

Republic of Botswana

The Investment Case for Nutrition

Commissioned by **UNICEF**

13 September 2019

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Preface

The welfare and prosperity of Botswana depend on the good nutrition of its children. Stunting continues to afflict too many of those children, and is a matter of national concern. The first ever evaluation of the Vulnerable Groups Feeding Programme – to assess its performance in reducing stunting – is therefore an important task. Mokoro Limited and the Botswana Institute for Development Policy Analysis were privileged to be commissioned to carry out this evaluation. We are grateful to have been given this opportunity.

Linked to the evaluation of the VGFP has been the development of an investment case for nutrition. This is intended to build on the evidence and analysis generated through the evaluation to explain why, and in what terms, national investment in the optimal nutrition of the population, and especially its children, is necessary.

Performance of the task has been hampered by a lack of data on several key issues. Data have not been received from the latest reassessment of stunting rates through a three-point analysis of relevant surveys. Figures on the costs relating to the VGFP have been difficult to obtain, and there remain significant gaps. The Investment Case for Nutrition that is submitted here is therefore less quantitative than it might otherwise be.

The report presented here is a revised version of the drafts submitted on 16 July and 20 August 2019, taking into accounts the comments received on the drafts from the Ministry of Health and Wellness and from UNICEF.

We are grateful for the co-operation and support provided in many parts of Botswana by staff of the Government of Botswana and by UNICEF – and, especially, for the willingness of beneficiaries and community leaders to discuss their experience of the VGFP with us.

Among senior colleagues we would like specifically to thank Onalenna Ntshebe, Michael Basheke and Yvonne Chinyanga of the Ministry of Health and Wellness, and Kenanao Motlhoiwa and Ulugbek Olimov of UNICEF, for their guidance and support.

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13 September 2019

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Abbreviations

AIDS	acquired immunodeficiency syndrome
ALNAP	Active Learning Network for Accountability and Performance in Humanitarian Action
ANC	antenatal care
BFHS	Botswana Family Health Survey
BIDPA	Botswana Institute for Development Policy Analysis
BMFHI	Baby and Mother Friendly Hospital Initiative
BMI	body mass index
BNNSS	Botswana National Nutrition Surveillance System
BSFP	Botswana School Feeding Programme
BVAC	Botswana Vulnerability Assessment Committee
CHV	community health volunteer
CSO	Central Statistics Office [now Statistics Botswana]
CSSR	Centre for Social Science Research, University of Cape Town
CWC	Child Welfare Clinic
DFID	United Kingdom Department for International Development
DHMT	District Health Management Teams
EC	European Commission
EQ	evaluation question
ET	evaluation team
FAO	Food and Agriculture Organisation of the United Nations
FGD	focus group discussion
FRS	Food Relief Services
GDP	gross domestic product
GMP	growth monitoring and promotion
GOB	Government of Botswana
HDI	Human Development Index
HEA	Health Education Assistant
HEO	Health Education Officer
HF	health facility
HIV	human immunodeficiency virus
IC	investment case
IEC	information, education and communication
IFA	iron and folic acid
IMAM	Integrated Management of Acute Malnutrition
IMCI	Integrated Management of Childhood Illness
IPMS	Integrated Procurement Management System
IR	inception report
ITT	invitation to tender
IYCF	infant and young child feeding
kg	kilogram
KII	key informant interview
LBW	low birth weight
m	million
MADFS	Ministry of Agricultural Development and Food Security
M&E	monitoring and evaluation
MAM	moderate acute malnutrition

MFED	Ministry of Finance and Economic Development
MGD	McGovern-Dole
MICS	Multiple Indicator Cluster Survey
MLGRD	Ministry of Local Government and Rural Development
MNP	micronutrient powder
MOA	Ministry of Agriculture
MOHW	Ministry of Health and Wellness
MUAC	mid-upper arm circumference
NA	not applicable
NCD	non-communicable disease
nd	no date
NDP	National Development Plan
NFCD	Nutrition and Food Control Division
NFTRC	National Food Technology Research Centre
NGO	non-governmental organisation
NNS	National Nutrition Strategy
np	no page number
NSPF	National Social Protection Framework
NSPR	National Strategy for Poverty Reduction
ODI	Overseas Development Institute
OECD DAC	Development Assistance Committee of the Organisation for Economic Co-operation and Development
ORS	oral rehydration salts
P	Pula
PLW	pregnant and lactating women
PMTCT	prevention of mother to child transmission
QS	Quality Support
REACH	Renewed Efforts Against Child Hunger
RHVP	Regional Hunger and Vulnerability Programme
SADC	Southern African Development Community
SAM	severe acute malnutrition
SAVE	Secure Access in Volatile Environments
SBCC	social and behaviour change communication
SRH	sexual and reproductive health
STI	sexually transmitted infection
SUN	Scaling Up Nutrition
TB	tuberculosis
TBC	to be confirmed
TL	team leader
TOC	theory of change
TOR	terms of reference
UNAIDS	The Joint United Nations Programme on HIV and AIDS
UNDP	United Nations Development Programme
UNEG	United Nations Evaluation Group
UNICEF	United Nations Children's Fund
VGFP	Vulnerable Groups Feeding Programme
WFP	World Food Programme
WASH	water, sanitation and hygiene
WHO	World Health Organisation
WIDER	World Institute for Development Economics Research

Summary

Botswana has attained the status of an upper middle income country. However, the benefits have not been evenly distributed, and, notwithstanding some recent improvements, Botswana continues to experience one of the highest levels of income inequality in the world.

While Botswana has a relatively well-developed health care service with national coverage, malnutrition among children remains high, and in some regions is at critical levels. Stunting at an early age irreversibly affects a child's brain development and thus their life chances; their achievement at school and their earnings ability in later life, as well as leaving them more vulnerable to infectious diseases. This has consequences for the individual, but also places a burden on the country as a whole, with increased demands on the health system and decreased earnings by adults, with knock-on effects for the country's gross domestic productivity.

This report was commissioned by the Government of Botswana, with technical and financial support from UNICEF, in order to create an authoritative investment case to show how stunting can be reduced in an economically feasible manner. In order for the recommendations to be useful they must be achievable and acceptable to the government and the society. With this in mind, three options are proposed in this investment case, cognisant that radical changes, even if the most effective in principle, are not always feasible or desirable in the first instance.

The current system to prevent malnutrition among children in Botswana includes the Vulnerable Groups Feeding Programme (VGFP). This ration-based system is considered in depth by a parallel report that evaluates the VGFP¹. The report's main finding is that, irrespective of broader design issues, the VGFP is ineffective due to the low amount of ration that actually reaches the target recipient. A conservative option (A) is thus proposed to strengthen the VGFP's impact through better procurement and distribution, and more effective rations.

However, there are also noticeable shortcomings in the appropriateness of the design of the VGFP to prevent malnutrition. A strengthening of the current system can only have a limited effect if the system itself is not fit for its purpose. Taking into account a growing body of evidence on the optimal approach for tackling malnutrition including stunting, two further options are considered in reviewing the investment case for nutrition. One option (B) retains the VGFP while seeking to optimise the system by reducing some facets, strengthening others, and supporting these changes with more community healthcare and social protection policies. In contrast, option (C) proposes a radical rethinking of nutrition, phasing out the VGFP, except for use in crisis situations, and replacing it with a multisectoral approach to nutrition, incorporating stronger social protection policies that are more appropriate for a stable and economically strong country like Botswana.

For each of these options, a high-level overview of the costs and benefits is given. These can be considered indicative, but make a strong case that the reform of the current system need

¹ Mokoro Ltd. and BIDPA, 2019. *Evaluation of the Vulnerable Groups Feeding Programme*. Gaborone: UNICEF for Ministry of Health and Wellness.

not be hugely costly and should, in fact, result in benefits that substantially outweigh the costs. From this analysis, option C emerges as likely to be both the most effective and the most cost-efficient, and is therefore endorsed as the best option. However, for this option to be effective, it would need to be implemented in an appropriate manner with cross-sectoral cooperation, and this would require endorsement at the highest level. Furthermore, in any move from the current system, a transitional phase would be needed in order to protect the most vulnerable. The evaluation report identifies measures that may be appropriate in the short and medium term to ease this transitional phase.

In addition, key policy reforms are briefly outlined that should be implemented, irrespective of which option is chosen, to ensure that Botswana's approach to nutrition is effective, efficient and appropriate to the current context.

This report has been prepared as part of the evaluation of the VGFP. It is intended to be read alongside the evaluation report, which contains much of the background information relevant to this investment case.

1 Introduction and context

1.1 The Vulnerable Groups Feeding Programme and an Investment Case for Nutrition

The Vulnerable Groups Feeding Programme (VGFP) has its roots in drought relief efforts initiated around the time of Botswana's independence in 1966. It is now a blanket supplementary feeding scheme, administered through health facilities (HFs) across the country, to improve the nutrition of children aged under five years (or six, if they have not yet entered school and started to benefit from the national school feeding programme). The VGFP also provides supplementary feeding for medically selected pregnant and lactating women (PLW) and tuberculosis outpatients. Further details of the programme are given at Annex 1.

With continuing concern about the levels of stunting in Botswana, the programme is currently seen as the country's primary means of tackling the problem. The significance of stunting as a challenge to national welfare is outlined in section 1.2 below.

An evaluation of the VGFP has been commissioned by the Government of Botswana (GOB) Ministry of Health and Wellness (MOHW), in partnership with the Ministry of Local Government and Rural Development (MLGRD) and the Ministry of Finance and Economic Development (MFED), with technical and financial support from the United Nations Children's Fund (UNICEF).

There has never been an evaluation of the VGFP before. The terms of reference (TOR) state that it was therefore considered important to undertake such a study "in order to inform policy and programme design to, in turn, maximise social outcomes, including stunting".

The TOR show that this evaluation has both a summative and a formative purpose. It is required to assess the performance of the VGFP. At the same time, its most immediate function is formative: making evidence-based proposals on how Botswana's stunting challenge might be tackled more effectively. These proposals should explain why and how to address the nutrition situation in Botswana, with its triple burden of malnutrition: underweight; overweight and obesity; and micronutrient deficiencies. This approach must be supported by an investment case (IC) that will show how stunting can be reduced – and preferably eliminated – in an economically feasible manner.

The Investment Case for Prevention of Stunting... which includes a set of realistic recommendations for policy and programme adjustments, prioritised investments and proven interventions towards prevention of stunting in the country.

Evaluation TOR.

This twofold purpose means proposing changes that government and society find legitimate and can achieve. It also means showing that the economic benefits of those achievements will exceed the cost – and will, indeed, help to meet that cost.

The investment case for nutrition is the subject of this document. The report of the evaluation of the VGFP is presented separately (Mokoro & BIDPA, 2019), although material from the

evaluation is included here where relevant. The proposals made in this investment case are of course linked to the findings and recommendations of the evaluation.

The evaluation TOR refer to both “an investment case for prevention of stunting” and “the Investment Case for Nutrition”. The evaluation team has taken the latter, broader approach, since it is not technically appropriate to focus only on stunting in a nutrition strategy. Nevertheless, stunting is a prominent concern for Botswana, as explained below.

1.2 The challenge of stunting in Botswana

Since the seminal study published by The Lancet in 2008, there has been an increasing recognition of the importance of addressing stunting (low height for age), given its effect not only on morbidity and mortality but also on the life chances of a stunted individual. In addition, the intergenerational cycle of undernutrition has become a consideration for programmers. In this cycle, undernutrition at one stage of life affects future stages, so that generations can be caught up in a cycle of poor nutrition and health outcomes. The 1,000 days from conception until a child’s second birthday are seen as a critical time, during which optimal nutrition can have a lasting impact on a child’s growth, learning, and future productivity (The Lancet, 2008). Stunting remains a significant challenge in Botswana, despite the fact that Botswana is wealthier, with better health services, than most countries in Africa. Annex 1 gives more details on nutrition in Botswana. It shows that, because data on this key indicator of socio-economic development are less complete and consistent than they should be, it is difficult to discern whether stunting among children aged under five has declined as far as might be expected over the last decade - although the data from clinics suggest that rates are still unacceptably high, given the nation’s overall level of income and development.

1.3 The challenge of poverty in Botswana

Botswana has experienced strong economic growth, from being one of the poorest countries in the world at Independence in 1966 to upper middle-income status today. This impressive economic growth, albeit precariously driven by heavy reliance on a single commodity, diamonds, has resulted in impressive advances against most social indicators. With an estimated population of 2.3m in 2018 (UNDP, 2018b) it currently ranks 101 out of 189 on the Human Development Index with an HDI of 0.717, and has been ranked among high human development countries in UNDP’s latest statistical update (UNDP, 2018a). It is also classified as an upper middle-income country, on the basis of its per capita national income of over USD 16,000 (OECD DAC, 2019). As Figure 1 below shows, Botswana’s gross national income per capita has risen substantially over recent decades, an achievement all the more impressive when compared with the regional average for Sub-Saharan Africa.

Botswana’s Gini index, a measure of income inequality, has fallen significantly over the past decade. According the World Bank it was 64.7% in 2002-03 and 60.5% in 2009-10 The most recent figure is 53.3%, its lowest recorded value to date (World Bank, 2019). This is a meaningful reduction, but inequality remains high. Botswana is still in the top ten most unequal countries in the world, taking joint tenth place with Brazil.

However, like some other countries that have made significant economic progress in recent decades, Botswana continues to be challenged by the poverty and poor nutrition that afflict a significant part of its population. The incidence of poverty remains high, although with signs of a decline from 30.6 percent in 2002/03 to 19.3 percent in 2009/10 and 16.3 percent in 2015/16 (GOB, 2018a). Income inequality, drought, and HIV/AIDS prevalence are the main

factors that induce poverty and vulnerability (RHVP, 2011). Government aid and transfers have reduced the incidence of poverty by eight percent, as shown in Table 1 below.

