



KAZA Zambia Scoping Study Report

KAZA Water Infrastructure for Livelihoods

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Disclaimer

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List of Acronyms

Acronym	Long-Form
BH	Borehole
CBNRM	Community-based natural resource management
CLTS	Community-led total sanitation
CRIDF	Climate Resilient Infrastructure Development Facility
ERR	Economic rate of return
FRR	Financial rate of return
GMA	Game Management Area
HWC	human-wildlife conflict
JICA	Japan International Co-operation Agency
KAZA	Kavango Zambezi
KLO	KAZA Liaison Officer
OD	outside diameter
RWL	Rest Water Level
SADC	Southern African Development Community
TFCA	Transfrontier Conservation Area
TNC	The Nature Conservancy
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations International Children's Emergency Fund

Introduction

Background

The Kavango Zambezi Transfrontier Conservation Area (KAZA TFCA) was formalised by the Heads of State of Angola, Botswana, Namibia, Zambia and Zimbabwe who signed its Treaty on 18 August 2011. The process of establishing this TFCA, however, dates as far back as 2003 when the Tourism Ministers of the five countries agreed in principle to establish a major new TFCA (with emphasis on conservation and tourism development) in the Okavango and Upper Zambezi River Basins. In 2006, the Ministers of Environment, Tourism, Natural Resources and Wildlife of Angola, Botswana, Namibia, Zambia and Zimbabwe signed a Memorandum of Understanding, agreeing to establish the KAZA TFCA. The KAZA Secretariat is in Kasane, Botswana.

Covering approximately 444,000 km², the KAZA TFCA is set to become the world's biggest conservation area, encompassing 36 formally proclaimed protected areas, comprising national parks, game reserves and game/wildlife management areas as well as conservancies and communal areas. It is also home to an estimated three million people, many of whom live in poverty and most of whom are dependent on agriculture and other natural resource use for their livelihoods. A recent socio-economic baseline survey of the KAZA pilot area found that human-wildlife conflict is a major livelihood problem, causing overall losses of 32% of crops, 14% of cattle and 50% of goats.

KAZA is therefore committed to enhancing the livelihoods of those who live in the area, with particular emphasis on those most directly affected by wildlife. In some areas, KAZA is working to facilitate biodiversity conservation through the enhancement of wildlife movements in dispersal areas between protected areas in the various countries. Those living in or near these areas are often badly affected by wild animals eating their crops and their livestock.

Part of the hardship that many KAZA residents face is lack of water for domestic and livestock use. People and their livestock must often travel great distances to obtain water, especially in the dry season. If they adjust their residence patterns to move away from wildlife dispersal areas, they must find new water sources.

As part of its efforts to secure more sustainable livelihoods for area residents, the KAZA project has negotiated the potential for funding from the UK-funded Climate Resilient Infrastructure Development Facility (CRIDF), which was established in 2013 to support 11 SADC Member States. In consultation with CRIDF, KAZA has been able to develop a pilot plan for providing water infrastructure and related initiatives to a limited number of communities in the TFCA.

The CRIDF water infrastructure support through KAZA is currently envisaged in three phases:

- Phase One – Delivery to communities in Eastern Zambezi region in Namibia and planning for Zimbabwe
- Phase Two – Delivery to communities adjacent to the Hwange National Park, Zimbabwe and planning for Angola, Botswana and Zambia
- Phase Three – Delivery to communities in Angola, Botswana and Zambia

If these interventions are successful, it may be possible to secure CRIDF funding for larger- scale support.

This report details the initial, scoping stage for pilot water infrastructure support in Zambia, under Phase Two as outlined above. In consultation with KAZA and its Zambian stakeholders, it was decided to focus this effort on the Mulobezi Game Management Area (GMA) in the Southern Province of Zambia.

