FINAL

Rural Community Water Management Plan for Tsetsebjwe, Botswana

TSETSEBJWE

Bobirwa Sub District, Central District, Botswana

Location Lat: S 22° 24' 49" Long: E 28° 23' 54''

'Tangible benefits to the community resulting from community managed interventions that can be replicated elsewhere'

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List of Acronyms

AP	Awareness Programme
BAC	Botswana Agricultural College
CBO	Community Based Organisation
CWMC	Community Water Management Committee
DWA	Department of Water Affairs
EPP	Emergency Plant Protection
FMD	Foot and Mouth Disease
MO	Monitoring Operative
MoA	Ministry of Agriculture
MoLG	Ministry of Local Government
PTA	Parent Teacher Association
RCWMP	Rural Community Water Management Plan
SADC	Southern Africa Development Community
TCWMC	Tsetsebjwe Community Water Management Committee
TDS	Total Dissolved Solids
VDC	Village Development Committee
WMC	Water Management Committee
WUC	Water Utilities Corporation

1. Introduction

This Rural Community Water Management Plan (RCWMP) has been developed in full consultation with the Tsetsebjwe community so that the community can better manage its water supply during periods of drought and assist in maintaining community livelihoods and wellbeing in times of water shortage and hardship.

The RCWMP is the product of a sub-regional project entitled ***'Development and Testing of Groundwater Drought Management Strategies in the Limpopo Basin Pilot Areas'*** funded by a GEF grant from the World Bank and implemented by the Groundwater Management Programme within the Southern Africa Development Community (SADC). This RCWMP is one of a number of similar Plans that have been developed as pilot programmes in rural communities in the Limpopo Basin in Botswana, Zimbabwe and South Africa.

2. Principles of the Plan

This RCWMP follows a number of guiding principles that will enable the community to sustain its livelihoods and improve wellbeing during periods of drought by better community management and use of local groundwater sources. The key guiding principles are:

- **Community Ownership**
  Close consultation with the Tsetsebjwe community and other secondary stakeholders is essential to the achievement of successful and sustainable results. The planning processes contribute to community ownership of the project and the resultant Rural Community Water Management Plan represents the community's expectations for water management.

- **Functional Simplicity**
  The content of the plan has been drafted to ensure that it suits the local context and is understandable to the majority of the community. The planning process has also involved detailed consultation with the Community Water Management Committee to ensure their understanding of the water supply interventions.

- **Essential Data Collection**
  Comprehensive and accurate quantitative data collection is essential in order to measure social and biophysical changes resulting from the water supply interventions. These data are key to evaluating the effectiveness of each intervention.

- **Basis of Long Term Community Water Management**
  The management plan was developed by the community in cooperation with the project team and it aims to provide a strong foundation for long term rural community water management. The plan will be adapted and updated over time by the Community Water Management Committee as lessons are learned by the community through the monitoring of various water supply and social indicators.

- **Enhance Community Knowledge**
  The RCWMP recognises the knowledge that exists within the community regarding time-proven techniques and traditional ways of water management. The Plan and the cooperative environment within which it has evolved provide additional information and knowledge to community members. A major outcome of the planning process, therefore, has been to enhance technical and management and skills within the community.

- **Community Contribution**
  The community was committed to helping initiate and subsequently maintaining the water supply intervention.

- **Equity and Special Needs**
  Although the interventions may benefit all residents of the village of Tsetsebjwe, the Rural Community Water Management Plan respects the special needs of the vulnerable members of the community. The needs of women, resource poor farmers, youth, disabled people and those living with HIV and AIDS have been prioritised as beneficiaries of the Plan.

- **Sustainability**
  This principle aims to sustain the physical, organisational and financial resources for the interventions, but cannot guarantee that this will continue in the post-project phase.

3. Goal and Objectives of the Plan

3.1 Goal

The goal of the RCWMP is to facilitate and empower the community to maintain its livelihoods and wellbeing during periods of drought.

