IRC

Water Master Plan
Logologo and Gudas sub-locations, Marsabit

Kenya Arid Lands Disaster Risk Reduction (KALDRR-WASH) program

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Version 2
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Supporting water sanitation
and hygiene services for life

fh food for the hungry

Millennium Water Alliance

Design and layout:
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Acronyms and abbreviations

AfDB	African Development Bank
CG	County Government
FBO	Faith-Based Organisation
FGD	Focus Group Discussion
FH	Food for the Hungry
GoK	Government of Kenya
HH	Household
IP	Implementing Partners
KALDRR	Kenya Arid Land Disaster Risk Reduction
KALR	Kenya Arid Land Region
KWS	Kenya Wildlife Service
LCCA	Life Cycle Cost Approach
LU	Livestock Unit
MUS	Multiple Use water Services
MWA	Millennium WASH Alliance
MWI	Ministry of Water and Irrigation
NGO	Non-Governmental Organisation
O&M	Operation and Maintenance
RIDA	Resources – Infrastructures – Demand - Access
WASH	Water Sanitation Hygiene
WC	Water Committee
WMP	Water Master Plan
WRMA	Water Resource Management Authority
WRUA	Water Resource User Association
WUA	Water User Association
WVI	World Vision International
3R	Recharge Retention Re-use

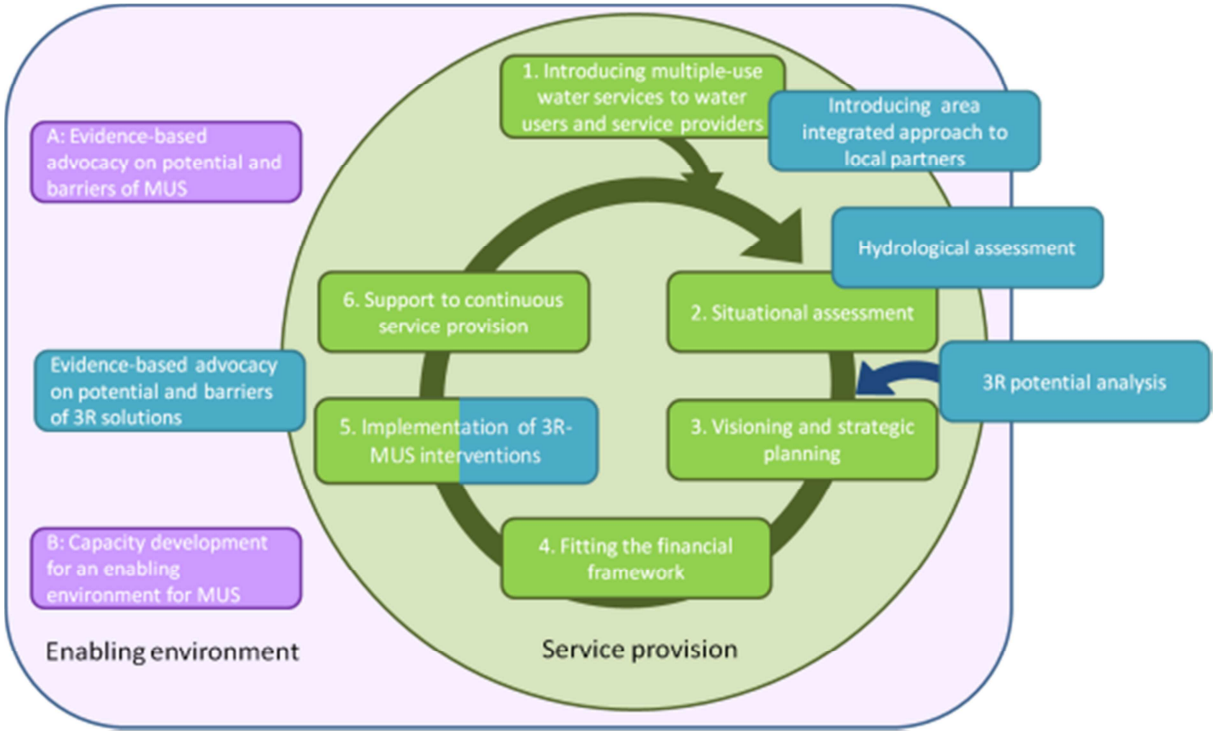
1 Introduction

1.1 Background

This report illustrates the third step of the 2-years KALDRR-WASH programme (2013-2014) of the Millennium Water Alliance (MWA), which aims at conducting water master plans in four pilot areas in the Kenya Arid Lands Regions (KALR), in partnership with MWA local implementing partners (IP)[1]. The final objective of the programme is to improve resilience of the communities to recurrent drought events by improving the overall management of water supply and use of water resources in the pilot areas.

The figure below (a combination of MUS guidelines[2] and the 3R approach) summarizes the steps of the process; the KALDR-WASH programme focus till present has been on steps 1, 2 (situational assessment) and 3 (visioning and strategic planning through the setting-up of a Water Master Plan).

Figure 1: Process cycle for water master planning in the KALDRR-WASH pilot areas



Source: Acacia, IRC, 2013

The situational assessment for Marsabit was conducted in May 2013 in the targeted sub-locations by IRC and Acacia Water. This assessment methodology was based upon the RIDA framework (Resources – Infrastructures – Demand – Access) and included presentation of the MUS (Multiple Use of water Services) and 3R (Recharge, Retention, Re-use) principles to the IP,

[1] The implementing partners are FH (Food for the Hungry) in Marsabit, CRS (Catholic Relief Service) in Wajir, World Vision in Turkana and CARE in Moyale.
[2] Adank (2012). Guidelines for Planning and Providing Multiple-Use Water Services, Adank et al., MUSGROUP, IRC and IWMI, 2012.

field visits to the communities, analysis of the multiple use of water and an in-depth hydrological analysis of the area using the 3R approach. The field visits where followed by a one-day stakeholder meeting to work on a vision for the area (full report of the situational assessment available on IRC website[3]).

A first Water Master Plan workshop, organised in January 2014 by Food for the Hungry (FH) and IRC, brought together 39 participants representing 11 groups of stakeholders. These include community and local government representatives as well as civil society organizations active in the area. **Annex 1** presents the full list of participants. Based on the workshop discussions, IRC and FH have drafted the Water Master Plan for endorsement and implementation by Marsabit stakeholders. This Water Master plan was further detailed and updated in December 2014, following a second workshop which took place in Marsabit in October 2014; this workshop focused on financing for sustainable water service provision, using the Life-cycle Cost Approach (LCCA).

The Logologo and Gudas Water Master Plan is an important milestone in the planning process for sustainable water service management in the area.

1.2 Purpose of the Water Master Plan (WMP)

The purpose of a local WMP is to achieve an effective, equitable and efficient use of water on a local level that will build resilience of the population against droughts and water related shocks.

The goal is to delegate planning and management to the local level, to ensure that water resources are used rationally and shared equitably and fairly among the communities in a sustainable way considering all different needs.

During the workshops, the following objectives of the WMP were discussed:

- Plan and guide implementation of water related infrastructure and water services for all types of water uses.
- Address priorities for potential water related activities.
- Achieve long-term investment and develop projects in the water sector.
- Promote conservation of water and natural resources.

It is recognized that the water planning process for the Logologo and Gudas areas need to link up with the on-going decentralization processes and contribute to overall rural development in the area.

1.3 Water Master Plan workshops objectives and methodology

The two WMP workshops, which took place in January and October 2014 in Marsabit, had six main objectives:

1. Bring stakeholders together in a planning forum to enable a joint search for solutions to the water gap in Logologo and Gudas areas, including agreeing assumptions for arriving at conclusions.
2. Agree to develop and implement a Water Master Plan for the Logologo and Gudas area.
3. Identify and agree on the strategic building blocks for the water master plan for the Logologo and Gudas area.

[3] "Towards a better balance between water demand and supply: The Local Water Resource and Service Management approach applied to the pilot area of Logologo in Marsabit"(ACACIA, IRC, 2013), http://www.ircwash.org/resources/towards-better-balance-between-water-demand-and-supply

4. Enable stakeholders understand and own the water balance analysis.
5. Agree on planning for actions based on the water master plan for the Logologo and Gudas area,
6. Build a detailed budget of prioritized activities for 2015.

The workshops consisted mostly of plenary sessions and working group session. Plenary sessions enabled participants to have a shared understanding of the issues under discussions in order to reach common agreements and conclusions. This was important especially for community members who could only participate actively through interpretation of discussions. Working group session enabled participants, working in small groups, to focus on key issues of governance, water service management and capacity building with a view to identifying challenges and suggesting areas of improvement. Working group findings were presented and discussed in plenary.

The body of the present report focuses on the outcomes of the first workshop, while outcomes of the second workshop are detailed in **Annex 2**.

2 Description and problem analysis of the Logologo and Gudas area

2.1 Marsabit County

This zone lies in one of the driest parts of the country and receives between 200mm and 800mm of rainfall per annum. As in other counties of the Kenya Arid Land region (KALR), the majority of the inhabitants (80%) are semi-nomadic, while 10% are occasional nomads and 10% are fully settled. According to FEWSNET[4] estimates, and as used in this study, a typical household keeps 5-10 cattle, 20-25 goats, 15-20 sheep, 0-5 camels and 0-1 donkey. Cattle provide the majority of income from household livestock production, followed by goats, sheep and camels. Camels and goats, on the other hand, are the highest contributors (about 30%) to food from household livestock production.

According to a report of the Social Analysis Study undertaken by the Arid Lands Resource Management Project in Kenya in 2004, migration in search of water and pasture is the first coping strategy among pastoralist communities in northern Kenya. In case of extreme drought conditions, the people turn to slaughtering their animals in order to preserve the meat; milk animals, especially goats, are lent out by the comparatively better off households to the poorer households to enable the latter have at least some milk for the family. Livestock production is the highest contributor to household income (up to 95%), which is generated from the sale of livestock products like meat, milk, hides and skins. Formal waged labor and casual labor make minimal contributions to household income (about 5%).

