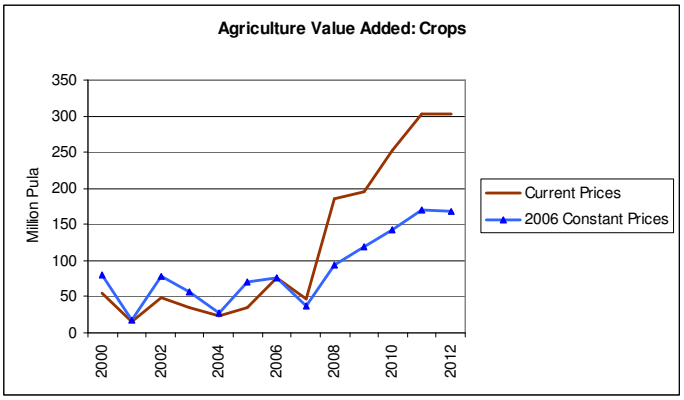
In the following, the data and interpretations are presented by subsector.

2. Crop subsector

2.1 Crops: GDP

Value-added derived from crops remained basically stagnant until the year 2007, both in current and in constant prices. From 2008 onwards, value-added increased steadily in both constant prices, and much faster in current prices (Figure 33). The value-added in current prices increased fourfold between 2006 and 2012; in constant prices, it increased by 120 percent.[79]

Figure 33: GDP Contribution of Crop Subsector



Source of data: Statistics Botswana, GDP by Sub-industries. File obtained in February 2014.

[79] The year 2006 was based as a reference because 2007 figures are atypically low.

Table 26: GDP Contribution (Value-Added) of Agricultural Subsectors, Current and Constant Prices

Million Pula

	Crops		*Livestock*		*Other*		Total Agriculture	
Year	Current Prices	Constant Prices	Current Prices	Constant Prices	Current Prices	Constant Prices	Current Prices	Constant Prices
2000	55	80	582	661	183	315	825	1,063
2001	17	18	578	783	232	339	831	1,142
2002	50	77	565	547	215	282	835	908
2003	35	56	693	704	276	329	1,012	1,091
2004	23	28	646	778	281	295	950	1,096
2005	35	71	596	712	307	310	928	1,068
2006	76	76	771	771	388	388	1,211	1,206
2007	46	38	1,002	862	489	486	1,505	1,359
2008	186	95	1,188	799	524	494	1,887	1,386
2009	196	118	1,194	760	676	598	2,071	1,474
2010	251	142	1,773	998	679	565	2,717	1,720
2011	303	171	1,607	574	711	566	2,636	1,326
2012	303	169	1,912	684	733	593	2,963	1,461
Averages								
2000-2007	42	56	679	727	296	343	1,012	1,117
2008-2012	248	139	1,535	763	665	563	2,455	1,474

Source of data: Statistics Botswana: GDP by Sub-industries. File obtained in February 2014.

Note: The sum of the columns on crops, livestock and other does not usually equal the value shown for "Total Agriculture" at the right side of the table. This is because imputed financial services are added/subtracted from the total, but not at sub-industry level.

Growth from 2008 onwards looks impressive, but there are some doubts over the significance, as growth is not reflected in quantitative crop statistics. The data on value-added and contribution do GDP may actually reflect primarily the input subsidies which the ISPAAD program has provided to crop farmers. ISPAAD funds started to flow on a larger scale in Fiscal Year and agricultural season 2008/09.[80]

ISPAAD spending amounted to about P200 million per year. The increase in the nominal value-added of crops from P76 million in 2006 to P303 million in 2012, an increase of P227 million, is higher, but only by a modest margin.

2.2 Crops: Agricultural Surveys

Results from the annual agricultural surveys confirm doubts about whether increased value-added does actually indicates real growth.

Maize production statistics show significant volatility and no clear trend. Production, which includes subsistence production, has been stagnant at about 10,000 tons per year, with significant fluctuations. For reference: chicken producers alone import some 90,000 tons of maize per year for mixing into poultry feed.[81]

Note that in this graph, the underlying data relating to commercial production were reduced from what the original publication shows because of clear, although not immediately obvious errors in the

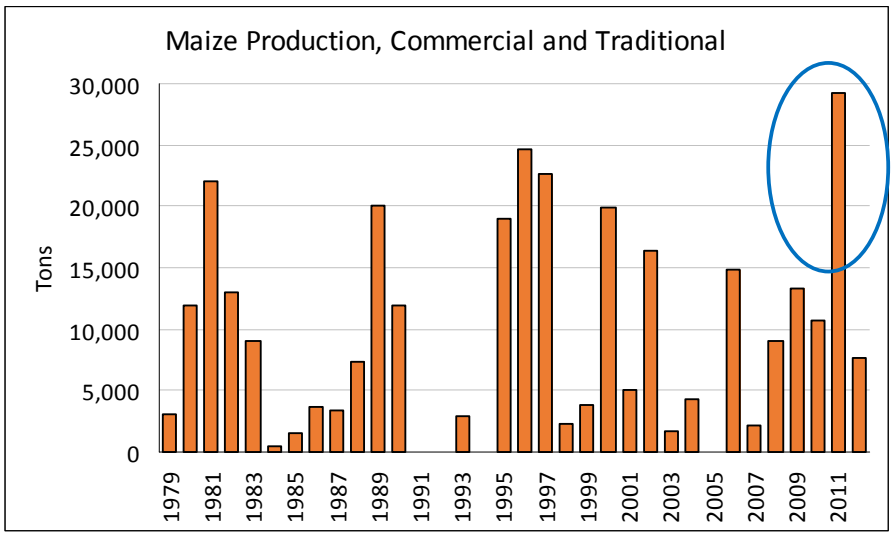
[80] Our Team could not ascertain whether the practice of compiling GDP data actually captures this effect. In practice, statistics bureaus assess output or sales data of a sector and then assume a factor to convert output to income. These conversion factors are only updated from time to time. Data for the commercial sector are collected via questionnaires, which farmers are expected to fill in according to their accounting data. Here, the effect of subsidies would be captured.

[81] According to a statement from a representative of the poultry industry during a workshop in February 2014.

data on commercial maize production in the years 2009 and 2010. The numbers were adjusted to take this into account.

The peak in 2011 shown in the chart below is entirely due to traditional sector production. Disaggregated data per district were consistent with the aggregated results shown.

Figure 34: Maize Production, Commercial and Traditional



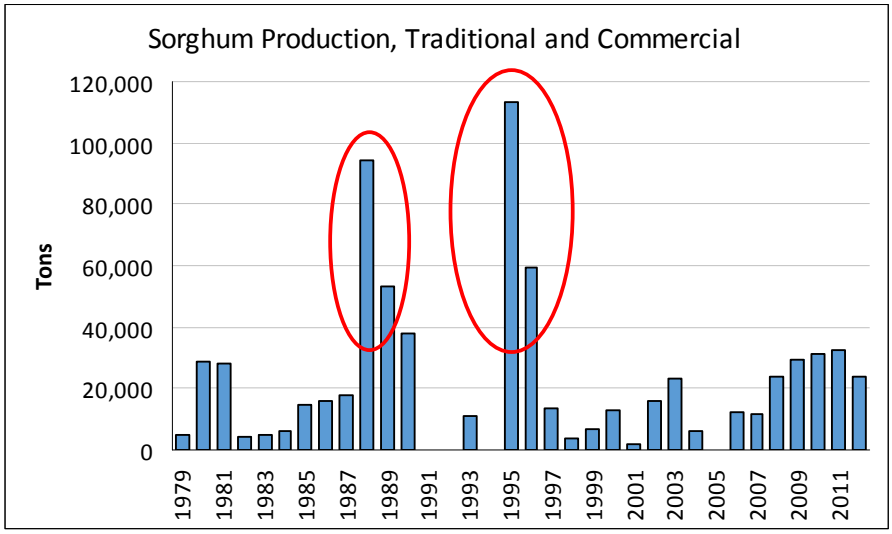
Source of data: Statistics Botswana: 2012 Annual Agricultural Survey Report. Gaborone, April 2014.

