

Water Master Plan Eyrib sub-location, Wajir

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



MILLENNIUM WATER
ALLIANCE



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Marion Giese

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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

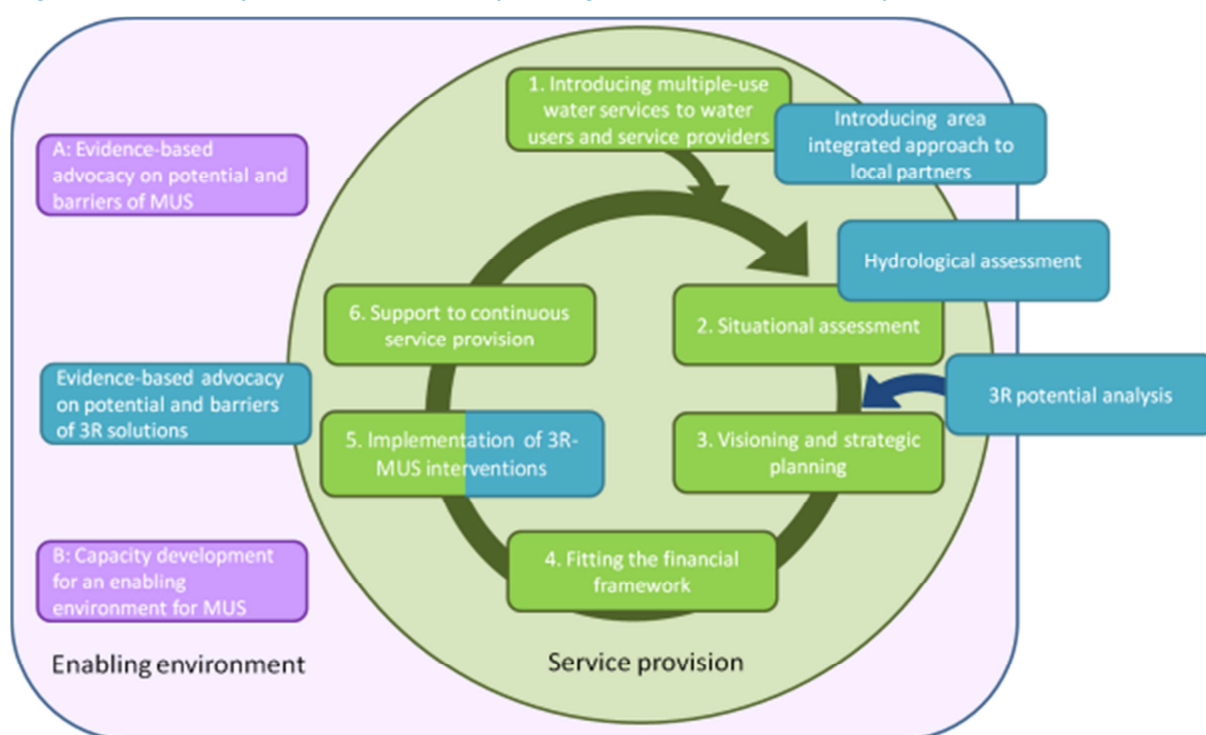
1 Introduction

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 guidelines² 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 Wajir was conducted in September 2013 in 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 IPs, field

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.

visits to the communities, analysis of the multiple use of water and an in-depth hydrological analysis of the area using the 3R approach. Field visits were followed by a one-day stakeholder meeting to work on a vision for the area (full report of the situational assessment available on IRC website³).

A first Water Master Plan (WMP) workshop, organised in December 2013 by CRS/Caritas and IRC, brought together 23 participants representing 13 groups of stakeholders. These included community and local government representatives as well as civil society organisations active in the area. **Annex 2** has the full list of participants. Based on the workshop discussions, IRC and CRS/Caritas Garissa have drafted the WMP for endorsement and implementation by the Eyrib stakeholders. This Water Master plan was further detailed and updated in December 2014, following a second workshop which took place in Habaswein in October 2014; this workshop focused on financing for sustainable water service provision, using the Life-cycle Cost Approach (LCCA).

The Eyrib WMP is an important milestone in the planning process for sustainable water management in the area.