FEWSNET also states that insecurity, poor road infrastructure and low levels of education are some of the underlying factors causing high food insecurity in the zone, although supplies often flow in from Ethiopia through Moyale and Marsabit (April-July) thereby contributing to food availability.

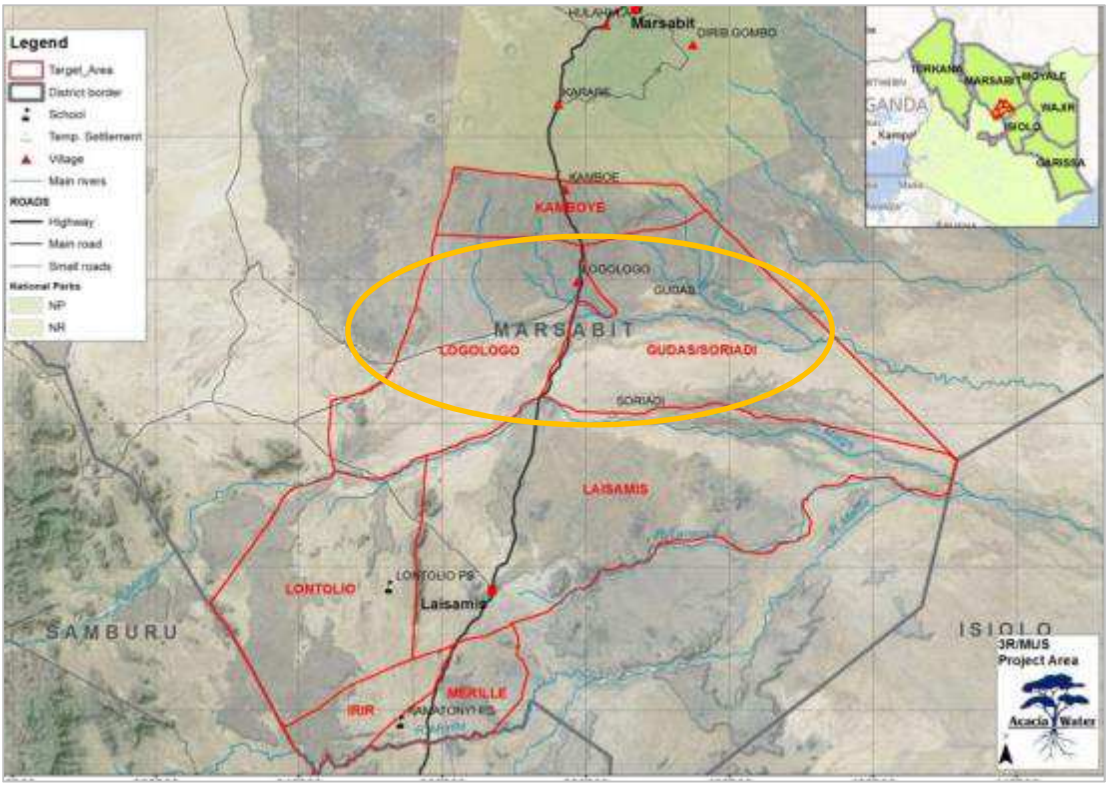
Other elements such as drought and intermittent flood as well as dependency culture to NGO and government support are significant elements hampering development activities in the area.

In terms of water access, rain, overland flow, gully flow, seasonal rivers, groundwater and springs are the resources from which water can be harvested and stored. In Marsabit, water is used mainly for livestock and domestic consumption. Within Marsabit County, movement of livestock is common between the dry and rainy season, to ensure access to grazing land and provision of sufficient water for the cattle. Agriculture is present but only at small scale (household level) for food crop.

[4] For full reports and further information check http://www.fews.net/east-africa/kenya.

2.2 Logologo and Gudas sub-location

Figure 2: Target area: Logologo and Gudas sub-locations (orange circle)



During the 3R/MUS situational assessment conducted in May 2013, the selected area consisted of Kamboe, Logologo and Gudas/Soriadi sub-locations, extended to Karare to the North and Laisamis to the south for the 3R landscape analysis (red area on the map).

In the framework of the Water Master plan, it was decided to restrict the pilot area to Logologo and Gudas/Soriadi sub-locations. The census 2009 population indicates a total population of 4,083 persons (3,334 for Logologo and 749 for Gudas); an estimated growth rate of 2.7% and an average household size of 4.5 people will be assumed for future estimations.

During the workshop, seven settlements of population were identified (see paragraph 4.2.2), with a majority of the domestic water demand being concentrated in the northern part of the pilot area, along the main Logologo road. Participants underlined the following points during the workshop:

1. As confirmed by the census data, Gudas is not widely populated and people present consists mainly of family members of households located in Logologo, who move to Gudas with their livestock in the dry season,
2. Seasonal migration of population and livestock from outside the target area is currently not frequent and will not be considered in water demand calculation; however, participants mentioned that in the near future, availability of additional water points may attract external population.

Detailed descriptions about water resources, infrastructure, water demand and access for the area can be found in the report 'Towards a better balance between water demand and supply: The Local Water Resource and Service Management approach applied to the pilot area Logologo in Marsabit (Acacia, A4A, IRC, 2013).

3 Vision for 2024 by stakeholders

During the stakeholder meeting held at the end of the situational assessment (May 2013), a map of the 3R/MUS pilot area was drawn, and a plenary discussion held to make a start with a longer term vision for the area.

The visioning discussion provided the first building blocks for a vision and longer-term plan for the area. In summary the visioning contain the following points:

- People want to see all boreholes and main pipelines functional so everyone can reach water easily.
- The overall access to water is used to improve public health and hygiene.
- More run off is caught and seasonal rivers are used better for the different water uses.
- The planning of the water infrastructure is taking into account the impact it has on the environment (grazing lands) and risk of depletion of the water sources.
- The size of the livestock herds is managed by selling and re-purchasing, balancing it with dry and wet seasons.
- Communities are capable to develop small scale agriculture in the area, building on the first experiences with drip irrigation, green houses and kitchen gardening, under the condition that pressure of livestock is reduced by increased water availability.
- The water infrastructure is managed by competent water committees that are supported by government and civil society organizations.

4 Water gap analysis

4.1 Definitions and assumptions

The water gap is expressed as the amount of water (m^3) that will be required to provide for all the different types of water uses during a dry period of 10 months. It is assumed therefore that the water storage facilities, like water pans or sub-surface dams are not replenished by rain water during this period. Deep boreholes that tap from sources much older are calculated to provide water 8 hours/day during the whole dry period.

The water gap for the Logologo and Gudas areas has been defined as:

Water gap in 2024 = (Demand in 2024) – (Existing capacity in 2014)

The objective of estimating the water gap for the different water uses is to be able to quantify and qualify interventions in the WMP that will bridge the gap. The following assumptions are made:

- Estimation is for the year 2024.
- Calculation for a typical dry year with a period with no rainfall during 10 months.

It is important to realize that all figures used are broad estimates and may still show considerable variations in reality. However, where possible the figures have been verified by using different source of information and confirmation by the stakeholders of the area.

Calculations were carried out with the help of a special tool[5] developed for the KALDRR-WASH programme. **All tables presented in this report and related to the calculation of water demand were extracted directly from the calculation tool.**

4.2 Calculation of total water gap

4.2.1 Estimated capacity of existing water infrastructure

The following table provides the estimated capacity of all existing water infrastructure in the target area for a 10 months dry period. It is assumed that:

1. Infrastructures that are at present non-functional or partly functional can be brought back to its design capacity.
2. Infrastructures that are functional but not yet delivered to the communities (water pan and borehole constructed for road work) will be made available for multiple uses in the near future.
3. Water pan effective capacity is equal to half the full capacity (due to evaporation and infiltration).

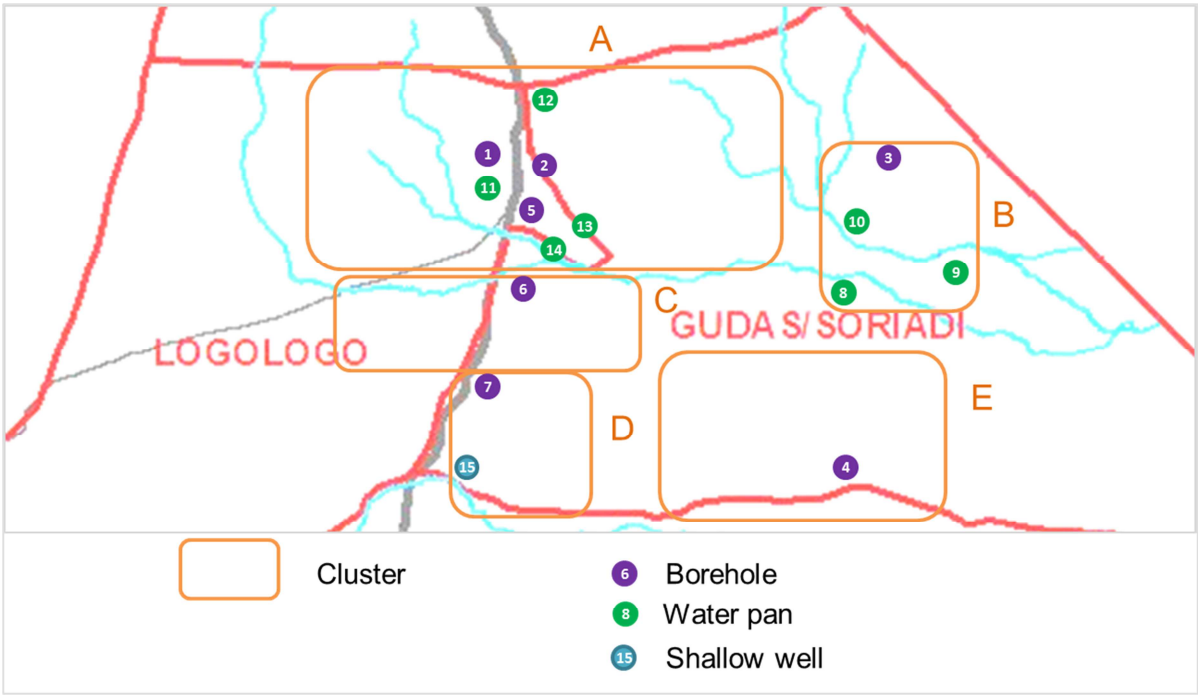
Missing yields were estimated by the participants during the workshop and shall be confirmed through further investigations.