Mulobezi GMA

Livelihoods in the Mulobezi GMA

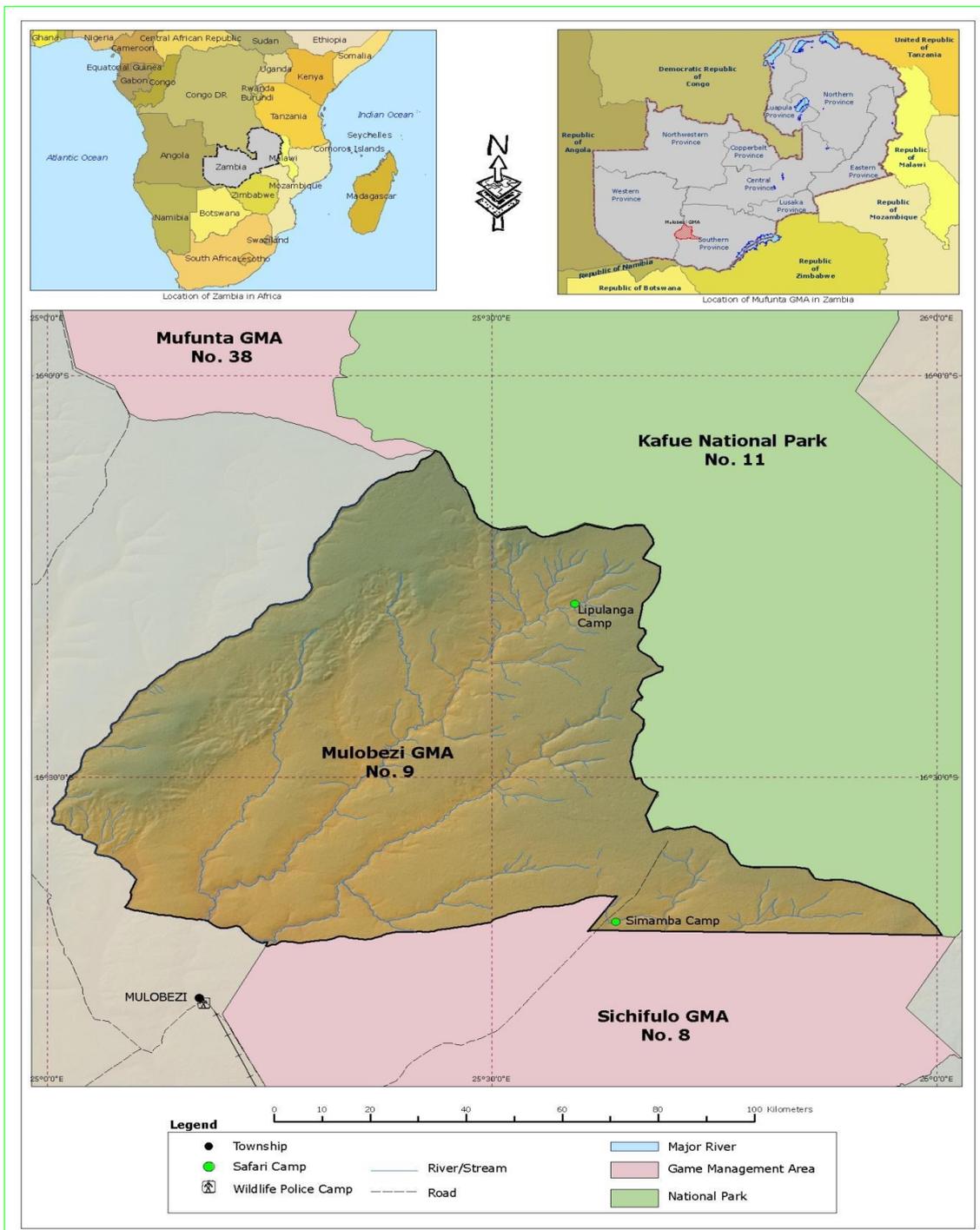
The Mulobezi GMA, coterminous with the Moomba chiefdom, has an area of about 3,430km² and lies south west of the Kafue National Park. The 2010 census counted a human population of 2,343 in 533 households. Population density is low and homesteads are scattered in low-density settlements.