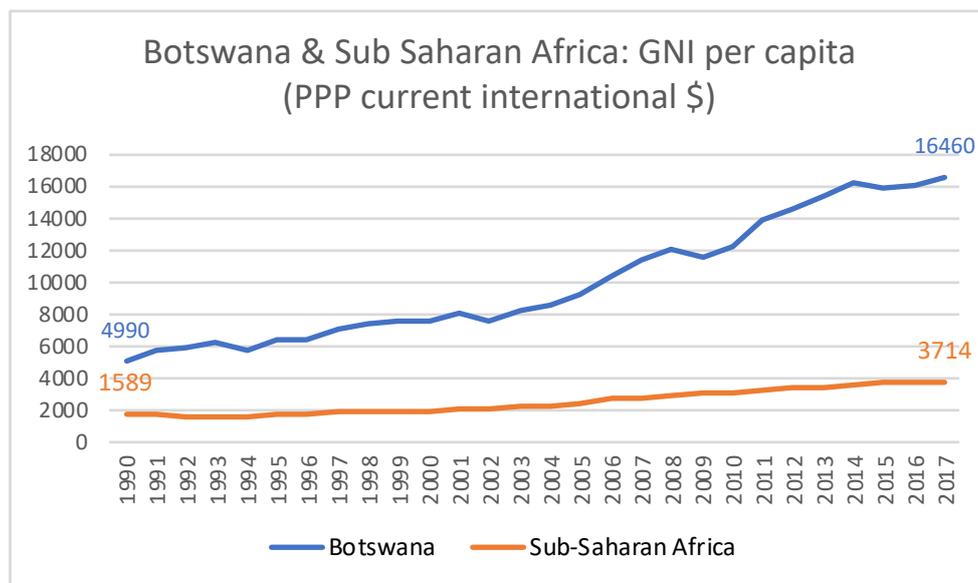


Figure 1. Botswana’s gross national income per capita, 1990 - 2017

Table 1. Poverty incidence by strata, 2015/16

Stratum	With government aid		Without government aid	
	Poverty head count (%)	Number of persons below poverty datum line	Poverty head count (%)	Number of persons below poverty datum line
Cities/towns	9.4	41,093	11.6	50,901
Urban villages	13.4	121,230	21.1	191,935
Rural areas	24.2	175,087	35.9	260,360
National	16.3	337,410	24.3	503,196

Source: GOB, 2018a.

Botswana’s experience has shown that even a well-intentioned and comparatively affluent government cannot easily reduce poverty, however much it spends on social and other infrastructure. Especially in the more arid west of the country, significant proportions of the population depend heavily on government social transfers.

Vulnerability in an increasingly erratic arid to semi-arid climate is a prominent feature of poverty in Botswana. Drought is a recurring theme in rural livelihoods and in government’s social protection efforts, although it is often argued that ‘drought’, with its implications of short-term crisis, is the wrong word for the country’s chronic vulnerability to low and irregular rainfall (Davies *et al.*, 2017: 10). The MOHW is one of the core participants in annual drought assessment surveys around the country. Government often has to declare drought, triggering official relief measures (GOB, 2017a: 51; Davies *et al.*, 2017: 9). Drought relief is one of the ten social protection programmes listed by the recent draft social protection framework as a responsibility of the MLGRD (GOB, 2018c: 4). Both the VGFP and the Ipelegeng labour-intensive public works programme were originally designed as short-term relief when drought was declared in specified areas – but both now operate all year round across the country.

Poor people in Botswana, like poor people everywhere, typically depend on multiple livelihood strategies. Those strategies may include support from one or more government programmes. Like the Ipelegeng programme, some of these are explicitly delivered as social protection. Others, like the VGFP, may officially focus on other sectors (like nutrition), but effectively serve as social protection.

1.4 The purpose of an investment case for nutrition

This report was commissioned in order to create an authoritative explanation of how stunting can be reduced in an economically feasible manner. In order for the recommendations to be useful they must be achievable and acceptable to the government and the society. With this in mind, several options are compared in this investment case, cognisant that radical changes, even if the most effective in principle, are not always feasible or desirable in the first instance.

For decades, Botswana has shown an admirably high programmatic and budgetary commitment to the welfare and good nutrition of its citizens. With a comparatively strong economy, it has been able to fund the VGFP and many other social protection programmes from domestic resources. But there is a growing consensus that all such spending requires critical review and renewed justification. Government needs to be confident that the substantial sums it invests in social protection and nutrition are optimally directed to programmes that work in the most productive way possible to achieve their objectives: food and livelihood security for all Botswana, including good childhood nutrition that lays the foundations for a healthy and productive life.

Government has recently developed a National Social Protection Framework (NSPF) which, although not yet formally approved, sets out the key lines of Botswana's national approach (see Annex 3 for a review of how nutrition is dealt with in the NSPF and other areas of government policy). The rationale for the NSPF is based on the following.

- Botswana has a mature social protection system to which the Government commits a significant amount of resources. The social protection programmes are fully funded by the government.
- Outcomes do not match the amount of spending due to inefficient delivery and overlapping programmes. There are administrative deficiencies, double dipping by some beneficiaries and lack of monitoring and evaluation.
- There is a realisation that the provision of social protection is an investment in Botswana's population and an important factor in its sustainable development (GOB, 2018c: 1).

Decisions on such state investments are never purely a matter of economics or budgetary feasibility. They are strongly influenced by a government's philosophy, policy and strategy about state support for the disadvantaged – all of which are explored in the draft NSPF. It is not the role of this investment case analysis to determine the character or direction of national social policy. But it can help to clarify the consideration of costs and benefits in determining what types and levels of state investment are justifiable.

1.5 Approach and methods

1.5.1 Evaluation of the VGFP

The evaluation team (listed on page ii above) adopted a mixed-methods approach to the evaluation. Working in close consultation with the MOHW and the MLGRD, the team assembled available data and documentation; interviewed key informants; carried out a field survey across 12 MOHW districts that interviewed over 250 VGFP beneficiaries and over 100 MOHW personnel, as well as holding focus groups with parents, carers and Village Development Committees; and undertook an online survey of District Health Management Team (DHMT) members and other GOB staff at district level in 23 MOHW districts. The evaluation was guided by an inferred theory of change for the VGFP – despite its importance, the VGFP has no design document or formal statement of objectives – and an evaluation matrix that amplifies the questions in the terms of reference.

1.5.2 Investment case

The investment case presents three options, to give policy makers an overview of different methods of tackling stunting and promoting good nutrition in Botswana. The costs and benefits of the different options are analysed. This is done at a high level, partly because of lack of detailed data, but also because the costs of many of the recommendations are not easily quantifiable in any meaningful manner. Similarly, the benefits are given indicatively, since, depending on how changes are implemented, the benefits could be vastly different.

Any attempt to meaningfully quantify long-term economic benefit is inherently difficult. Long-term economic forecasts (and, in many cases, short-term economic forecasts) are notoriously unreliable, dependent as they are on complex sets of events that are essentially unpredictable. Nevertheless, by focusing on causality, on the links between good nutrition at an early age, cognitive development and, eventually, well-paid employment, a strong case will be made for the importance of adequate nutrition, and the urgent need for reform.

1.5.3 Guidance

The evaluation and the production of the investment case were guided by a Technical Working Group and reported to a Steering Committee. Two quality support advisers assisted the evaluation team.

1.5.4 Limitations

Ideally, a full cost-benefit analysis of the current system would have preceded the presentation of the options. The evaluation team received limited reliable information on cost data, nutrition indicators and information on the nutritional content of the rations. Lack of basic cost data on the VGFP has limited our ability to provide a quantified cost analysis of the current system, and also raises questions about the capacity of relevant ministries to oversee social protection programmes. It would seem that a key intervention, no matter which option is selected, should be to ensure that robust tracking of financial and non-financial data is established to allow for ongoing monitoring of programme implementation and occasional evaluation of programme effectiveness and efficiency.

In addition, the nature of the VGFP, being a nationwide programme that has been in place for decades, makes it difficult to assess its benefits, as there is no control group or meaningful counterfactual. In drafting the IC, the evaluation team has therefore focused on efficiency measures, demonstrable causal chains yielding a high-level analysis of the potential costs and benefits of its recommendations.

2 The economic case for investing in nutrition

Malnutrition, particularly stunting, has a life-long effect on the ability of the child to develop and participate in economic activity. This has consequences for the individual, but also for the nation as a whole.

2.1 Overview of the rationale for investing in nutrition

Adequate nutrition is a fundamental human right, and is also a global commitment by Botswana in the form of Sustainable Development Goal 2 (end hunger, achieve food security and improved nutrition and promote sustainable agriculture), to ensure that children are well fed and able to develop to their full potential.

In addition, there are economic benefits to having a well-nourished population, for the individual and for the country as a whole. Sufficient nutrition as a child is a necessary condition for the development of the brain and the body and thus the foundation for a healthy and productive member of society and the economy.

Recent evidence has highlighted the importance of the first 1,000 days of life: from the conception of a child through to the second birthday (section 1.2 and Annex 2). In this window, insufficient nourishment can lead to irreversible damage in the child's development. Thus, the nutrition of pregnant and lactating women is also important for the welfare and development of the child.

The immediate benefits to good nutrition can be seen in the general health and in the physical and mental development of the population. Malnourished children are more prone to infectious illnesses. They are less likely to be well developed mentally, which has an impact on their ability to learn and perform well at school. If impeded at an early stage of life, physical and mental development cannot easily be recouped once the children are older: hence the emphasis on optimal nutrition during the first 1,000 days of life.

2.2 The economic impact of malnutrition

The cost to the country of malnutrition is obvious, but it is difficult to quantify since often the counterfactual does not exist and each country is different. However, there is clear evidence that improvements in nutrition result in better economic performance. There is a convincing rationale that this should be the case, given that a prosperous economy needs an educated, able and healthy work force, and the incontrovertible evidence that malnutrition affects these measures (Galasso, 2016; Galasso & Wagstaff, 2017). Rates given in this section are drawn from a paper by UNICEF and WFP (UNICEF & WFP, 2014), and can be seen as indicative. Tackling malnutrition will have some good effects in the short term, for example, healthier children and lower infant mortality. But it is in the medium to long term, when these children achieve adulthood, that the economic effects can really be felt in a better-educated and more vigorous workforce, more able to build a stronger economy.

A child who is malnourished to the point of being stunted has reduced brain development. This affects their school performance, which is estimated to be reduced by the equivalent of 2 – 3 years of schooling. This also has a knock-on effect on their earning potential in later life, estimated to be equivalent to a reduction of 22% of their wage earnings.

In addition, stunted children are at a high risk of infectious diseases, and studies have found that the likelihood of dying from an infectious disease increases by 1.9 to 6.5 times if the child is stunted. The cost of this on a human level, as well as on an economic level in terms of potential burden on the health service and reduced contribution to the economy, is self-evident. Childhood malnutrition is also linked to the growing burden of non-communicable diseases in Botswana, which not only affects individual and household livelihoods but constrains economic activity and increases health care costs.

In later life, people who were malnourished as children have a lower earning ability than those who were not. This affects not only their wellbeing, but, where malnutrition is widespread, the productivity of the entire country. The net effect of improving nutrition on the country's GDP is estimated to be in the region of 2 – 3%, which in the case of Botswana is equivalent to approximately P5.25 billion per year.

Such figures are necessarily indicative, depending as they do on multiple context-specific factors, such as the quality of the health system, and the state of the employment market. Nevertheless, what should be obvious is that the benefits of improved nutrition can be great, not just for the individual, but also for the economy.

2.3 An economic and a human rights rationale

Clearly there is a strong case for investing in child nutrition, both on the level of a calculation of financial and economic benefits to the individual and the country, as well as on a more fundamental human rights level: sufficient nutrition early on in life is a basic necessity to allow people to flourish. It is therefore in the interest of the Government of Botswana to ensure that its children are well nourished and do not suffer from stunting at an early age, which would affect their ability to perform in school as well as their performance, as adults, in the workplace and their ability to contribute to the country's continued economic growth.

3 Analysis of the current VGFP

Building on the analysis in the evaluation report on the VGFP, this section focuses on its quantifiable costs and benefits, as far as these have been possible to ascertain.

3.1 Approach

The assessment of the VGFP represented some unique technical difficulties which made evaluating the impact of the VGFP in a robust manner extremely difficult.

The usual method of quantifying the impact of a programme would involve taking indicators before the programme commences, in order to establish a baseline, then to measure indicators once the programme has been in place for a given period, and finally to analyse the difference, also taking into account any other factors that may have affected the indicators measured. An alternative to comparing the 'before' and 'after', as above, is to compare across areas. This could involve doing a pilot study and comparing its results with an area which has not had the intervention. Alternatively, if the intervention is widespread, its impact can be compared with 'control' groups that have not experienced the intervention.

There are obvious shortcomings to both these methods described above, and they must be handled with an eye to the details of the context of the situation and how it varies across time or between different areas. To assess the change that can be reasonably attributed to the programme is a subtle matter, and analysts must be careful not to confuse correlation with causation. Nevertheless, epistemological issues aside, it is not unreasonable to attempt a statistical impact analysis with some hope of results.

However, in the case of the VGFP, which has been in place for decades, and which has a nationwide coverage, neither of the above methods is possible. It would make no sense to compare the situation in Botswana before and after the VGFP, nor, since the coverage is nationwide, can one compare areas with and without. To compare to a neighbouring country, such as Namibia, would be a stretch, and only supportable if it was thought that the programme has sufficient impact to be meaningfully measurable across countries once other factors had been controlled for: this was not judged to be the case. To compare a district that received more rations with a district where ration supply was lower was also considered; but the lack of sufficiently detailed and reliable data meant that meaningful analysis was not possible.

Given these constraints, other methods were sought to assess the impact of the VGFP in a robust manner. These methods include:

- a theory of change approach;
- analysis of the level of indicators to see if they are 'reasonable' for Botswana, given its socio-economic status;
- consideration of 'best practice' elsewhere to see how Botswana compares;
- assessment of the efficiency and effectiveness of the VGFP in its own terms.

A combination of these methods was used to build up a solid, evidence-based understanding of the contribution of VGFP to stunting rates in Botswana. Further details are available in the evaluation report (Mokoro & BIDPA, 2019).

In order to analyse the VGFP in a coherent manner, a process diagram was constructed. This shows, in a simplified way, the flow of resources from the GOB to the intended recipients: see Figure 5 at the end of this chapter (page 14). Possible inefficiencies were considered at each stage, with a view to testing their importance, and identifying mitigating factors in order to improve the system. Figure 5 also shows which organisation is responsible for the different stages of the VGFP.

3.2 Costs of the VGFP

The costs of the VGFP are somewhat obscure: the budget is bound up with the budget for school feeding, and it was only with great difficulty that cost estimates were obtained for significant parts of the VGFP. The costs are shown in Table 2 below.

These costs are principally borne by the MLGRD. The MFED was able to provide a total figure for the budget allocated to the MLGRD for the VGFP as well as the school feeding programme, but further breakdown was not available on a budgetary level. MLGRD has provided estimates of its annual costs, which amount to approximately P255m, excluding capital expenditure. Taking the 2017/18 number of beneficiaries that the programme is reported to have served, this MLGRD recurrent annual VGFP expenditure is about P843 per beneficiary.

MOHW also bears costs, as it is its employees who administer the programme on the ground, and it also has headquarters staff whose roles include overseeing the VGFP. Unfortunately, no figures were available to indicate the scale of these costs, which include staff time to coordinate, supervise and monitor the programme across the country at health facilities and through DHMTs; factory inspections, testing and analysis of the chemical and microbiological quality of commodities; and participation in procurement processes through the provision of specifications.

The table below includes recurrent costs only; it does not take into account capital expenditure on warehouses, transport and other similar costs.