[5] The tool was developed using Excel and is available upon request with FH.

Figure 3: Available water infrastructure in 2014 in Logologo sub-location

#	Sub location	Type	Name	Borehole				Water pan	
				Yield (m3/hr)	Pumping (hrs/d)	Dry periods (Days)	Capacity (m3/y)	Capacity (m3)	Effective capacity (m3/y)
1	Logologo	Borehole	Lesitima	24	5	300	36,000		
2	Logologo	Borehole	Sanjir	3	5	300	4,500		
3	Logologo	Borehole	Gudas	5	20	300	30,000		
4	Logologo	Borehole	Soriadi	3	20	300	18,000		
5	Logologo	Borehole	Road Construction 1	20	6	300	36,000		
6	Logologo	Borehole	Road Construction 2	20	6	300	36,000		
7	Logologo	Borehole	Road Construction 3	10	6	300	18,000		
8	Logologo	Water pan	Kohte					1,500	750
9	Logologo	Water pan	Gudas 1					5,000	2,500
10	Logologo	Water pan	Gudas 2					5,000	2,500
11	Logologo	Water dam	Logo Logo road					40,000	20,000
12	Logologo	Water pan	Lekorele					10,000	5,000
13	Logologo	Water pan	Tornasira - 2					20,000	10,000
14	Logologo	Water pan	Tornasira - 1					15,000	7,500
15	Logologo	Shallow wells							30

Figure 4: Location of water points in the target area



4.2.2 Domestic water demand

Domestic water demand was adjusted (as compared to previous calculations) on two criteria:

- By using a higher population than in previous report. Both population from Logologo and Gudas (3,334 and 749 people respectively, Data Census 2009) were considered. It is clear however that these are estimates only, as in Gudas (according to the participants) settlements of pastoralist population are only temporary and mainly composed of family members from households based in Logologo.
- By adjusting the water demand for population: 50L/p/d or 30L/p/d in urban and peri-urban areas, and 20L/p/d in rural areas (see map and table below).

Figure 5: Clusters of domestic water demand in Logologo and Gudas (K m^3/year, 2024)

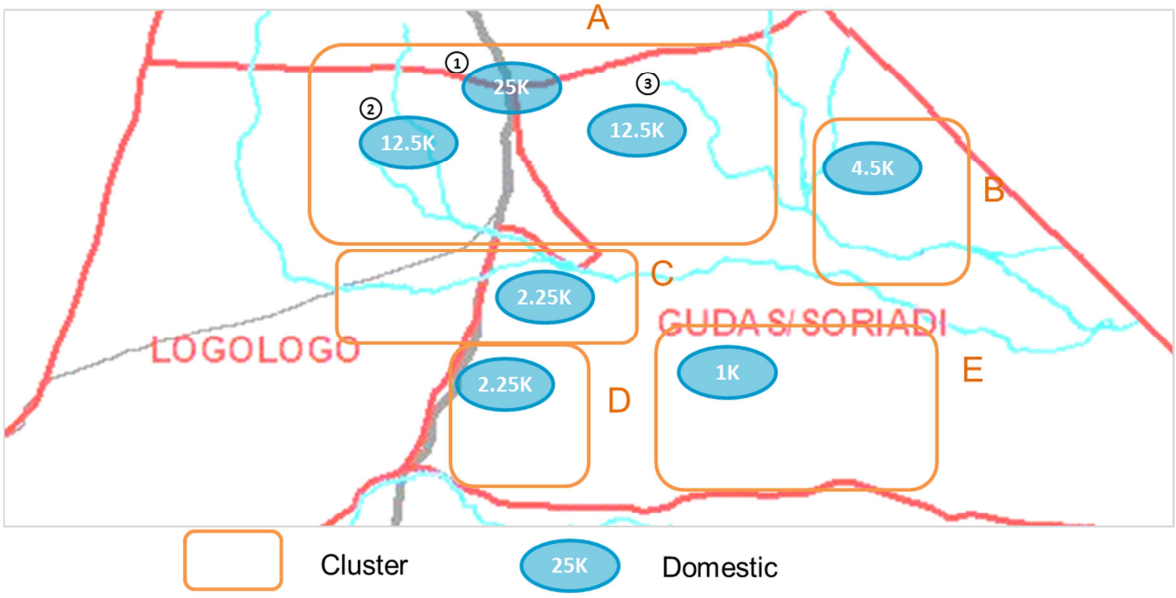


Figure 6: Domestic water demand per cluster in 2024 for Logologo sub-location

	Population (people)	Demand (L/d/p)	Demand (m3/y)	Rounded-up (m3/y)
Cluster A-1	1,650	50	24,750	25,000
Cluster A-2	1,400	30	12,600	12,500
Cluster A-3	1,400	30	12,600	12,500
Cluster B	750	20	4,500	4,500
Cluster C	375	20	2,250	2,250
Cluster D	375	20	2,250	2,250
Cluster E	150	20	900	1,000
	6,100		59,850	60,000

For a 10 months dry period:
Based on these calculations, the domestic water demand in 2024 is 59,850 m^3, rounded-up to **60,000 m^3**.

NB on the population figure:
The population of Logologo + Gudas for 2009 is equal to 3,334+749 = 4,083 people. With an annual growth rate of 2.7%, the population is estimated to 6,089 people in 2024, rounded-up to 6,100 people.

4.2.3 Livestock water demand

Assumptions on number of animals per household and daily consumption of water per day have been discussed during the workshop, and it was agreed to keep the assumptions as described in the previous report (see below). However, FH will check with livestock specialists if these assumptions shall be reviewed.

Figure 7: Assumptions on livestock water demand for Logologo

Assumptions:

	Stakeholders estimate on livestock per HH	FAO LU	Water Demand L / head / day	Water Demand L / head / day
Cattle	7	0.5	50	25
Goats	23	0.1		5
Sheep	17	0.1		5
Camels	3	1.1		55
Donkey	0.5	0.6		30

Figure 8: Livestock water demand for Logologo

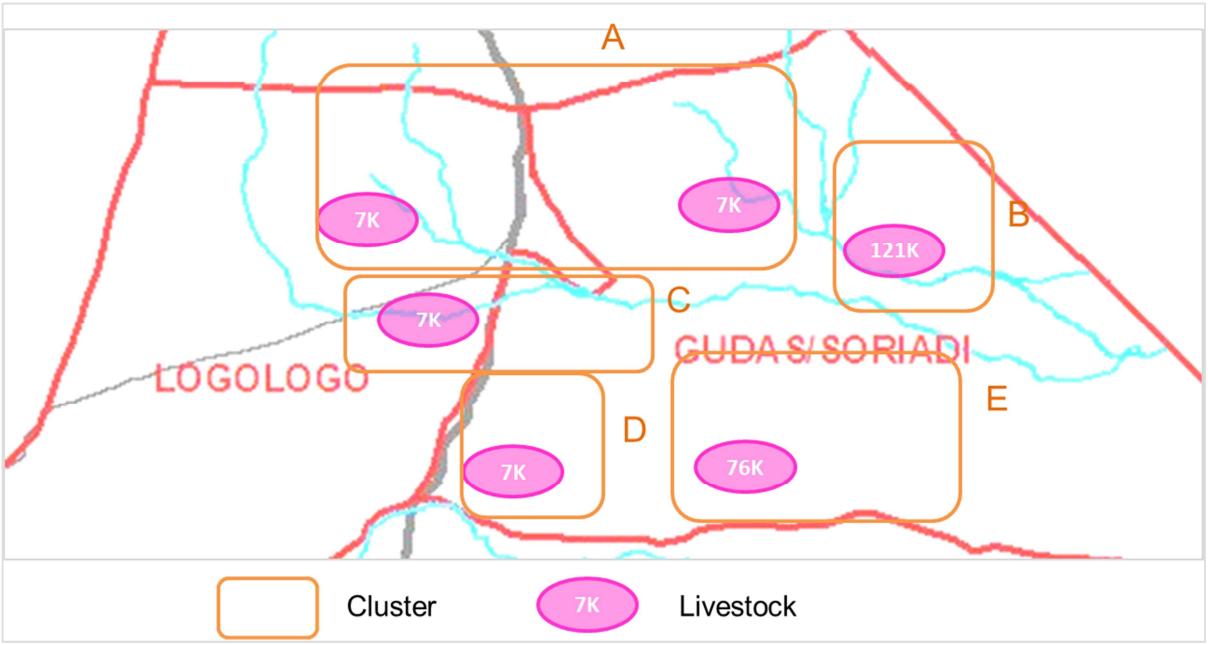
	Number of livestock heads					
Year	**Cattle**	**Goats**	**Sheep**	**Camels**	**Donkey**	**Livestock Unit**
2014	7,222	23,728	17,538	3,095	516	11,452
2024	9,426	30,972	22,893	4,040	673	14,947
2034	12,304	40,427	29,881	5,273	879	19,511

	Water demand (L or m3/day)
	Livestock
Year	
2014	572,576 L / d 573 m3/d
2024	747,373 L / d 747 m3/d
2034	975,533 L / d 976 m3/d

For a 10 months dry period:
The livestock water demand in 2024 will be 747 m^3/day x 300 days = 224,100 m^3, rounded-up to **225,000 m^3**.

