



Water Governance in Botswana

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EXECUTIVE SUMMARY

RECOMMENDATIONS

- Parliament should approve the water policy for implementation as soon as possible.
- Accelerate the implementation of the IWRM-WE plan with more focus on WDM to keep water affordable and promote greater allocative efficiency.
- Urgently revise and expand the water sector's legal instruments to be more cogently integrated with governance arrangements in other sectors.
- Establish the Water Resources Board and the Water Regulator, and develop a comprehensive water pricing policy.
- The government needs to explore additional funding sources for the water sector (eg, private sector-led investments or public-private partnerships).

Botswana is water scarce, with endemic drought and varied rainfall. In order to meet increases in water demand efficiently and sustainably, greater policy coherence and implementation is needed. The government acknowledges the principles of integrated water resources management (IWRM), but this is largely rhetorical. Water management is still centralised and stakeholder participation is often non-existent. The 1991 National Water Master Plan (NWMP) and its 2006 Review (NWMPR) have guided water resource management. In 2013, an IWRM-water efficiency (IWRM-WE) plan was approved with a detailed action programme. These reforms aim to separate the institutional responsibilities for water provision, management and regulation; review finances, tariffs and subsidies; and review water policy and legislation. However, implementation has been slow. The 2012 draft water policy awaits approval by Parliament and the Water Act has not been revised since its enactment in 1968. Without these institutional arrangements, future water supplies will likely be jeopardised. This policy briefing describes and analyses Botswana's water governance structure. It argues that institutional reform in demand management and conservation is crucial to ensure a sustainable supply of water.

INTRODUCTION

Botswana is landlocked and arid. With a population of roughly 2 million, growing annually at 2.4%, sustainable water use is imperative. Three-quarters of the population live in eastern Botswana, which has higher rainfall levels than western Botswana, and soil that is poor but workable. However, only an estimated 3% of the country is arable agricultural land, and this is mostly in the north-east, which has the highest rainfall. At least 10% of the population live in Gaborone in the south-east. Botswana's mean annual rainfall is 416mm, ranging from 650mm in the north to 250mm in the south-west. Water resources are limited and could constrain future economic growth if inefficiently stored, transported and utilised.

Water demand is forecast to reach 285.8 cubic megametres (Mm³) a year by 2030,² whereas demand was only 193.4Mm³ in 2000. Mining and energy

accounted for 18% of water use in 2000; livestock for 23%; and irrigation for 15%. Residential users consumed approximately 41% of available supply.³ Agriculture is thus the largest industrial consumer, despite a relatively small proportion of arable land being under irrigation. However, in productivity terms, agriculture generates relatively less value added. This makes increased efficiency urgent, especially in the context of competing uses.

Botswana is coal-abundant, and with diamond revenues set to decline the country is considering expanding coal mining for global exports. If it exported 72Mt/a (as one study suggests), this would require at least 5.7Mm³ of water a year.⁴ This is problematic amid the contention that mines and mining towns already over-extract groundwater.⁵

Although Botswana's water policy framework emphasises conservation and demand management, implementation is limited, as 'there is a great deal of ignorance about the state of water resources in the country, compounded by shortages of scientific data and ineffective monitoring'.⁶ Groundwater abstraction limits are set at 22.75Mm³ a year (for mining, agriculture and industry). It is unclear how these limits are set, and they are often exceeded. Punitive measures are infrequently administered, especially if employment is likely to be negatively affected.

The emphasis on increasing supply is complicated by distribution problems. The 2014 Botswana water accounts suggest that system water losses average 19–26% or 3.5Mm³ a year, costing roughly \$1.01 million. Maintaining existing infrastructure is a significant challenge, let alone building new infrastructure.