Figure 1 Crops in Mulobezi GMA, March 2015

Livelihoods in the GMA are characterised by poverty. Soils are sandy and infertile. Average annual rainfall between 2000 and 2012 was 465 mm. Services are remote. Formal sector employment opportunities are limited to a long-established sawmill at Mulobezi (just outside the GMA) that has been struggling to maintain commercial viability. Potential income from tourism has been reduced since the ban on hunting was introduced in January 2013. Water resources are inadequate (see below). Crops and livestock are damaged by wildlife living within the GAM or moving across it to and from the Kafue National Park to the north; residents noted that in a dry year like 2014-15, crop damage by kudu is exacerbated as they come closer to human settlements. Other common pests are elephants, lions, bush pigs and monkeys. Eighty-four per cent of households surveyed in the GMA by a TNC study in 2014 reported that they had experienced shortages of food at some time in the previous 12 months (Child *et al.*, 2014: 45). Drought and lack of farming inputs were described as key causes of these shortages (Child *et al.*, 2014: 46).

Figure 2 Mulobezi GMA



Map reproduced from Child *et al.*, 2014.

MULOBEZI HUMAN-WILDLIFE CONFLICT DATA

DATE REPORTED	SPECIES INVOLVED	DAMAGE CAUSED	AREA AFFECTED	ACTION TAKEN
19/02/15	ELEPHANT	MAIZE	CHONZO	ASSESSMENT & SCARING.
21/02/15	LION	THREAT TO LIVE STOCK & HUMAN	MABWE	ASSESSMENT BUT ANIMAL NOT SEEN.
25/02/15	ELEPHANT	MAIZE	SIAMURAM	ASSESSMENT PRINTS SEEN
3/03/15	KUDU	MAIZE & PUMPKINS	MULOBEZI	ASSESSMENT NO ANIMAL SEEN
05/03/15	KUDU	MAIZE & PUMPKINS	MULOBEZI	OFFICER DEPLOY TO SCARE
07/03/15	ELEPHANT	MAIZE PUMPKINS	LONZE	NO ACTION WAS TAKE SINCE REPORTER CONFIRMED THAT ANIMALS LEFT.
16/03/15	BUSH PIG	MAIZE	MOOMBA	NO ACTION TAKEN SINCE REPORTED
16/03/15	KUDU	MAIZE	MULANGA	ASSESSMENT

Figure 3 Human-wildlife conflicts recorded by Mulobezi wildlife staff

Water and sanitation in the Mulobezi GMA

A number of communities in the GMA draw water from boreholes equipped with hand pumps. Various programmes have installed these services over the years, including one funded by the Japan International Co-operation Agency (JICA). Some of the water points no longer function, either because of mechanical breakdowns or due to inadequate groundwater supplies – or both. There are no other water extraction technologies (such as windmills and solar pumps) in use in the GMA. The 2014 survey by The Nature Conservancy (TNC) found 58% of respondents reporting that they used wells (primarily boreholes with hand pumps) for their water supply, with the rest drawing their water from rivers (Child *et al.*, 2014: 31).

There is thus a pressing need for more adequate domestic water supply in many communities of the GMA. Reticulating water from the same sources to a limited number of livestock troughs and to one or two small areas where irrigated garden production could be developed would be an additional major contribution to basic human needs and more sustainable livelihoods for the local population.

The Kazungula District Council implements national policy on rural water supplies (see Annex 2), emphasising that the development of such infrastructure should be demand-driven. There is a formal procedure for the submission of applications to the Council for the installation of water supplies, and communities are expected to make a cash contribution of ZMW 1,500 before drilling starts. This fund is kept at the Council, and allocated toward future O&M costs that may arise. User communities are expected to elect local water committees to manage their boreholes and water points and supervise operation and maintenance. The Council supports these local institutions with training and technical advice, and operates a spares store at Kazungula. Water

users are expected to pay their local committees a monthly fee for their water supplies. Each committee sets the amount of this fee.

