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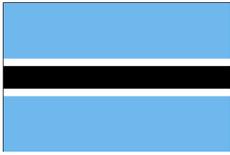
UNDP-UNEP POVERTY-ENVIRONMENT INITIATIVE



Policy Brief

Arable Agriculture and the Case of Peri-Urban Horticulture in Botswana

Observations from a Sector Assessment and Case Study



BOTSWANA

Key Messages

- Arable agriculture support programmes are crucial in providing cash transfers and addressing rural poverty issues
- Availability of treated waste water in urbanized areas holds opportunity for enhanced peri-urban market-based import substitution horticulture
- Horticultural production requires regulation and the development and implementation of strict irrigation water quality standards in order to guarantee compliance with relevant health regulations incl. soil contamination
- Peri-urban vegetable production offers employment as well as opportunity for small-scale horticultural allotment schemes for the poor; the latter would require vital capacity building and skills transfers
- An enabling environment would require water quality regulations, access to suitable land and reliable supplies of treated water

Introduction

Agricultural resources in Botswana are largely important in rural areas where the highest poverty incidence is consistently recorded. Many people in Botswana, both urban and rural, continue to have an association with agriculture as part of multiple sources of livelihood in order to reduce the risks associated with vulnerability on the basis of the country's marginal natural environment and a high dependence on (diamond) mining.

Rural areas have the highest concentration of households living below the poverty datum line in 2009/10 at 14.5 per cent compared to urban villages at 10.4 per cent and cities / towns at 5.2 per cent (Statistics Botswana, 2013).

In 2012, UNDP-UNEP Poverty-Environment Initiative (PEI) Botswana published an Economic Study into the contribution of natural resources towards economic growth with particular focus on tourism and agriculture. This brief discusses some of the observations and the case of peri-urban agriculture as an opportunity for development.

Marginal arable agriculture: some observations

Agriculture contributes around 2% to total annual GDP. Botswana's climate and soils are generally unsuitable for arable agricultural production with only 5 per cent of the country currently used for crop production.

Younger et al (2010) found that rural households headed by farmers were just about as poor as those household whose heads were unemployed. The PEI-BIDPA study (2012) argues that poverty in Botswana can thus best be addressed by an economic diversification policy that supports employment of the poor. However, supporting sustainable



and efficient agricultural production could attract and absorb the less educated poor, provided agricultural wages are competitive to (minimum) wages in non-agricultural sectors.

This is especially true in the case of small holder farmers as they cannot easily change jobs to more competitive and productive industries. For heads of household who cannot take advantage of migration opportunities to find jobs in manufacturing or service sectors, supporting them by providing agricultural incentives is useful as a kind of social protection,¹ but it will almost certainly not create any dynamic growth in agriculture for a host of reasons including lack of technology adaption and the inelasticity of the agricultural sector in response to economic incentives.

In this regard, Lekobane and Seleka (2011) observe that households receiving either public or private transfers (food and cash) are less likely to participate in subsistence arable agriculture. Interestingly, the same study

¹ Others have argued though that the mere administrative costs of subsidizing agriculture are so high that it would be more cost-effective to reduce poverty by transferring cash (BIDPA, 2012a).

indicates that farmers who have access to a more diversified income portfolio are hence less risk averse and more likely to invest in crop farming.

The above is corroborated by the findings of an ISPAAD study² (BCA Consult, 2012) which found that about 70% of ISPAAD beneficiaries indicated a monthly income of less than Pula 465.22 (<USD 60) which they derived from dryland and mixed farming as well as from cash transfers such as old age pension and Ipelegeng payments. This signifies rather deep poverty severity in that ISPAAD beneficiaries are predominantly poor and that the majority of households benefitting from ISPAAD fall far below the Poverty Datum Line (PDL). The limited success of ISPAAD as an agricultural support programme, as evidenced by limited food production, high incidence of crop failure and stagnating average yield figures in communal areas, would seem to be offset by the fact that many farmers rather appreciate the social protection aspect of ISPAAD as part of a package of public transfers into a cash-strapped rural economy.

Key Findings

Government attempts to promote arable agriculture have not resulted in national food self-sufficiency. However, current efforts to promote farming, including ISPAAD, Livestock Management and Infrastructure Development (LIMID) and the CEDA (Citizen Entrepreneurial Development Agency) Young Farmers initiative, are hampered by lack of labour and in some cases limited access to suitable land, especially for new entrants into farming. A decisive shift is needed away from blanket government schemes that support traditional agriculture toward targeted interventions which encourage new entrant private investors into the sector. This would change agriculture productivity patterns in response to changing demographics and input. With the possible exception of cattle, climate and soils are generally not suitable for agricultural production as only 5 per cent of the country is currently used for crop production. The Ministry of Agriculture is encouraging the production of agricultural output on the basis of agro-ecological zones. This approach, alongside a strong political will towards poverty eradication and the use of appropriate and relevant agriculture resources, could improve the effectiveness of this sector in addressing rural poverty and associated levels of unemployment.