3.2 Objectives

The specific objectives of the RCWMP are:

a) To promote improved rural community management and use of water sources, especially groundwater sources, during periods of drought.
   - More water available for domestic use especially during drought spells
   - More water available for food gardens especially during drought spells
   - More water available for livestock especially during drought spells
   - As a result of better water management practices reduce the need for emergency water supply
   - Improved water quality

b) To maintain and improve livelihoods, self-reliance and level of development during drought by means of community managed actions.
   - reduce food shortage: Number of emergency feeding programmes decrease
   - increase the number of food gardens
   - increase the period of food garden activity
   - Increase the number of months harvesting crops from gardens can occur
   - Increase the quantity and quality of locally produced vegetables
   - As a result of greater self-sufficiency from gardens throughout the year, has the socio-economic situation of beneficiary/vulnerable households improved

c) To improve general health in the community
   - Improved nutritional levels
   - Number of diarrhoea occurrence stays the same or decrease
   - Decrease in cases of malnutrition amongst children under the age of 5years

d) Destitution remains the same or decreases.

e) To improve the general knowledge of the community concerning groundwater, pollution and drought preparedness

f) Motivate the community to adopt positive water management practices

g) Ensure the community and Water Committee are sufficiently familiar with physical intervention and know how to maintain and repair it

h) Empower the community to take control and mange their water resources effectively, by improved knowledge, data collection and data interpretation

4. Community Overview

[For additional information see the Rural Community Water Management Planning Process Manual for Tsetsebjwe]

4.1 Location

- Site location –Tsetsebjwe Village, Bobirwa Sub District, Central District, Botswana.
- Georeference - 22° 24' 49.4"S 28° 23' 54.1"E
- Topographic map - 1:50 000 scale sheet 2228B4
- Elevation - 804 m above mean sea level

4.2 Community Characteristics

Comprehensive descriptions of the climate, drainage, geology, geomorphology, soils, natural vegetation, fauna and agriculture of Tsetsebjwe are to be found in the Rural Community Water Management Planning Process document.

4.2.1 Demography

- **Population groups** -
- The major languages spoken are Sebirwa and Setswapong with limited Sepedi (Northern Sotho). Setswana is spoken widely being the official language used at the Kgotla.
- **Population** - (2001); total: 4396 (male: 2,031; female: 2,365); plus surrounding villages: total: 3,467 (male: 1,502; female: 1,965).
- **Chief**: Kgosi Motsamai and Mr Ketlhalefile Gabanamotse; headmen overseeing seven wards.

4.2.2 Community Amenities

- **Village structure** – Tsetsebjwe is a Tertiary II Settlement within Bobirwa District, resourced by the district capital, Bobonong. The community has a basic social infrastructure comprising a number of village committees: Village Health Committee; Village Development Committee; and Farmers Committee). , Females head an increasing number of households. Focal points – include: Kgotla, schools, clinic and police station.
- **Business centre** – Tsetsebjwe receives support from the Sub-District centre of Bobonong. There is limited migration away from the area for work.
- **Roads** - Located at the junction of tarred roads between Bobonong, Selibe Phikwe, the international border crossing at Zanzibar and the Tuli Block Back Line.
- **Stores** - variety of stores, shops and other service agencies.

- **Power** – village is supplied by Botswana Power Cooperation.

4.2.3 Community Economic Activities

- **General** - The main activities include cattle ranching, on surrounding cattle posts, and the cultivation of rain-fed crops, on lands areas. Some employment is obtained in the Tuli Block game ranches and commercial farms. Bobonong, Selibe Phikwe and other nearby towns provide sources of employment. HIV/AIDS challenges development of the Bobirwa sub-district. Unemployment and poverty, however, are development constraints. Water scarcity and recurrent drought negatively impact economic activity. Arable farming and livestock farming, piece jobs and permanent paid employment are the main forms of livelihood. Informal sector businesses such as vending, tailoring, brick molding, sale of bush products, such as mophane worms, and brewing are also important.
- **Agricultural Development:** arable and livestock farming are the backbone of the Tsetsebjwe economy. Agricultural Statistics show that at Tsetsebjwe the total area ploughed per planting season is significant. However, low rainfall, periodic drought and livestock disease are major constraints in the achievement of agricultural productivity and livelihood security.
- **Tourism Development**: a number of tourist lodges and campsites provide local employment. The village is located on the tourist route between the Botswana and South Africa border, at Zanzibar, and northern Botswana. The Tuli Block Game Reserve can be accessed through Tsetsebjwe providing opportunity for tourism related activities.
- **Projects** – NGO activity is limited to HIV/AIDS related programmes. A water related project of the Botswana Agricultural College (BAC) addresses village flooding.
- **Disaster Management -**
- A drought and flood Early Warning System is in place to inform drought preparedness, mitigation and management. Water Affairs and Meteorological Services maintain early warning systems.

4.3 Tsetsebjwe Community Water Supply

4.3.1 Existing Water Supply System

- Main source of water supply is obtained from 3 boreholes in Karoo-age basalt and sandstone at Mathathane, 20 km away, and transferred to the Tsetsebjwe community by pipeline. These boreholes were drilled by DWA and the system is now operated by Water Utilities Corporation (recently transferred from Bobonong Sub-District administration).