The TNC survey found that 46 per cent of Mulobezi households used latrines, with the rest having no sanitation facilities. The latrines in use are of traditional construction. Zambia has adopted a campaign to achieve open defecation free status nationwide, using the community-led total sanitation (CLTS) approach. The Kazungula District Council has already appointed and trained four CLTS ‘champions’ in the GMA. Digging and maintaining latrine pits is difficult in the sandy ground conditions of Mulobezi. The District Council is exploring appropriate technologies to tackle this problem.



Figure 4 Functioning borehole, Mulobezi GMA

Local institutions

Although the target area for this scoping exercise, the Mulobezi GMA, falls within the Kazungula District of Southern Province, the rural centre on which it depends for most local services, Mulobezi, falls outside the GMA in the new Sichili District of Western Province. The GMA is coterminous with the Moomba Chiefdom, and is represented by one councillor on the Kazungula District Council. Village Action Groups provide a local governance structure within the chiefdom.

Wildlife management and related community services are provided by the former Zambia Wildlife Authority (recently absorbed back into government as the Department of National Parks and Wildlife in the Ministry of Tourism and Arts), which has a small office in Mulobezi. Social services, including water and sanitation, are the responsibility of the Kazungula District Council, located some four to five hours’ drive away from the GMA.

The United States-based conservation organisation The Nature Conservancy (TNC) operates a community-based natural resource management (CBNRM) programme in the Mulobezi GMA, with a small staff based at Mulobezi. TNC has facilitated the development of a Community Resource Board that is meant to steer CBNRM efforts in collaboration with the Department of National Parks and Wildlife.

Site identification

On 17 March 2015, CRIDF and KAZA consultants, together with TNC staff, held a consultative meeting with the leadership of the Moomba chiefdom at the palace of His Royal Highness Chief Moomba (see Annex 1). The Chief was unwell, and his son chaired the meeting. The District Councillor was also present. At this meeting, the visitors outlined the possibility of CRIDF-funded water infrastructure being developed on a pilot scale in the GMA, comprising a borehole and hand pump with limited reticulation to a nearby livestock watering facility and one or two small irrigated gardens. They emphasised that there is as yet no guarantee that funds will be secured for this purpose. Various speakers confirmed that an intervention of this nature would be welcome, as a number of communities in the GMA are completely without water supplies and others have inadequate and/or broken infrastructure. The consultations led to identification of the priority target communities shown in Table 1 below. Populations shown are those quoted by local informants.

Table 1 Proposed sites in Mulobezi GMA

Community	Estimated population (households)
Kamwi (Kalobe area)	34 households, 200 people
Lyni (Kalombe area)	34 households, 161 people
Mabwe	9 households (no. of people unknown)
Namuse	55 households (no. of people unknown)
Silangi	26 households (no. of people unknown)

Following the introductory site selection meeting, the team visited all the sites on 17 and 18 March.

Details of proposed sites

Introduction

Limited time for field observations at the sites identified in the introductory consultative meeting meant that it was only possible to obtain some basic information about each. This is presented below as the basis for further, detailed investigation that, the team explained to local residents, would be the next stage of planning if this scoping study is approved (as part of the Bankability Stage).

Kamwi

Estimated population: 34 households, 200 people.

Kamwi broken borehole	16.65081 S	25.17482 E
Kamwi proposed borehole	16.64720 S	25.17069 E

The existing borehole at Kamwi has not been producing water reliably since 2009. People currently get water from rivers, or, when these are dry, travel long distances to other boreholes in the GMA that may still be yielding. Residents stated that the pump is mechanically intact, but that the water level is low. Water can sometimes be extracted after good rains. Residents suggested a different, more central site for a new borehole, as the existing one is not well located for many homesteads in the community. The new site would be next to a community school that the people of Kamwi plan to build.