1.2 Purpose of the Water Master Plan (WMP)

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

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:

- To 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.

The workshop recognised that the water planning process for Eyrib needs to link up with the on-going decentralization processes and contribute to overall rural development in the area.

1.3 Water Master Plan workshops

The two WSP workshops which took place in December 2013 and October 2014 had six main objectives:

1. To bring stakeholders together in a planning forum to enable a joint search for solutions to the water gap in Eyrib area, including agreeing assumptions for arriving at conclusions.
2. To agree on the development and implementation a water master plan for the Eyrib area.
3. To identify and agree on the strategic building blocks for the water master plan for the Eyrib 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 Leheley, Kulaaley and Eyrib in Wajir" (ACACIA, IRC, 2013), <http://www.ircwash.org/resources/towards-better-balance-between-water-demand-and-supply>.

4. To enable stakeholders understand and own the water balance analysis.
5. To agree on planning for actions based on the water master plan for the Eyrib area.
6. Build a detailed budget of prioritized activities for 2015.

1.4 The Water Master Plan workshop progress

The workshops consisted mostly of plenary sessions and working group sessions. 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. The working group findings of the first workshop were presented and discussed in plenary are presented in **Annex 1**.

The body of the present report focuses on the outcomes of the first workshop, while outcomes of the second workshop are detailed in **Annex 3**.

1.5 Stakeholder identification

The workshop participants in general felt that the stakeholders for Eyrib were well represented with the remark that in future the private water truckers and WRMA need to be included as well. The latter was invited for the workshop, but was not able to participate.

2 Description and problem analysis of the Eyrib area

2.1 Wajir County

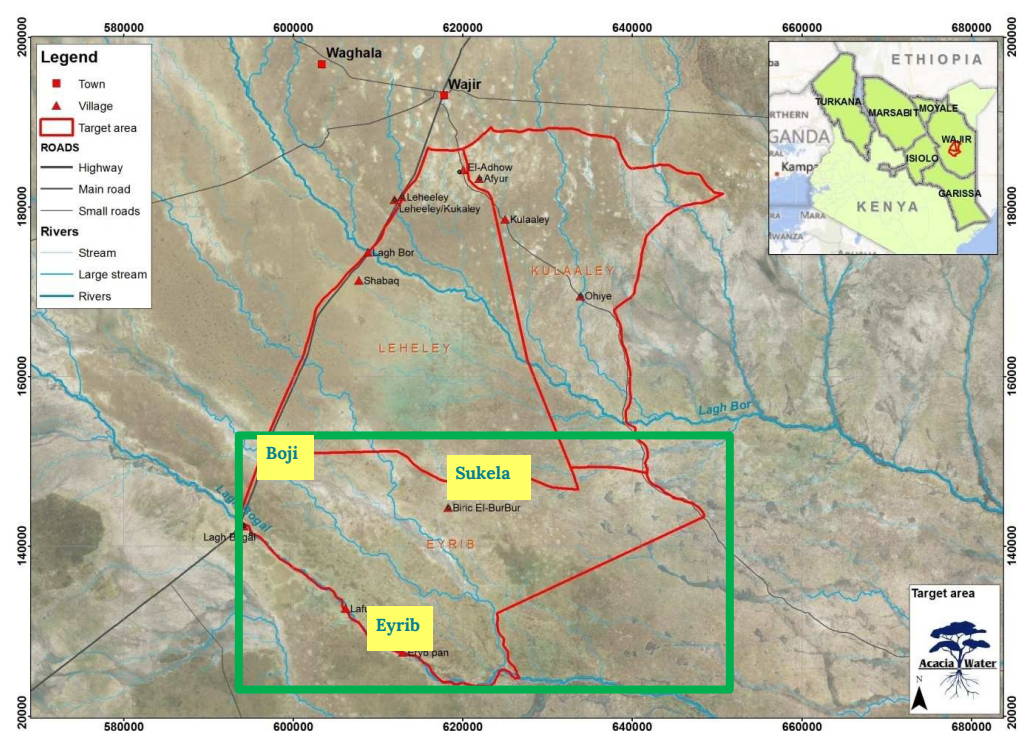
The Kenya Open Data states that the main economic activity in Wajir County is pastoralism with some agro-pastoralism being practiced in the Northern part of the County. The large tracts of land in the County provide the grazing pastures for the large camel and cattle herds found in the county. According to FEWSNET livestock production is the most significant source of income, contributing from 60-80% of the total household income. From Focus Group Discussions (FGDs) with the people of Eyrib, Sukela and Boji the average household (which make up approximately 75% of the population in these settlements) keep an average of 80 shoats, 10 cattle, 30 camels and at least 2 donkeys. Both camels and donkeys are considered burden or transportation animals. According to FEWSNET, while goats' contribution to food and cash income is important, camel's contribution to household food is crucial as they provide milk throughout most of the year.