NOTE: Data on commercial maize for 2010 and 2009 were reduced from what the publications state because of errors detected in commercial maize production as reported in the Agricultural Survey Reports.

The production of **sorghum**, the other main agricultural crop in Botswana, stood at around 25,000 tons in the past years. However, statistics show exceptional variations across years.

The data for the years 1988-1990 and again for 1995-1996 are totally outside the series' trend, but appear to reflect particular situations. We were told that 1995 was an extremely good year because rainfall was good and seeds and other inputs available.

Figure 35: Sorghum Production, Traditional and Commercial

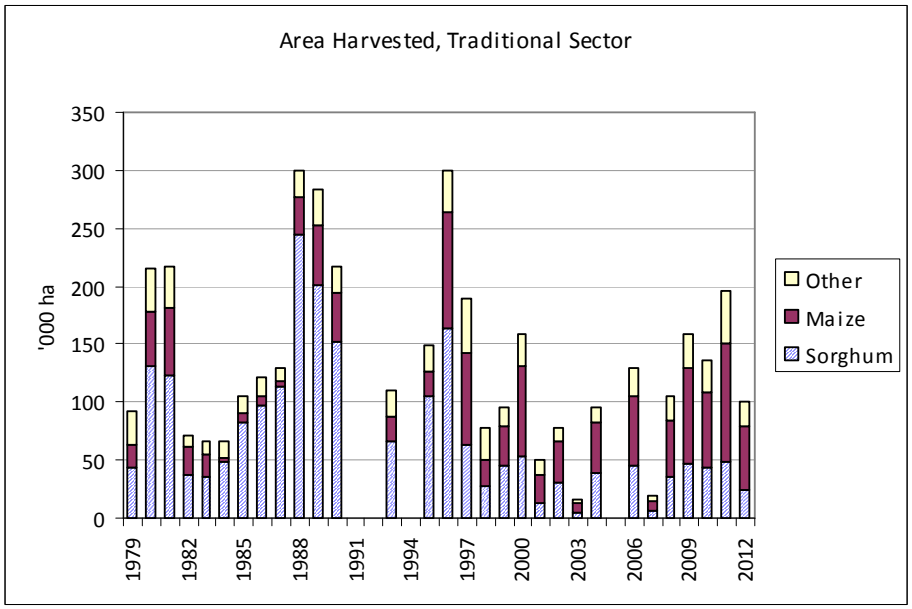


Source of data: Statistics Botswana: 2012 Annual Agricultural Survey Report. Gaborone, April 2014.

Data on area harvested are more consistent than production data (Figure 36). The area harvested for all crops combined in the traditional sector stands around 150,000 ha, again with drastic fluctuations across years. Data show pronounced peaks for the periods 1998-1990 and 1996) which are presumably due to good rainfall.

The last few years are interesting because they could show the effect of the agricultural support schemes in general and ISPAAD in particular. The area harvested has been consistently higher than in the beginning of the 2000's, with the exception of 2007. Fluctuations, mainly due to irregular rainfall, make it difficult to determine whether the increase represents a trend.

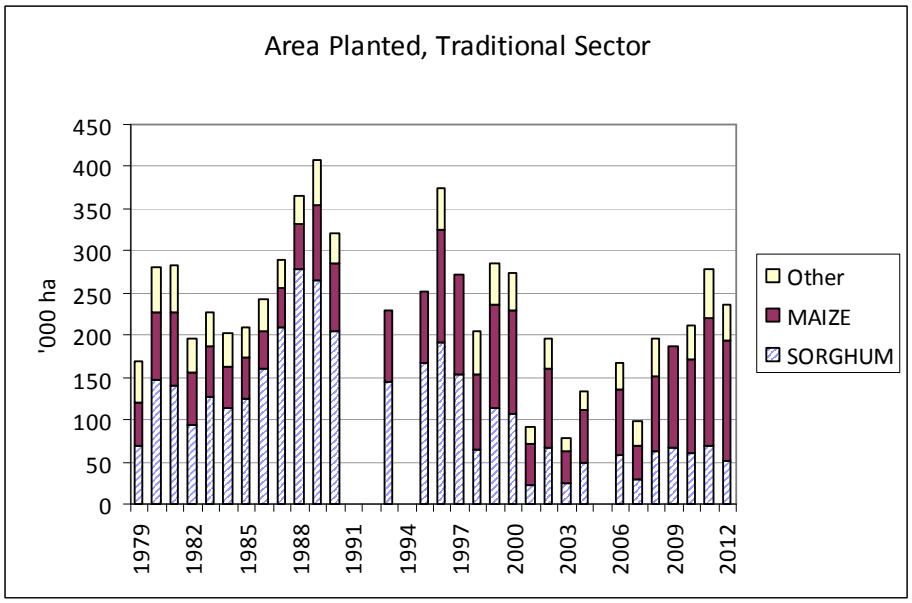
Figure 36: Area Harvested in the Traditional Sector, All Crops



Source of data: Statistics Botswana: 2012 Annual Agricultural Survey Report. Gaborone, April 2014.

Series on area planted reveal again the fluctuations, and evidence the absence of a clear trend (Figure 37). Area planted in the period 2006-12 is again higher than it was in the beginning of the decade, but lower than it was in 1980-90. At the same time, one can clearly see a shift from sorghum to maize. In interviews, this was explained by the fact that traditional farms are becoming increasingly short of labor. Unlike maize, sorghum is subject to birds harvesting the crop, and extensive time and effort are required for bird scaring in the weeks before harvesting. Therefore, traditional farmers opt to grow maize rather than sorghum.

Figure 37: Area Planted in the Traditional Sector, All Crops

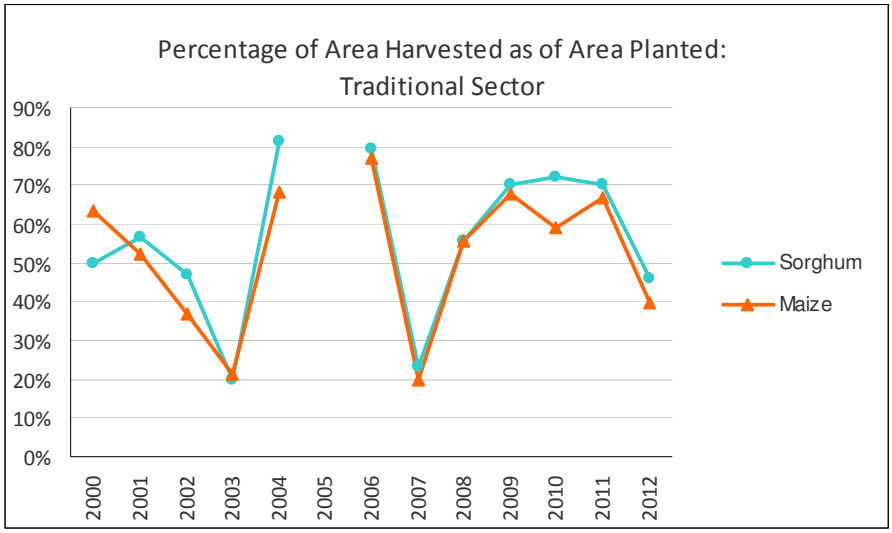


Source of data: Statistics Botswana: 2012 Annual Agricultural Survey Report. Gaborone, April 2014.

The share of area planted in the traditional sector that was actually harvested has been around 60 percent since 2008, but has fallen to 40-45 percent in 2012 (Figure 38). The average in recent years is higher than in the period 2000-2004, but climate related fluctuations may be disguising trends.

Note that the timing of rainfall determines areas planted and harvested in a different way. Some first rainfall is required before land can be prepared and crops planted. If the rains then fail, it is likely that only part of planted land is actually harvested. Thus, actual as well as expected rainfall determines both indicators.