Table 2. Cost of the VGFP (recurrent expenditure)

Item	Budget (P)	Source	Period
Government of Botswana			
Total GOB budget	70,421,489,276	MFED	2019/20
Total cost of feeding programmes: VGFP + School feeding	Unknown		
Total cost of food supplies: VGFP + school feeding	659,726,530	MFED	2019/20
Total cost of VGFP (MLGRD + MOHW)	Unknown		
MLGRD			
Total cost of VGFP to MLGRD	254,543,804	MLGRD	Various
Cost of VGFP rations (estimate)	250,696,081	MLGRD	Various
VGFP: other costs (estimate)	3,847,723	MLGRD	2019

Item	Budget (P)	Source	Period
Cost of rations:			
Tsabana	78,137,610	MLGRD	2018/19
Malutu	33,575,665	MLGRD	2019
Sugar beans	39,270,000	MLGRD	2014
Vegetable oil	99,712,806	MLGRD	2019
Total (estimate)	250,696,081	MLGRD	Various
Cost of transport:			
Cost of fleet maintenance	711,888	MLGRD	2019
Cost of drivers	592,787	MLGRD	2019
Operational costs:			
Warehouses	163,587	MLGRD	2019
Cost of staff	436,914	MLGRD	2019
Overheads:			
Management costs	792,157	MLGRD	2019
Procurement costs	1,150,389	MLGRD	2019
MOHW			
Cost of VGFP:			
Cost of staff time	Unknown		
Cost of resources	Unknown		
Cost of management	Unknown		

Source: data supplied by MFED, MLGRD.

3.3 The benefits of the VGFP

The impact of the VGFP is difficult to quantify precisely, due to:

- lack of confirmed data on stunting;
- nationwide coverage, meaning there are no counterfactuals to compare;
- length of time the VGFP has been in place; thus comparison with the situation pre-VGFP is difficult.

Instead of looking at the direct impact, therefore, the team has considered the potential for benefit, which is dependent on the nutritional value of the rations themselves, and the extent to which the rations reach the intended recipients.

The evaluation's online survey of district-level MOHW and other staff suggested that the main reasons the VGFP did not have a large impact were that, firstly, most rations were not consumed by the child, and secondly, that full rations are often not available, as illustrated in Table 3 below:

Table 3. VGFP evaluation online survey: reasons for low impact of the programme

Reason	Percentage of respondents mentioning reason
Most of the rations are not eaten by the child	69%
Full rations are often not available	63%
Tsabana/Malutu are not correctly prepared	22%
People don't attend clinic often	12%
Other - please state	8%
VGFP is not the right programme	6%

Source: VGFP evaluation online survey of district-level staff of MOHW and other ministries.

Clearly, if the VGFP rations are not reaching the intended recipients, the programme cannot have a positive effect on the intended population. It should also be noted that the global literature now suggests that nutrition-specific approaches – direct nutritional interventions like the VGFP – can only contribute 20% of the total solution to stunting. Nutrition-sensitive interventions in fields like water, sanitation, hygiene, agriculture and women’s empowerment contribute 80% of the solution (Bhutta *et al.*, 2013b).

Research for the evaluation indicates that a very low percentage of the rations actually reaches the recipients. Figure 2 below quantifies this, based on the evaluation’s field research, and shows that, after issues with distribution, spoilage and the sharing of food, only around 14% of the ration reaches the intended recipient (see Annex 4 for further details and for variants).

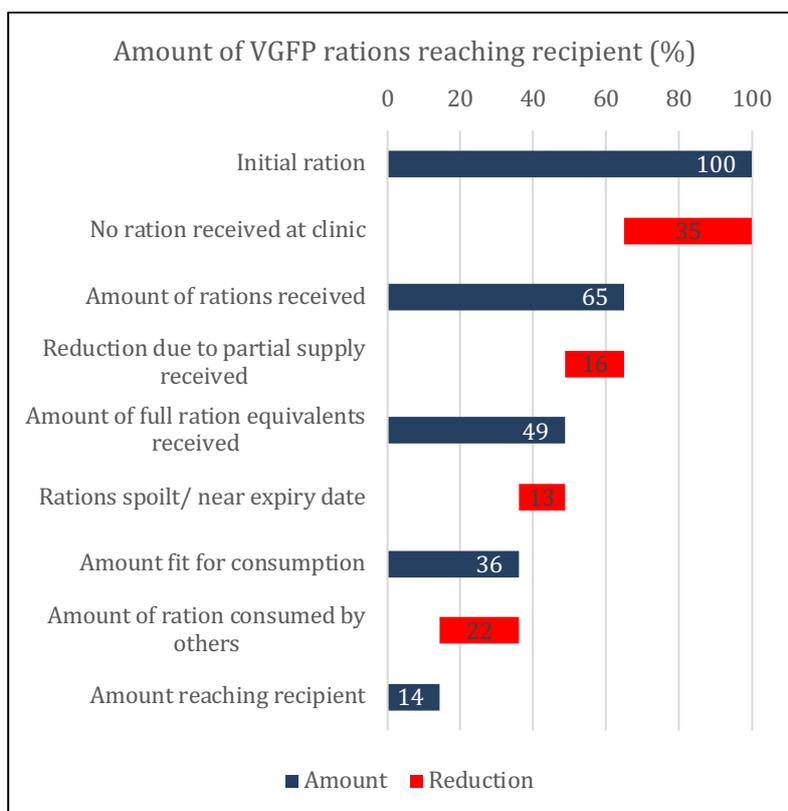


Figure 2. Amount of VGFP rations reaching recipient

Source: Evaluation team field research & analysis.

The above figures apply to the supply of Tsabana and Malutu; supply of oil and beans was reported to be lower. The same analysis, run with Botswana National Nutrition Surveillance System (BNNSS) data where available, produced the slightly higher figure of 19% of the ration reaching the intended recipient. However, BNNSS data combine full and partial rations and do not record which commodities are supplied .

The analysis was also run for only the bottom quartile of MOHW districts (the six districts with the highest prevalence of moderate and severe underweight): the amount of ration reaching the recipient there is estimated to be in the region of 7%.

The estimates used relate to the experience over the past 12 months. It may be that this has been a particularly difficult period and thus it does not necessarily reflect experience throughout the lifetime of the VGFP.

In addition to the above, there is some effectiveness analysis to be considered: the nutritional effectiveness of the ration as manufactured, and further loss in the nutrient content due to incorrect storage and preparation of the ration.

While the benefit of the ration received is likely to be low, given the low percentage that reaches the recipient, there may be other benefits from the programme; for example, increased attendance at the clinics as a result of people wishing to receive the rations, which would have positive impact on other health indicators, such as the opportunity for vaccinations, growth monitoring and promotion, and other health checks on the children. However, when questioned, the consensus of evaluation informants was that attendance at the clinics is strong in the first years of the child’s life, as parents and carers are concerned to ensure vaccinations are done.

There was some feeling among informants that rations did influence clinic attendance. However, on analysis of the Botswana National Nutrition Surveillance System (BNNSS) data, no relationship could be found. This can be illustrated at a high level, by considering the pattern of clinic attendance, as shown in Figure 3 below, for the average (median) clinic, and the upper and lower quartiles, which is relatively unchanging.

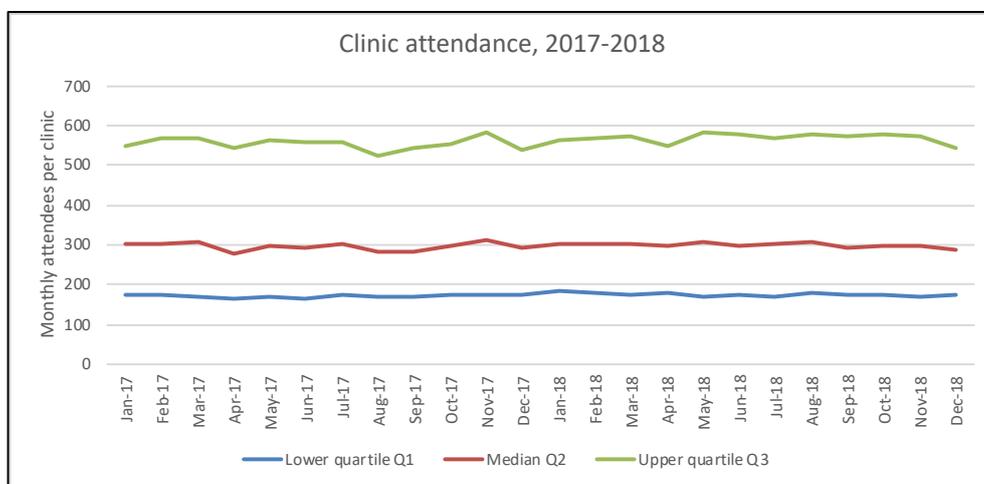


Figure 3. Monthly clinic attendance, 2017-18

Source: BNNSS data, evaluation team analysis

In contrast, ration availability at the clinics varies considerably over the same period. Figure 4 below shows ration availability, that is, rations supplied compared with the number of attendees at the clinic, on a monthly basis over 2017 to 2018².

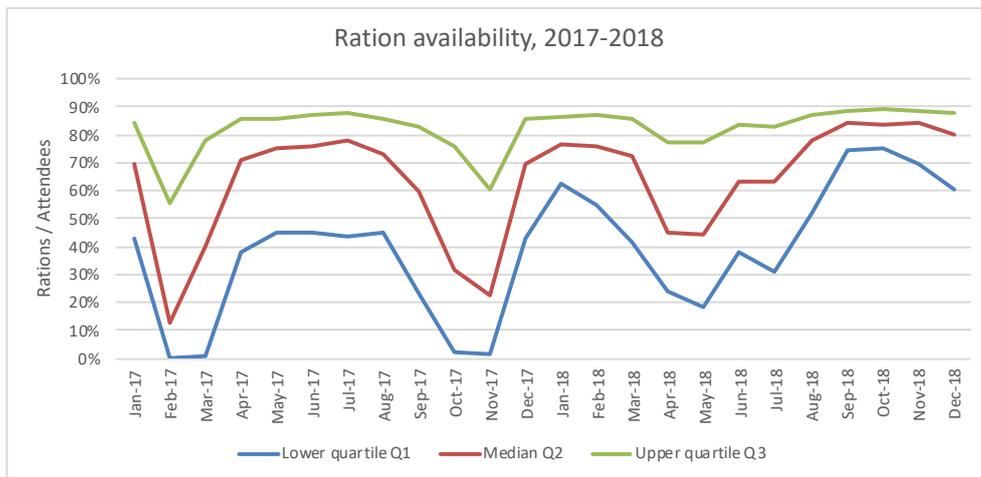


Figure 4. Ration availability, 2017-18

Source: BNNSS data, evaluation team analysis.

Analysis on the basis of individual clinics revealed no connection between the availability of rations one month and attendance the following month. This can give some confidence that attendance is not entirely contingent on rations. Nevertheless, if rations were to be withdrawn, the situation should be closely monitored to check that there is no adverse effect on attendance at the clinic for other matters, such as vaccinations and general health checks.

² Note: In order to reduce variance, this analysis has been performed only on clinics with an average of 100 monthly attendees or more; it uses BNNSS data and thus does not distinguish between full and partial rations.

Simplified process diagram of VGFP (bottleneck analysis)

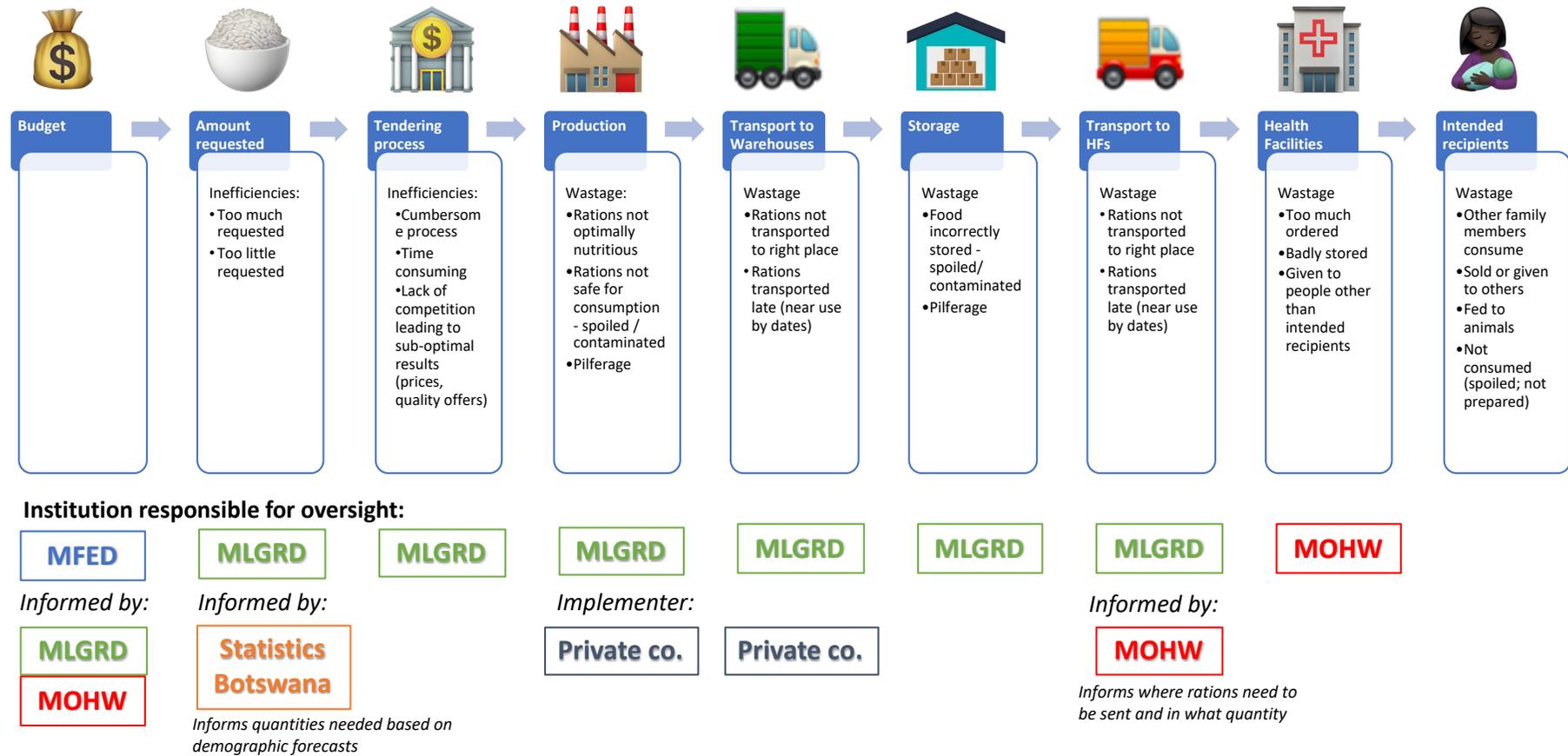


Figure 5. Simplified process diagram of the VGFP (bottleneck analysis)

4 Policy and organisational recommendations

This chapter offers an overview of some basic recommendations that are necessary in all scenarios and therefore lie outside the analysis of the following chapters. They should be implemented no matter what approach is taken towards the future of the VGFP. They are explained more fully in the evaluation report, which proposes how they can be phased across the short, medium and long term.