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, including Wajir and in case of extreme drought conditions, the people turn to slaughtering their animals in order to preserve the meat and milk animals, especially goat, are lent out by the comparatively better off HHs to the poorer HHs to enable the latter have at least some milk for the family. Other important coping strategies according to FEWSNET include petty trading during period of stress, and when households come together at watering points. Formal waged labour and casual labour make minimal contributions to household income. Finally, FEWSNET states that constraints to livestock production that limit the contribution of livestock to food security include poor access to markets, low prices fetched for animals; high insecurity and risk of raids even along trading routes; frequent shortages of drinking water for livestock; shortages of pasture and browse; and the prevalence of endemic livestock pests and diseases.

In general, communities in Wajir area use water mainly for livestock and domestic consumption. Minor irrigation is carried out immediately south of Wajir town. Water is often not available at all in the villages and during dry seasons water has to be trucked over long distances.

2.2 Eyrib location

Figure 2: Eyrib location (green rectangle)



Source: Acacia, 2013

The 2009 population census of Eyrib sub-location is 2,795 persons where for future projections an estimated growth rate of 3.2% and an average household size of 6 persons/household has been assumed. During the workshop three settlements were identified: Eyrib, Boji and Sukela (see figure 2). For purpose of demand estimates Eyrib has been projected roughly twice as big as Boji and Sukela (in 2023!). Eyrib with 10 years is the oldest settlement while Sukela and Boji have existed approximately 6 years. During the workshop the following key observations related to the area were made by the participants:

- The entire Eyrib Location, which comprises Eyrib, Sukela and Boji Sub-locations, has only one functional earth pan that is located in the Eyrib sub-location;
- Due to distance, the people in Boji and Sukela settlements cannot access water from the Eyrib earth pan for their use.
- The drought cycle is becoming more and more frequent, almost occurring every 2 years, during which the long rainy season – Gu – sometimes completely fails. In such instances, dry spells of consecutive 10 months, from May (which should be the start of the long rainy season) till February are experienced.
- In Eyrib Location and Wajir district in general, there is no longer clear cut dry season/wet season grazing areas due to an abuse of dry and wet season animal watering sources since all wet or dry season grazing/livestock watering areas have been turned into human settlements, and people are becoming more and more sedentarized replacing the traditional nomadic pastoralist lifestyle.

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 Leheley, Kulaaley and Eyrib in Wajir' (Acacia, IRC, 2013).

3 Vision for 2023 by stakeholders

The people of Eyrib Location (Eyrib, Sukela and Boji South sub-locations) are concerned about the fact that a good portion of their household income leaves their respective villages and benefits people who are not their own – for example the owners of water trucking lorries – with the result that their social and economic growth is limited and they are not able to expand. This money could be unleashed for livelihood expansion if the people get water. Some of the activities that they could undertake if they got adequate water include:

- Expanding kitchen gardening into small scale farming so that the village can be self-sufficient especially in vegetables.
- Planting of trees.
- Expansion of the school and in particular to attract and retain girls by providing better hygienic services.
- Construction of a health facility as there is none in any of the three sub-locations;
- Take care of all domestic chores that are water dependent. Currently, some people are unable to pay the high cost of water, forcing them to take water on credit but at reduced volume, thus being unable to meet all domestic chores such as body washing and washing of clothes.
- Small scale enterprises such as tea kiosks and restaurants etc.