The continuation of the policy to support agricultural input subsidies is necessary to address rural poverty, provided the benefits of outputs meet the minimal requirements of livelihoods for the poor. However, if input subsidies are used to promote agricultural activities that make beneficiaries exposed to even higher risk of loss of income and lower levels of livelihood, the

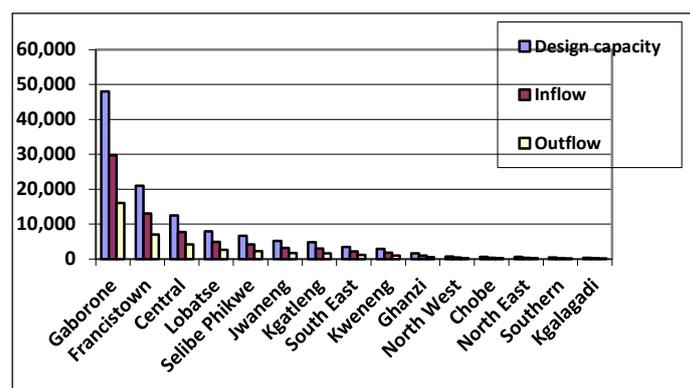
² Poverty and Social Impact Analysis (PSIA) of the Integrated Support Programme for Arable Agricultural Development (ISPAAD) undertaken by BCA Consult Pty Ltd, commissioned by the Poverty Environment Initiative (PEI) in 2012.

beneficiaries may receive the subsidy and then choose to pursue other livelihoods strategies which may include unsustainable exploitation of natural resources. Thus, the poor may adopt desperate means of survival and hence overharvest fuel wood (for sale) and other veld products such as the mophane caterpillar, to the detriment of the environment and ecosystems. Thus, agriculture support should reduce incentives that encourage over exploitation of resources to unsustainable levels and introduce policy instruments and institutions that facilitate improved access to appropriate land in order to encourage sustainable competitive agriculture.

Urban water availability, access and agriculture development

Rapid urbanization in Botswana has led to the growth of waste water resources in Gaborone, Francistown and the Central District that can be utilized for irrigation especially in commercial urban agriculture (Figure 1). Current treatment plants have relatively large design capacities. Even though the plants collect more than 50 percent of their current capacity, there is a limited amount of outflow of treated waste water and hence only a small proportion of it is put to productive use in agriculture. An increased use of treated waste water particularly in horticulture will complement current use of rainwater harvesting through river systems in the Tuli Block and Notwane areas responsible for most of the horticulture production growth in Botswana.

Figure 1: Availability of Waste Water Resources by Treatment Plants by design capacity, inflow and outflow in m³/day by Districts



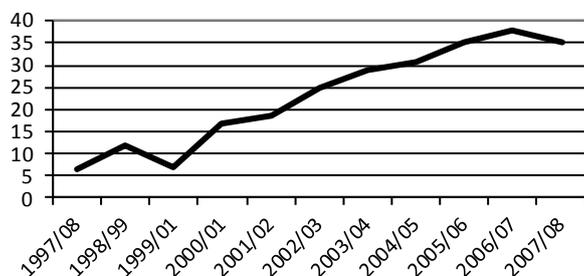
Source: DWMPC 2012 (as quoted in BIDPA, 2012a)

The case of peri-urban horticulture

Data from the Ministry of Agriculture (MoA) indicates that total horticultural yields per hectare rose dramatically from 1997/98 to 2007/08 and this could demonstrate a high potential for this sub-sector if appropriate support and focus is provided (see Figure 2 below). Within agricultural GDP, the share of livestock has fallen from approximately 75% to 55% (1994-2011) with the expansion

mainly of horticulture from approximately 22% to 42% over this period.

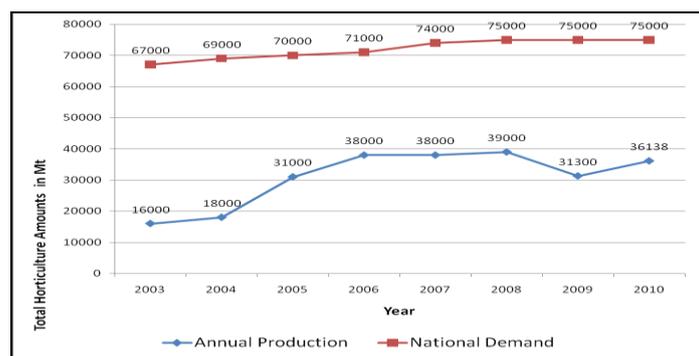
Figure 2: Horticultural Yield (mt/ha)



Source: MoA (various) in: BIDPA (2012a)

Figure 3 shows a considerable gap between annual national demand and national production in horticultural products, for the period 2003 to 2010. The graph reflects a relatively slow increase in demand and a narrowing of the gap through a slow but consistent average increase in local supplies. The growth in demand may in part be explained by growing purchasing power and a change in taste and eating habits of a rapidly urbanizing population. Hence, a positive gap between demand and supply of horticulture products, combined with an increased supply of treated water resources and available land suggests a strong case for peri-urban horticulture development around a number of major settlements in Botswana.