4.1 National Nutrition Strategy

The current National Nutrition Strategy covers the period 2015 – 2020, and should therefore be revised so that a new one can take effect next year. This is an opportunity to convene all the relevant sectors to develop a multisectoral nutrition strategy for the country, with a common results framework around which all sectors can unite. The new Strategy should be based on the full multisectoral spectrum of nutrition-sensitive and nutrition-specific approaches and measures, specifying clearly what the responsibilities of the various ministries and other agencies will be and prioritising action to ensure good nutrition of children during the first 1,000 days of life.

The new National Nutrition Strategy should thus:

- be multisectoral;
- have a common results framework with a single set of indicators agreed by all relevant sectors;
- take into account a life cycle approach that considers maternal nutrition, adolescent nutrition and child nutrition;
- adopt an equity approach;
- address the triple burden of malnutrition (undernutrition, overweight/obesity and micronutrient deficiencies).

Global evidence and current best practice suggest that a multisectoral approach is the optimal way to address malnutrition. Alongside this it is important to support a lifecycle approach and to tackle intergenerational malnutrition. In Botswana, where there is a triple burden of malnutrition (undernutrition, overweight/obesity and micronutrient deficiencies), any nutrition strategy should aim to reduce all forms of malnutrition.

As part of a revised National Nutrition Strategy, the Government of Botswana should develop a Social and Behaviour Change Communication (SBCC) strategy that covers maternal, adolescent, infant and young child nutrition, care practices and hygiene. As poor child care and feeding practices and hygiene practices were all identified as drivers of malnutrition, this indicates a need to improve the effectiveness of education and counselling. An SBCC strategy should be developed that covers maternal, adolescent, infant and young child nutrition, care practices and hygiene. This strategy needs to be adopted by all relevant stakeholders and should identify the channels through which it can be delivered.

The new National Nutrition Strategy should specify how nutrition approaches and measures will interface with social protection systems and programmes, and agriculture, to ensure food

security. When this has been achieved, the need for supplementary feeding of children in Botswana should fall away. The new National Nutrition Strategy should emphasise and specify the SBCC approaches that expanded nutrition extension cadres and programmes would adopt in order to optimise the knowledge and awareness of parents and carers about young child nutrition.

Building on Botswana's existing membership of the Scaling Up Nutrition (SUN) Movement, the new National Nutrition Strategy should establish a functional multisector co-ordination platform for nutrition. It is important that there is strong nutrition governance in Botswana. Key for this are functional co-ordination mechanisms. These would convene relevant stakeholders such as different ministries and their partners, co-ordinate and manage the implementation of activities and take any necessary joint actions based on learning.

4.2 National Social Protection Framework

The NSPF has been in final draft for over a year. It should soon be formally approved as the foundation for the complementary enhanced nutrition and social protection approaches recommended by the evaluation.

4.3 Information management and monitoring and evaluation systems

To maximise efficiency, avoid wastage, and optimise system performance, better data on the cost of programmes, as well as stronger monitoring and evaluation systems, are needed (section 1.5.4 above). A strengthened monitoring and evaluation system should support a culture of 'adaptive learning' whereby findings and learning lead to programmatic improvements. This should help ensure that policies are implemented effectively and efficiently.

5 Options for tackling malnutrition

This chapter offers an overview of optional scenarios for a GOB approach to malnutrition, given at a high level for the consideration of policymakers. An analysis of the costs and benefits of each option is given in chapter 6.

The options given below are in addition to the policy recommendations in the previous chapter of this report, which should be adopted irrespective of which of the following scenarios is chosen.

The three scenarios should be considered against the background of the evaluation report's recommendations, which – as noted above – are phased for the short, medium and long term.

5.1 Overview

This section summarises the three scenarios, grounded in the analysis undertaken in the evaluation report. Each contains a different, though in some cases overlapping, set of recommendations to improve nutrition and decrease the rate of stunting in Botswana. These options take into account the importance of social and political acceptability, as well as economic feasibility and value for money. It is worth noting that there may be some trade-off between these aims, and the options presented here take different positions on prioritising acceptability and ease of implementation versus the efficiency and effectiveness of the programme.

The first option (A) is to strengthen the current system as it stands, and make it as efficient and effective as possible without initiating any fundamental changes. As such, it is the most conservative and thus likely to be the most widely acceptable. However, it is not the most effective or efficient, and therefore not likely to have the most impact, nor represent the best value for money.

The second option (B) considers ways to optimise the current system, by removing some facets, strengthening others and adding further support where appropriate. This is likely to result in a better use of resources, and to have a greater effect in a more economically efficient manner.

The third option (C) is a more fundamental change to Botswana's approach to malnutrition. It would involve phasing out the current ration system entirely, except for crisis situations, and replacing it with stronger social protection policies, some of which would cover the entire population, and others of which would be targeted at the most vulnerable. This option should be the most effective and efficient, but it may not be considered practically or politically feasible at this time.

5.2 Option A: continue VGFP with efficiency improvements

The current system is highly ineffective and inefficient, as demonstrated in section 3.3 and Figure 2 above, with only around 14% of the Tsabana and Malutu ration reaching the recipient - and even less in the case of oil and beans. Under such circumstances, the VGFP cannot be effective. By adopting some measures to tackle key weaknesses in the current system, the situation could be improved significantly. But such improvements would not redress the

fundamental failings of a nutrition strategy that relies only on a nutrition-specific intervention and does not adequately address the underlying causes of malnutrition.

5.2.1 Measure A1: improve procurement and distribution systems

Issues with the procurement and distribution systems mean that, around 35% of the time, no rations are reaching the Child Welfare Clinic for distribution to the recipients. Moreover, it is reported that when rations do arrive, they are often only partial, and 25% of the time these rations are near or past their expiry date, or spoiled and not fit for distribution.

This results in a huge wastage: for every 100 kg of rations which are meant to arrive, only 36 kg arrive as scheduled in a state fit for consumption (see Figure 2). This figure is for Tsabana and Malutu: the situation is even worse for oil and bean rations.

Furthermore, the districts where levels of malnutrition are high, and the need of rations therefore arguably strongest, are more likely to suffer from shortages. In the evaluation research, government staff working in the quartile of deprived districts with the worst child underweight reported that failure in supply of Tsabana and Malutu occurred, on average, 53% of the time, compared with 39% for the other districts. Furthermore, insufficient, partial supply of rations occurred with a frequency of 63% for the most deprived districts compared with 37% of the time for the others.

For the system of procurement, it is recognised that reform is already under way with a new online procurement system, which has caused disruption in the short term but should result in a better system once it is running properly. In addition, it is understood that a multi-year tendering process is under consideration, which, as long as it is combined with sufficient monitoring, could result in a more predictable supply.

It may also be worth considering measures to open the market and increase competition. This, if handled appropriately, with sufficient regulation to ensure quality standards are met, could result in greater quality of product at a lower cost.

For improving the distribution of rations (Tsabana, Malutu, oil and beans), the following options may be considered, in the context of overall efforts to strengthen logistical co-ordination:

- improving the transport capacity of MLGRD by investing in new vehicles and improving the maintenance of the current fleet;
- transferring responsibility for transport and logistics to the MOHW; or
- transferring more responsibility for transport and logistics to the ration manufacturers or to another private company.

Measures for improving storage systems at warehouses and in store rooms at health facilities to reduce spoilage may also be considered. Since a report on nutritional composition and supply chain issues is being prepared in parallel, the evaluation team have not gone into any further depth on this subject. It is worth noting that, under the current system, there appears to be a responsibility gap. Whichever method is chosen, it would be prudent to put in place a system of checks and incentives to ensure more frequent and more timely delivery. This issue is clearly of paramount importance. If rations do not reach the health facilities as planned and scheduled, they cannot benefit the recipients as intended.

5.2.2 Measure A2: improve ration formulation

Aware that the nutritional composition of Tsabana and Malutu may not be optimal, the MOHW has arranged with WFP for it to be assessed. This is expected to lead to a reformulation of the ration. Nutritional testing of the product as manufactured should of course continue frequently, with all suppliers of Tsabana and Malutu.

Any reformulation should take into account not only the nutritional value, but also consider making the ration more desirable for its intended consumers (children under the age of 5) and less desirable for anyone else – although still adequately palatable for the medically selected adults for whom it is prescribed. This could be achieved by changing the colour and composition of the ration to make it less of a favourite food for adults. Ideally, if it could be provided in a form that does not need preparation, for example, as a biscuit, this would have the dual advantages of making it easier to feed it only to the child, and avoiding any loss in nutritional value due to poor preparation.

5.3 Option B: alter the VGFP to be more effective, and strengthen social protection

This option combines optimisation of the current system and an increased focus on the recipients who are in most need. It differs from option A by putting a greater emphasis on nutritional education and social protection measures, and on the first 1,000 days of life (from conception to the child's second birthday).

One result of this is the recommendation to cease distribution of rations to children over the age of two. This would mean ceasing distribution of Malutu for children entirely, though it may be necessary to continue it for medically selected pregnant and lactating women and other vulnerable adults (and to children aged 24-59 months during drought). It should be emphasised that this is based on the understanding that there are more effective methods of ensuring that children of that age have access to good nutrition. It is not recommended that the withdrawal of Malutu be done in isolation; it should only be considered in conjunction with an increase in nutritional support and social protection.

5.3.1 Measure B1: improve procurement and distribution systems

As in section 5.2.1 above; in addition, the cost of procurement and distribution is anticipated to fall, since fewer rations will be distributed.

5.3.2 Measure B2: improve ration formulation

This would be as in section 5.2.2 above, but with the simplification that it would only apply to Tsabana. The only reason to continue with the production of Malutu would be to continue coverage for the vulnerable adults: selected pregnant and lactating women, and tuberculosis outpatients. It may be more efficient to find a different solution for them, or to provide them with Tsabana instead.

5.3.3 Measure B3: expand the cadre of community health workers and increase education on nutrition and caring practices

The evaluation report stresses that lack of good quality nutritional education, poor childcare practices and poor feeding practices all contribute to malnutrition and are issues that cannot be addressed merely by the provision of rations. A future, enhanced approach to optimum nutrition will depend on expanded, better-skilled nutrition extension cadres: Health Education

Assistants and others at health facility level, and supervision/co-ordination staff at district level. For this reason, it is strongly recommended that greater numbers are employed at health facility or community level, who are able to make contact with those most in need.

As well as general education on child nutrition and feeding practices, an educational campaign to discourage adults from consuming Tsabana could be considered, to further increase the likelihood of the ration being consumed by the child.

5.3.4 Measure B4: focus on the first 1,000 days

There is strong evidence that it is the first 1,000 days of life, from conception to a child's second birthday, that are the most important from a nutritional perspective. Undersupply of nutrients at this early stage can result in lasting and irreversible damage in the development of the child's physique and mental capacity. This means that the focus of a nutritional intervention should be on pregnant and lactating women, and children under the age of two.

The increased nutritional needs of pregnant and lactating women, who are the nutritional providers for the first 15 months of life, ideally until the child is six months old, should continue to be met principally by the existing system of supplying iron and folic acid supplements through antenatal clinics (ANCs), with the addition of extra nutritional counselling and education through a reinforced health extension services (Measure B3). Medically selected pregnant and lactating women should continue to receive a ration. Given the high level of obesity in women in Botswana, it is not recommended to extend the coverage of the ration to all pregnant and lactating women.

Children between the ages of six months and two years should continue to receive Tsabana – preferably a ration that is reformulated to have higher nutritional content and be less appealing to adults.

Children above the age of two are still vulnerable to stunting. However, their needs are better met through the nutritional counselling and education of their parents/carers, as well as stronger social protection measures.

It must be emphasised that the withdrawal of Malutu should only be done alongside strengthened social protection, in order to avoid adverse consequences for vulnerable children between the ages of two and five years.

5.3.5 Measure B5: strengthen social protection measures

As noted above, Option B is an interim scenario in which the provision of supplementary feeding is restricted to the priority target group, while social protection measures are simultaneously strengthened to ensure the food security of vulnerable households. Those measures, alongside stronger and more effective household- and community-level nutrition education, should ensure that parents and carers are able and competent to ensure the good nutrition of children who are no longer receiving Malutu.

The National Social Protection Framework, which awaits formal approval by Cabinet, is a strong platform for the initiation of the measures that are needed in this regard. Option B thus assumes that the GOB will take implementation of the NSPF forward.

5.4 Option C: phase out the VGFP, implement a full-spectrum nutrition strategy and ensure adequate social protection

This option represents the long-term strategy that the evaluation report proposes: phasing out the VGFP as a feeding programme for children. This option is based on an understanding of current best practice, that direct provision of food is to be used sparingly and only in crisis situations where absolutely necessary. In its place, this option envisages tackling malnutrition as part of a multisectoral nutrition strategy that achieves the required suite of nutrition-sensitive measures as well as nutrition-specific ones. To succeed, a multisectoral nutrition strategy should be complemented by a social protection strategy that ensures the basic food and livelihood security of vulnerable households. Both would be developed on the basis of the policy progress recommended in sections 4.1 and 4.2 above.

This option would not necessarily reduce total government expenditure and should not be seen as a diversion of funding from the welfare of children to other sectors. Savings accrued from phasing out the VGFP should be reinvested in expanded health worker numbers and in reinforcement of the social protection system. The net effect on expenditure cannot be calculated at this point, since it would depend on the specific measures and policies pursued. Depending on how this was implemented, the net expenditure could increase, decrease or be cost neutral as a result of the changes recommended.

5.4.1 Measure C1: expand the cadre of community health workers and increase education on nutrition and caring practices

This would be as envisaged for measure B3 (section 5.3.3 above). Moreover, the freeing up of MOHW workers at health facility level from ration distribution would provide additional resources that could be used to increase the level of health care at a community level.

5.4.2 Measure C2: focus on the first 1,000 days

Although supplementary feeding would not normally be provided under this scenario for pregnant and lactating women or children aged under two years, nutrition programming would continue to emphasise the first 1,000 days as the critical period. This emphasis would be prominent in the strengthened nutrition education and counselling services that option C would entail. Mothers and children medically identified as malnourished would still be referred for the provision of supplementary feeding, normally through the social protection system.

5.4.3 Measure C3: strengthen social protection measures

In the rationalisation and co-ordination of nutrition and social protection programming that option C requires, ensuring that social protection measures are strong and comprehensive enough would be a key obligation. This may involve increased universal benefits for parents and carers or young children, and/or increased targeting of the most vulnerable. Increasing social protection measures is an essential complement to the enhanced, multisectoral nutrition programming that the VGFP evaluation recommends. The required strategies are included in the draft NSPF. Once that framework is approved, the key requirement will be to fund the staff capacity and social transfers required to ensure that food security is assured through social protection rather than through nutrition programming.