During the stakeholders meeting in September 2013 the following elements for the vision for the Eyrib location were identified:

Table 1: Building blocks for vision 2025 water management in Eyrib location

Desired Future: Vision for water (demand and access) in 2025	
Issue	What and how
Demand: for what purpose is water needed?	• Water for: Livestock; domestic use; small scale irrigated agriculture complete with irrigation infrastructure; water related small scale enterprises such as food kiosks/restaurants; environmental conservation/tree planting; consumption by wildlife; expansion of primary and secondary schools, health facilities.
Infrastructure: What types of water sources and infrastructure will meet the demand?	• Rehabilitated/desilted and improved (existing) earth pans and waterways/channels; new earth pans; construction of boreholes; piped water to households; harvested rain water – both roof and run off; and, livestock watering troughs for all categories of livestock
Responsibility for service provision: Who will be responsible for water services provision?	• Government institutions such as the Northern Water Service Board and the related WSPs; Non-government actors in the water sector such as Caritas Garissa.
Strategy for infrastructure management: How will the water infrastructure/facilities be managed and accessed?	• Management by overall water committee and an overall WUA in each community supported by user type/sectoral sub-committees. • Access by sectoral WUAs which will be organized according to type of use, e.g. livestock watering WUAs; irrigated farming WUA and enterprise WUA. • All users and management groups to be trained in respective roles and

Strategy for service provision and management: How will the demand for water service and accountable management be achieved?	responsibilities. • Each management level to have by-laws, including arbitration process in case of conflict. • Integrated and holistic water use planning; involvement of communities and their respective <i>Gudis</i> in planning and identification of various water project sites, community participation through contribution of unskilled labor, security and storage of materials and equipment. • WUAs and water committees to be registered to give them appropriate legal recognition. • Audit to be done be undertaken the government's water office. • All sectoral WUAs to report to report to an overall community level WUA.
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Any foreseen challenges/obstacles/difficulties that may hinder achieving the desired future: Important issues to think about:

- If the legal instruments responsible for water provision such as the Northern Water Service Board or Water Service Providers will not be active in the area.
- If non-government actors continue to intervene in small unsustainable ways, leading to insufficient water provision.
- If irrigation infrastructure and livestock watering troughs will not be part and parcel of the water source design and implementation.
- As a result of settlements in the dry season grazing areas, there is already overgrazing in these areas which may lead to future conflict over pasture.
- If there is no proper education to users on tariffs for various uses, then some people may fail to pay for water after taking it on credit, which may lead to conflict.
- Need for health facilities.
- Need for additional educational infrastructure (classrooms and more toilets) in Eyrib and construction of a school in Boji South.

Although the above table reads as kind of a wish list, a few observations are worthwhile to make:

- There is a strong desire to formalize water management and governance, taking into account the different types of water use.
- Recognition of need for behavior change among users for sustainable financing of water services.

During the workshop it was agreed that the master plan will take a time frame of 10 years and the following additional observations relevant for the vision were made:

- In the next 10 years, the [human] population of Eyrib and Boji sub-locations will have increased almost two-fold due to their location along major highways while that of Sukela would only increase nominally.
- On the other hand, population of livestock per household will have decreased by:
 - 15% cattle.
 - 12 % shoats.
 - 3% camels.
 - Donkeys will not be affected.
- The percentages considered in estimating the above reductions in livestock population included:
 - 2 year drought cycle.
 - The mortality and calving rates.
 - Increasing sedentarization leads to diversification of livelihood bases, even though livestock will continue to remain the dominant means of livelihood.
 - Increasing construction of water points will further exacerbates sedentarization and consequently put pressure on pasture by limiting the total area available for grazing.
- The strategy of dedicating separate wet - and dry season grazing areas has been abandoned in the area and future planning for water interventions should take into consideration:

- Water source/infrastructure should always be planned for the combination of domestic and livestock use.
- Water infrastructure should be located near/within an existing settlement so as to ensure:
 - o Ownership and ease of management and control by the community; that no new settlement will be created, which would add to the stress on pasture.
 - o That no new settlement will be created, which would add to the stress on pasture.

4 Water gap analysis

4.1 Definitions and assumptions

The water gap is expressed as the amount of water (m³) 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 Eyrib area has been defined as:

$$\text{Water gap in 2024} = (\text{Demand in 2024}) - (\text{Existing capacity in 2014})$$

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 2023.
- Calculation for a typical dry year with a period with no rainfall during 10 months.