Recommendation:

- Investigate feasibility of new borehole and related infrastructure at proposed site.
- Investigate feasibility of rehabilitating/deepening existing borehole and adding standard package of additional infrastructure.

Lyoni

Estimated population: 34 households, 161 people

Lyoni proposed borehole site	16.57040 S	25.20306 E
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Residents at this community draw their water from a stream some 200m away. When the stream is dry, they walk about one and a half hours to get water at Kalombe Community School. Most people carry the water from there on their heads, as other means of transport are scarce. The proposed borehole site is in a central spot in the community, close to (but not within) the headman's place.

Recommendation:

- Investigate feasibility of new borehole and related infrastructure at proposed site.

Mabwe

Estimated beneficiary population: 9 households (no. of people unknown)

Mabwe existing borehole	16.52462 S	25.44803 E
Mabwe school site for new borehole	16.55828 S	25.43138 E

Mabwe has a borehole (supplied by JICA) that serves four communities. However, several other communities are without water. Residents propose construction of a borehole and pump at a site where a community school is to be built. At present this site is in undeveloped bush, but there are three small communities that would reportedly benefit from a water point at this spot, which is central to them: Muchindu, 2.5 km S; Mudobo, 1.5 km E; and Jumba, 1.5 km N. The community apparently has blocks ready for construction of the new school, but are hoping for funding from TNC.

Recommendation:

- Investigate further the geography and population of the local communities that would reportedly be served by a water point at the proposed site, and whether and when the community school will actually be built.
- If outcome of these investigations is positive, investigate feasibility of borehole and related infrastructure at proposed site.

Namuse

Estimated population: 55 households (no. of people unknown)

Namuse induna's place	16.59904 S	25.10052 E
Namuse proposed borehole site	16.59758 S	25.10004 E
Namuse broken borehole	16.56323 S	25.11389 E

Namuse is an extensive area of sparse settlements, with a functioning borehole some 5 km S of the induna's place and a broken borehole about 7 km in the opposite direction. There is also a functioning borehole at a community school some 5 km from the induna's place. About 46 households live between the functioning borehole and the broken one, with another 9 reported to live within Namuse further N of the broken borehole. In much of this area, people get their water from local streams or, when these are dry, from the Machili river, about one hour's walk away.



Figure 5 Non-functioning borehole, Namuse

Initial discussion at the induna's place suggested that a new borehole should be placed there. However, the team advised that a more neutral and slightly more central spot should be chosen nearby.

The broken borehole stopped working in 2010. According to a local resident, it could be fixed, although that has been tried more than once and at present the local water user committee has been unable to get more spare parts. It had collected ZMW 1,400 for the previous, unsuccessful repairs.

Recommendation:

- Investigate repair of existing Namuse borehole and adding standard package of additional infrastructure.
- Investigate feasibility of new borehole and related infrastructure at proposed site.

Silangi

Silangi headman's place	16.67213 S	25.32838 E
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It had been possible to announce visits to the other sites in advance, but this could not be done for Silangi, which meant that the local induna and advisers were unprepared for the team's visit and could not immediately suggest a site for a new borehole. At present the community uses a traditional shallow well in the nearby valley bottom. This usually lasts until September, but residents expect it to dry up earlier this year due to the poor rains. Livestock are watered nearby in the valley. When the well runs dry, people sometimes try to

dig it deeper in order to find water. If this does not work, they go to a borehole instead, which was installed in 2014 at Siamukalala, about 4 km away.

Initial discussion during the impromptu meeting suggested that a new borehole should be sited at the induna's place. However, the team advised further consultation to identify a site that would be most genuinely central to the community (some of whom live on the far side of the valley, and would ideally be served by their own water point on that side). The team was therefore unable to identify an agreed new borehole site during this visit.