Although Botswana was not one of its case study countries, a recent World Bank study offers valuable insights on the relative costs and benefits of providing nutrition-specific interventions via the health system only, and combining such interventions with nutrition-sensitive

interventions in complementary sectors (World Bank, 2018). The box below provides a brief overview of the key points.

Box 1: The benefits of combining nutrition-specific and nutrition-sensitive actions in Sub-Saharan Africa

A 2018 World Bank study on the underlying determinants of nutrition in Sub-Saharan Africa, and the association of stunting with these determinants, offers valid evidence in favour of Option 3 versus Option 1 or 2 in the context of Botswana.

The study notes that much of the effort to date to address malnutrition and stunting has focused on the costing, financing and impact of nutrition-specific interventions delivered through the health sector, such as the VGFP.

The study, however, argues that, especially in Africa, where faster economic growth is less strongly associated with a reduction in stunting than elsewhere in the world, accelerating progress on reducing stunting requires enlisting more sectors in order to address the underlying determinants of malnutrition.

The study bases this call on its analysis of empirical evidence from sources such as Demographic and Health Surveys. It argues that a more holistic view of the multiple deprivations experienced by children, and of how the joint distribution of underlying factors results in stunting, is essential for identifying the important gaps in these drivers that should be addressed.

It investigates care/food security; health; and water, sanitation, and hygiene (WASH) as the key drivers. Key findings are:

- Very few children have access to all three drivers at the same time.
- In all 33 countries in the study, more children did not have access to any of the drivers, than children who had access to all three.
- The stunting of children with simultaneous access to all three is significantly lower, than children who have access to all three.
- The greatest gains in stunting reduction are when access increases from zero to one driver *and* when access increases from any one to any two drivers.
- The greatest reductions in stunting are associated with increases in access from none (0) to any 1 nutrition driver and from any 1 driver to simultaneous access to any 2 drivers.
- The marginal effect on the probability of a child being stunted from access to adequate health only is greater than the marginal effect from access to adequate food and care only or access to adequate WASH only. This, the study says, suggests that if funding is truly constrained, health-based nutrition interventions should be priority.
- But, the study also found that there are real marginal effects of complementing health interventions with simultaneous access to adequate food/care or simultaneous access to adequate WASH.
- Finally, and key for this evaluation's Option 3, is the study's confirmation of the link between household wealth and stunting. Income or wealth may have what appears to be a small positive impact on the height-for-age score of children in their first two years of life, but these small positive effects compound as the child ages, resulting in larger differences in the scores that are more apparent later in life. Furthermore, the full difference cannot be explained by the impact captured by the components of food and care, WASH, and health.

The study concludes that a fundamental ingredient of a successful nutrition strategy is the scale-up of interventions in agriculture, health, care, and WASH that are jointly targeted to geographic areas (or populations within these areas) with high stunting prevalence. If budgets are constrained, and targeting by one sector only is possible, this sector should be health. If a targeted area is already covered with health interventions, the decision of whether to add WASH or agriculture, should be driven by cost, as the benefits of simultaneous coverage of both are similar. Furthermore, the study authors emphasise that increased access to adequate levels of the underlying drivers of nutrition coordinated across different sectors should not be considered in isolation from programmes increasing incomes and minimizing income variability in rural areas, both important determinants of household demand for better nutrition. **Instead, programmes and interventions aimed at increasing the level and stability of income among populations where stunting is prevalent should be considered as indispensable components of a 'multisectoral' approach to reducing undernutrition in Sub-Saharan Africa.**

Source: World Bank, 2018.

5.5 Summary

Any of the three options above would be more effective than the current VGFP. The choice between them will depend on the ambition of the Government of Botswana and its capacity to implement change.

New systems take time to work effectively, and a phased approach would be necessary, as the evaluation report explains. When contemplating option C, in particular, it should be recognised that interim, transitional phases would be required before the fully transformed approach to nutrition and social protection would be in place. The evaluation report identifies the measures that could be taken in the short and medium term in order to achieve this preferred option.

6 Analysis of costs and benefits

As noted above, the VGFP evaluation report makes a comprehensive, interlocking series of recommendations phased over the short, medium and long term. To make an investment case analysis more comprehensible, this chapter structures that analysis by comparing the VGFP in its current state of implementation with the three options or scenarios outlined in chapter 5 above. The analysis is based on calculations set out at Annex 4.

6.1 Analysis of costs and benefits of three options against the status quo

Table 4 summarises the cost implications of the different components proposed as detailed in the previous chapter, for each of the scenarios.

- Where there are defensible estimates for costs, they are indicated.
- The rows of the table lists the components that make up the different scenarios.
- The table makes a distinction between whether the scenario will imply savings (i.e. change or eliminate the base cost, or the cost of the system with no change), and whether it implies additional cost, for each element.
- If the component is not part of the scenario, or if the change does not have an implication for the cost line, it is marked as 'no implication'.
- Where changes are proposed, the text is in black bold. Where there is no change, it is in light grey.
- Alternate component rows are shaded, to assist with seeing base and additional cost implications as a grouping by component at a glance.
- The table can be read by column, reading down through the components making up each scenario. It can also be read by component, to see each component's presence and implications in each scenario.

Table 4. Overview of the cost implications of the three scenarios

Measures		Status quo: Current system	Option A: Strengthen current system	Option B: strengthen and focus current system; additional support	Option C: replace VGFP with better community health care and education and increased social protection
Improve procurement and distribution systems	BASE COST SAVING IMPLICATIONS	Existing Cost: Current procurement and distribution system costs >P3m	Reduction in the cost of the current procurement and distribution system, in absolute terms and for each child reached		Elimination of existing cost, except for cost of targeted feeding but at reduced cost per child if it occurs with a strengthened system
	ADDITIONAL COST IMPLICATIONS	No implication	Once-off cost of reform design and implementation. Cost of a reformed procurement and distribution system this will depend on the method chosen and on market behaviour.		No implication: no additional cost of distribution systems, except if targeted feeding occurs with a strengthened system, then the cost of strengthening the system
Reformulate rations	BASE COST SAVING IMPLICATIONS	No implication	Costs per child may be more or less expensive than current cost, depending on the reformulation		Elimination of existing cost, except for cost of targeted feeding
	ADDITIONAL COST IMPLICATIONS	No implication	There will be a cost to reformulation		If new rations for targeted food packages, cost of reformulation
Expand cadre of community health workers and increase nutritional education	BASE COST SAVING IMPLICATIONS	No implication	No implication	No implication	A saving, as the reduced use of health care workers to manage feeding programme would free up their time, or allow for fewer health care workers
	ADDITIONAL COST IMPLICATIONS	No implication	No implication	Increase in community health workers: est. cost of P19m	Increase in community health workers: est. cost of P19m The freeing up of clinic staff from VGFP could cover a proportion of this.
Focus on first 1,000 days: policy & education	BASE COST SAVING IMPLICATIONS	No implication	No implication	No change	Existing cost eliminated, except for targeted feeding cost
	ADDITIONAL COST IMPLICATIONS	No implication	No implication	Little additional cost: predominantly a matter of policy, though some re-training required	Little additional cost: predominantly a matter of policy, though some re-training required
Focus on first 1,000 days: change in rations	BASE COST SAVING IMPLICATIONS	No change (Current cost of rations: >P250m)	No implication	Remove Malutu (cost saving: est. P33m)	Remove VGFP rations for children entirely (cost saving est. > P255m), except cost of targeted feeding
	ADDITIONAL COST IMPLICATIONS	No implication	No implication	No implication	No implication
Strengthen social protection	BASE COST SAVING IMPLICATIONS	No implication	No implication	No implication	Elimination of current cost, except for cost of targeted feeding
	ADDITIONAL COST IMPLICATIONS	No implication	No implication	Cost of additional social protection	Cost of additional social protection

This builds to a high level analysis of the costs and benefits of the different options given in the table below. The cost of the changes would, in most cases, be heavily dependent on the approach chosen and, in some cases, on market factors. Therefore only indicative figures have been given, and only when there is some confidence in them. With the available data it is not possible to estimate how the costs of Options A, B and C would differ from the current recurrent cost (to MLGRD only) of about P843 per beneficiary per year. Adopting Option C would obviously remove that P255m from MLGRD's annual recurrent budget. Other costs, for community health staff and extension programmes and for social protection, would rise. There is no certainty that they would rise by more than P255m. Even if they did, it seems likely that the increment would be offset by the fiscal gains that would accrue from the stronger GDP generated by a well-nourished nation (section 6.2).

Table 5. Current VGFP and three scenarios

	Status quo: Current system	Option A: Strengthen current system	Option B: strengthen and focus current system; additional support	Option C: replace VGFP with better community health care & education and increased social protection
Costs	Est. cost to MLGRD, excl. transport: P255m. Costs to MOHW: unknown. Level of stunting unacceptably high, particularly in certain districts, and little evidence that it has improved.	Cost for improved procurement and distribution systems may not necessarily be high: this would depend on the approach. Cost of reformulation.	Cost for improved procurement and distribution systems may not necessarily be high: this would depend on the approach. Cost of reformulation. Increase in community health workers: estimated cost of P19m. Cost of additional social protection.	Increase in community health workers: est. cost of P19m (this may be offset by the freeing up of staff and resources due to no longer needing to administer the programme). Cost of additional social protection.
Benefits	With only around 14% of rations reaching intended beneficiaries, the benefit is low.	More rations arriving on time, combined with a ration that is less appealing to adults, could result in a significant improvement in the amount of rations reaching the children, equivalent to over 250% of the current amount ³ . Efficiency savings in the procurement and distribution system would result	Removal of Malutu: est. cost savings in region of P33m. More rations arriving on time, combined with a ration that is less appealing to adults, could result in a significant improvement in the amount of rations reaching the children, equivalent to over 250% of the current amount. Efficiency savings in	Removal of VGFP: est. cost savings in region of >P255m (conservative estimate). This option represents best practice in terms of directly addressing the related problems of malnutrition and inequality. Once implemented, this option should be no more expensive

³ See Annex 4 for calculation.

	Status quo: Current system	Option A: Strengthen current system	Option B: strengthen and focus current system; additional support	Option C: replace VGFP with better community health care & education and increased social protection
		in a much lower cost per kg delivered. Added to this, higher nutrition will further increase the ration's effectiveness.	the procurement and distribution system would result in a much lower cost per kg delivered. Added to this, higher nutrition will further increase the ration's effectiveness. This applies to Tsabana only. In addition, better community health and education should reduce stunting levels significantly.	than the status quo, while being far more effective in tackling stunting and improving the general health and nutrition of children and the wider population.
Summary	A costly programme with little output to the desired end.	Some additional expenditure here could result in a more efficient and effective programme.	Retaining an improved version of the current VGFP while strengthening other systems may be a good compromise in the medium term, achieving stronger efficiency and effectiveness than Option A.	In the medium to long term, this represents the best option for improving nutrition and thus leading to a healthier, more productive population, with implications for the health services and eventually for increased GDP.

6.2 Benefits to the economy of Botswana

Section 2.2 above states that it is difficult to quantify the very real costs of malnutrition to the economy of Botswana – and it is equally difficult, therefore, to estimate the economic benefits of ending stunting and ensuring that young Batswana reach their full potential in the future economy of the nation. Recent research reaches the following relevant conclusions:

[Globally] per capita income today is probably 7% lower than it would have been if none of today's workers had been stunted in childhood. In Africa and S. Asia this 'stunting penalty' is likely to be even higher – around 9-10% of GDP per capita...

Reducing stunting through nutrition-specific interventions, such as breastfeeding counselling and micronutrient supplementation, is one option. The impacts of such interventions on stunting are not especially large, but neither – for the most part

– are their costs. And because the economic consequences of stunting are large, even small changes in stunting can have large economic effects. We estimate that scaling up to 90% coverage a package of 10 nutrition-specific interventions in 34 countries over a period of 10 years would take the stunting rate in 2025 down to 36% below to its 2010 value... We estimate a rate-of-return for the 34 countries [covered by this study] as a whole of 17%, with a benefit-cost ratio of 15:1.

Galasso & Wagstaff, 2017: 50.

Galasso and Wagstaff recognise that nutrition-specific solutions are only a minority element in an overall effective multisectoral approach to stunting. Nevertheless, the assessment quoted above hints at the scale of benefits an effective, integrated set of interventions can achieve. The UNICEF and WFP study quoted in section 2.2 estimates the net effect of improving nutrition on a country's GDP to be in the region of 2-3%, which in the case of Botswana is equivalent to approximately P5.25 billion per year.

7 Conclusion

Malnutrition, particularly stunting, imposes a heavy cost on Botswana. That cost is in the 20% to 30% of Botswana who will never achieve their full personal or economic potential due to poor nutrition at an early age. This represents around half a million people who will not be able to contribute to Botswana's economy as they could if they had they been well nourished, especially during the first 1,000 days of their lives. Botswana has a comparatively small population for its area. It cannot afford to squander its human resources in such a manner.

The current VGFP is a waste of resources. The VGFP evaluation report emphasises that although it may be thought of as a nutrition programme, it currently functions as a social protection programme, and even in those terms it cannot be assessed as efficient or effective.

Investing in nutrition, and especially in optimal nutrition in the first 1,000 days of life within a full-spectrum strategy of nutrition-sensitive and nutrition-specific interventions, is a sound use of national resources. It is the foundation for a healthy, productive population and thus of an optimally productive economy. Adopting the recommended combination of nutrition and social protection strategies would involve a significant reallocation of resources and would greatly reduce the budget needed for supplementary feeding. At the same time, it would increase the budget required for health education and counselling, and for full implementation of the National Social Protection Framework.

With the data currently available, it is not feasible to conclude whether the investment case for nutrition involves extra spending. What is clear, however, is that the investment case is strong. The benefits to strengthening support for good nutrition may be measured in economic terms in future years, and will also be seen in a healthier, stronger, more capable population. If Botswana is to diversify its economy and strengthen it for the 21st century, then these changes are not merely desirable but essential.

Achieving these changes will require considerable political and institutional will. Institutional and programmatic restructuring on this scale will be a substantial challenge; but meeting that challenge is in the national interest.

Annex 1 The Vulnerable Groups Feeding Programme

This annex describes the VGFP: its long history, its current operational structure and institutional arrangements; and the data that could be found about its budget, its expenditure and its beneficiaries.

Background

To mark the 50th anniversary of what became the VGFP, MLGRD staff undertook a historical review of the programme (summarised to the evaluation team in GOB, 2019a and GOB, 2019b). The Botswana National Supplementary Feeding Programme was started on 1 April 1966 as a response to the famine induced by what the nation's founding President, Sir Seretse Khama, described to Parliament as "the worst drought in living memory" (Davies *et al.*, 2017: 9). This programme was implemented by the United Nations World Food Programme (WFP) under Emergency Operation 324 (Seekings, 2016). It was extended six times (October 1970, April 1975, October 1978, December 1983, November/December 1986 and October 1991).