- Previous attempts by the Ministry of Local Government / Water Department to drill boreholes for Tsetsebjwe were not successful. The reticulated water is for domestic use only.

- Water for livestock is obtained from hand dug wells mostly situated along a NW-SE trending linear fracture zone cutting across the village. Most of the hand dug

wells close to the village are no longer in use due to contamination from pit latrines. This water is used for road maintenance and brick production.

- Water shortages are frequent in Tsetsebjwe as a result of supply system failure and its scarcity undermines the development potential of the village. Tsetsebjwe will, however, benefit from the Thune Dam which is currently under construction and is expected to be completed by 2013.

4.3.2 Additional Drought Mitigation Water Supply Structures (Piloted)

The existing community water supplies have been augmented by the SADC project that completed a number of physical interventions to assist in drought mitigation using groundwater sources. These interventions were designed on the basis of appropriate community-level technology that potentially can be replicated and be maintained by rural communities. The physical interventions focussed on utilising shallow, easily accessible groundwater resources adjacent to the community which, although relatively low yielding, could be used to supplement community potable supplies or be used to provide water to support livelihoods (especially food–producing community gardens and subsistence livestock) during periods of drought.

The new water supply structures provided by the SADC project are summarised below and their locations are shown in Annex A.

Specific water supply interventions were implemented some 4.5 km south of Tsetsebjwe village in a shallow calcrete-floored valley where existing wells indicated the presence of groundwater (see Annex A). The interventions are:

- Sinking of a new large diameter well.
- Equipping the new well with a windmill.
- Providing a storage tank adjacent to the well.
- Provide reticulation from the well to a storage tank.
- Fence a new community garden area.
- Provide reticulation from the storage tank to the community garden area.

4.4 Water Management Structures

4.4.1 Rural Water Supply Stakeholders.

- Department of Water Affairs (DWA) sets overall nationwide regulations and guidelines. DWA representatives at District Council level collaborate closely with representatives from the Ministry of Agriculture (MoA) and Ministry of local Government (MoLG) at offices in Bobonong. Representatives of the MoLG at District Council level responsible for rural water supply ensure that interventions lie within the legal water framework and enhance livelihoods through better water provision. The DWA representative at the Bobirwa sub-District Council ensures communal access to water and equipment maintenance.

- The MoA advises communities on crop production, animal health and reproduction, drought relief programmes, small scale irrigation schemes and dams and livestock water provision. The MoA are represented at district level by agricultural and veterinary extension officers.

4.4.2 Water Stakeholder Interactions

- The National Water Master plan, recommended separation of water resources planning and management from water service delivery.
- The Water Utilities Corporation (WUC) is responsible for water service delivery. The DWA is responsible for water resources planning and management.
- District Councils formerly responsible for the operation and maintenance of village water supply will hand this responsibility to WUC. Pump Operators at village level ensure water supply and repair and maintenance of equipment.
- Community institutions focus on the Kgotla, a village forum which adjudicates on water related disputes.
- Other stakeholders include livestock owners, arable farmers, safari companies and mining companies with groundwater rights

4.5 Drought Awareness and Coping Mechanisms

Sociological baseline survey analysis indicates that the main impacts of major droughts on communities are:

- lack of food,
- crop failure,
- lack of fodder,
- increased livestock disease and mortality, and
- lack of water.

These are more intense versions of the general sociological community issues felt during normal dry season periods.

4.5.1 Community Perception of Drought.

- Community perception - relates to Hydrological Drought seen as the following outcomes:
    - reduced rainfall,
    - pursuance of livelihoods becomes constrained,
    - lack of food for people and livestock,
    - livestock becomes thin, grossly undermined productivity,
    - low crop yields to total crop failure,

  - reduced water for livestock,
  - reduced income from agriculture and livestock leads to aggravated poverty

- Rainfall drought is made worse by land degradation, deforestation and global warming resulting in the erosion of cultural practices developed during years of good rainfall. Cultural mitigation activities include prayers, offerings such as libation to the ancestors and rain making ceremonies. Traditionally, widows and women who had miscarriages were cleansed to prevent drought.
- Community definition - Traditional beliefs associated with drought are mainly based on the increasing lack of adherence to traditional practices with the advent of modernisation. Loss of traditional values such as praying to the ancestors for rain and lack of adherence to cultural taboos, especially those associated with widowhood, miscarriages and death are believed also to contribute to drought occurrence.