It is important to realise 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 tool⁴ 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 Eyrib sub-location for a 10 months' dry spell. It is assumed that infrastructure that is at present non-functional or partly functional can be brought back to its design capacity.

Table 2: Estimated available water infrastructure capacity in 2013 in Eyrib sub-location

Infrastructure	Water use	Estimated yield m ³ /d	Capacity (m ³)	Effective capacity (m ³)	Percentage of total use	Total existing (m ³)
Eyrib Earth pan	Domestic		30,000	20,000	55	11,000
Eyrib Earth pan	Livestock		30,000	20,000	30	6,000
Eyrib Earth pan	Seasonal		30,000	20,000	10	2,000
Eyrib Earth pan	Wildlife		30,000	20,000	5	1,000
Qoqar borehole	Livestock	25				7,500
Bilcibur-bur borehole	Livestock	20				6,000
Alidumal borehole	Livestock	20				6,000

⁴ The tool was developed using Excel and is available upon request with CRS.

4.2.2 Domestic water demand

Figure 3: Domestic Water Demand Eyrib

		Water demand (L /h/day)
		Basic domestic
		20
Year	Population	
2013	3,219	64,382 L / d 64 m ³ /d
2023	4,411	88,218 L / d 88 m ³ /d
2033	6,044	120,880 L / d 121 m ³ /d

For a 10 months dry period this results in a domestic water demand in 2023 of 88 m³/day x 30 days x 10 months = 26,400 m³, rounded figure is **25,000 m³**.

4.2.3 Livestock water demand

Figure 4: Livestock Water Demand Eyrib

Number of livestock heads							
Year	Cattle	Goats	Sheep	Camels	Donkey	Livestock Unit	
2013	5,365	10,730	3,756	8,048	268	13,145	
2023	7,352	14,703	5,146	11,027	368	18,011	
2033	10,073	20,147	7,051	15,110	504	24,680	

		Water demand (L or m3/day)
		Livestock
Year		
2013		657,228L / d 657m3/d
2023		900,561L / d 901m3/d
2033		1,233,985L / d 1,234m3/d

After discussion by the stakeholders of Eyrib, the figures of Figure 4 were corrected. It was felt that the numbers of livestock will not grow proportionally with number of households. The new estimate for livestock water demand in 2023 is:

Table 3: Livestock Water Demand Eyrib – corrected

Livestock	Cattle	Sheep	Goat	Camels	Donkeys	LU
Reduction factor	0.85	0.88	0.88	0.97	1	
Livestock numbers Table 4	7,352	14,703	5,146	11,027	368	18,011
New livestock numbers	6,249	12,939	4,528	10,696	368	16,858

The new total Livestock Unit (LU) for Eyrib =16,858. With the LU water demand of 50 l/h/d, this gives a Livestock water demand of 843m³/day and the 10 month dry period demand of 843x30x10 = 252,870 m³, rounded figure = **250,000 m³**.

4.2.4 Agriculture

Figure 5: Agriculture Water Demand Eyrib

Irrigation water need (m ³ /month and average m ³ /day)													
Agriculture													
	January	February	March	April	May	June	July	August	September	October	November	December	
2013 month	0	0	0	0	133	304	304	304	272	135	0	0	
day	0	0	0	0	4	10	10	10	9	5	0	0	
2023 month	0	0	0	0	182	417	417	417	373	185	0	0	
day	0	0	0	0	6	14	14	14	12	6	0	0	
2033 month	0	0	0	0	250	572	572	572	511	254	0	0	
day	0	0	0	0	8	19	19	19	17	8	0	0	

For agriculture a 6 month period of irrigation is assumed. Therefore the agriculture water demand in 2023 is = 1,992 m³, rounded figure = **2,000 m³**.