Both ground and surface water resources are utilised, the latter mostly from ephemeral rivers and dams. Western Botswana has no surface water, and relies entirely on groundwater. The Chobe and Okavango rivers are the only perennial rivers, located in the north. Subject to licensing by the Water Apportionment Board, water is abstracted by the Water Utilities Corporation (WUC) and by self-providers. Livestock farmers, mines, tour operators, outside settlements and construction companies are the major self-providers. Crop production is predominantly rain fed. Groundwater abstraction has increased by a third, from less than 150Mm³ in 1990 to 195Mm³ in 2013/14. The population increase, economic growth and improved living standards have increased water demand and consumption, putting pressure on

available water resources. In response, the government has invested in the construction of additional dams (Dikgatlong, Thune and Lotsane) and water transfer schemes. A 400km-long north-south carrier (NSC-1) is being expanded and has an optimum capacity of 25Mm³ per year. This intra-basin water transfer scheme pumps water from the Motloutse River in the north-east to major villages and towns along the eastern corridor of Botswana, ending in Gaborone. A second carrier, NSC-2, was estimated in 2010 to cost \$854 million, and should deliver an additional 45Mm³ per year. Construction has started and will transfer water from Dikgatlong Dam to southern Botswana, supplementing the NSC-1.⁷ The NSC-3 will abstract water from the Chobe-Zambezi River mainly for irrigation in the Pandamatenga area, and augment water supply in south-eastern Botswana.

STRATEGIES, POLICIES AND LAWS

The 2006 NWMPR⁸ and the 2013 national IWRM-WE Plan⁹ comprise the country's water strategies. The NWMPR states that continued supply expansion will lead to high and unsustainable water costs. A policy shift towards water demand management (WDM) is required. The opportunity costs of government-funded supply expansion are particularly high in the context of competing development priorities. Regarding the NWMPR's recommendations for institutional change, the 1968 Water Act has not yet been revised, the Water Resources Board has not yet been established and there is no formal water pricing policy. Currently, the following process determines pricing: the WUC proposes a pricing structure, which has to be approved by the Ministry of Minerals, Energy and Water Resources. A block tariff system is applied with rising water tariffs for higher user bands. Self-providers pay for water rights attained from the Water Apportionment Board, but not for raw water abstraction. The 2012 Draft Water Policy calls for a raw water extraction fee for all water withdrawals to help fund water management activities and encourage conservation. The NWMPR further calls for increased use of treated effluent for activities that do not require potable water.

The national IWRM-WE plan (2013–2030) was developed to enable IWRM implementation and seeks to 'improve people's livelihoods and welfare ... through efficient, equitable and sustainable water resources development and management'.¹⁰ Efficient

water allocation, WDM and benefits from shared water resources are among the plan's priorities. It recognises the need to implement water accounting as a tool to enhance water allocation efficiency. This activity is currently implemented by the Department of Water Affairs (DWA) with participation of sectors such as mining and agriculture. Institutionally, the Water Resources Council and the DWA are expected to lead and co-ordinate implementation of the plan. Funding strategies to ensure the successful implementation of the IWRM are urgently required.

The 2012 Draft Water Policy provides a framework to enhance access to good quality water by all users and promote the sustainable development of water resources to support economic growth, diversification and poverty eradication. The policy aims to ensure that water is allocated more efficiently across different user sectors. It advocates a decentralised catchment area approach to address area-specific resource conditions. Once the policy is approved, the WRB and Water Regulator will be established. The WRB is responsible for overseeing and allocating water resources and developing water-related policies, while the Regulator needs to ensure financial sustainability by guiding and monitoring water tariff structures. Currently there is no regulator and elements of water pricing are provided for in the 1968 Water Act and 1970 WUC Act. The minister of minerals, energy and water resources approves the tariffs, which are adjusted when the need arises. The policy was approved by cabinet in July 2012 but still awaits approval by Parliament.

The National Development Plan 10's (NDP10) water sector goal is to 'supply adequate water efficiently of the required quality for different purposes'¹¹ and supports the sustainable use and management of water resources. The plan emphasises the importance of a participatory approach in developing and managing water. In terms of infrastructure, the plan envisages the completion of the Dikgatlong, Lotsane, Thune and Mosetse dams, which will increase total dam capacity from 400Mm³ to 948Mm³, while combined sustainable yield will increase from 68Mm³ to 147.9Mm³ per year. These are the last suitable dam sites in Botswana, as all other catchment areas have been exhausted. Further groundwater sources should be investigated in combination with a shift towards a stronger WDM and increased use efficiency. In this respect, the NDP10 notes that the legal instruments of the water sector are outdated¹² and need

urgent revision and expansion.