Recommendation:

- Facilitate further discussion in the community to identify an agreed appropriate site for a water point.
- Investigate feasibility of new borehole at the agreed site.

Extension support

One or two small irrigated gardens associated with each water point could significantly enhance local residents' nutrition and livelihoods. However, extension support would be needed to facilitate institutional arrangements for the group ownership, operation and use of these gardens, and to provide technical advice on optimum cultivation methods in the harsh local conditions. It may be possible for TNC to provide this support through its existing programmes.

Sanitation

As in other CRIDF-funded KAZA water infrastructure initiatives, it would be vital for the installation of new or rehabilitated water infrastructure in the Mulobezi GMA to be accompanied by efforts to achieve open defecation free status for the participating communities, accompanied by appropriate hygiene measures. It should be possible to achieve this through more vigorous implementation of the Kazungula District Council's existing CLTS programmes in the GMA. KAZA should consult further with the Council to ascertain whether additional funding would be appropriate for this purpose.

Summary

Table 2 below presents a summary of preliminary recommendations for CRIDF-supported actions by KAZA at each of the sites. These proposals are subject to more detailed feasibility assessment during the detailed design phase.

Table 2 Project elements per site

Project element	Kamwi	Lyoni	Mabwe	Namuse	Silangi
Additional check on siting			✓		✓
Rehabilitate existing borehole	✓			✓	
Borehole and hand pump	✓	✓	✓	✓	✓
Reticulation to max 2 garden sites	✓	✓	✓	✓	✓
Fencing of garden(s) (max 0.5 ha each)	✓	✓	✓	✓	✓
Small-scale irrigation equipment	✓	✓	✓	✓	✓
1 year extension inputs on gardening, conservation agriculture	✓	✓	✓	✓	✓
1 livestock watering trough with reticulation from borehole	✓	✓	✓	✓	✓
Intensified sanitation programme to achieve open defecation free status	✓	✓	✓	✓	✓

Annex 1 Participants in introductory meeting

17th MARCH 2015

ATTENDANCE LIST

<u>NAME</u>	<u>POSITION</u>	<u>VILLAGE</u>	<u>SIGN</u>
1. MAIMBOLWA MAKOMO	CRB ADMIN	MULOBEZI	MCA
2. PHAIDES MUNJANSA	VILLAGE SCOUT	MULOBEZI	M. Hinga
3. HASTINGS LYONI	FMC (chairperson)	KALAMBWA	Jess
4. DAVIDSON SIKASIBI	AREA COUNCILOR	KAPAFIN GWA	Osita
5. John Mudobo	Hedeman Mudobo	Mudobo.	J. Mudobo
6. ROBSON MALWA	C.D.C Secretary	MABWE	R. M
7. PHINIAS MURISTEMMI		Lukena	Rm.
8. Samuel Muchelemani	RMC	Lukena	Sam
9. ANON SIKABAKANI	RMC C/person	Lukewa	B. M
10. ROBSON Mweene	TNC-Mulobezi	Mulobezi	R. M
11. PRINCE GABRIEL MOOMBA CHIEF'S REP			
12. STEPHEN TURNER	CONSULTANT - KAZA	U.K.	SOTC
13. NICK SMART	CONSULTANT - KALA	RSA	NS
14. Patricia Mupeta - Muzamwa	TNC - Lusaka	Lusaka	P. M
15. Moses M. Mulimbo	NPW - Mulobezi D/C	Mulobezi	M. M
16. Regina Zyele	TNC - Lusaka	Lusaka	Regina
17. Gustafsson R. Njovu	TNC - Lusaka D/REP Lusaka	Lusaka	Regina
18. Victor Siamudaala	TNC	Lusaka	Regina
19. SIAZUOLU LAZAROS	CHIEF'S SECRETARY	SIAMUNJA	S. M

Annex 2 Meeting with Kazungula District Council

A meeting was held with officers of Kazungula District Council on 19 March 2015 at 10h00.