4.5.2 Current Coping Mechanisms

- Perception - last drought was 2004; it occurs every four to five years.
- Adaptations to environment - minimalistic lifestyle for existence in a marginal environment that can cope with ‘short-term drought’.
- Strategies for Long Term Drought - normal coping mechanisms collapse; impacts of water and food shortages lead to livestock mortalities. Strategies include:
  - Two main components: control of pests of national importance at government expense and the provision of support to farmers to recover from droughts in the form of ploughing and planting as well as the provision of free seeds. Labour intensive projects are identified and community members are employed on a rotational basis to augment loss of income from agriculture.
  - Sale of livestock – cattle herd size is viewed much more as a store of wealth and as a symbol of status.
  - Relocation of livestock - move cattle to areas that have been least affected by the drought (difficult due to the restrictions in cattle movements during outbreaks of the Foot and Mouth Disease (FMD)).
  - Some income to sustain households is derived from beer brewing even during drought.
  - Migration to major towns and villages in search of employment is an option for the younger, more able-bodied members of the community.
  - Piece working, as labourers and maids for civil servants and lodge owners in the area, becomes more important during drought periods
  - Government projects include:
    - Supplementary feeding and subsidized food for work programmes.
    - Drought Relief Emergency Plant Protection (EPP) programme to reduce pre- and post-harvest losses of field and horticultural crops.

There are two components: control of pests and drought recovery support to farmers with ploughing, planting and seed provision.

- Labour intensive projects identified for community members - employment on rotation to augment loss of income.

4.5.3 Future Drought Mitigation Measures

The supplementary water sources developed during the current programme together with the community monitoring process will enable the Tsetsebjwe community to more effectively anticipate the onset of drought induced water shortages. The necessary tools have been provided to enable better water resource management to minimise the impact of a prolonged period of reduced water supply. As detailed in this RCWMP, this community management may involve a selective reduction of water usage, the prioritisation of water users, a change in water application for agricultural purposes and for some other methods.

5. Community Water Management Plan

5.1 Plan Administration

The RCWMP is managed and was implemented within a new community management structure. This structure was developed through a number of sociological interventions undertaken with the Tsetsebjwe community. These interventions progressed from baseline data collection through needs assessment and awareness training to the formation of a community management structure. The structure is specifically designed for the management of the community water supply and the implementation of this Water Management Plan *[this process is fully described in the Planning Process Manual].*

This water management structure, namely the Tsetsebjwe Community Water Management Committee (TCWMC) was established in 2010. It consists of members of the community and key government officers with interests in village water supply, veterinary services, crop development, education and community development. Office bearers include Chairperson; Vice Chairperson; Treasurer; Secretary; vice-Secretary and ordinary members.

The key role of the TCWMC is leadership and oversight of the community water supply management and drought mitigation initiative. The TCWMC will:

- Ensure the efficient and effective management of the water infrastructure.
- Ensure regular communication with the community regarding the use of project facilities.
- Be responsible for developing a listing of water users.
- Collect the user fees as appropriate.
- Ensure the proper operation and maintenance of the interventions.

Quarterly TCWMC meetings shall be held to assess progress, resolve problems that emerge and make decisions as required. Community meetings will also be held to share information on progress, challenges that may be arising and the overall direction of the initiative.

5.2 Plan Implementation and Monitoring

The RCWMP for Tsetsebjwe was implemented by the community and is managed by the Community Water Management Committee.

In the context of the RCWMP there are two essential aspects to monitoring, namely:

- Monitoring the success or otherwise of the implemented interventions to the maintenance or enhancement of community livelihoods during drought through better use of groundwater

- Monitoring of any environmental (social and physical) impacts resulting from the interventions that have been implemented.

Existing socio-economic conditions are documented *[Planning Process Manual]* to provide a baseline measure that enables assessment of the impacts of the interventions using future monitoring information.

5.2.1 Physical Monitoring

Physical monitoring measures the indicators of groundwater availability and quality. These in turn provide indications on impending water shortages or issues of the suitability of water for use. The availability of local, shallow groundwater during the dry season, and especially during periods of drought, may well be critical in maintenance of community livelihoods and wellbeing (health, food supply etc).

The physical indicators monitor the physical impacts of the intervention on the availability and use of groundwater resources are summarised in Table 5.1 below:

Table 5.1 Physical Monitoring Indicators

Physical Monitoring Indicators			
Component	**Parameter**	**Method**	**Where; by Whom**
Groundwater	Groundwater level	Electrical Water level Dipper	Well; Community
	Groundwater Abstraction	Water Meter	Well; Community
Climate	Rainfall	Simple Rain Gauge	School; Pupils
Water Quality	Total Dissolved Solids	Hand held TDS meter	Well; Community

5.2.2 Social Monitoring

Sociological monitoring will be used to assess the impact of the additional water supply provision and the RCWSMP implementation on community development, wellbeing and livelihoods. It will also indicate the viability of rural community water management and empowerment.