The current guidelines say that

Over the years, the VGFP has served to assist the nutritionally at risk and to improve the declining household food security during drought years. Initially, beneficiaries were medically selected for enrolment into the VGFP during non-drought years. However, following the 1992 to 1997 drought, it was recommended that selection criteria should include socio-economic circumstances rather than medical conditions only; hence the beneficiary categories were redefined.

GOB, 2013a: 33.

The statement in the evaluation TOR that the GOB introduced the VGFP "as a mitigation to prevent stunting" is therefore not wholly accurate. As drought relief, the programme had broader social protection objectives. In 1993 the programme was embedded in the MLGRD budget and during a transitional period of five years WFP handed over the programme to the government. In 1998 the GOB took on full responsibility for the VGFP.

Between 1966 and 1979, WFP provided corn soya meal (commonly known as Malutu), vegetable oil, dried skimmed milk and maize meal through this programme. From 1980 to 1997, the rations comprised the same commodities plus additional foods for severely malnourished children: eggs, pumpkins, beans, peanuts, sugar, oranges, potatoes and dark green vegetables (GOB, 2019b).

By the time UNICEF commissioned work on a social development policy framework in 2010, the VGFP was functioning much as it does now, with the Tsabana enriched sorghum/soya blend added for children aged from 6 to 36 months and Malutu given to children aged up to 59 months (or 72 months if not yet in school). That study reported that

under the Vulnerable Group Feeding Programme (VGFP):

- *specially designed food rations are distributed through clinics to all children aged between 6 and 60 months (there are separate ration packages for 6-18, 19-36 and 37-60 months, and all rations are doubled for severely malnourished children);*
- *this under-fives feeding programme is currently extended to children up to six years old;*
- *food rations are distributed through clinics to selected pregnant and lactating women and to tuberculosis outpatients.*

Guidelines for the VGFP are included in recent guidelines on growth monitoring and promotion and nutrition surveillance [GOB, 2008]. No other formal policy statements or reviews appear to exist...

Foodstuffs for infants, pre-school children, pregnant and lactating women and tuberculosis patients are distributed at health facilities for preparation and consumption at home. The tsabana sorghum/soya formula used for infants has been developed and is produced in Botswana. Vitamin enrichment is adjusted according to the target group...

Procurement, delivery and accounting for the required foodstuffs to schools and health facilities all over Botswana are major logistical and administrative challenges. Some procurement is still done centrally by MLG; other supplies are procured by Councils. Predictable difficulties arise, such as the unavailability of some commodities from time to time, late deliveries and occasional food quality or storage problems. (Pest control in stores is a regular budget item.)

Turner *et al.*, 2010a: 106, quoting GOB, 2008.

The budget for the VGFP was reported to be P196m for 2009/10 and P195m for 2010/11. The VGFP and school meals were reported to be the only two social protection programmes reaching more than 5% of the population (Turner *et al.*, 2010a: xi; 115). Further data on the VGFP as recorded about ten years ago are provided in the Evaluation Report.

Current structure and activities

The background just presented above makes it clear that the VGFP was designed as a general food security intervention, with its roots in drought relief. It thus served as a social protection mechanism rather than a nutrition intervention; although the current evaluation arises from concern about its effectiveness in improving young children's and pregnant and lactating women's nutrition. A drought relief function is retained in the current programme, with rations being increased in areas and at times for which the GOB annual assessment process has led to the declaration of drought.

As noted above, there is no formal design document for the VGFP. According to an overview presented to the evaluation team, the objectives of the programme are:

- *to improve the nutritional status of children under the age of five and at-risk medically selected lactating and pregnant women through the provision of supplementary foods;*

- to mitigate against intermittent food shortages during droughts. GOB, 2019a: 4-5.

The following groups of people are eligible to receive VGFP rations.

- Children between the ages of 6 – 59 months.
- Children between the ages of 60 – 72 months if not in school (currently, 70% of schools have a reception class, and most children in this age group are therefore in school).
- Pregnant women who, according to medical assessment at health facilities:
 - are anaemic;
 - have low weight at the first antenatal care (ANC) visit ($\leq 45\text{kg}$);
 - have children under five who are underweight;
 - have been pregnant five or more times;
 - are under the age of 18;
 - have poor pregnancy outcomes.
- Lactating mothers (within one year of delivery) who are:
 - anaemic;
 - feeding twins or more;
 - with children under five who are underweight;
 - under 18 years of age.
- TB outpatients (GOB, 2019a: 12-14; see also GOB, 2013a: 34-35).

VGFP rations for children are collected when parents and carers (who include some men) bring the child to the health facility for routine growth and health checks. The rationing criteria are shown in the table below.

Table 6. VGFP rationing criteria

Beneficiary	Food commodity	Ration	Selection criteria
Children 6 -18 months	Tsabana	150g/day i.e. 2.5kg pack x2 per month	All children in this age group
	Oil	25 ml/day i.e. 1 bottle (750ml) per month	
Children 19-36 months	Tsabana	200g/day i.e. 2.5kg packx3 per month	All children in this age group
	Oil	25 ml/day i.e. 1 bottle (750ml) per month	
Children 37- 60 months	Fortified precooked Sorghum Soya meal (Malutu)	175g/day i.e. 5.5kg pack per month	All children in this age group

Beneficiary	Food commodity	Ration	Selection criteria
	Beans	60g/day i.e. 1.8kg per month	
	Vegetable Oi	25 ml/day i.e. 1 bottle (750ml) per month	
Pregnant and lactating women, TB and leprosy outpatients.	Fortified precooked Sorghum Soya meal (Malutu)	175g/day i.e. 5.5kg pack per month	Medically selected per Criteria
	Beans	60g/day i.e. 1.8kg per month	
	Vegetable Oil	25 ml/day i.e. 1 bottle (750ml) per month	

Source: GOB, 2019b: 14; see also GOB, 2013a: 34.

Institutional arrangements

From a narrow, budgetary perspective, the VGFP is entirely the responsibility of the MLGRD, whose Food Relief Services (FRS) within its Department of Local Government Finance and Procurement Services are responsible for the procurement and distribution of programme rations, delivering them (via its network of warehouses) to health facilities around the country. All GOB funding earmarked for the VGFP is allocated to the MLGRD and used for these procurement and logistics purposes. FRS performs a similar function for school feeding commodities.

In terms of implementation, however, the VGFP is largely the responsibility of the MOHW, which manages all government health facilities, most of which (with the exception of some hospitals) provide VGFP rations to the target groups. The MOHW is also responsible for nutrition advice and training at HFs and in the community. The MOHW Nutrition and Food Control Division (NFCD, part of the Department of Public Health) has technical oversight of the VGFP and is responsible for nutrition surveillance services. Its technical roles include the preparation and review of product specifications, regular food quality monitoring for compliance with quality standards at production and distribution points, and training staff who are responsible for the operation of the programme. Health facilities are responsible for monthly child growth monitoring, management of the food rations, food rationing, record keeping of rations received at the clinic and issued to beneficiaries, and for the provision of outreach services, including following up with those children who are not performing well and providing support as appropriate. Despite these leading roles in the programme, there are no separate budget lines for the VGFP within the MOHW. A senior MOHW informant stressed that it is not the role of the Ministry to run a feeding programme.

Budget and expenditure

The evaluation team has so far had little success in obtaining adequate information about the budget of the VGFP. This is partly because the MOHW budget and expenditure, for the thousands of person days that it commits annually to the programme, are concealed in other budget lines. So far, estimates of the number of days at what total salary cost have been unforthcoming. It is also because repeated efforts to obtain full data from MLGRD about its budget and expenditures on the procurement and distribution of VGFP commodities have been unsuccessful. (Some MLGRD data combine the VGFP with the provision of commodities for

school feeding, as in the first draft of the national social protection framework (GOB, 2017a: 13, 53.)) Approaches to the Ministry of Finance and Economic Development also failed to yield much information.

A commonly quoted MLGRD budget figure for the VGFP is about P200m per year, all financed from the GOB recurrent budget. In 2009/10, the budget for the programme was P196m, and in 2010/11 P195m, both figures excluding transport costs (Turner *et al.*, 2010a: 115). Some expenditure data are available for MLGRD's procurement of VGFP commodities.

Table 7. VGFP procurement costs, 2009/10 - 2017/18

Year	Procurement expenditure (Pula)
2009/10	69,354,359.70
2010/11	76,904,510.87
2011/12	139,303,281.60
2012/13	79,499,011.20
2013/14	93,627,072.00
2014/15	172,636,241.70
2015/16	157,605,537.72
2016/17	not available
2017/18	109,974,035.28

Source: MLGRD.

Beneficiaries

As noted above, the VGFP is one of the widest-reaching social protection programmes in Botswana. The data below were supplied by MLGRD; it seems unlikely that exactly the same number of beneficiaries were served in three successive years from 2010/11 to 2012/13.

Table 8. VGFP beneficiaries, 2009/10 - 2017/18

Year	Beneficiaries
2009/10	230,985
2010/11	274,644
2011/12	274,644
2012/13	274,644
2013/14	248,693
2014/15	242,388
2015/16	250,971
2016/17	233,340
2017/18	302,343

Source: MLGRD.

Annex 2 Nutrition in Botswana

Introduction

Botswana continues to face a suite of nutrition challenges, as Table 9 shows. The growing significance of the double burden of malnutrition is clear. According to the World Health Organization (WHO), the coexistence of high stunting and overweight rates is a proxy marker of this double burden, which is typical of populations in the nutrition transition (WHO, 2017).

Poverty and poor maternal nutrition are reflected in the growing number of children with low birth weight. This rose from 8% in 2000 to 13.1% in 2007 (SUN, nd⁴).

Table 9. Nutrition in Botswana: most recent data

Issue	% of group affected	Source
Under 5 stunting	31.4	GOB, 2009
Under 5 wasting	7.2	GOB, 2009
Under five overweight	11.2	GOB, 2009
0-5 months exclusive breastfeeding	20.3	GOB, 2009
Women anaemia 15-49 years	30.2	WHO, 2011
Adolescent overweight male	9.5	SUN, nd
Adolescent overweight female	23.4	SUN, nd
Adult overweight male	22.3	NCD Risk Factor Collaboration, 2016a
Adult overweight female	27.8	NCD Risk Factor Collaboration, 2016a
Adult obesity male	8.5	NCD Risk Factor Collaboration, 2016a
Adult obesity female	30.5	NCD Risk Factor Collaboration, 2016a
Adult diabetes male	7.6	NCD Risk Factor Collaboration, 2016b
Adult diabetes female	9.5	NCD Risk Factor Collaboration, 2016b

Botswana recognised the complex multi-sectoral nature of its nutrition challenge when it joined the Scaling Up Nutrition (SUN) movement in April 2015. As the Lancet's seminal series points out, chronic malnutrition contributes to poor health outcomes and has long term effects on survivors, who face a higher risk of poor cognitive development, poor education performance and low economic productivity, eventually leading to poverty, and likely repetition of the cycle (The Lancet, 2008; The Lancet, 2013). The nutritional status of Botswana children is discussed in more detail below.

⁴ nd: no date.

The nutritional status of Botswana children

In order to understand the progress and challenges of the VGFP and identify the best way forward, it is important to review what is known about the nutrition of Botswana children. As is shown below, this must be pieced together from various sources.

Children's nutrition and the effectiveness of supplementary feeding programmes are a longstanding concern for the Government of Botswana, as was reported in 2010.

Available data suggest that the beneficial effect of the children's feeding programmes may have been minimal over the last 15 years. Comparison of data from the Botswana Family Health Surveys (BFHS) III and IV of 1996 and 2007 and the Multiple Indicator Cluster (MICS) Survey of 2000 suggests improvement between 1996 and 2000, and a deterioration since then.

Table 10. Nutrition indicators for children aged under five, 1996 - 2007

Indicator	Description	BFHS III, 1996	MICS, 2000	BFHS IV, 2007
Underweight prevalence	Percentage of under-fives who are too thin for their age	17	13	11.7
Stunting prevalence	Percentage of under-fives who are too short for their age	29	23	31.2
Wasting prevalence	Percentage of under-fives who are too thin for their height	11	5	8.6

Source: Turner *et al.*, 2010a: 114, quoting GOB, 2009 (with recalculated BFHS data: see Evaluation Report for further details)

At the time of writing the best available data on nutrition come from the recalculated 2007 BFHS (GOB, 2009; see also Nnyepi *et al.*, 2011). For children under 5 years old, this showed adjusted levels of stunting, underweight and wasting as 31.2%, 11.7% and 8.6% respectively. However, the survey also found the level of overnutrition in children under 5 was 15.2%, with 7.7% being overweight and 7.5% being obese.

With the information from the BFHS survey now quite dated, there are limited other sources of data to give clues as to how the nutrition situation may have changed since 2007. Three national surveys have been conducted since then: the Welfare Indicator Survey 2009-2010, the Multi-Topic Household Survey 2015-16, and the Botswana Demographic Survey 2016-17. But the findings of a recent three-point analysis of these surveys are still awaited. A Determinants of Malnutrition study was conducted in 2015 in five of the 27 MOHW districts⁵ experiencing moderate to high malnutrition prevalence (Powis *et al.*, 2015: 11). This found that the prevalence of stunting in children under 5 years was 21.0%, the prevalence of underweight was 13.1% and the prevalence of wasting was 7.3%. While this indicates that stunting levels may have decreased, some caution should be exercised as the study only sampled five districts. An analysis of clinic data (September 2016 – May 2017) indicates a stunting level of 22.6%, which would corroborate the hypothesis that stunting levels have

⁵ Francistown (urban), Selebi-Phikwe (urban), Kweneng East (urban and peri-urban), Kgalagadi South (rural) and Gantsi (mixed urban and rural).

decreased. The Determinants of Malnutrition study found that the prevalence of low birth weight (LBW), representing a birth weight < 2.5 kg, was 12.5%, in keeping with the prevalence of 13.1% noted in the 2007 BFHS.

Clinic data show the level of underweight in children under 5 to be around 4%, although when a sample of clinic data (September 2016 – May 2017) was reanalysed it was found that the underweight figures were understated by a factor of more than 9.1%. This suggests that these data are weak. It is worth noting that the national target for underweight prevalence is 3%.

The data on micronutrient deficiencies are very limited. The WHO Nutrition Landscape Information System suggests that anaemia in children under 5 years (Hb <110 g/L) was 43% (2011); anaemia (Hb <110 g/L) in pregnant women was 34% (2016); and anaemia (Hb <120 g/L) was 30.0% in non-pregnant women (2016) (WHO, 2019a).

The BFHS (2007) found that the prevalence of a body mass index (BMI) of at least 25 was 38.6% among adults 25-64 years of age. The health risks of being overweight are particularly serious in women (53.4%) compared to men (22.1%).