Figure 38: Comparison Areas Planted and Harvested, Traditional Sector



Source of data: Statistics Botswana: 2012 Annual Agricultural Survey Report. Gaborone, April 2014.

Note: Data for 2005 are not available, as there was no survey report for that year.

Yields per area (measured in kg/ha) are assessed in relation to area planted and area harvested. Long series are only available for yields per area planted. Yields indicate efficiency of land use, but not necessarily of farming and farm labor. Increasing yields per hectare is the main focus of agricultural research and often also of agricultural policy. Yet, increasing areas rather than intensifying agriculture through the use of fertilizer and enhanced weeding on smaller plots may be an economically rational approach.

The more interesting indicator of yield per unit of labor is, unfortunately, not available, and would also be difficult to asses in practice.

Two different ways to assess yields per hectare are used: yields can be expressed as production per hectare planted or per hectare harvested.

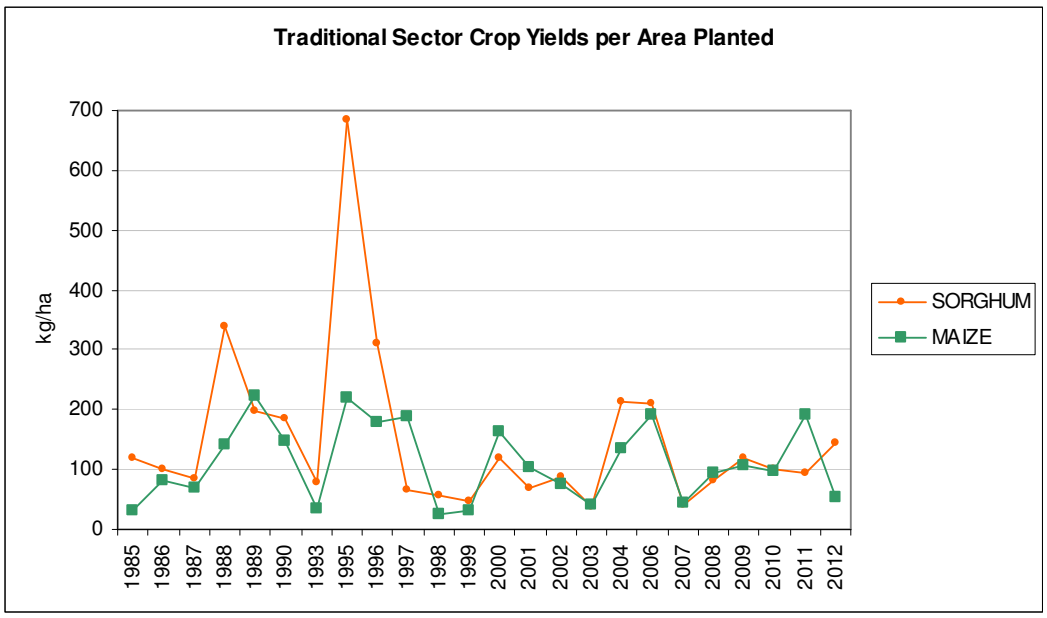
Yields per hectare for the main crops of the traditional sector continue to fluctuate. There is essentially no improvement compared to the first 10 years shown in the chart below (Figure 39). Yields per area planted fluctuate around 100 kg per hectare, which is very much below the yield obtained in research stations and way below the regional target (2000 kg/ha). Yields have not visibly improved after the introduction of ISPAAD in 2008.

The sorghum yields in 1988, 1995 and 1996 are reported at 300 kg per hectare or above. These years are exceptional due to favourable rainfall. Since the respective years were years with good rainfall, a low difference between areas planted and areas harvested may have played a role. Data on yield per area harvested are unfortunately not available as time series.

Although land productivity does not seem to have improved, labor productivity may have. Mechanization in traditional agriculture has increased during the past few years, and was promoted by

ISPAAD paying the full cost of land preparation for small farmers. Unfortunately, statistical series to support this hypothesis are not readily available.[82]

Figure 39: Crop Yields, Traditional Sector (Per Area Planted)



Source of data: Statistics Botswana: 2012 Annual Agricultural Survey Report. Gaborone, April 2014.

Crop yields per area planted and harvested are significantly higher in the commercial sector than they are in the traditional sector (Table 24). The difference is particularly high with respect to sorghum. However, one should be cautious with a general comparison because almost all sorghum and most maize is grown in the Pandamatenga area, which is characterized by very special conditions with regard to rainfall, fertility of soils and farm size, as well as the associated degree of mechanization and use of hybrid seeds, fertilizer and chemical means of pest control.

[82] In order to construct such series, figures from each years' printed reports would need to be extracted; but even then, the labor input can only be estimated roughly for lack of detailed data about full and part-time labor on traditional farms.

Table 27: Crop Production and Yields, Traditional Versus Commercial Sector

	Traditional					Commercial					Total	
	Planted (ha)	Harvested (ha)	Production (tons)	Yield / planted (kg/ha)	Yield /harvested (kg/ha)	Planted (ha)	Harvested (ha)	Production (tons)	Yield / planted (kg/ha)	Yield /harvested (kg/ha)	Production (tons)	
Maize												
1993	83,956	22,186	2,976	35	134	1,301	1,198	1,278	982	1,067	4,254	
2004	63,214	42,804	7,223	114	169	615	586	313	509	534	7,536	
2006	77,884	60,289	14,896	191	247	148	126	260	1,757	2,063	15,156	
2007	40,253	8,048	1,830	45	227	422	404	328	777	812	2,158	
2008	88,437	48,533	8,416	95	173	176	130	553	3,142	4,254	8,969	
2009	120,727	82,461	13,040	108	158	281	249	230	819	924	13,270	*
2010	109,792	65,184	10,540	96	162	324	239	239	738	1,000	10,779	*
2011	151,164	101,107	29,070	192	288	325	318	165	508	519	29,235	*
2012	140,937	55,735	7,450	53	134	385	316	227	590	718	7,677	
Average 2004-12	99,051	58,020	11,558	112	195	335	296	289	1,105	1,353	11,848	
Sorghum												
1993	138,394	66,562	10,797	78	162	5,924	5,821	5,730	967	984	16,527	
2004	44,454	38,736	10,581	238	273	11,835	11,832	1,175	99	99	11,756	
2006	58,484	46,426	12,369	211	266	5,833	5,790	29,124	4,993	5,030	41,493	
2007	29,976	7,092	1,255	42	177	3,139	2,935	10,519	3,351	3,584	11,774	
2008	63,225	35,410	5,211	82	147	9,931	7,504	18,421	1,855	2,455	23,632	
2009	67,015	46,977	7,904	118	168	11,686	11,684	21,475	1,838	1,838	29,379	
2010	61,089	44,233	6,181	101	140	15,525	14,521	25,145	1,620	1,732	31,326	
2011	63,720	42,660	5,946	93	139	6,489	6,059	26,645	4,106	4,398	32,591	
2012	51,795	24,231	7,461	144	308	11,223	11,203	16,560	1,476	1,478	24,021	
Average 2004-12	54,970	35,721	7,114	129	202	9,458	8,941	18,633	2,417	2,577	25,747	

* Numbers estimated; original figures contained clear errors in one commercial block.

Source of data: Statistics Botswana: Annual Agricultural Survey Reports, Table 2.3, various years.

Yields in the traditional sector differ across districts (Table 28). But at district level, fluctuations across years continue to be very substantial.