Sociological monitoring builds on existing processes such as on-going data collection and other data sources as well as the work of the community. It requires the application of the following fundamental principles:

- Use both qualitative and quantitative methods.
- Apply community-based, simple, understandable participatory measurement tools.
- Invest in community capacity development and training in monitoring approaches.
- Incorporate action that informs TCWMC decision making.
- Share the monitoring results with the community.

The social monitoring indicators are divided between population welfare, food production and agriculture that are monitored by the TCWMC (see Tables 5.2, 5.3)

Table 5.2 Monitoring of Population Welfare Indicators

Population Welfare Indicators	Monitored through	Means of Verification
Health: Number of diarrhoea occurrences	Periods of illness and numbers of people affected	Tsetsebjwe Clinic Records
Health: Occurrence of malnutrition and stunting	Nutritional status of children under five years of age	District Health Team Statistics
Destitutes: number of people registered as destitutes	Destitute records	VDC Destitute Lists; S&CD Destitute records and Reports from the Destitute graduation programme
Water: Need for emergency water supply	Frequency and period of water tankering to village	CWMC records
Food: Number of emergency feeding programmes	Frequency and period of supplementary feeding/distribution programmes	Tsetsebjwe Clinic Records School Supplementary feeding programmes

Table 5.3 Monitoring of Food Production and Agriculture Indicators

Food Production and Agriculture Indicators	Monitored Through	Means of Verification
The number of gardens	Number of new gardens established	Observation; community records
Period of working on garden	Number of months working on garden	
Number of months harvesting crops from garden	Number of months living from garden	
Number of locally produced vegetables	Local vegetable production rates	
Nutritional levels	Number of underweight children Number of underweight adults	Tsetsebjwe Clinic Records Community Home Based Care Records
Water available for domestic use	Daily litres abstracted for domestic consumption	Community monitoring records/reports Observations
	Weekly observations (documented in diary)	
	Document special happening	
	Discussion in regular village meeting	
	Village observation	
Water available for livestock during drought spells	Daily litres abstracted for livestock consumption	Community monitoring records/reports Observations
	Weekly observations (documented in diary)	
	Document special happening	
	Discussion in regular village meeting	
	Count cattle/livestock	
Water quality	Test water quality, TDS	Community monitoring records/reports Observations
	Observation smell, taste, colour	

Tables 5.2 and 5.3, monitoring indicators for population welfare and for food production and agriculture are closely linked. The welfare indicators in Table 5.2, health, destitutes, water and food, are closely dependent on the food and agriculture indicators listed in Table 5.3 which assess the availability of food production and the wellbeing of livestock. The food and agriculture indicators are very important because in many ways these are easier to measure than the population welfare indicators and are a good secondary or indirect measure of the welfare of the community. The specific welfare indicators in Table 5.2 will reflect the same status of wellbeing but these are a direct measurement from the community.

This linkage between the indicators is the reason why all the different measurements need to be made. The depth to water level in the well, the quality of the water, the amount of water being taken from the well to the tanks all contribute to the overall evaluation of the community wellbeing and allow it to assess whether it is at risk from a shortage of water and food and how this is reflected in health and poverty. These measurements, coupled with of all the other social and physical observations, contribute to the overall assessment of community wellbeing.

5.2.3 Awareness

The awareness programme for the Plan builds upon activities undertaken during the course of the plan development. This continues to impact upon raising community awareness of the importance of groundwater resources, the impact of certain practices on its pollution as well as the benefits of drought preparedness. Discussion of all these concepts with community members provided a useful basis for developing the indicators for the results to be obtained from the awareness programme. In future the outcome of the awareness programmes (AP) and training should be externally monitored. The following indicators can be used for this (Table 5.4)

Table 5.4 Awareness Programme (AP) Monitoring

Awareness Programme	Social Indicator
General Awareness Programme (Stage I)	- Has the general knowledge of the community concerning groundwater, pollution and drought preparedness improved? - Is the community motivated to adopt positive water management practices? -Have community practices, such as littering and indiscriminate disposal of chemicals, improved? - Has the number of new, environmentally friendly pit latrines being built in the community increased?
Intervention Operation awareness and training	- Has the socio-economic situation of beneficiary/vulnerable households improved?
Intervention Operation awareness and training	- Are the community and Water Committee familiar with the physical intervention and do they know how to maintain and repair it?