The Determinants of Malnutrition study found that 52.6% of infants were breastfed within one hour of birth and 22.7% of infants were breastfed exclusively for the first six months of life while the median duration of breastfeeding was 12 months. There was no association between the exclusive breastfeeding rate and the median duration of breastfeeding across quintiles of wealth score, place of residence, gender of the child or caregiver education.

According to the BFHS 2007 data, the prevalence of stunting rapidly increases to more than 40% within the first 24 months of life which would indicate that it is associated with poor infant feeding, particularly complementary feeding, poor child-care and hygiene practices and high burdens of infectious diseases. Formula-fed infants are at higher risk of diarrhoeal diseases. A 2013 University of Botswana child-mortality study indicated that the major causes of death among children were respiratory infections, sepsis, meningitis, diarrhoea, and malnutrition. Most deaths occurred in the first month of life, and 63% of children who died had some degree of malnutrition. This study estimated that 50% of those who died were HIV exposed and 17% HIV-infected. Overall, according to the 2007 Botswana Family Health Survey (BFHS), new-born, infant and under-five mortality were 34, 57 and 76 respectively per 1,000 live births (UNICEF, 2013: np⁶).

A World Bank study found that stunting is strongly associated with poverty status, low education of parents, rural and urban village location, and unemployment. Stunted children are predominantly in households that are poor or vulnerable, located in rural poor areas, and headed by someone unemployed or less educated. Stunting is strongly associated with household size; it is more likely in households with nine or more children (World Bank, 2015: 12).

These fundamental causes of stunting in Botswana lead to the more immediate causes, as identified four years ago by the Determinants of Malnutrition study.

⁶ np: no page number

Children noted to have low birth weight (birth weight of < 2.5 kilograms) were significantly more likely to be wasted, stunted, or underweight at the time of the study visit, regardless of their current age. Low birth weight is a function of preterm delivery and/or intrauterine growth restriction... This highlights the need for protocols and nutritional interventions for women with poor weight gain during pregnancy and/or low body mass index. It also points to the need of targeted nutritional interventions for those preterm and small-for-gestational age infants who are not gaining weight appropriately early in life, including HIV-exposed uninfected infants. Children with a history of hospitalization were significantly more likely to be stunted, the chronic form of malnutrition, at the study visit. There are no protocols in place to ensure that recently hospitalized children receive routine, scheduled outpatient health and nutritional care... Addressing the health of mothers during pregnancy and providing interventions to preterm and low for gestational age infants present opportunities to modify growth outcomes of children under the age of 5 in Botswana. However, improved detection of malnutrition through enhancements to PIMSII, more frequent monitoring of length/height, and staff retraining may have a large impact on reducing malnutrition and under-5 mortality. Furthermore, given the overall impact on health, educational attainment and earning capacity of children who experience malnutrition, as well as the impact on the human capital of Botswana as a nation, identifying and providing nutritional interventions to children who are experiencing growth decline prior to actually meeting malnutrition criteria may have the largest impact on improving individual health and optimizing Botswana's human capital. The findings of the Determinants of Malnutrition study highlight the need for a multi-sectorial collaboration to comprehensively address factors associated with under-5 malnutrition.

Powis *et al.*, 2015: 7-8.

Annex 3 Nutrition in Botswana government policy

As noted in the Evaluation Report, the Nutrition and Food Control Division in the MOHW Department of Public Health has sectoral responsibility for nutrition in Botswana, although it is not responsible for the procurement and distribution to health facilities of VGFP rations. The NFCD employs nutritionists in 12 of the MOHW's currently 27 districts. In each of those districts, a District Health Management Team co-ordinates all sectoral issues and actions, including those concerning nutrition. (Current restructuring will reduce the number of MOHW districts to 18 and retitle DHMTs as Regional Health Teams.)

The Botswana National Nutrition Strategy, 2015 – 2020, currently guides the GOB's work in nutrition (GOB, 2015). It has seven priority areas.

Table 11. Priority areas in the National Nutrition Strategy, 2015 - 2020

Priority area	Activities	Implementation status
1. Infant and young child feeding	<ul style="list-style-type: none"> • IYCF Policy • Monitoring of the Code of Marketing • Training of health workers and incorporate IYCF training into pre-service training • Accelerate Baby and Mother Friendly Hospital Initiative (BMFHI) • Community-based counselling and support, potentially through community based workers of the Community Home Based Care Programme. • Communication for behaviour and social change through multiple channels, such as public education campaigns, SMS messaging, TV spots, TV soap operas, endorsement by famous personalities etc. • Counselling on complementary feeding. • Protocols and systems for protecting, supporting and promoting IYCF during emergencies (e.g. diarrhoea outbreaks). 	IYCF counselling done on an ad-hoc basis at the CWC
2. Micro-nutrient interventions	<ul style="list-style-type: none"> • Vitamin A supplementation for children 6 to 59 months old • Deworming of children 12-59 months • Deworming of pregnant women • Micronutrient powders for children (home fortification) • Iron and folic acid supplementation of pregnant and lactating women • Salt iodisation • Cereal flour fortification 	Vitamin A supplementation and deworming carried out for children. IFA of pregnant women a government intervention. MNPs and cereal flour fortification not happening.
3. Improved care practices and growth monitoring and promotion	<ul style="list-style-type: none"> • Growth Monitoring and Promotion programme • Vulnerable Group Feeding Programme 	GMP and VGFP both government programmes

Priority area	Activities	Implementation status
4. Prevention and treatment of childhood infections	<ul style="list-style-type: none"> • Nutrition counselling as part of IMCI, in particular, feeding of the sick child and optimal IYCF practices • Hygiene and sanitation counselling as part of nutrition counselling. • How to feed sick children as part of IYCF counselling • Vitamin A supplementation for cases of measles, xerophthalmia, prolonged diarrhoea and severe malnutrition. • Deworming of under five children with vitamin A (as discussed under micronutrient interventions) • Bed nets for young children in malaria areas • Treatment of diarrhoea with low osmolarity ORS and zinc. 	Education sessions meant to be carried out before the CWC and counselling done on an ad-hoc basis at the CWC
5. Integrated management of acute malnutrition	<ul style="list-style-type: none"> • Management of severe acute malnutrition and moderate acute malnutrition as per the national protocol 	Management of acute malnutrition a government programme
6. Women's and girls' nutrition	<ul style="list-style-type: none"> • Public communications campaign against overweight and obesity in girls and women • Nutritional counselling for overweight and obese women at all available contacts used for nutrition counselling such as GMP • Nutrition education messages for girls in school • Strategies and policies to reduce or eliminate the availability of snack foods in and around schools • Strategies and policies to reduce salt, sugar and trans-fat consumption through both processed and home-prepared foods. • Healthy school meals and snacks. • Dietary guidelines for the Botswana population. 	Education sessions meant to be carried out before the CWC and counselling done on an ad-hoc basis at the CWC
7. Management, monitoring and evaluation	<ul style="list-style-type: none"> • Timely, population-based data on nutrition, in particular micronutrient deficiencies, IYCF practices, worm infestation and coverage data of essential nutrition interventions. • Advocacy for increased funding for effective nutrition interventions. • Personnel responsible for implementing, monitoring and evaluating in all districts 	Ongoing efforts to upgrade M&E of nutrition programmes

Source: GOB, 2015.

Despite the context analysis showing an understanding of the multisectoral nature of the drivers of malnutrition, the activities described under each of the National Nutrition Strategy's seven priority areas have a nutrition-specific focus, drawing on global evidence from the Lancet 2013 nutrition series, focusing on the 1,000 day period from conception to a child's second birthday (known as the window of opportunity to address stunting: The Lancet, 2013). For example micronutrient interventions are all focused on supplementation apart from cereal fortification, while prevention and treatment of childhood infections includes zinc and oral rehydration solution (ORS), handwashing and feeding the sick child, although it does include

the provision of bed nets. Ironically, it is the draft National Social Protection Framework that advocates more of a nutrition-sensitive approach.

Botswana's Focal Point for the Scaling Up Nutrition Movement is based in the Ministry of Agricultural Development and Food Security (MADFS), and is the Ministry's Deputy Permanent Secretary of Technical Services. The MOHW is supportive of Botswana's SUN commitment. However, there has been little traction achieved to date under the SUN Movement, with no establishment of a multisectoral nutrition co-ordination platform and no strategy document yet prepared to outline multisectoral nutrition actions. A Nutrition Technical Committee has existed but did not meet last year (2018). Reasons given for this lack of progress include a high turnover of staff within the MADFS at a political level, which means officers get up to speed only to leave the post within a short time. The Ministry did produce a paper examining how agriculture could affect nutrition (GOB, 2017b), but this has not translated into a deliberate implementation of nutrition-sensitive agriculture and food security interventions through the Ministry.

The draft National Social Protection Framework calls for "nutrition-sensitive social protection" and describes the VGFP as part of the social protection system (GOB, 2018c: 14).

To make social protection more nutrition sensitive, social protection programs need to mainstream nutrition into all programming with the following types of activities:

- *Target activities to the most nutritionally vulnerable populations*
- *Include education activities within social protection interventions to increase household awareness of health and nutrition care giving and health seeking behaviours*
- *Enhance the quality of nutrition services (e.g., growth promotion, interventions for improved diet quality) in social protection interventions — particularly transfer programmes*
- *Use school feeding programs as vehicles for micronutrient supplementation and deworming, including links with nutrition education*
- *Scale up in times of crisis in order to reduce the long-term negative impacts of external financial, price and weather shocks.*

GOB, 2018c: 16-17.

It urges the adoption of nutrition-sensitive social protection measures through three pathways: improving income, food availability and increasing assets, targeting nutritionally vulnerable populations through the 1,000 days approach and promoting improvement, access and delivery of health and sanitation services.

Building systems for nutrition impact will require policy coordination between the Ministry of Health and social protection programs. This needs to be informed by robust analysis of local causes of malnutrition – food access and affordability, behaviours and practices and policy analysis of the social protection and health/nutrition sectors. In addition, national nutrition and social protection policy

documents need to be linked and mutually supportive with coherent systems to address risks across the lifecycle; integrated nutrition objectives

GOB, 2018c: 17.

It can be seen that GOB thinking on appropriate approaches to nutrition has broadened since the National Nutrition Strategy was adopted. While the National Social Protection Framework has not yet been formally approved, its call for multisectoral, nutrition-sensitive approaches to be combined with nutrition-specific ones is certainly relevant.

Annex 4 Efficiency calculation

VGFP evaluation fieldwork indicated that two of the major weaknesses of the current VGFP are its procurement and distribution systems and the amount of sharing of the ration that occurs within the household.

Attempts to measure the magnitude of these issues using existing data were confounded by the lack of reliable information. In its place, the evaluation team has done original fieldwork and analysis to gain an estimate of the impact these fundamental issues have on the efficiency of the system in ensuring the rations reach the intended recipients. These figures are based on people's perceptions of the situation right now, or in the last 12 months, and should be taken as indicative, to give an idea of the order of magnitude of the issue, rather than being absolute.

Data sources & analysis

This analysis is based on fieldwork data collected by the team. Two sources of data were used for this analysis:

- online survey - this was completed by government staff (over 95% of whom worked for the MOHW) in 23 of the 24 MOHW districts;
- field survey - interviews conducted in health facilities with parents and carers and with MOHW staff, and undertaken in 12 selected MOHW districts.

Thus the figures used are based on people's judgment of the situation rather than independent observations of the situation. It is the judgment of people who are in a good position to have knowledge of these factors. Nevertheless, it remains a judgment. Given this, effort was made to triangulate the data with other sources where possible.

The key statistics used in the calculation are:

- ration availability (months no ration received in last 12 months);
- partial rations (months partial ration <50% received in last 12 months);
- ration spoiled / near expiry date;
- amount of rations consumed by child.

For ration availability, other sources of data existed: principally the BNNSS data, which give information on rations, attendance and some indicators of malnutrition on a health facility level. A value for ration availability was calculated, based on rations/attendance, for an average (median) HF in 2018, only taking into account HFs with monthly attendance of >100 people. This value was 63%, with an interquartile range of 38% - 83%. The value of average availability of rations from the online survey was 65%, which is close enough to feel some confidence in the figure.

Figures for partial rations were not available from any source we could identify. Similarly, a figure for rations spoiled / near expiry date was not available. However, arguably, any rations not suitable for consumption would not be included in BNNSS data. In order to take that

possibility into account, a scenario was run using BNNSS data and the answers compared to create a realistic range of values.

It is also worth noting that the online survey was concerned with people’s experience over the past 12 months. Therefore, if the distribution chain has been particularly poor over the past 12 months, and there is evidence to believe that it has been, this may represent a low point in the efficiency of the VGFP, rather than being a judgment about its efficiency over the course of many years.

For the amount of rations consumed by the child, we only had information from Powis *et al.*, 2015, which suggested that the prevalence of other household members sharing the ration was high, at 86% for Tsabana. However, it gave no indication of how much the child received themselves: whether their share of the ration was small or substantial.

For our field research, therefore, we surveyed parents and carers in clinics and asked them: “In the last month, how much of Tsabana/ Malutu did child eat?” This yielded the following responses, with the vast majority asserting 50% or less, and only 9% saying that no sharing occurred (thus a lower figures than cited in the previous study).

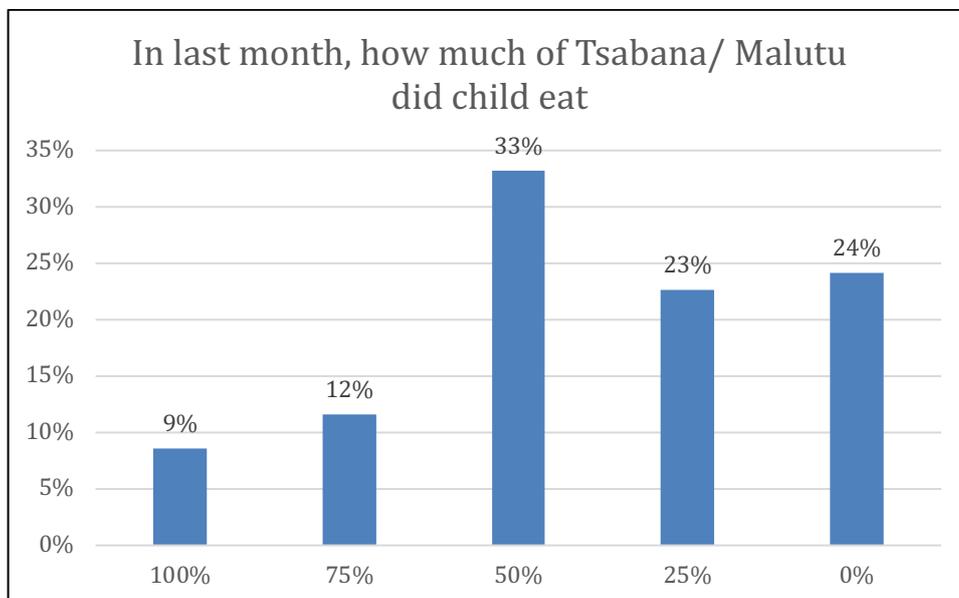


Figure 6. Ration consumed by child (parents/carers response)

Source: Evaluation team fieldwork, interviews with parents/carers in health facilities.