Table 28: Traditional Crop Yields by District: Average of Five Years between 2006 and 2012

District / Region	Maize		Sorghum	
	kg/ha planted	kg/ha harvested	kg/ha planted	kg/ha harvested
Barolong	240	306	114	225
Ngwaketse South	269	352	329	422
Ngwaketse North	117	154	217	534
Ngwaketse Central	220	264	171	290
Ngwaketse West	88	114	89	145
SOUTHERN REGION	217	275	295	416
Bamalete/Tlokweng	126	230	238	317
Kweneng South	76	139	58	110
Kweneng North	116	176	62	109
Kweneng West	103	151	63	109
Kgatleng	83	130	59	145
GABORONE REGION	99	156	66	123
Mahalapye East	57	120	85	120
Mahalapye West	77	131	90	134
Palapye	51	106	114	149
Serowe	108	179	147	217
Bobonong	74	133	88	124
Letlhakane	121	217	55	99
Selebi-Phikwe	42	93	82	130
CENTRAL REGION	72	137	106	148
Tati	74	138	113	180
Tutume	101	172	186	243
Tonota	97	156	143	188
FRANCISTOWN REGION	97	166	155	214
Ngamiland West	75	125	157	223
Ngamiland East	101	180	127	320
Chobe	192	398	369	620
MAUN REGION	95	167	192	305
Gantsi	91	144	18	45
Hukuntsi	36	71	56	59
Tsabong	277	420	33	78
WESTERN REGION	117	182	17	30
TOTAL TRADITIONAL	128	200	130	206

Source of data: Statistics Botswana: Agricultural Survey Reports, various years.

Note:

The 5 years are 2006, 2007, 2009, 2011 and 2012. No detailed data are available for the years not covered.

Mainly for reference, Table 29 below provides areas planted and harvested by traditional and commercial farmers in numeric format. The data show the small weight of commercial farming on the basis of area planted and harvested. Noteworthy are the variability of area planted by commercial farmers and also the totally unclear effect of ISPAAD (in operation since the 2008/09 season) on the area harvested by traditional farmers. .

Table 29: Area Planted and Harvested, Traditional and Commercial Farmers

hectares

	Area planted			Area harvested		
	Traditional	Commercial	Total	Traditional	Commercial	Total
2003	79,810	16,235	96,045	17,215	16,198	33,413
2004	140,250	16,856	157,106	98,442	16,207	114,649
2006	173,409	9,067	182,476	133,039	8,744	141,783
2007	102,285	5,967	108,252	21,322	5,580	26,902
2008	203,714	22,807	226,521	108,515	17,288	125,803
2009	242,663	15,998	258,661	242,663	15,998	258,661
2010	219,443	19,937	239,380	141,245	19,151	160,396
2011	261,967	27,311	289,278	173,955	26,717	200,672
2012	243,764	18,997	262,761	102,659	18,719	121,378

Source of Data: Statistics Botswana: Agricultural Survey Reports, various years, Table 2.3.1.

Note: Areas refer to all agriculture and include those used to grow oil seeds, beans or fodder. The figures are slightly higher than those underlying Figure 37.

3. Livestock

3.1 Livestock: GDP

The livestock subsector's real contribution to GDP has essentially not increased over the period 2000-2012. However, puzzles and mysteries remain that our Team could not clarify. First, it is unclear why real value-added should have dropped in 2011 and 2012, since statistics do not show a steep reduction of herd sizes for these years. Second, the distance between series in real and in current prices suddenly increased substantially in 2011 and even more in 2012. Either a substantial increase in cattle prices or a much higher incidence of subsidies could explain this. However, no such price or subsidy increases could be found in these years.[83]

Statistics Botswana, responding to the question, gave the following explanation: "In 2011, animal population was declining. During this year there was drought and outbreak of foot and mouth disease in the northern side of Botswana which resulted in culling of affected animals. Drought killed a lot of traditional farming livestock. This resulted in the lower value added experienced in 2011."[84] This, however, is not reflected in agricultural statistics about stocks and does not explain the much lesser drop in GDP in current than in constant prices.

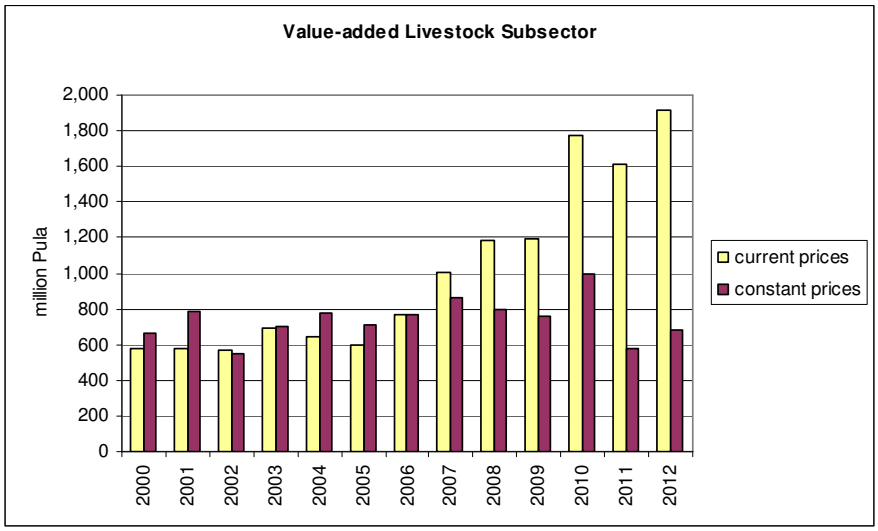
Industrial chicken production has seen significant expansion in recent years. It is not captured in agricultural survey reports, but is included in GDP statistics under "livestock".

Thus, it remains unclear whether incomes derived from the livestock subsector actually increased in 2012 or not.

[83] We checked whether the sudden growth of the gap between current and constant price series could be explained by exchange rate fluctuations, but had to dismiss the initial hypothesis.

[84] E-Mail sent on February 25, 2014.

Figure 40: Value-Added of Livestock Subsector, Current and Constant Prices

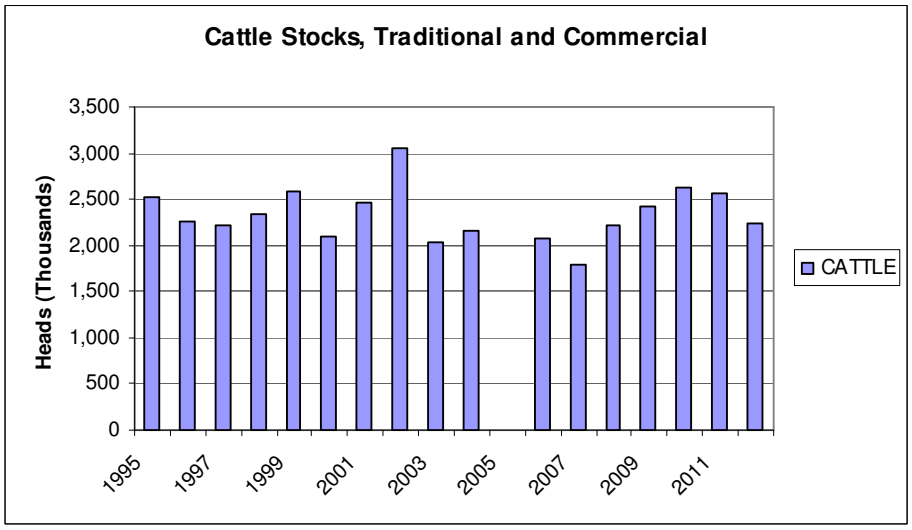


Source of Data: Statistics Botswana: GDP by Sub-industries. File obtained in February 2014.