5.2.4 Training

A groundwater awareness programme was presented to the broader community as well as specifically to the WMC. It followed the guidelines and used the material set out in the Groundwater Awareness Manual developed during the project. Several awareness sessions were held during the implementation process and an awareness/training programme was completed.

As part of the intervention implementation process the WMC was provided with equipment with which to conduct the physical monitoring of water supplies [i.e. an electric water level dipper, a hand held water quality (TDS) meter and several direct reading rain gauges] and an awareness/training programme was completed. Specific training for the WMC and their appointed Monitoring Operative (MO) in use of monitoring equipment and documentation of monitoring data was implemented on completion of the physical interventions.

Going forward, the community has been encouraged to seek supplementary training from national and regional stakeholders in other aspects related to the sustainability and improvement of the SADC project intervention. Training has specifically been provided in equipment maintenance (windmill, pumps etc) and general CBO management (record keeping, finance etc). The community has resolved to do this and to improve stakeholder ties as much as possible.

5.2.5 Feedback Mechanisms

Data Collection and Reporting

- Data will be collected by the WMC MO. Basic equipment has been provided to the MO to enable data collection, entry, assessment and reporting. The MO will be responsible for data collection, recording, basic assessment, reporting to the TCWMC at its quarterly meetings, and archiving. The MO will also be tasked with the basic operation and maintenance procedures related to the intervention. The MO will also work closely with and collect data from on-going community level monitoring activities, including:

    - the school rainfall monitoring programme,
    - local clinic health status records,
    - Social Welfare Programme quality of life assessments,
    - agricultural staff records on arable and livestock production,
    - reports from the government's Early Warning System which predicts, monitors and develops responses to drought and assesses the impact of interventions.

Data assessment will also involve a thorough assessment of project performance against the physical and social indicators. The data collected from the MO as well as from other community level sources will be assessed and compiled into a quarterly monitoring report. The TCWMC will use this monitoring report to assess overall project performance and to inform its decision-making.

The TCWMC will ensure effective monitoring through observation of the following:

- Reduced yield and hence abstraction from the groundwater source over a few days.
- Damage, disrepair and malfunction on the physical interventions.
- Change in water colour and/or smell.

- Livestock and humans fall ill after drinking the water (increase in health problems such as diarrhoea).
- Die off or changes in appearance of vegetables/crops irrigated with the water.
- Local vegetation die off in the vicinity of the water sources.

The TCWMC will also ensure the MO maintains a diary of:

- The introduction of any emergency water supply – frequency and period of water tankering to the village.
- Emergency support programmes – frequency and supply of non-standard supplementary feeding programmes to vulnerable social groups; provision of livestock supplementary feeds; provision of seeds, fertilisers; special measures for the protection of basic assets that households may need for survival (breeding stock, animal draught power).

Stakeholder Feedback

An essential component of this CMWP, i.e. enhancement of community ownership and control of both the physical interventions and the water resource. Feed-in and feedback processes, mainly through the Kgotla and other established community development forums, are planned through the TCWMC.

The TCWMC will meet on a quarterly basis to review project progress, achievements, challenges and community concerns as well as the strategies for addressing these. The TCWMC will be the decision-making body on project issues and will ensure effective community consultation on issues of concern related to the project. The TCWMC will ensure feedback on all these issues. The annual schedule of kgotla meetings will be used to share project progress, challenges as well as disseminate information on issues of relevance, interest and concern to the community.

The momentum for active and effective stakeholder participation will be reinforced through further development and dissemination of the community's blue-print of action outlining annual priorities, developed under the SADC project. Reporting will follow the roles and lines of communication outlined in this plan and will occur during regularly scheduled quarterly meetings of the TCWMC. The eligibility criteria and application procedures for community garden use as well as user rights and obligations will also be shared at this community meeting and referred to the kgotla forum if required.

The kgotla forum will also be used to keep the Tsetsebjwe community informed of issues in water and drought management raised by other stakeholders such as the District Disaster Management Committee, Early Warning Systems, WUC and DWA. PTA meetings and church conferences will also be used as vehicles for disseminating key water management and drought mitigation messages.

5.2.6 O and M Plan

With respect to the operation and maintenance of the additional water supply interventions installed during the project, the WMC was offered basic maintenance training by the

suppliers of the equipment installed, particularly the windmill pumping system. This involved a presentation on the principles and components of the system together with a practical demonstration of preventative maintenance.