MOHW staff working in health facilities were asked, “How much of Tsabana/ Malutu do children eat on average?” which came up with a different distribution of answers:

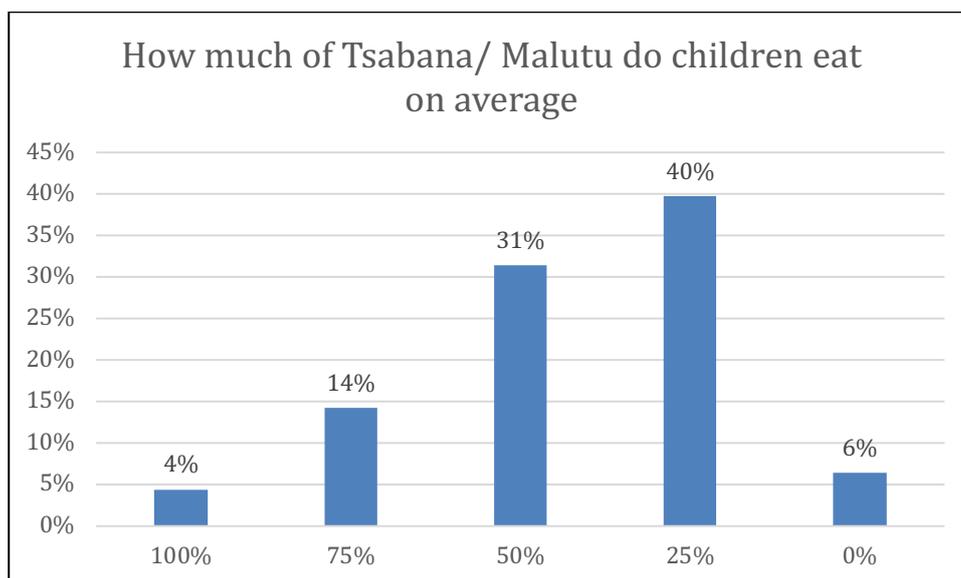


Figure 7. Ration consumed by child (MOHW staff response)

Source: Evaluation team fieldwork, interviews with MOHW staff in health facilities.

These distributions initially look very different; however, if the average value is derived from each, the results are strikingly similar, with the former averaging at 39.6% and the latter at 40.4% - no significant difference. The reason for their difference in appearance lies principally in the fewer extreme responses (of 100% and 0%) given by MOHW staff, which could be entirely explained by the fact that they are asked for the "average" rather than for a specific amount. Thus, the similarity in the estimates offers some degree of triangulation and confidence in the figures used. Further details can be found in the evaluation report.

Calculation of efficiency of current VGFP

The table below sets out the figures used for the calculation and their sources.

Table 12. Data sources for efficiency calculation

	Base case	Source	Notes
No rations delivered	35%	Online survey, Government staff	100% = no rations delivered all year; 0% = rations delivered every month
Partial rations received	41%	Online survey, Government staff	100% = rations are always only partial; 0% = rations always full
Months rations spoiled/ near expiry date	26%	Online survey, Government staff	100% = rations are always spoiled/near expiry date; 0% = rations are always fit for consumption
Amount of ration consumed by child	40%	Fieldwork in HF, homes with parents and carers and MOHW staff	100% = all rations consumed by child; 0% = no rations consumed by child

Partial rations were defined as being "less than 50%". In order to calculate how much rations were received, it was decided to use the deliberately high value of partial rations being, on average, 40% of full rations. It may be that this figure is lower. Note also that no account has

been taken of a reduction due to rations being partial but greater than 50%. Furthermore, this figure applies to Tsabana and Malutu; issues with supply of the additional commodities, beans and oil, are reportedly worse.

Table 13. Ration efficiency of current VGFP

Item	Original figure	Calculation of percentage received	Percentage received * cumulative amount	Cumulative amount
Initial ration				100
Months full supply received	% Months no supply received (35.45%)	Supply received (100% - 35.45%)	64.6% * 100 =	64.6
Months partial (<50%) supply received	% Months partial supply received (41.95%)	Full supply received (100% - 41.95%) + Partial supply received (41.95% * 40%)	74.8% * 64.6 =	48.3
Months rations spoilt/ near expiry date	% Months rations spoilt/ near expiry date (26.31%)	Ration in fit state to be consumed (100% - 26.31%)	73.7% * 48.3 =	35.6
Amount of ration consumed by child	% Amount ration consumed by child (40.00%)		40.0% * 35.6 =	14.2
End amount				14.2

The above calculation is illustrated in Figure 8 below.

To check the sensitivity of this model to the inputs, the same analysis was run, but this time using the BNNSS figure of 63% for the availability of rations, with no additional wastage due to rations being spoilt or near expiry date. The figure for partial rations was kept constant, since the BNNSS data does not account for this, as was the figure for the proportion of rations consumed by others. This analysis yielded a final figure of 19% of the intended ration reaching the recipient.

A further scenario was run using online survey data from a theoretical bottom quartile of districts (the six districts with the highest prevalence of moderate and severe underweight). This scenario was significantly worse, with increased figures for no rations received, partial rations received and rations spoiled / near expiry date, resulting in a final figure of 7% of ration reaching the recipient.

These additional figures do not form upper or lower bounds around the central figure, as there could be higher and lower scenarios, but they give an indication of a reasonable range in results.

For purposes of comparison, future scenarios were modelled against the original figure of 14%.

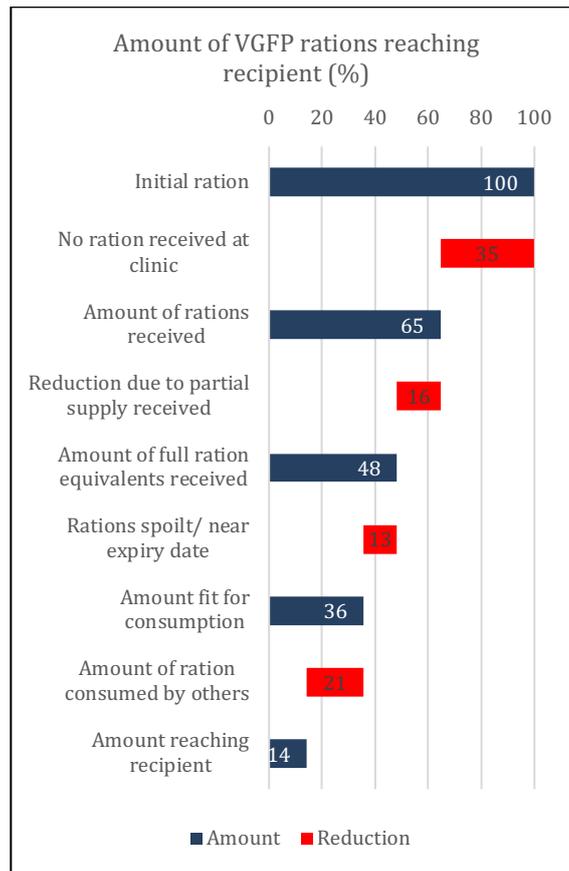


Figure 8. Ration diminishment (current VGFP)

Calculation of improved efficiency under Options A & B

Better distribution and procurement systems would be expected to yield significant improvements in the amount of rations received in a good condition and timely manner. Estimates were made of the potential for improvement; these estimates were made conservatively based on the team’s understanding of what would be reasonable to achieve. In addition, the reformulation of the ration to make it less appealing to adults is modelled as increasing the amount of ration consumed by the child.

Table 14. Estimated efficiency improvement under Option A

	Base case	Option A
No rations delivered	35%	20%
Partial rations received	42%	20%
Months rations spoilt/ near expiry date	26%	10%
Amount of ration consumed by child	40%	60%
Amount reaching recipient	14%	38%

This can be illustrated in the following diagram:

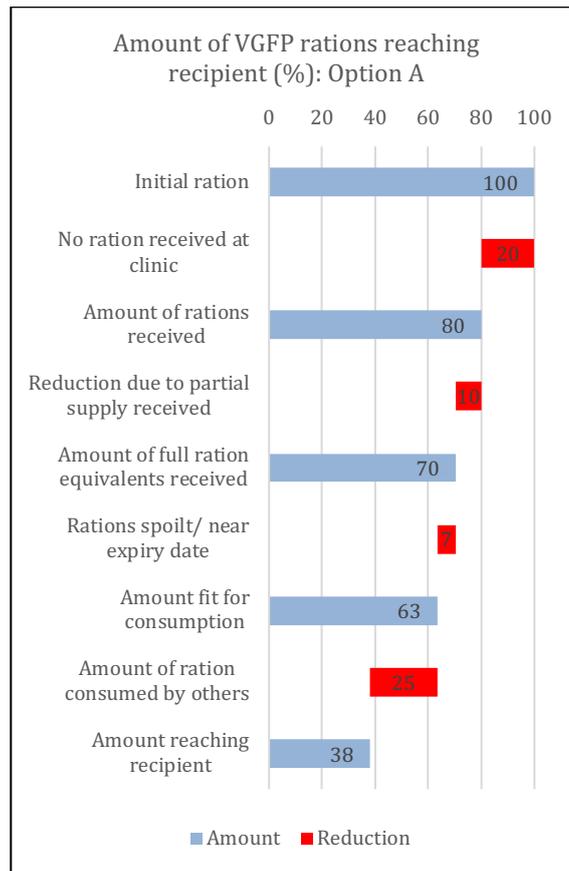


Figure 9. Ration diminishment (Option A)

The amount reaching the recipient is still low under this scenario, mainly constrained by the amount of rations that is consumed by others in the household. Depending on the reformulation, and associated nutritional education, it may be possible to increase the percentage of food that is consumed by the child, though this may be less effective in food-insecure areas, which are also those where the ration is most needed. Nevertheless, the increase of ration reaching the recipient, from only 14% to 38%, is equal to more than 250% of the rations received in the base case even with these conservative estimates.

The same figures were used for Option B, though in this scenario it would apply only to Tsabana.

Calculation of improved efficiency by improving supply chain only

As a point of comparison, we considered the overall efficiency of the system if the supply chain only was improved.

To this end we modelled two scenarios. Under the first scenario, only the frequency of delivery was improved to 80% (from 65%), while the percentage of partial rations and rations which were spoilt or near expiry date remained the same as under the current base case. Under the second scenario, the whole logistics system was improved, so that, taking into account partial rations and rations unfit for consumption, the percentage of full rations supplied fit for consumption was 80% (the percentage of no rations, partial rations and spoilt / near expiry date rations were all reduced by a factor of 4 compared to the base case).

Table 15. Estimated efficiency due to improved supply chain

	Base case	Improved delivery	Improved supply chain
No rations delivered	35%	20%	9%
Partial rations received	42%	42%	10%
Months rations spoil/ near expiry date	26%	26%	7%
Amount of ration consumed by child	40%	40%	40%
Amount reaching recipient	14%	18%	32%

The figures above are represented in the charts below.

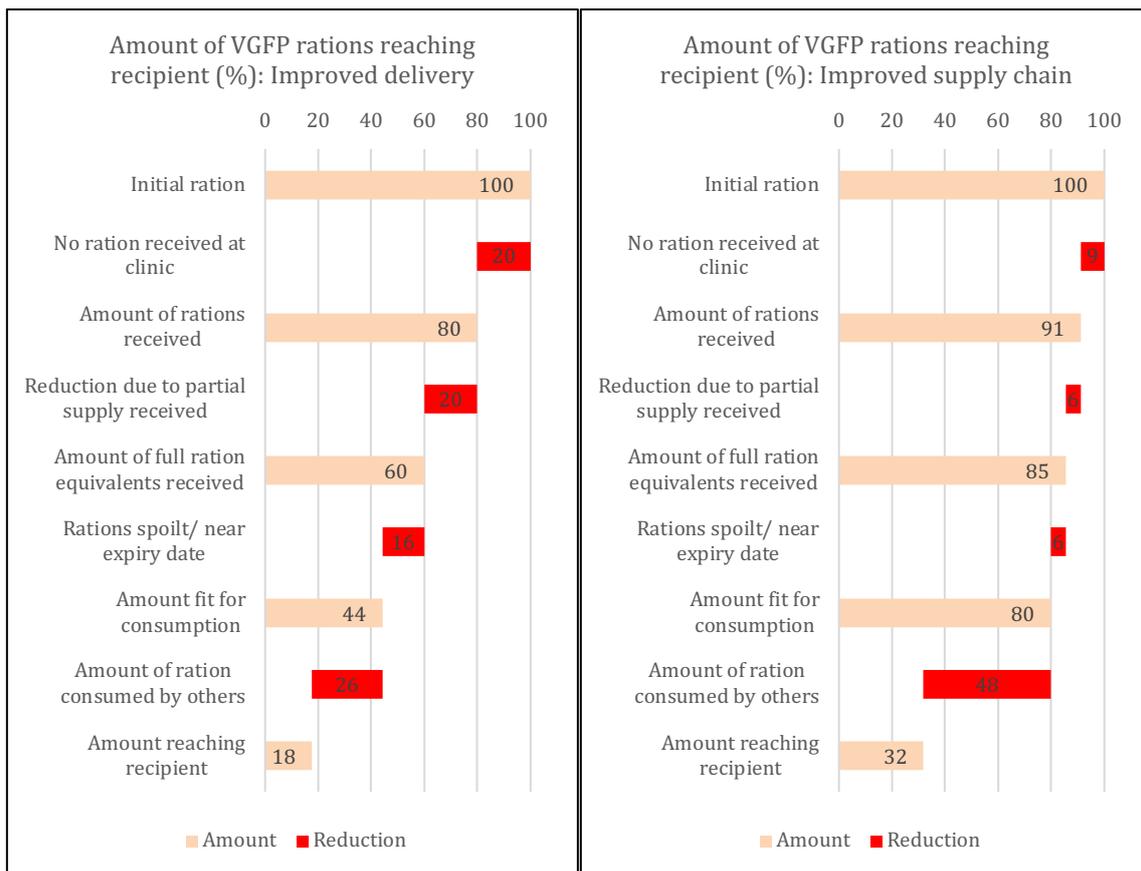


Figure 10. Ration diminishment (supply chain improvements)

It is notable that even though the second scenario has a far better supply chain than Option A considered above, the overall amount reaching the recipient is lower as the proportion of rations consumed by others is assumed to remain constant. This may not be the case: it may be that if more rations were supplied then the intended recipient would receive a higher proportion of them, but this is not a foregone conclusion. For this reason, our recommendation is that improvements to the current VGFP need to go beyond logistics and also change people's behaviour.

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