3.2 Livestock: Agricultural Surveys

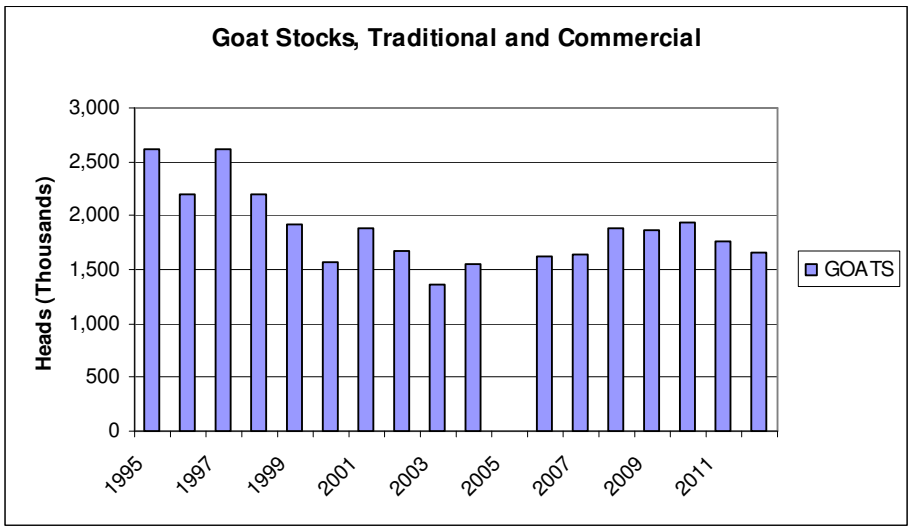
Stocks of cattle and goats, as reported in Agricultural Surveys, have been rather stable over the past 20 years, as shown in the charts below. The succinct drop of cattle population from 2002 to 2003 is emergency sales and death in the wake of a severe drought.

Figure 41: Cattle Stocks



Source of data: Statistics Botswana: 2012 Annual Agricultural Survey Report. Gaborone, April 2014.

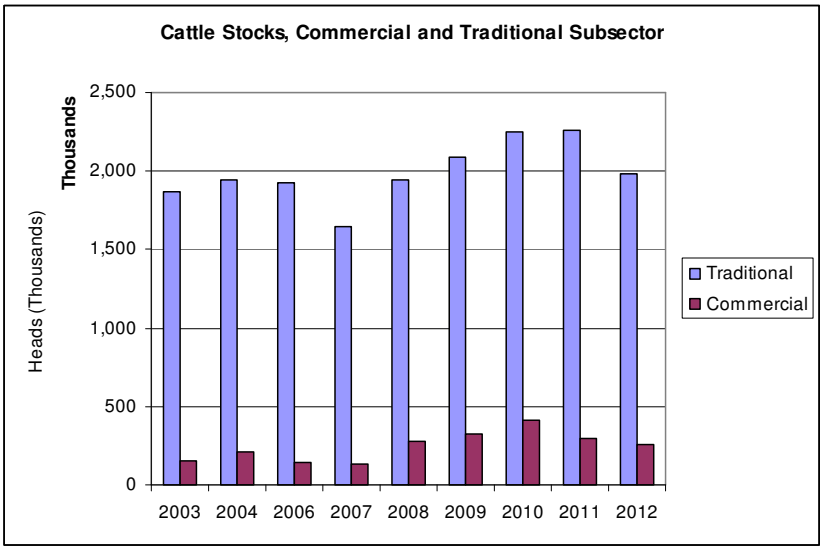
Table 30: Goat Stocks



Source of data: Statistics Botswana: 2012 Annual Agricultural Survey Report. Gaborone, April 2014.

Cattle holding and production is predominantly an activity of the traditional sector. Note, however, that the categories "commercial" and "traditional" depend on the type of land tenure. Although commercial cattle holders are predominantly business oriented, a substantial part of traditional cattle is also owned by individuals who have substantial numbers of heads. In the case of cattle, "traditional" does not mean "small-scale" or "subsistence".

Figure 42: Cattle Stocks by Commercial / Traditional



Source of data: Statistics Botswana: Agricultural Survey Reports. Various years (assembled from tables in the text part of the report).

Death and off-take rates

Offtake rates, which, in the aggregate statistics, indicate the percentage of animals slaughtered, are always significantly lower in the traditional than in the commercial sector. Low offtake rates can indicate

- high death rates, so that the number available for slaughter is reduced, or
- higher average age – animals grow older before they are taken for slaughter.

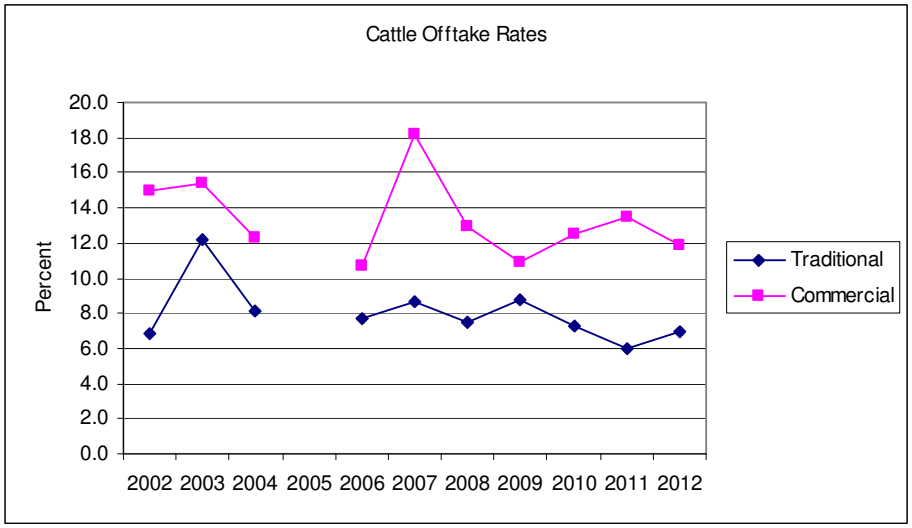
In the case of an impeding drought, offtake rates in the commercial sector are exceptionally high as farmers take their cattle for slaughter while they still have a reasonable weight. In the traditional sector, this practice is not widely done, which in part explains higher mortality rates here.

High average age may be indicative of logistical difficulties in selling animals, frequent poor health status and weight so that farmers prefer to wait until food availability has improved and cattle have gained mass, or a conscientious decision by farmers who attach value to herd size itself, for instance because herds are a means of saving and possibly status.

Herd size is limited primarily by the availability of grazing land and access to water. If not related to high death rates, low offtake rates imply that revenue per unit of available land is lower than it could be. Depending on management decisions, this reduces income of cattle holders or contributes to over-grazing.

Offtake rates in the commercial sector are always higher than in the traditional sector, by a substantial margin (Figure 43).

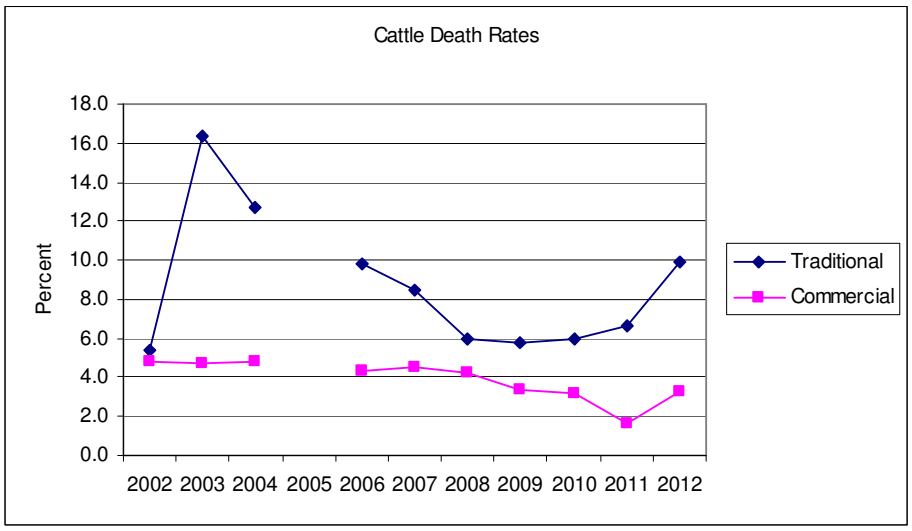
Figure 43: Cattle Offtake Rates, Traditional and Commercial



Source of data: Statistics Botswana: Agricultural Survey Reports. Various years.

While commercial offtake rates are higher than in the traditional sector, death rates are significantly lower (Figure 44). The peak of death rates in the traditional sector in 2003 was due to drought and related lack of feed. Commercial farmers were able to supplement feed and sell off animals that could not be fed in time. These options weren't been available to many holders in the traditional sector.