This distribution of the livestock water demand across the target area was done as follow:

Figure 9: Livestock water demand in 2024 (K m^3/10 months dry season)



4.2.4 Agriculture

Regarding water demand for small-scale irrigation, the following assumptions were made based on the discussions with the participants:

- Water demand calculated in settlements located in the northern part of the sub-location.
- Regarding Soriadi, there is potential for maize being cultivated by non-pastoralist population through flood-irrigation.

Figure 10: Agriculture water demand Logologo

	Irrigation water need	
	Agriculture	
	Year	Average / day
2014	6,977 m3/year	19 m3/day
2024	9,106 m3/year	25 m3/day
2034	11,886 m3/year	33 m3/day

For a 10 months dry period:

The irrigation water demand in 2024 will be 9,106 m^3, rounded-up to **9,000 m^3**.

Figure 11: Agriculture water demand in Logologo and Gudas (K m^3/year, 2024)

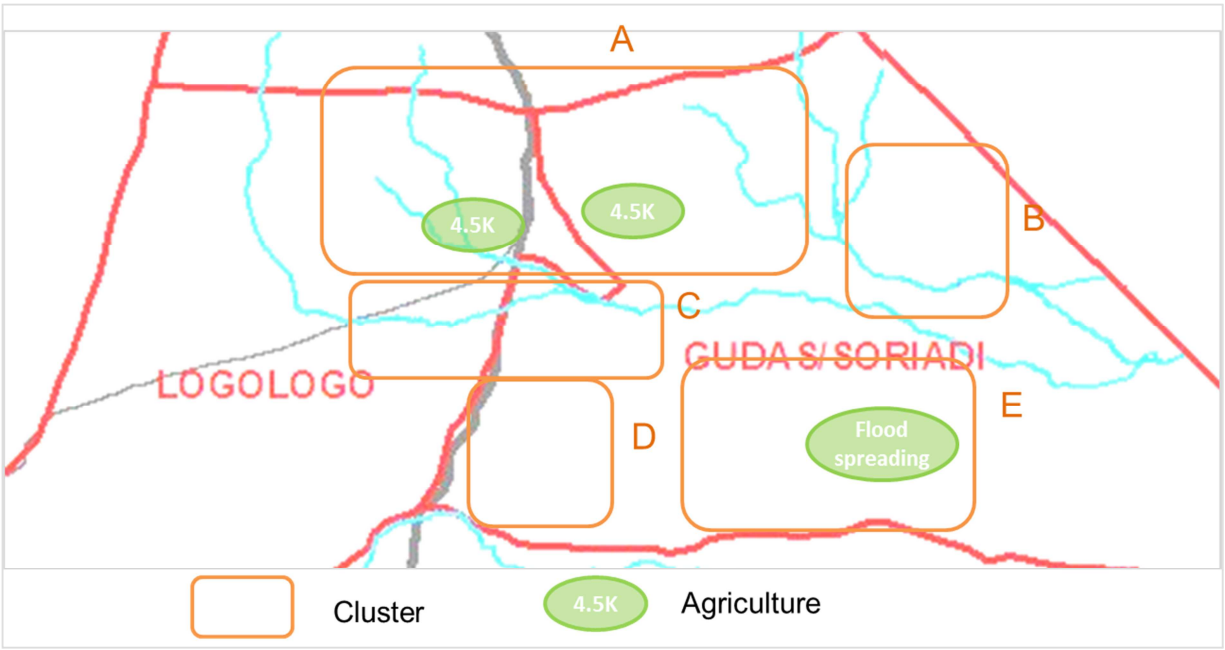


Figure 12: Agriculture water demand Logologo - monthly overview

		Irrigation water need (m3/month and average m3/day)											
		Agriculture											
		January	February	March	April	May	June	July	August	September	October	November	December
2014	month	458	0	686	177	1,052	1,397	489	0	825	567	839	487
	day	15	0	23	6	35	47	16	0	28	19	28	16
2024	month	597	0	896	231	1,374	1,823	638	0	1,077	740	1,095	635
	day	20	0	30	8	46	61	21	0	36	25	37	21
2034	month	780	0	1,169	301	1,793	2,379	832	0	1,406	966	1,430	829
	day	26	0	39	10	60	79	28	0	47	32	48	28

4.2.5 Seasonal migration

It was agreed during the WMP workshop that only very few seasonal migration take place within the Logologo / Gudas sub-location and movement of population and livestock are mainly from family members of household within the area. Nowadays, boreholes are kept for domestic consumption while water pans are used for livestock (in the rainy season).

However, more water points will be made available in the near future (in particular from road construction) and opportunities might come-up e.g. selling water to migrating herds. Until further notice, water demand for seasonal migration will be considered equal to **0 m^3**.

4.2.6 Wildlife

Stakeholders confirmed the presence of wildlife in the area (antelopes, zebra…) but during the rainy season only. As the WMP focuses on water demand during the 10 months dry period, water demand for wildlife is considered equal to **0 m^3**.

4.3 Location of water demand, water gaps and water surplus

Water demand was compiled and illustrated using a map of the pilot area (see Figure 13) based on the following assumption:

- The northern part of the pilot area concentrates most of the population with urban and peri-urban settings; a pipeline connection is also foreseen, which will also encourage higher water consumption. In this area, livestock consists of small animals only (goats and sheep).
- In the South, population is expected to settle around the new boreholes; the yield of these upcoming water points will be enough to cover water demand of livestock.
- In the Eastern part of the pilot area, although there is not much settles population, water demand is high for livestock; there is water shortage foreseen for 2024.
- Agriculture activities might increase if water becomes more available; greenhouses are expected to be concentrated around the Logologo area, and small scale agriculture might develop around the new boreholes.

Based on this overview of the water demand and the analysis of the existing water point, a table of water gaps and water surplus has been drawn (See Figure 14: Water gaps and water surplus in Logologo sub-location

). This data have also been illustrated on a map (see Figure 15).

Figure 13: Total water demand in the target area (2024, m^3/10 months dry period)

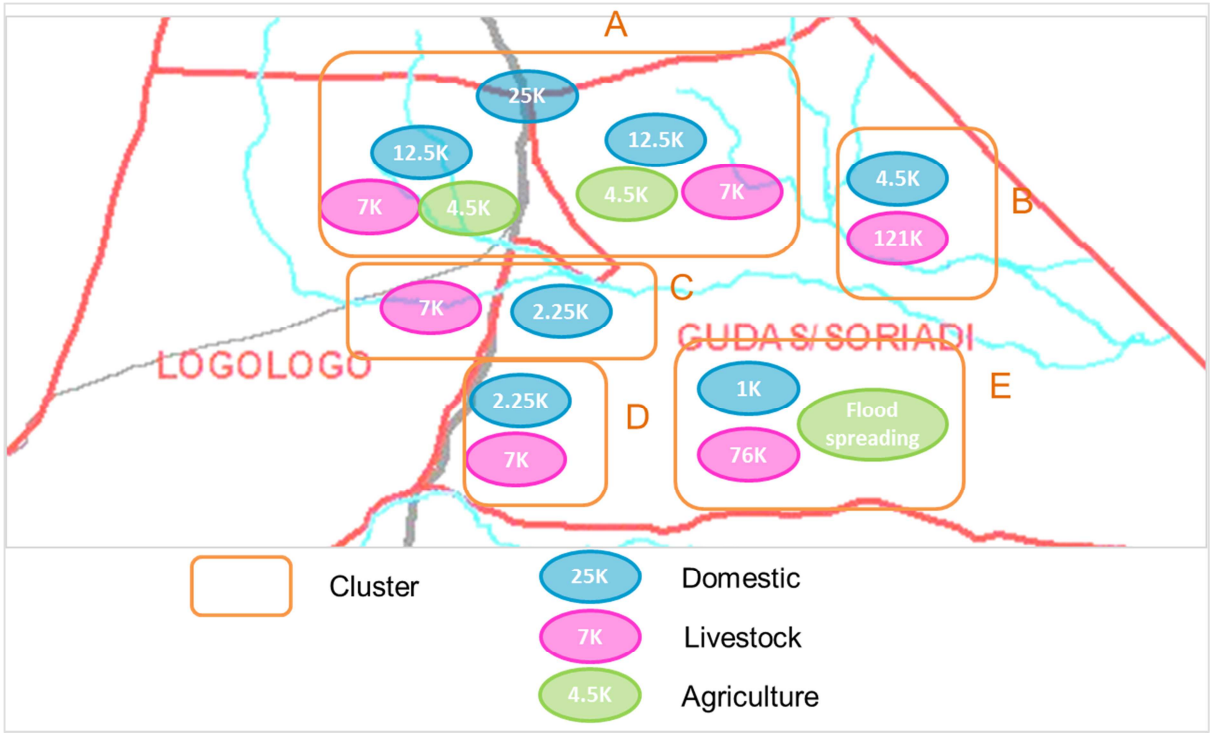
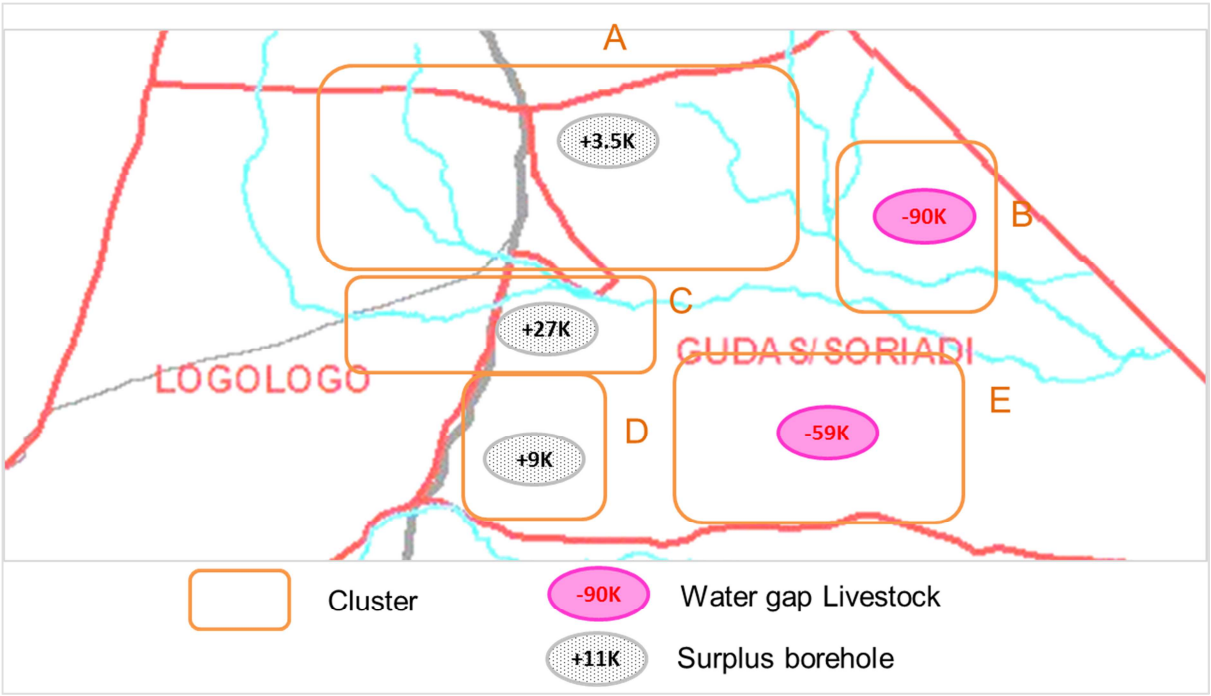