The WMC has appointed a MO responsible for regular basic operational management and maintenance of the system. The MO will report regularly to the WMC on system performance and will report any maintenance requirements. Dependent on the magnitude of these requirements the WMC will arrange themselves for any repair, possibly with communication with the equipment suppliers (see Annex D for details) or possibly by communication with other district stakeholders e.g. District Council, MoA, DWA, who may be able to assist.

5.3 Plan Actions/Strategy

The plan actions/strategy can be broken down into to two key components: triggers and responses. The triggers will be the points at which community actions are required to address the problem of drought and water scarcity. An example might be that the water level in the well has reached a depth that leaves the pump at risk of being exposed to the air, it might equally be a point at which the number of vegetables produced the garden are not enough for everybody to share, or it might be a point when, for example, over half the community is complaining of stomach disorders.

The responses are the actions that may be executed by the community to mitigate the possibility of increased hardship in times of water scarcity or in response to over us of the resources. The response needs to assist the community to cope with the drought/water scarce period in order to minimise hardship and livelihood loss. The combination of both the actions/strategies and the triggers and responses will result in the better management of the community water resources

5.3.1 Triggers

The TCWMC will through the monitoring system keep abreast of the available water resources. The series of triggers identified and modified by ongoing community experience will be used to make decisions regarding the use of water resources. Appropriate triggers can only be learned from experience with the monitored data and critical well levels combined with health, food and agricultural indicators will need to be created in due course. This should not be a difficult exercise as the community will recognise the critical conditions in each of these four sectors from past experience. It will be the successful integration of the monitored information that will create a meaningful single trigger that may be less easy to arrive at.

The committee will need to review the data they have gathered in order to recognise potential problems potential problems that may be arising. This review is the community's 'early warning system'. Data include groundwater depletion, reduction in water quality or system malfunction. Indicator thresholds will need to be established to initiate a pre-defined community response to address water shortage through system failure.

The most important triggers will be the changes observed and associated with water stress or signals of impending water shortage. The triggers will reflect periods of increasing and decreasing water stress, dependent on the status of the water resources and especially in the early part of the (presumed) rainy season.

5.3.1 Reaction

During periods of increasing water stress, the TCWMC plans to apply restrictions on water use. The Tsetsebjwe community will limit vegetable and stock watering and place priority on water for domestic use. The TCWMC will ration and allocate water to the community on the basis of their household size.

On completion of the physical intervention in Tsetsebjwe, groundwater baseline monitoring will be undertaken regularly by the community. Specific values of water level, abstraction or water quality will need to be identified at which point the WMC will need to act. Once this has been established and moderated by community experience, a structured community action plan will be developed and disseminated to the community. A key principle of the action plan will be that it is for the ultimate benefit of the community and that it will seek to help preserve communal livelihoods during periods of water stress (drought).

The TCWMC anticipates the following actions to ensure the sustainability of water resources:

- Restrictions on water use for gardens.
- Allocation and rationing of water based on household size.
- Relocation of livestock to alternative water sources.
- Use of existing social arrangements with owners of private boreholes.
- Reliance of government water tankers/supply during shortages and breakdowns.
- Restrictions on abstractions from specific sources (e.g. shallow wells).
- Restriction of abstraction for non-potable use.
- Segregation of potable and non-potable sources to reduce pollution.
- Change in agricultural practices (i.e. different, dry land, crops, planting times).

The implementation of the RCWMP and the use and further development of the additional water source interventions should be used as a platform to publicise the mandate and role of the TCWMC to a broader development constituency. Strategic links will also be developed by the TCWMC with regulatory stakeholders, district and community level institutions such as the District and Village Disaster Management and Farmer's Committees whose mandates have some overlaps with that of the TCWMC. Regular communication on the status of water resources will be shared. The TCWMC will keep abreast of all existing district level drought monitoring processes to include early warning, risk and impact assessment as well as mitigation and response mechanisms. By so doing, the TCWMC will have mechanisms through which its own monitoring system and action triggers can be validated.