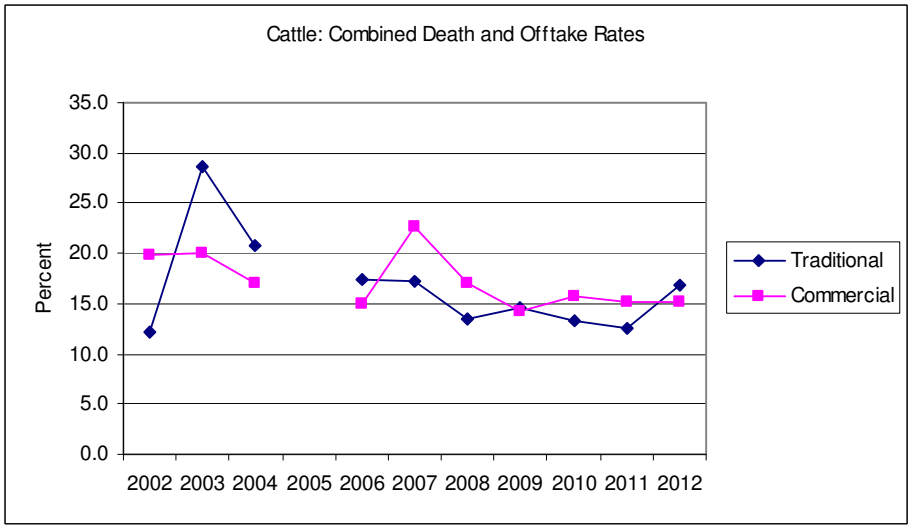
Figure 44: Cattle Death Rates, Traditional and Commercial



Source of data: Statistics Botswana: Agricultural Survey Reports. Various years.

A look at the combined offtake and death rate shows that the remaining differences between the two farming systems tend to disappear, which suggests that low offtake rates in traditional livestock holding are primarily the result of high incidence of deaths Figure 45).

Figure 45: Combined Death and Offtake Rates, Traditional and Commercial



Source of data: Statistics Botswana: Agricultural Survey Reports. Various years.

Statistical tables also show a column denominated as “losses”. These are between 1.5 and 2.5 percent for commercial cattle, but average about 5.5 percent for traditional cattle for the years where data were available. Losses covers stray animals, animals killed by predators and accidents including those suspected to have been stolen. They are higher in traditional cattle oldings because of the inherent difficulties to keep herds together under this extensive grazing system.

A look at statistical data disaggregated by district shows considerable variations across districts, but also consistently high death rates (Table 31). As mentioned, the rate of "losses" is high. The gap between the traditional and the commercial cattle sector are substantial (Table 32).

Table 31: Traditional Cattle Rates by District, Average for Six Years

District	Offtake	Death	Loss	Total	Stock 2011 (Thousands)
Barolong	9.3%	8.5%	3.8%	21.5%	20.3
Ngwaketse South	7.4%	8.1%	3.6%	19.1%	37.2
Ngwaketse North	6.7%	8.5%	2.7%	17.9%	51.1
Ngwaketse Central	6.6%	10.4%	5.0%	22.0%	67.8
Ngwaketse West	6.2%	8.4%	4.3%	18.8%	50.1
SOUTHERN REGION	6.9%	8.8%	4.0%	19.7%	226.5
Bamalete/Tlokweng	6.3%	14.4%	2.8%	23.5%	18.4
Kweneng South	6.8%	12.3%	4.0%	23.1%	127.2
Kweneng North	6.4%	7.9%	3.4%	17.7%	88.6
Kweneng West	8.3%	7.4%	4.7%	20.4%	119.6
Kgatleng	7.8%	8.6%	6.2%	22.7%	94.6
GABORONE REGION	7.3%	9.3%	4.6%	21.3%	448.3
Mahalapye East	9.5%	9.7%	5.6%	24.8%	53.4
Mahalapye West	8.5%	7.8%	7.1%	23.5%	204.0
Palapye	9.9%	10.1%	6.9%	27.0%	140.9
Serowe	9.5%	6.7%	4.9%	21.0%	159.8
Bobonong	6.3%	12.1%	7.1%	25.6%	52.0
Letlhakane	8.7%	8.8%	5.5%	23.0%	191.5
Selebi-Phikwe	7.6%	10.4%	6.2%	24.2%	78.2
CENTRAL REGION	8.7%	8.7%	6.1%	23.6%	879.8
Tati	4.5%	12.5%	4.3%	21.3%	32.5
Tutume	5.6%	10.2%	4.7%	20.5%	224.5
Tonota	8.3%	9.7%	7.5%	25.5%	58.2
FRANCISTOWN REGION	6.2%	10.2%	5.3%	21.7%	315.2
Ngamiland West	2.0%	8.2%	3.3%	13.5%	54.9
Ngamiland East	4.6%	8.9%	6.5%	20.0%	186.2
Chobe	4.5%	12.5%	4.7%	21.7%	2.6
MAUN REGION	3.9%	8.8%	5.7%	18.4%	243.7
Gantsi	11.6%	9.6%	5.4%	26.6%	93.0
Hukuntsi	10.6%	10.1%	13.9%	34.7%	26.7
Tsabong	8.5%	7.7%	6.1%	22.3%	27.0
WESTERN REGION	10.7%	9.0%	7.5%	27.2%	146.7
TOTAL TRADITIONAL	7.7%	8.9%	5.5%	22.0%	2,260.3

Source of data: Statistics Botswana: Agricultural Survey Reports, Table 4.5 and Table 4.5A. Various years.

Note:

Selected years are 2004, 2006, 2007, 2009, 2011 and 2012; the selection was dictated by availability of data.

Table 32: Commercial Cattle Rates, Selected Years

				Percent
Year	Offtake	Death	Losses	Total
2004	12,3	4,8	2,1	19,2
2006	10,7	4,3	1,5	16,5
2007	18,2	4,5	1,5	24,2
2009	10,9	3,4	1,0	15,3
2011	13,5	1,6	2,4	17,5
2012	11,9	3,3	1,5	16,7

Source of data: Statistics Botswana: Agricultural Survey Reports, Tables 9.x. Various years.

3.3 Poultry

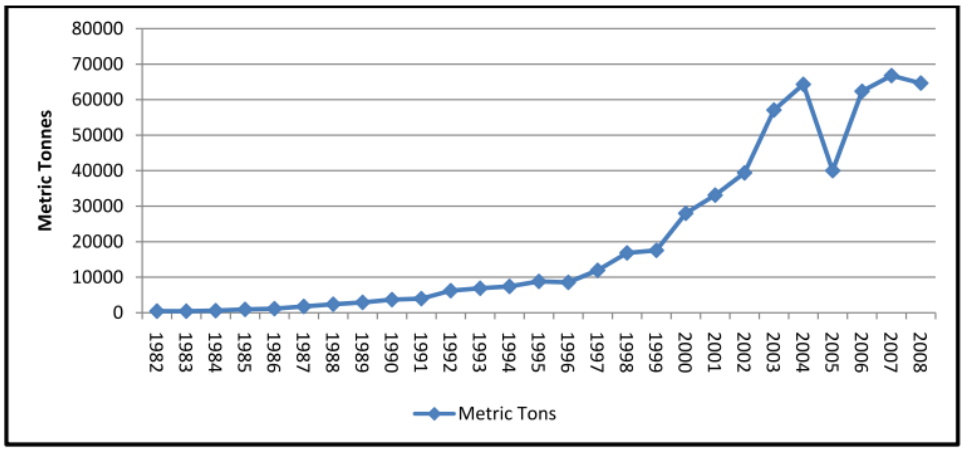
Few data on industrial poultry meat and egg production could be found. This sector is not covered by the Statistics Botswana surveys, but most likely covered in GDP statistics.

Industrial poultry production has increased significantly over the years. Government efforts to create a poultry sector based on smallholders and publicly owned and operated abattoirs have failed, although the installations created in the 1990's became the basis for the industrial sector. Feed is mixed locally on the basis of imported ingredients. All maize required for chicken feed is imported.