Figure 14: Water gaps and water surplus in Logologo sub-location

Cluster	Use	Water demand	*Available*		Use	Supplied by....		GAP	Surplus	
			Borehole	*Waterpan*		Borehole	Waterpan		BH	Waterpan
A	D	50,000	*76,500*	*0*	D	50,000			3,500	/
	L	14,000	*(BH 1 - 2 - 5)*		L	14,000				
	A	9,000			A	9,000				
B	D	4,500	*30,000*	*5,750*	D	4,500			/	/
	L	121,000	*(BH 3)*	*(WP 8 - 9 - 10)*	L	25,500	5,750	89,750		
	A	0			A					
C	D	2,250	*36,000*	*0*	D	2,250			26,750	/
	L	7,000	*(BH 6)*		L	7,000				
	A	0			A					
D	D	2,250	*18,000*	*0*	D	2,250			8,750	/
	L	7,000	*(BH 7)*		L	7,000				
	A	0			A					
E	D	1,000	*18,000*	*0*	D	1,000			/	/
	L	76,000	*(BH 4)*		L	17,000		59,000		
	A	0			A					

Remark: For the calculation of the water gap in cluster A, water pans 11, 12, 13 and 14 were not taken into account.

Figure 15: Location of water gaps and water surplus per cluster (m^3/year, 2024)



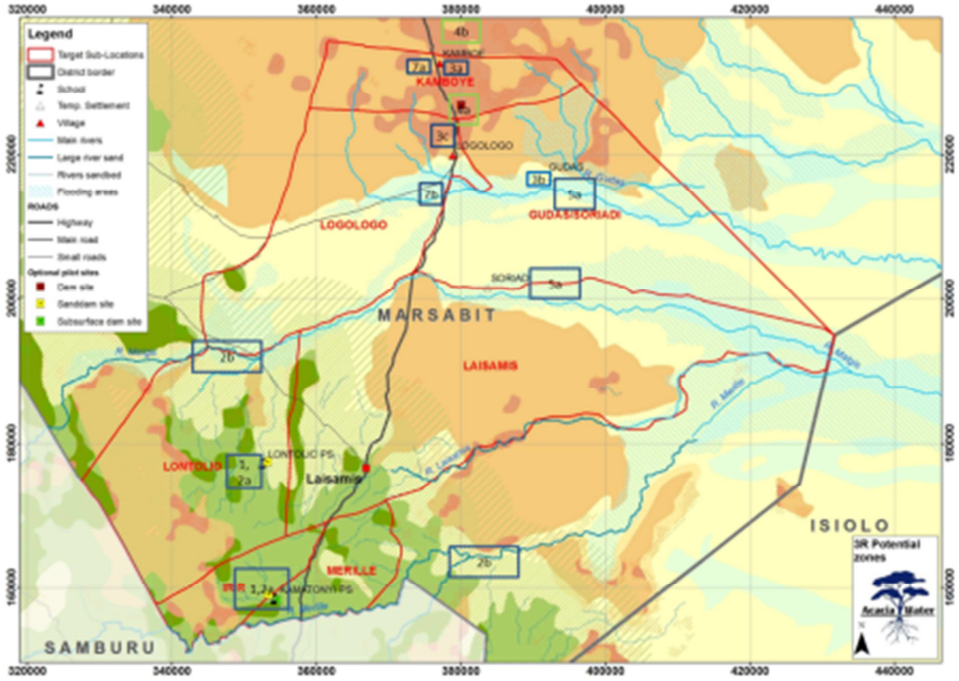
5 Water infrastructure planning

5.1 Potential 3R interventions

At locations with water shortage, 3R interventions can be used to increase the amount of water available during the dry season, by storing and buffering water in the rainy season. Several technologies are available, and the choice depends on both the physical landscape and type of water demand.

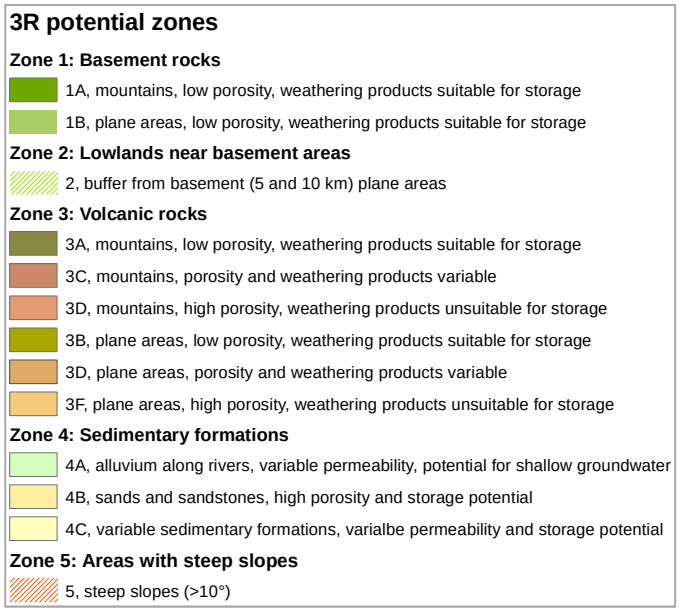
An analysis of the area for potential 3R interventions was conducted in May 2013 and an area map produced (Figure 16), dividing the area in zones with different 3R potential:

Figure 16: 3R potential zones in the Marsabit pilot area



Source: Acacia, IRC, 2013

Figure 17: 3R clarification color scheme of the 3R potential



Source: Acacia, IRC, 2013

In the Logologo target area the following 3R potential zones are present:

- Zone 3C: Mountains, high porosity, weathering products unsuitable for storage.
- Zone 3F: Plane areas, high porosity, weathering products unsuitable for storage.
- Zone 4C: Variable sedimentary formations, variable permeability and storage potential.

Figure 18: Possible 3R interventions in the Logologo area

	A Pans and valleydams	B Sanddams	C Subsurface dams	D Shallow, freatic groundwater: wells and riverbank infiltration	E (Flood)water spreading and spate irrigation	F Gully plugging, contour bunds, and other run-off reduction /infiltration options	H Closed tanks	G Deeper, confined aquifer groundwater: wells / boreholes
Zone 1A	x[1]	**X**	x	x		x	x	x
Zone 1B	x[1]	**x**	**x**	x	x	?	x	x
Zone 2	x[1]	x[2]	**x**[2]	x	x	x	x	x
Zone 3E	**x**			x		x	x	x
Zone 3F	x			(x)		x	x	x
Zone 4A	x			x	x	?	x	x
Zone 4C	x			x	x	?	x	x
Zone 5	x	(x)		x		x	x	x

The crosses denote the potential:
x. possible
***x**. high potential*
***X**. very high potential*
(x). limited potential
? unknown

Source: Acacia, IRC, 2013

Figure 18 provides an indication of which 3R interventions are the most promising in the area. A more elaborate analysis and description can be found in the assessment report of 2013[6].

5.2 Recommendations for infrastructure planning

Participants of the stakeholder meeting made an additional analysis of the available infrastructure in the target area, and made following comments (also see Figure 3: Available water infrastructure in 2014 in Logologo sub-location

- Some of the existing infrastructures (boreholes #3 Gudas, #4 Soriadi and Kijito) are currently not operational and will need to be repaired/rehabilitated.
- There is also an existing pipeline laid by the Ministry of Water which is operational, but needs rehabilitation work.
- Water supply will be sufficient in the future if "road boreholes" are made available to the communities.

The discussion on infrastructure planning was very passionate and led to interesting point of views; conclusions led to the fact that water is available (or potentially available) in the area in big quantities:

Water seems sufficient in the pilot area, apart from the East (Gudas).
Technical issues are more in terms of O&M, on which the group has made the following recommendations:

- Road boreholes have a very high yield, which suppose the use of a powerful pump as well as high operating costs; in addition to this, experience shows that generator-powered settings are always an issue (regular breaking down). For these reasons, the group advises the installation of electricity, made feasible via the connection to the nearest point in Kamboye. This would permit the pump to be operational 24H/24 at high yield.
- The group also recommended the use of solar energy (e.g. for Sanjir, Gudas and Soriadi) for boreholes which are operated with smaller pumps.
- Finally, the group highlighted the issue of management and the need to put in place a viable service provider, for example a private water company, as Water User Committee do not manage well currently.