Present:	Kelyson Mang'ola	Physical Planner (Town Planning) and Acting District Planning Officer, Kazungula District Council (Chair)
	Sitali Liwena	KAZA Liaison Officer - Zambia
	Gisford Muleya	Community Development Officer, Kazungula District Council
	Robson Mweene	TNC Field Co-ordinator, Mulobezi GMA
	Rebecca Tembo	Rural Water Supply and Sanitation Co-ordinator, Kazungula District Council
	Stephen Turner	Consultant to KAZA and CRIDF

The meeting was held to consult with the Kazungula District Council (KDC) on the proposed water infrastructure to be developed by KAZA in the Mulobezi GMA with funding from CRIDF. Messrs Liwena, Mweene and Turner briefed the KDC officers on the background to the initiative, the type of intervention envisaged, the consultations held with local leadership and community members in the Mulobezi GMA (including the Councillor for Moomba), and the site inspections carried out. They mentioned the likely package of support, comprising a new or rehabilitated borehole with hand pump (windmills and solar pumps may be inappropriate given lack of local operating and maintenance experience) with reticulation to a standpipe and possibly a livestock watering point and an irrigated garden. They indicated that small dams to retain water for livestock use might also be considered, although sites have not yet been investigated. They emphasised that the current visit has been purely for scoping, and that the intervention is not yet guaranteed to happen.

The KDC staff welcomed the initiative and outlined current policy on rural water supply and sanitation. They would be glad to work with KAZA and the community to introduce the new infrastructure in such a way that it conforms to policy and promotes sustainability. This has the following implications.

- Communities should apply to the KDC for the water supply service. Applications should be accompanied by minutes and the attendance list of the community meeting at which the application was endorsed. The TNC Mulobezi Coordinator could facilitate this.
- Before construction, a user community should contribute K1,500 as an initial maintenance fund.
- KDC personnel would want to see the plans and do a physical check of the proposed sites. It was suggested that this could be done at the time that the KAZA water engineer(s) visit the GMA for a detailed design study.

- The District Council will facilitate formation and training of a ten-member village water committee. Again, the TNC Mulobezi Coordinator could support this process.
- The normal standard is that each water point should serve 250 people. Most of the communities identified in the GMA meet this criterion, but it was suggested that, due to the small and scattered population of the GMA, the requirement might be relaxed in some cases.
- User fees are normally contributed monthly. The community decide how much to contribute. Funds are held by the committee treasurer.
- The KDC now operates a spare parts shop at its premises in Kazungula. This enhances spares availability for district water users; but the shop is distant from the Mulobezi GMA.

KDC personnel advised that salinity is a significant issue in the district. They therefore strongly advise the use of poly piping rather than steel. They also recommend use of the longer-lasting Afridev pumps, rather than the India type.

The KDC staff confirmed that the water supply intervention should be accompanied by work to promote appropriate sanitation. Zambia has adopted the Community-Led Total Sanitation (CLTS) approach, and four CLTS 'champions' have already been trained in Moomba chiefdom. They have been provided with bicycles. The TNC Mulobezi Co-ordinator noted their names and will make contact. Additional CRIDF-funded sanitation intervention may not be necessary, but the possibility of some extra support to strengthen the CLTS effort in the area could be considered. Latrine pits are a challenge in the sandy conditions of the area. The KDC will soon be attending a meeting in Monze to discuss ways of building latrines in such conditions.

The meeting closed with further assurances from the KDC staff that the proposed intervention would be welcome, and that they hope it will actually take place. All parties agreed to maintain contact and take the work forward together.

References

Child, B., Muyengwa, S. and Mupeta-Muyamwa, P., 2014. *Baseline study for the Kasonso and Mulobezi Game Management Areas (GMA) in Zambia.*

CRIDF 