The industry is characterized by high concentration (few producers, vertically integrated dominate the market) and important economies of scale. Therefore it is doubtful whether renewed Government efforts to promote once more a diversified poultry industry with high involvement of farmers can succeed.[85]

The only information about poultry meat production that could be found is shown below (Figure 46).

Figure 46: Poultry Meat Production in Botswana



Source: Grynberg, Roman and Masedi Motswapong (2011): Competition and Trade Policy: The Case of Botswana Poultry Industry. BIDPA Working Paper 3. Botswana Institute for Development Policy Analysis (BIDPA), Gaborone. Page 9.

4. Horticulture and others

Horticultural products make up about 70 percent of the "Other" category in detailed GDP statistics. The remainder relates to honey production, fruits, velt products, fishing and forestry.

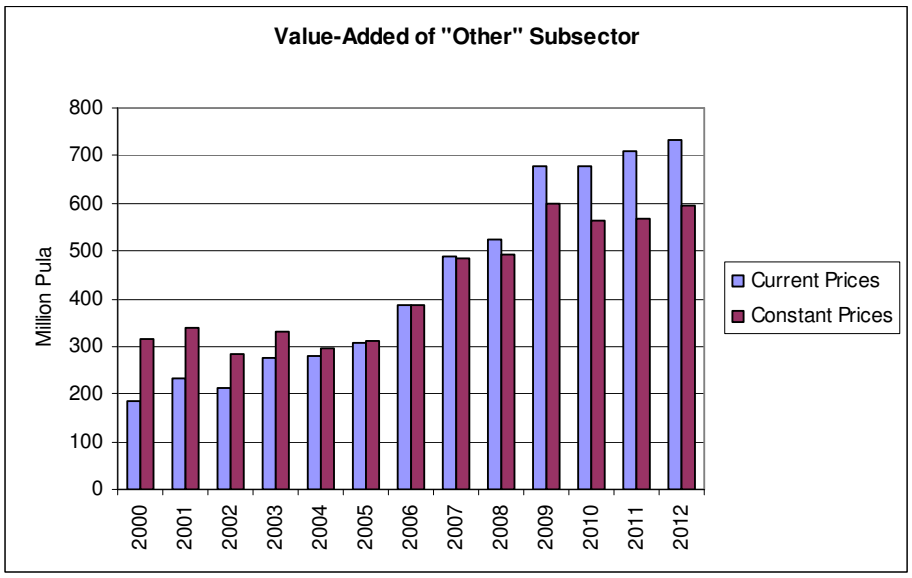
The series about value-added in the "others" subsector shows substantial and regular growth, and the behavior of the series in constant and current prices, respectively, appears plausible.

According to these series (Figure 40), income derived from horticulture stagnated between 2000 and 2005, then increased significantly until 2009, and stabilized there for the remainder of the period. Nominal value-added continued to grow, as would be expected, as a result of gradually rising prices

[85] See Grynberg, Roman and Masedi Motswapong (2011): Competition and Trade Policy: The Case of Botswana Poultry Industry. BIDPA Working Paper 3. Botswana Institute for Development Policy Analysis (BIDPA), Gaborone.

in Botswana. Without the effects of inflation, real value-added has grown from P388 million in 2006 to about P580 million in the period 2010-12, an increase by approximately 50 percent.

Figure 47: Value-added of the Subsector "Other"



Source of data: Statistics Botswana, GDP by Sub-industries. File obtained in February 2014.

Data are difficult to extract from annual survey reports because it does not present long series on horticultural products. Data until 2009, available from a study published in 2012, are shown below.[86] The impressive growth is clearly visible.

Table 33: Area and Production of Vegetables Crops in Botswana From 1997-2009

Table 1. Area and production of vegetables crops in Botswana from 1997-2009

Years	Production (Tons)	Area (hectares)	Productivity (yield ha^{-1}
1997/1998	6900.00	407.85	16.92
1998/1999	9198.00	496.75	18.52
1999/2000	3546.00	545.45	6.50
2000/2001	7289.00	1060.11	6.88
2001/2002	8080.00	671.35	12.04
2002/2003	13406.00	462.34	29.00
2003/2004	15874.09	904.57	17.55
2004/2005	18179.63	982.36	18.51
2005/2006	30762.95	1036.00	29.69
2006/2007	24076.16	882.45	27.28
2007/2008	31985.00	925.21	34.57
2008/2009	31150.00	830.00	37.53

Source: Madisa (2012)

[86] See Madisa, M.E.; M. Obopile; Y. Assefa (2012): Analysis of Horticultural Production Trends in Botswana. Journal of Plant Studies, Vol. 1 No. 1, March 2012.

Table 34: Area and Production of Fruit Trees in Botswana From 2003-2009

Table 2. Area and production of fruit trees in Botswana from 2003-2009

Year	Productions (tons)	Area (hectares)	Productivity (yield ha^{-1})
2003/2004	3388.05	340.79	9.94
2004/2005	5212.49	311.40	16.74
2005/2006	6686.79	337.97	19.79
2006/2007	8118.99	683.99	11.87
2007/2008	9551.18	1030.00	9.27
2008/2009	7850.00	1030.00	7.62

Source: Madisa (2012)

Annex 2:
Current Agricultural Support Schemes

This annex draws information from brochures provided by the institutions or available for download from the Internet. It only shows the current benefits and rules as of February 2014.

1. ISPAAD (version May 2013)

The ISPAAD rules were modied with effect for the 2013/14 planting season. This section describes the new benefits and rules. Old roles applied from 2008/09 to 2012/13 seasons.

The main innovations in the new guidelines are:

- Grouping of farm holdings into the categories of subsistence / emerging / commercial farmers, also in order to reduce administrative costs;
- Seeds were initially subsidized at a rate of 50 percent irrespective of farm size; the rate was reduced in the new guidelines;
- Limit of free plowing for subsistence farmers: the first 5 hectares continue to be free, the subsidy of 50 percent for the following 6^{th} to 15^{th} hectares was eliminated;
- Introduction of a 35 percent subsidy on fertilizer and herbicides for emerging farmers, 30 percent for commercial farmers; under the old regulation, they were not eligible, the maximum area covered was 11 hectares.
- Herbicides were introduced and subsidized at the same rate as fertilizer in order to allow minimum tillage and control of weeds by chemical means rather than plowing.

1.1 Input subsidies

The benefits available through ISPAAD depend on the type of farm. The number of years for which the benefits are provided is not limited.

ISPAAD distinguishes three classes of farmers:

a) Subsistence farmers cultivate up to a maximum of 16 ha and use small equipment that is suitable for their area of production;

b) Emerging farmers cultivate up to 150 ha; and

c) Commercial farmers cultivate more; they can get subsidizid inputs only for an area of up to 500 ha.

Subsidy rates:

Type of Input	Subsistence farmers: first 5 ha	Subsistence farmers: additional 6th to 15th ha	Emerging farmers up to 150 ha	Commercial farmers up to 500 ha
Plowing, row planting, tillage, harrowing	100%	–	–	–
Hybrid seeds	100%	–	35%	30%
Open pollinated seeds	100%	100%	35%	30%
Fertilizer, herbicides	100%	–	35%	30%

Additional conditions are:

- Land preparation costs are limited to
  - Plowing and row planting: P800 per hectare
  - Minimum tillage: P500 per hectare
  - Harrowing: P360 per hectare
- Fertilizer and herbicides are available only if farmers row-plant.

1.2 Fencing and boreholes

Fencing is promoted in order to protect fields from animals, especially from goats. Distinction is made between cluster, group and individual fencing. Groups and Clusters must have a working constitution and a Committee.

If beneficiaries do not undertake crop production activities, the material reverts to Government.

Clusters

Extensive consultation should take place, collective ownership of the fence must be clarified. The cluster shall have a working constitution and a Cluster Committee. Areas are normally between 150 ha and 3500 ha.