More general comments were also made on opportunities to exploit to provide sufficient water for each type of water demand; among others:

- Domestic water demand: encouraging water piped network in urban and peri-urban area, rain water roof-catchment in schools and taking into account issues around water quality and treatment.
- Livestock: increasing the number of water storage through for animals and increasing awareness on the need to pay a fee per head of animal; the group also mentioned the separation of boreholes used for domestic use from boreholes used for livestock[7], to avoid conflict of interests. Finally, it was mentioned that in Soriadi/Gudas, settlements are not permanents; therefore á house shall be made available for the operator.

[6] See report: (Acacia, A4A, IRC, 2013):Towards a better balance between water demand and supply: The Local Water Resource and Service Management approach applied to the pilot area Logologo in Marsabit, http://www.irc.nl/page/81861.

[7] Although there is a gap of water in grazing land areas, communities favour boreholes over water pans for livestock needs, as it is easier to maintain and control by the community members; water pans are usually considered "common" goods and tend to attract more people. Water pans would be an option for the community members only if it is located next to the community.

- Agriculture: adoption of drip irrigation.
- Seasonal migration: additional boreholes to be drilled in strategic location (in Gudas/Soriadi area).
- Wildlife: adopting a multi-sectorial approach to wildlife issues and establishes water storage facilities on migration routes, although other argued that extra infrastructure for wildlife would increase tensions with the local population.

The list below shows the list of Action points agreed upon by the group; the first 2 items were identified as priority:

- Improve power supply for the boreholes.
- Creation of storage tanks / water troughs for livestock in grazing areas.
- Develop piped network.
- Repair boreholes in Logologo.
- Fence boreholes.

Increase capacity of boreholes near grazing lands (Gudas/Soriadis).

6 Water governance

The Marsabit stakeholders discussed water governance in their area and have observed the following:

6.1 Existing water governance structures

The group listed the existing structure / institutions for dealing with policies and regulation:

- Ministries (Ministry of Environment, Water and Natural Resources) at national and county level (as with the new water law, many responsibilities are being shifted to County level),
- WRMA.
- Water appeal board.
- Water service trust fund.
- Water Management Committee (WMC).
- Catchment area advisory committee (CAAC).
- Water Resource User Association (WRUA).
- National Water Resource and Pipeline Corporation.
- Water service regulator board (WSRB).

Most issues are dealt with at local level directly with the Water Management Committees; when it comes to issues of access to water, proposal are made through the DWO/WRMA and other national bodies. Conflict resolution is made through the local and/or traditional administration such as the chief, DC, DO etc. It can however be forwarded higher up if necessary.

Follow-up on monitoring and application of policies is usually done though national bodies, NGOs and bodies at local level – although the participants mentioned that it was not happening in the Logologo area.

6.2 Effectiveness of water governance structures

The existing governance structures were described as being not effective by the group; reasons mentioned include:

- Conflicts and breakdowns are not tackled with properly.
- Need for capacity building and trainings.

- Lack of infrastructure development.
- When there is development of infrastructures, it is not done according to regulation and policies.
- Maintenance of existing infrastructure is non-existent.
- O&M support is lacking.
- Big issue of accountability.
- Lack of monitoring and book-keeping.
- Unclear functions and roles of management committees.

6.3 How to improve water governance and management

The working group was asked to come-up with suggestions on how to improve the governance and management of the water points; answers have been given by type of water demand:

- For domestic water supply:
  - Increase of quality and quantity monitoring.
  - Increase settings of targets.
  - Development of infrastructures.
- Supply of free chemicals for water treatment.
- For livestock:
  - Construction of trough for animal.
  - More storage tank.
  - Increase of sources of water for livestock.
  - Pollution control.
- For small scale agriculture:
  - Increase of storage structures (dams, pans, roof catchment, tanks).
  - Government to provide incentive to improve small scale agriculture (include NGO in the process).

No concrete actions were agreed upon regarding governance; a group led by Cyril Nyambane from WRMA will carry-on the discussion based on the above improvement suggestions.

7 Water service management

The Marsabit stakeholders discussed the following related to water service management:

7.1 Existing water service management strategies and their effectiveness

In summary the understanding of the existing water management system is:

- Water service management is governed by the provisions of the Water Act and includes management by:
  - WSBs acting through the district water office at the district level.
  - WUA (Water Users Association): related to the WSB (Water Service Board).
  - WRUA (Water Resource Users Association): related to WRMA.
  - At the community level, management of water is the responsibility of water users, who are expected to elect Water Management Committees to act on their behalf; in the target area, a new committee has been elected in November 2013.
- The water committees are responsible for tariff setting for domestic and livestock use, and for ensuring equity in access to water; in the target area for example, the tariff is set at 2 KSH per water jerrican for domestic use while green houses and lodges provide their own diesel to pump water.
- Operation and maintenance should be the responsibility of the WUAs and Water Management Committees but in many cases, NGOs and the water office do step in to support the operation and maintenance of water facilities.
- The Water Act is not fully followed, partly because institutions like the WSB lack the capacity to cover the whole county and therefore is locally not present.

Given the preponderant role of the WMC, additional clarifications were given on its role and responsibilities:

- The newly formed WMC ("Logudas") is common to all boreholes in the Lologo/Gudas area, although usually WMCs are formed to manage one borehole only;
- The Chairmen explained that they are in fact responsible for all boreholes in the Logologo and Gudas sub-locations (= the master plan area). The sub-county water officer confirms the explanation by the WMC chairman and explains that the WMC has been formed but has not yet been trained and there clearly are still some gaps.
- Conclusion by IRC is that the WMC is set up along the guidelines of the WUA, which in principle can aim for becoming a registered WSP with Northern WSB in line with the Water Act of 2002. A new dimension comes in with the proposal of a Logologo Water Company to replace the community based WMC, which is proposed by the infrastructure group and needs to be discussed further under the heading of 'service management'.

7.2 How to improve water service management

Overall, water service management is seen as being ineffective. The following suggestions were made for improvement of water service management:

- Reinforce laws to encourage active involvement of all stakeholders.
- Encourage collection of money at water points in an efficient way through:
  - Installation of water meters at distribution points.
  - Reinforcement of water tariffs.
  - Better book keeping.
- Employ skilled labor.
- Improve coordination of management committees.
- Repair breakdowns and leakages along pipe system.

7.3 Action Plan 2014

No priorities were set regarding the management arrangement for the water services, but based on the list above it becomes clear that issues of accountability and a system for financial management shall be part of the priorities.

The sub-county water office in Laisamis will lead and carry-on the discussion for this topic (Mr Joseph Leparlearo).

8 Capacity building

8.1 Existing capacity gaps

At district water office level it is noted that:

- Poor communication network from/to the district water office.
- Lack of spare parts – no store (spare parts come from Nairobi).
- Inadequate monitoring of water resources.
- Low prioritization of water issues at district / county level.

At the community level the Water Management Committees (WMCs) have the following gaps:

- Non-adherence to set laws, which are not followed (e.g. people do not pay for water for livestock).
- Lack of technical skills (operator are just member of the community).
- No payment for water use.
- Lack of proper financial management (and regular collection of fee).
- Water distribution is not equitable (focusing on some uses only; e.g. some children school use water trough).
- Lack of storage facilities at boreholes level (e.g. Lesitima BH).
- Poor maintenance of water infrastructure (e.g. Sajir BH constructed in late 1950 with tank that has a lot of leakages).

8.2 Opportunities

The opportunities identified to work on the gaps are:

- At district level:
  - Improve network between district level and community level management.
  - Establish contacts for provision of spare parts (to be brought together with other goods such as food).
  - Take advantage of communication infrastructure e.g. mobile phone to improve communication (current installation of Safaricom network in Logologo).
  - Integrate the water master plan into the county government plan (because lack of integration with the county water management).
  - Encourage regular monitoring trips by the sub-county water office.
- At community level:
  - Training for the existing local operator.
  - Training of the WMC on financial issues.
  - Sensitize the Water users on the sustainability plan (people do not pay because they are not aware that the money is used to maintain the BH).
  - Improve water distribution connectivity and water storage.
  - Adhere to set-up pumping schedule.
  - Set-up and adhere to O&M plans.

8.3 Action Plan 2014

No priorities were set regarding the management arrangement for the water services, but the group recognised that gaps cannot be solved through a few trainings only and only through continuous work.

FH will take the lead of the process and follow-up discussion and actions with Logologo stakeholders.

Table 1: Action Plan 2014

Component	Proposed Action	Priority for 2014	Responsibility
Water infrastructure	• Encourage repair of existing borehole, development of piped network in urban/semi urban area and making “road” boreholes available to the community. • Favour boreholes over water pans for livestock – unless water pans are located near the community and a house is being constructed for guarding it.	• Improved power supply for existing and future boreholes • Storage tanks / water troughs for livestock (Gudas/Soriadis)	• Ministry of Water, Environment and Natural Resources, Department planning and Design (Mr Dickson Maitho)
Water Governance	• Suggestions linked to governance and management included: – Increase the quantity and quality of monitoring. – Increase the settings of target. – Conduct pollution control. – Provide incentives (by the Gov) to improve small scale agriculture.	• /	• WRMA (Mr Cyrus Nyambane)
Water Service Management	• Reinforce laws to encourage active involvement of all stakeholders, • Encourage collection of money at water points in an efficient way through: – Installation of water meters at distribution points. – Reinforcement of water tariffs. – Better book keeping. • Employ skilled labour. • Improve coordination of management committees. • Repair breakdowns and leakages along pipe system.	• /	• Sub-county water office in Laisamis (Mr Joseph Leparlearo).
Capacity Building	• Integrate the water master plan into the county government plan. • Improved communication (district to community level, with spare parts providers, field visit by sub-county water office). • Trainings: for local operator, WMC (on finance). • Encourage payment of fee, respect of pumping schedule and adherence to O&M plans.	• /	• FH (Elijah Nyangena Gichora)