Figure 3: Trends in Horticulture Production and Demand (Mt)



Source: Horticulture Unit (2012) in: BIDPA (2012a)

Promotion of peri-urban agriculture is consistent with changing demographic patterns and rural-urban migration as to-date more than 60 per cent of the population is resident in cities, towns and large urban villages (61.7% in 2011)³. Many women in the informal sector business trade in horticultural products.

³ UNDESA (2011) World Urbanization Prospects (2011 revision); as per the same source, Botswana's rate of urbanization is estimated at 2.5% for the period 2005-2010.

What could peri-urban agriculture mean for poverty eradication in Botswana?

Agriculture development in peri-urban areas can contribute to diversification within agriculture sector and provide a positive response to changing demographic patterns, changing tastes and close the gap between supply and demand in the Botswana's horticulture market.

Promotion of commercial horticulture in the periphery of cities and rural towns will inevitably lead to increases in the value of suitable agricultural land. However, policy instruments should be developed to ensure that such land remains affordable and available for horticulture production, particularly in those areas where it is geographically feasible and economically attractive and cost effective to access treated waste water resources.

Thus policy measures to develop and support necessary infrastructure which will facilitate the effective use of treated water in horticulture production would need to be prepared in order to develop the industry. Peri-urban agriculture has the potential to contribute considerably to national horticulture production which to-date is largely based on rain-fed and small-scale irrigated horticulture production in areas beyond the immediate urban periphery.

Although in the short term, the industry may experience labour shortages, the long term employment prospects look positive as unskilled labour will be increasingly absorbed in this sub-sector which carries the potential of substantially higher returns compared to the traditional arable agriculture sector or even unskilled paid jobs at minimum wage level in other economic sectors. Hence there is considerable scope for horticulture to contribute to the efforts of Government in the area of import substitution and through the efforts of the EDD, the economic diversification drive.

Output from horticulture also carries the potential for the development of forward linkages and provision of additional jobs in the marketing, transport, storage, packaging and retail sectors. Thus, creation of sustainable jobs paying competitive wages through commercial (peri-) urban agriculture in the horticulture sub-sector carries promises for enhanced poverty eradication in areas which are home to an increasing number of poor households due to a consistent trend in rural – urban migration.

It is important to note however that not all peri-urban areas carry the potential for enhanced horticultural production as the key variables of grey water supply (through sewerage treatment) and market demand for vegetables need to be in place. Not all urban settlements (defined as over 5000 in number and with 75% of the labour force in non-agricultural employment) comply with these requirements.

Policy implications and recommendations

The potential re-use of water for peri-urban agriculture is undisputed as only a fraction of suitable treated water is currently used (Emongor and Ramolemana, 2004). The need to further develop and implement standards, regulatory instruments and oversight bodies has been recognized by Government as a requirement to avoid health issues related to vegetable production. Drip irrigation provides a low microbial risk from waste water treated to international standards. Based on the current standards, especially crops such as cabbage, beetroot, water melon, butter nut, sweet potato and other root crops could be recommended.

In this regard, a case study of horticulture production in Glenn Valley revealed that government institutions responsible for providing required inputs are not effectively coordinated. The biggest risks have been unreliable water supply and post-harvest losses. Improved supply and coordination should facilitate faster development and growth of peri-urban agriculture in Botswana through effective use of existing resources. In addition, there is need to control potential contamination of the soil with heavy metals and to improve steps through which land access is made available to those who are interested and in need of land to undertake urban agriculture.

There is potential for enhanced use of suitable reliably-supplied treated waste water for market-based horticultural production in peri-urban areas. In order to realize this potential there is need for a reliable supply of treated irrigation water against agreed quality compliance standards which will guarantee appropriate health requirements.

Government is recommended to further develop an enabling policy and regulatory environment to promote small-scale peri-urban horticultural production by developing the necessary

regulations, making suitable small-scale land allotments available and incentivize a reliable commercial supply of treated waste water.

Business and employment opportunities will be created whilst low income consumers will gain if locally grown products are cheaper than the imports they replace. For the poor to benefit from this opportunity to get involved in commercial vegetable production, substantial capacity building in technical and entrepreneurial skills would be vital.

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