Government purchases the fencing materials, construction will be carried out through *Ipelegeng*. Maintenance is at the charge of the group.

In addition, clusters can request that ISPAAD drills and equips boreholes. The costs of maintenance and operation are borne by the cluster. The boreholes are exclusively for provision of domestic water.

Group fencing

Group fencing is available for groups with less than 150 ha. A group consists of at least two farmers.

Benefit: 50% of the cost of fencing material up to P200,000.

Individual fencing

Benefit: 50% of the cost of fencing material up to a maximum of P70,000.

Access to the land must be proven, the lease period should not be less than 50 years.

1.3 Horticulture

Criteria:

- Access to owned or leased land (minimum of 10 years for the lease period)
- The project should be full-time owner managed or managed by a person with technical know-how.
- A business plan and annual financial statements have to be presented.
- There must be an established and reliable source of water.

Benefits:

- For a maximum of 3 years: grant of 40% on inputs (pesticides, fertilizers, package material, seedlings and seeds) for individuals, 60% for groups. Maximum: P120,000. Minimum farm size: 0.5 ha for individuals, 2.0 ha for groups.
- Farm equipment: grant of 40% for individuals, 60% for groups. Maximum: P200,000. Minimum farm size: 1.0 ha for individuals 2.0 ha for groups.

1.4 Seasonal loans

ISPAAD facilitates seasonal credit through the National Development Bank (NDB). NDP charges the prime rate to farmers and claims the difference between the prime and market rates from the Ministry of Agriculture. Applicants should have cover under the Agricultural Credit Guarantee Scheme (ACGS).

2. LIMID

Benefits are shown in the table below.

Item subsidized	Maximum grant	Percent of cost as grant	Notes
Smallstock: purchase and veterinary requisites	P12,000	90%-100%	Only for resource-poor farmers
Tswana chicken: 21 hens and 4 cocks	P10,000	90%-100%	Only for resource-poor farmers
Borehole drilling	P120,000	Individuals: 50% Groups 2-9 members: 60% Groups 10+members: 70%	Number of cattle 61-200
Borehole/well equipping	P40,000	50-70 % as above	Number of cattle 61-200 for groups, 1-60 for individuals

Item subsidized	Maximum grant	Percent of cost as grant	Notes
Water reticulation	P120,000	50-70% as above	Number of cattle 61-200 for groups, 1-60 for individuals
Borehole/well purchase	P120,000	50-70% as above	Number of cattle 61-200
Equip existing boreholes and reticulate water, communal areas	n/a	100%	Groups of small herd owners in communal areas with 1-40 cattle each, groups with 15 or more members
Fodder processor	P12,000	Individuals: 20% Groups 2-9: 50% Groups 10+: 70%	
Kraal, crush and loading ramp	P28,000	as above	
Fodder barn	P15,000	as above	

In addition LIMID assists small-scale poultry farmers to establish slaughtering facilities. They must form a cooperative with at least 15 members. The maximum grant for an abattoir is P4 million. MOA will construct and operate these abattoirs until they are profitable. "Ministry will gradually relief itself of the management of the facilities by either handing them over to local authorities or sell them to private sector / parastatals ..."

3. CEDA Loans

These loans are for commercial farmers not necessarily in principle, but by the way eligibility criteria are formulated. The annual interest rates are:

- 5.0% for loans of P500 to P500,000
- 7.5% for loans up to P4 million
- Prevailing prime rate for up to P30 million.

A grace period of up to 4 years can be granted.

Among the many preconditions are a business plan, deeds, soil and water tests if applicable. Special requirements by type of agriculture are (selected items only):

Subsector	Requirements
Horticulture	A minimum size of 2 ha shall be considered as the most preferable scale. Water yields of 5-6 m³ per hour per hectare
Citrus crops	A minimum of 4 ha of land At least 6 m³ per hour of water
Rain-fed Agriculture (Seasonal)	Minimum of 150 ha

Subsector	Requirements
Cattle breeding	Minimum breeding stock of 100 cows for commercial farming Minimum breeding for stud of 40 cows Weaner production of 100 cows Weaner finishing of 200 cows Minimum distance between water points of 6 km
Smallstock	Minimum breeding stock of 200 goads or sheep Minimum land of 2ha per goat/sheep Buck to Doe ratio of 1:25
Poultry: Broilers	At least 10,000 birds per cycle Reliable and acceptable slaughter facilities Reliable sources of water and electricity
Poultry: Layers	At least 5,000 birds per cycle Reliable source of water and electricity
Piggery	Minimum stock of 100 sows Reliable source of water There must be an abattoir within the sub-district or an abattoir must be included as part of the budget.
Dairy farming	Minimum of 100 cows Electricity and 60 liters of water per cow per day must be available
Feedlot	Farmer must have an agreement with BMC Water yield of 5 m^3 per hour

Annex 3: Proposal for Action Plan

No.	Area / Objective	Action	Who?	Occasion and timing
1	Maputo Declaration: Respect the idea but avoid inefficient spending	Do not commit to the 10% target in the context of the planned CAADP compact. Scale down expectations with regard to agricultural growth for income creation and diversification in view of Botswana's limited agricultural resource base. Instead, commit to broaden the agricultural base where it is viable.	MOA policy-makers	CAADP preparation, in 2014
2	Policy: Ensure food security and affordable prices, avoid distortions	Maintain open border policy on agricultural products and avoid price support interventions. Do resist pressure to support producer prices.	MOA general, also Ministry of Trade and Industry	permanent
3	Policy: Contribution of local production to food security	Provide guidance as to whether and where local production actually improves food security and clearly identify costs to the budget if unprofitable production is to be promoted on this argument. Otherwise, promote products and production where Botswana has comparative advantages.	MOA	permanent
4	Big investment projects: avoid projects that are not economically beneficial and environmentally acceptable and sustainable	Conduct thorough feasibility studies, focus on economic factors and check realism of underlying assumptions, in particular for the planned Zambezi irrigation project. Consider the economic benefit of extending more primary infrastructure (roads, telecommunications, electricity) to agricultural areas.	MOA, Agricultural Hub	Particularly with regard to decisions about the planned Zambezi scheme
5	Extension: improve effectiveness	Invest in mobility of extension staff. Consider reviewing the current structure of extension services, implementation and communication strategies and funding.	MOA during budget preparation	also during NDP 11 preparation
6	Technology and innovation: produce recommendations that meet farmer's needs and are	Conduct a study on ways to make the chain from research through extension to farmers and back more effective. Con-	MOA Policy Department, with involvement of research and tech-	2014/15 Prior to preparation of NDP 11

No.	Area / Objective	Action	Who?	Occasion and timing
	suitable for the conditions under which they operate	sider a National Research Council. Ensure farmers' voice in determining research priorities. Increase on-farm trials and focus on economic and social benefits. Ensure sufficient funding for promising research proposals.	nical departments Budget and NDP 11 preparation: MOA and MFPD	
7	Planning: Realistic targets	Improve realism when setting quantitative targets. Maintaining production levels is a good target already.	MOA	Preparation of NDP 11 and other strategies
8	Support schemes: Monitoring	Strengthen monitoring of support schemes, especially ISPAAD. Following results for a small sample of farmers would be useful.	MOA, Departments for Planning and Policy and Crop Production	permanent
9	Support scheme: Improve ISPAAD	ISPAAD should be reviewed to address the implementation flaws identified, to target better different types of farmers and show the relationship with other support measures	MOA, Departments for Planning and Policy and Crop Production	2014/2015
10	Emergency relief: Finance	Continue to provide additional funds for emergency response to MOA, avoiding the need to reduce funding of projects.	MOA, MFDP	permanent
11	Livestock: LITS	Ensure that the successor system (ear tags) is compatible with the conditions of traditional livestock holders.	MOA, Livestock and Vet Services Departments	2014-2015
12	Horticulture and Irrigation	Continue with the idea to use effluent water for irrigation. Support horticultural farmers to work with value chains.	MOA Crops Department, MOA budgeting	2014-15, preparation of NDP 11