Annexes

Annex 1: List of participants - Water Master Plan Workshop - Marsabit 22-23 January 2014

S/NO	Name	Organization	Function	Mobile contact
1.	James M. Mwai	WRMA		0723532108
2.	Dickson K. Maitho	Ministry of environment water & natural resources		0726677752
3.	Cyrus E. Nyambane	WRMA		0724883926
4.	Joseph L. leparleru	Water office- Laisamis	Officer	0727556628
5.	Samuel Hunyu	NEMA		0723105546
6.	Nicholus Omwolo	ADS/CCS	Coordinator	0720675541
7.	Collins Amboso	FH	program engineer	0722542380
8.	Elijah Gichora	FH	WASH coordinator	0710478273
9.	Edna Anab	FH	WASH officer	0721210962
10.	Benerdette Njoki	MOH	PHO	0202595174
11.	Evans Bichage	ACAH	WASH coordinator	0202632993
12.	Eziekiel Mogaka	MOH	PHO	0729014010
13.	Ombuna Wilson	MOALOF	Deputy director	0724431562
14.	S.R Letikurich	MOALOF	engineer	0726589111
15.	Satim eydimole	Log logo WMC	Member	0725560740
16.	Kena A. Moga	Log logo WMC	Assistant chief	0702890089
17.	Fatuma Abdiker	Log logo WMC	Member	0703604494
18.	Rashid B. Dokhole	Log logo WMC	secretary	0727915544
19.	Letawon Lbanchir	Log logo WMC	member	
20.	Leokono Bernard	Kamboe WMC	Chair person	0712899287
21.	Lasapuk Leacho	Kamboe WMC	member	
22.	Lecron Moga	Log logo WMC	member	
23.	Natili Kahle	Log logo WMC	member	
24.	Bustia Ali	Log logo WMC	member	
25.	Rapas Kochale	Log logo WMC	member	
26.	Lpesie Arigele	Kamboe WMC	member	
27.	Illo Komogol	Log logo WMC	Chair man	
28.	Huricha Esimakayo	Log logo WMC	member	

29.	Abane Moga	Log logo WMC	member	
30.	Lmajipan Learapo	Kamboe WMC	member	
31.	Tipyian Lesukat	Kamboe WMC	member	
32.	Bori Lesopa	Kamboe WMC	member	
33.	Nathan Leitoro	Kamboe WMC	member	
34.	Samuel Letipo	Kamboe WMC	secretary	
35.	Lumbay Lekureya	Kamboe WMC	member	
36.	Ntito Kapina	Kamboe WMC	member	
37.	Samuel Moga	Log logo WMC	member	0720990466
38.	Sammy Lebarakwe	Log logo WMC	member	0713340751
39.	Leiron Moga	Log logo WMC	member	

Annex 2: Outcome of the "Financing sustainability" workshop - October 2014 – Marsabit

1-Introduction

This annex presents the results of the third step of the 2-year KALDRR-WASH programme (2013-2014) of the Millennium Water Alliance (MWA), which aims at conducting water master plans in four pilot areas in the Kenya Arid Lands Regions (KALR), in partnership with MWA local implementing partners. The final objective of the programme is to improve resilience of the communities to recurrent drought events by improving the overall management of water supply and use of water resources in the pilot areas. The third step includes an update of the plan for 2015, including the annual budget based on the Life-Cycle Cost Approach (LCCA).

On 15 and 16 October a Life-Cycle Cost Approach (LCCA) workshop was organised in Marsabit by Food for the Hungry (FH), in collaboration with IRC. The objectives of this workshop were that by the end of the workshop:

- Key stakeholders have a deep/clear understanding of LCCA,
- Stakeholders have their capacity built in planning processes,
- The Water Master Plan is further developed including financial planning,
- Next steps have been listed, including who does what, when and how.

A total of 15 representatives from national and local government (Ministry of Agriculture, Ministry of health, WRMA, NEMA, County water office, SWO- Moyale) and civil society (Concern worldwide, FH Kenya, Caritas) actively participated in this workshop.

During the workshop, the activities as described in the Marsabit Water Master Plan were presented and discussed in plenary, after which they were further reviewed, detailed out and updated in smaller working groups. Participants were trained on the LCCA for financing sustainable water services. This included an introduction to the concept of service levels and the different cost components or categories (see figure 1). Following the LCCA training, participants used the LCCA concepts to develop an annual budget for the 2015 work plan. This was again initially done in smaller working groups, after which the results were compiled and discussed in plenary.

2-Feedback on the Water Master Plan

On the first day of the workshop, the Water Master Plan document, which was the output of the stakeholder workshop in January 2014, was presented to the participants. The following comments and additions were provided by the participants:

- There is a problem with siltation of water pans. This is largely due to animals drinking at the water pan. In general 40% of the dam capacity is lost.
    - It was agreed that there is a need to deal with siltation of the Water Master Plan.
- The Master Plan focusses on irrigation of maize, sorghum and beans, as agreed during the stakeholder consultations preceding the Master Plan development. However, the point was raised that pastoralists may be more interested in irrigating grazing lands.
    - It was discussed that irrigating pasture would be more water intensive and would require much more water.

- Based on the 3R study, FH is planning to install a storage tank in Logologo (Legitima). Furthermore, FH has cited a number of sand dams in the area neighboring Logologo and Gudas.

3-Activities and budget for 2015

On day 1, participants elaborated on the activities for the year to come, related to the water master plan. On day two, they developed the budget, bringing into practice the lessons learnt from the LCCA training. Table 1 provides an overview of costs for each of the main cost components, using the categories of the Life Cycle Costing Approach. Figure 1 explains briefly the different cost categories. The allocation of each activity to a certain cost category is done in Table 3. Table 2 presents the estimated costs of 2015 activities related to each pillar: infrastructure; water governance; water management; and capacity building. Table 3 is providing the same cost information, but also includes the suggestions of the participants for the questions which organization/stakeholder is responsible for the activity and who will mobilise the financing.

Figure 1: The Life-cycle costs of water services

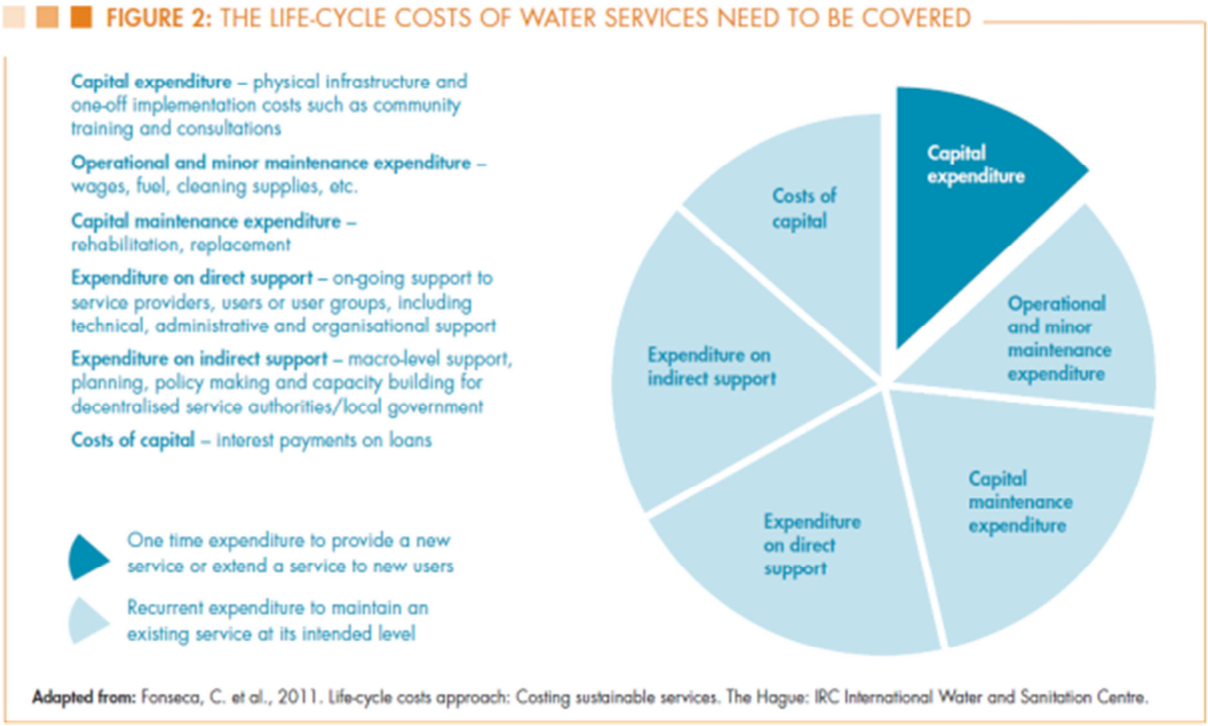


Table1: Budget per cost category

Cost category	Total costs (in KES) in 2015	Costs per person (KES/ person) in 2015 (based on an average population of 5,500 people)
Total capital expenditure	9,590,000	1744
Operation and minor maintenance costs*	60,000	11
Direct support costs	3,769,800	685
Indirect support costs	799,000	145
Total	**14,218,800**	**2585**

* excludes daily fuel and salary costs, because it wasn't calculated during the workshop

Table 2: Detailed costs per pillar

		Number (in 2015)	Unit cost (KES)	Total cost (KES)
	A - INFRASTRUCTURE			
A1	Borehole technical survey in Gudas/Soriadi	1	200,000	200,000
A2	Water pan technical survey	1	120,000	120,000
A3	Kiosks construction in Sanji and Lesgitima	6	200,000	1,200,000
A4	Office construction for the Logudas WMC	1	1,000,000	1,000,000
A5	Installing solar pomp on existing borehole	1	3,000,000	3,000,000
A6	Operator house construction in Gudas	1	1,000,000	1,000,000
A7	Cattle trought construction in Gudas/Soriadi (standard length)	2	200,000	400,000
A8	Silt trap construction for water pans	1	300,000	300,000
A9	Borehole fencing (metallic fencing)	2	200,000	400,000
			sub-total A	7,620,000
	B - WATER GOVERNANCE			
B1	Study to assess training need assessment of WMC members	1	50,000	50,000
B2	Formation of the WRUA in Logologo, including:			
B2.1	Mobilization of the members	1	30,000	30,000
B2.2	Registration (with the administration)	1	12,000	12,000