6. Plan Proponents and Signatories

Consultants

John. L. Farr	Project Director
Luise Zagst	Senior Sociologist
Ketsile Molokome	Sociologist
Joel Ntsatsi	Hydrogeologist

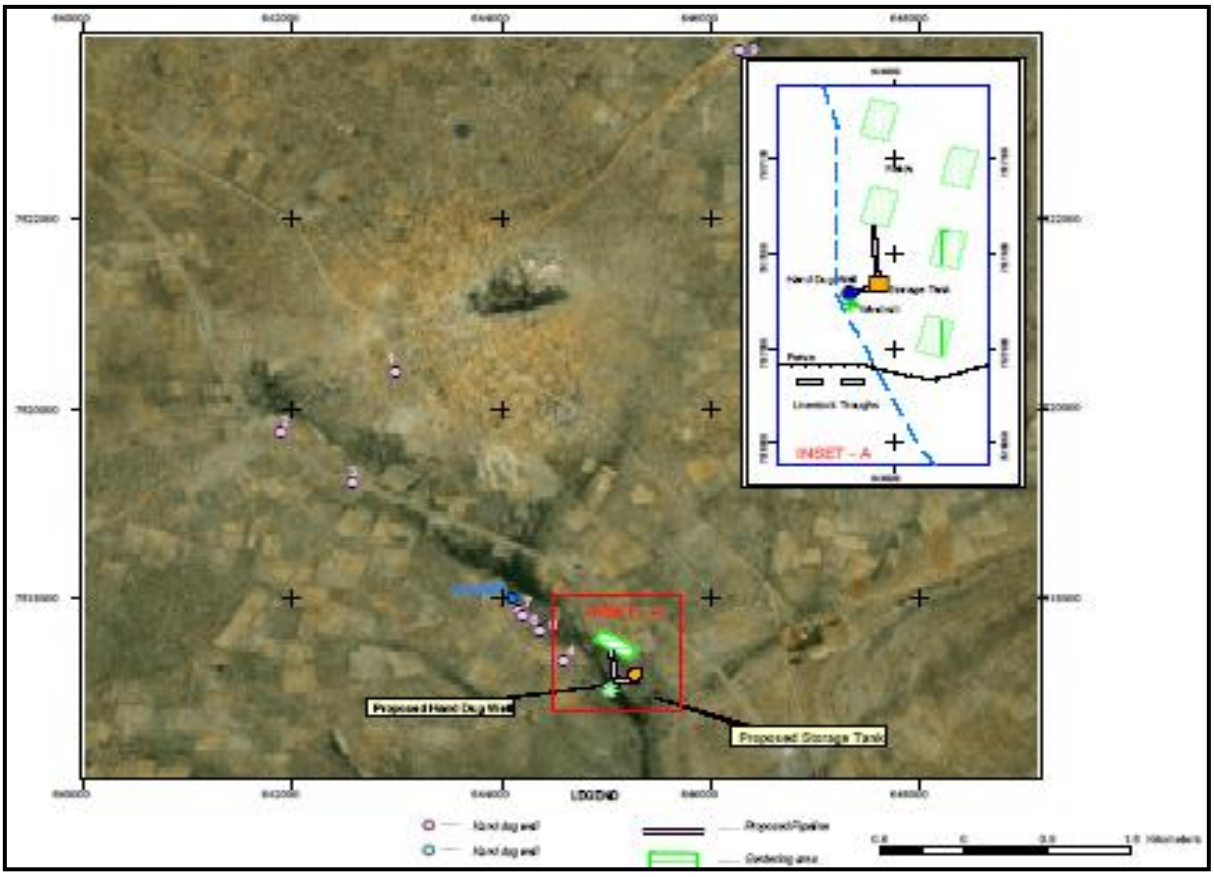
Community

The table below provides the list of persons who developed this plan and their signatures.

Name	Organisation/Department	Signature
David Manake	Community Water Management Committee (CWMC) Chairperson	
Kgotso Modise	Vice Chairperson CWMC	
Gaborekwe Ketumile	Secretary	
Onalenna Nchadi Ale	Vice Secretary	
Kebareng Gabanamotse	Treasurer	
Collen Seitumeng	Ordinary member CWMC	
Tshepo Tukisi	Ordinary member CWMC	
Mokgadi Mokwena	Ordinary member CWMC	
Galeyo Gaerupi	Ordinary member CWMC	
Paul Montsho	Ordinary member CWMC	
Kgosi Motsamai	Kgosi	
	Social & Community Development Officer	
Lucus Lesotho	Agricultural Demonstrator, Department of Crops, District Agricultural Office	
Kgosi Gabanamotse	Tribal Administration	
Mphoreng Philly	Pump Operator	
Babedi Gabarebolwe	Veterinary Officer	

ANNEX A

Location of Physical Interventions Tsetsebjwe, Botswana


INSET - A
Proposed Hand Dug Well
Proposed Storage Tank
LEGEND

ANNEX B

As Built Drawings

ANNEX C

Equipment Suppliers

– where to obtain parts and batteries etc.