The implementation of the IWRM will cut across a number of sectors, eg, mining, land, natural resources/biodiversity, development, agriculture and tourism. Therefore, the governance arrangements of these sectors need to be integrated with those of the water sector.

Institutional framework

The WSR process was initiated in 2008 and aims to establish more efficient and sustainable water management; separate water provision and resource planning; reduce inefficiencies; and fill management gaps in the water sector.¹³ To achieve this, several institutional changes were proposed:

- The WUC becomes solely responsible for water supply, reticulation and wastewater treatment in all settlements. Previously both the DWA and district councils provided water, while the Department of Waste Management and Pollution Control handled wastewater.
- The DWA's mandate changes to water resource planning, development and management. This includes the planning and development of large water infrastructures such as dams and transfer schemes.
- The Water Resources Council (to replace the Water Apportionment Board) and the Water Regulator must be established.

Self-providers such as mines and farmers are responsible for their own water supply and management, subject to attaining user rights from the Land Board and the Water Apportionment Board (WAB). The combined groundwater abstraction of self-providers is almost half of the country's total water abstraction.¹⁴ Future water resource management plans, built on better data, need to ensure that groundwater abstraction is sustainably utilised and managed. Currently, only a limited number of users submit their annual water monitoring reports to the WAB.

The government funds public water supply with a degree of cost recovery from water charges, while the private sector pays for its own water supply costs (where the WUC does not provide water). The capital and operational costs of public water supply have risen sharply over the last decade.¹⁵ The operation and maintenance expenditures per m³ have not decreased, despite the WSR process's intention to increase the efficiency of water service provision. WUC costs

exceeded revenues between 2010 and 2014. Water may become unaffordable to users when tariffs increase to cover cost increases. There is also a risk that the government will no longer be able to afford the necessary subsidies when it cannot fully recover provision costs. The recommended shift in IWRM focus and WDM is essential to curb rising water expenditures. Consumers in all sectors should be incentivised to either reduce consumption or employ technologies that will do so. For instance, using rainwater tanks for residential users, and reticulating used water where possible for industrial users, is crucial to sustainability.

Historically, the water sector has benefited from government funding, but this may change. Private sector investment needs to be encouraged, perhaps especially through the creation of public–private partnerships modelled on contextually relevant examples from other countries.

CONCLUSIONS

Botswana requires rapid institutional transformation in the governance of its water sector if it is to ensure sustainable supply and utilisation. Implementation of the IWRM, and sustainable development in the water sector, requires a more supportive governance structure. Water resource management has been guided by two national water master plans (1991 and 2006) and recently by the 2013 IWRM-WE plan. The government has implemented water sector reforms but progress is slow and limited to establishing new roles for the WUC and the DWA. These reforms have arguably delayed the shift towards demand management, which is crucial, as the WUC is struggling to maintain supply to all settlements and the country regularly experiences severe water supply shortages. The reforms have led to the development of a draft water policy that has yet to be approved. The national IWRM-WE plan will strengthen the enabling environment for the IWRM's implementation.

ENDNOTES

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- 3 Rahm D, Swatuk L & E Matheny, 'Water resource management in Botswana: Balancing sustainability and economic development', *Environment, Development and Sustainability*, 8, 2006.
- 4 Extrapolated from Debswana, 'Morupule Colliery Expansion Project: Environmental Impact Statement', 1, 2008, http://www.ecosurv.com/sites/default/files/project_files/ESIA%20Morupule%20Colliery%20Expansion%20Executive%20Summary.pdf, accessed 24 April 2014, and assumed to be similar for other mines.
- 5 Rahm D, Swatuk L & E Matheny, *op. cit.*, p. 165.
- 6 *Ibid.*, p. 176.
- 7 Paya B *et al.*, 'Botswana's north south carrier 2 water transfer scheme: A new lifeline towards unlocking the potential of eastern Botswana', <http://www.ewisa.co.za/literature/files/ID107%20Paper107%20van%20der%20Walt%20M.pdf>, accessed 21 August 2015.
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