B2.3	Workshop at county level on the roles of institutions (WMC/WRMA) and the Water Act, for officials and WCM and WRUA members (in total 20 persons during 2 days)	1	220,000	220,000
B2.4	5-days workshop for development of sub-catchment management plan (WRUA representatives + others, in total 40 pers.)	1	1,000,000	1,000,000
B2.5	Meeting with potential donors	4	68,250	273,000
B3	Legalization of WMC/WUA into WSP	1	92,000	92,000
B4	Monitoring visit to the WMC/WUA by line ministry (2 people) on operational, financial management and governance	4	56,000	224,000
B5	Yearly external audit of WMC/WUA on operational, financial management and governance	1	30,000	30,000
			sub-total B	1,931,000
	C - WATER MANAGEMENT			
C1	Equipping boreholes with water meters (2 inch)	4	50,000	200,000
C2	Equipping water kiosks with water meters	7	10,000	70,000
C3	Workshop for water tariff setting for Logudas WMC (2 days, 15 participants)	1	45,000	45,000
C4	Provision of tools and equipment to WMC	2	30,000	60,000
C5	Radio programme to sensitize communities on water management issues	4	1,000	4,000
C6	Awarding the best performing County WUA/WMC	1	600,000	600,000
C7	Training of WMC members on proper financial management (16 participants for 2 days)	2	48,000	96,000
C8	Construction of store for fast moving spare parts for Logudas	1	1,700,000	1,700,000
C9	Communication campaign to encourage PPP e.g. fitting solar panels and water meters	2	50,000	100,000
			sub-total C	2,875,000
	D - CAPACITY BUILDING			
D1	Training of borehole operators (for 8 people for 2 days)	1	83,200	83,200
D2	Training of plumbers/meter readers (8 participants for 1 day)	1	41,600	41,600

D3	Workshops on water governance structure and defining by-laws (for 20 participants for 1 day)	4	94,000	376,000
D4	Short courses at the Kenya Water Institute (for 3 selected participants)	1	423,000	423,000
D5	Public session for community sensitization (WUA) in Logologo area	1	85,000	85,000
D6	Establish feedback mechanisms between WMC and Water Users though meetings	4	85,000	340,000
D7	WASH Stakeholder forum at sub-county level	4	51,000	204,000
D8	Organisation of exchange visit for best practices (20 people, 3 day)	1	240,000	240,000
			sub-total D	1,792,800
			TOTAL	**14,218,800**

Table 3: Budget per cost category, including suggestions by participants

WATER MASTER PLAN - Pilot area: Logologo-Gudas									
ACTIVITIES AND BUDGET 2015									
Date: 16/10/2014 - By IRC, FH and stakeholders									
Priority			Number (in 2015)	Unit cost (KES)	Total cost (KES/year)	How it was calcultated	Who is responsible?	Cost category	Source of funding
		A - INFRASTRUCTURE							
	A1	Borehole technical survey in Gudas/Soriadi	1	200,000	200,000	Internal hydrogeologist	WRMA	CapEx	FH/CG or any other dev. Partners
	A2	Water pan technical survey	1	120,000	120,000	Internal hydrogeologist /W Engineer	WRMA	CapEx	FH/CG or any other dev. Partners
	A3	Kiosks construction in Sanji and Lesgitima	6	200,000	1,200,000	/	Contractor through FH	CapEx	FH/CG
	A4	Office construction for the Logudas WMC	1	1,000,000	1,000,000	/	Contractor through CG/FH/other partner	CapEx	FH/CG or any other dev. Partners
	A5	Installing solar pomp on existing borehole	1	3,000,000	3,000,000	/	MoW/County water office	CapEx	CG
	A6	Operator house construction in Gudas	1	1,000,000	1,000,000	/	Water office/NGO	CapEx	FH/CG or any other dev. Partners
	A7	Cattle trought construction in Gudas/Soriadi (standard length)	2	200,000	400,000	/	Min. of Livestock dev. /MoPublic works	CapEx	FH/CG or any other dev. Partners

	A8	Silt trap construction for water pans	1	300,000	300,000	1000 m3 x 300 KES	County water office	CapEx	FH/CG or any other dev. Partners
	A9	Borehole fencing (metallic fencing)	2	200,000	400,000	30x30x30	WMC	CapEx	FH/CG or any other dev. Partners
				sub-total A	7,620,000				
		B - WATER GOVERNANCE							
	B1	Study to assess training need assessment of WMC members	1	50,000	50,000	quest (20k), enumerators(20k), FGD(10k)	NGOs / Ministries	DS	NGO/CG/others
	B2	Formation of the WRUA in Logologo, including:							
	B2.1	Mobilization of the members	1	30,000	30,000	/	WRMA	DS	CG/WRMA
	B2.2	Registration (with the administration)	1	12,000	12,000	5k (CBO), 5k (WRMA), 2k (transfer)	WRMA	DS	WRUA
	B2.3	Workshop at county level on the roles of institutions (WMC/WRMA) and the Water Act, for officials and WCM and WRUA members (in total 20 persons during 2 days)	1	220,000	220,000	500KES/day for participant, 4k/facilitator, 10k training materials, transport 40k, accomodation 120k, 3k/day (venue),	WRMA, WRUA	DS	CG, NGO
	B2.4	5-days workshop for development of sub-catchment management plan (WRUA representatives + others, in total 40 pers.)	1	1,000,000	1,000,000		WRMA, Water office	DS	CG, NGO
	B2.5	Meeting with potential donors	4	68,250	273,000		WRMA	DS	CG, NGO
	B3	Legalization of WMC/WUA into WSP	1	92,000	92,000	Certificate (12k), 3 pers. Transport to Nairobi (66k), 1 ext. helper (20k)	WUA/WMC	DS	Tariffs

	B4	Monitoring visit to the WMC/WUA by line ministry (2 people) on operational, financial management and governance	4	56,000	224,000	5k/pers+dri 3k+transport 30k	Line Ministry	DS	WUA
	B5	Yearly external audit of WMC/WUA on operational, financial management and governance	1	30,000	30,000		WUA	DS	WUA
				sub-total B	1,931,000				

		C - WATER MANAGEMENT							
	C1	Equipping boreholes with water meters (2 inch)	4	50,000	200,000		WMC	CapEx	Owners of system (WMC))
	C2	Equipping water kiosks with water meters	7	10,000	70,000		WMC	CapEx	Owners of system (WMC)
	C3	Workshop for water tariff setting for Logudas WMC (2 days, 15 participants)	1	45,000	45,000	1500 pp; 15 persons, 2 days,	Planning office	DS	NGO / development partner
	C4	Provision of tools and equipment to WMC	2	30,000	60,000	esitmate	WUAS	Opex	WMC
	C5	Radio programme to sensitize communities on water management issues	4	1,000	4,000	10KES per unit per 100 units	county information office	IDS	county information office / WRMA / development partners
	C6	Awarding the best performing County WUA/WMC	1	600,000	600,000	Including training for one WMC)	county office	IDS	county office
	C7	Training of WMC members on proper financial management (16 participants for 2 days)	2	48,000	96,000		water office and WRMA		FH/ country government / dev partners
	C8	Construction of store for fast moving spare parts for Logudas	1	1,700,000	1,700,000	fast moving spares: 1.2 million + constructing 1 room= 500,000	NDMA / county water office		WMC to pay for spare parts /

	C9	Communication campaign to encourage PPP e.g. fitting solar panels and water meters	2	50,000	100,000	stationary, coorindation	county water office / NDMA	IDS	Development partners
				sub-total C	2,875,000				
		D - CAPACITY BUILDING							
	D1	Training of borehole operators (for 8 people for 2 days)	1	83,200	83,200	trasport: 2000; upkeep: 2000; 10000lumpsum materials; facilitators: 2x 5000/day; hall hire: 2000; tea: 100/pp; 500 lunch/pp	WRMA/ FH/ Development partner	DS	WRMA/ FH/ Development partner
	D2	Training of plumbers/meter readers (8 participants for 1 day)	1	41,600	41,600	trasport: 2000; upkeep: 2000; 10000lumpsum materials; facilitators: 2x 5000/day; hall hire: 2000; tea: 100/pp; 500 lunch/pp	WRMA/ FH/ Development partner	DS	WRMA/ FH/ Development partner
	D3	Workshops on water governance structure and defining by-laws (for 20 participants for 1 day)	4	94,000	376,000	trasport: 2000; upkeep: 2000; 10000lumpsum materials; facilitators: 2x 5000/day; hall hire: 2000; tea: 100/pp; 500 lunch/pp	FH; WMC	IDS	Development partners
	D4	Short courses at the Kenya Water Institute (for 3 selected participants)	1	423,000	423,000	upkeep / transport/ etc	FH; KWI; WMC	IDS	Development partners

	D5	Public session for community sensitization (WUA) in Logologo area	1	85,000	85,000		Water and fishary dep; county government or admin	IDS	Development partners
	D6	Establish feedback mechanisms between WMC and Water Users though meetings	4	85,000	340,000		Water and fishary dep; county government or admin	IDS	Development partners
	D7	WASH Stakeholder forum at sub-county level	4	51,000	204,000	including ocmmunity members	county water office / WRMA / Lead agencies	IDS	FH / Development partners
	D8	Organisation of exchange visit for best practices (20 people, 3 day)	1	240,000	240,000		WRMA	IDS	FH / Development partners
				sub-total D	1,792,800				
				TOTAL	**14,218,800**				