4.2.5 Seasonal migration

Figure 6: Seasonal Water Demand Eyrib

Seasonal water demand (m ³ /month and average m ³ /day)													
Migration of people and livestock													
	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	
2013 month	0	0	0	38,870	38,870	38,870	19,435	0	0	38,870	38,870	3,887	
day	0	0	0	1,296	1,296	1,296	648	0	0	1,296	1,296	130	
2023 month	0	0	0	53,261	53,261	53,261	26,631	0	0	53,261	53,261	5,326	
day	0	0	0	1,775	1,775	1,775	888	0	0	1,775	1,775	178	
2033 month	0	0	0	72,981	72,981	72,981	36,490	0	0	72,981	72,981	7,298	
day	0	0	0	2,433	2,433	2,433	1,216	0	0	2,433	2,433	243	

After discussion by the stakeholders of Eyrib, the preliminary estimates of Figure 6 were corrected. It was found more realistic to plan only for seasonal migration during the months of November and December.

The new estimate for seasonal water demand in 2023 is: $53,261 + 5,326 = 58,587 \text{ m}^3$ with a rounded figure of **60,000 m³**.

4.2.6 Wildlife

Where the situational assessment report assumes that wildlife consumption is estimated at 50% of the livestock consumption, the stakeholders based their estimate on a best guess of how many wildlife animals are actually in the area. This resulted in the estimate that wildlife need is not more than 1% of the livestock need, resulting in **2,500 m³** for the 10 month dry period.

4.2.7 Total water gap

The total water gap for the year 2023 is presented in Table 4:

Table 4: Total Water Gap Eyrib

Use	Water demand m ³ (2023)	Existing capacity (2013)	Water gap m ³ (2023)
Domestic	25,000	11,000	14,000
Livestock	250,000	25,500	224,500
Agricultural	2,000	0	2,000
Seasonal	60,000	2,000	58,000
Wildlife	2,500	1,000	1,500
Total	339,500	39,500	300,000

4.3 Location of water gaps

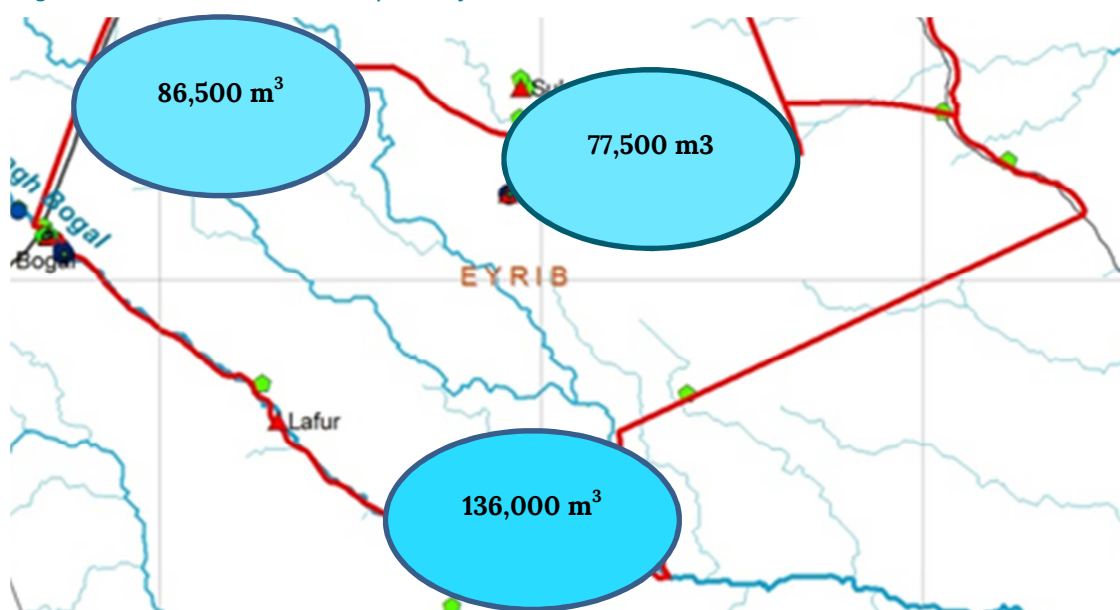
During the WMP workshop the stakeholders agreed that all future water sources need to be created near the present settlements. After the workshop a correction was made for some of the calculations. Table 5 and Figure 7 provide the water gap for the different locations.

Table 5: Location of Water Gaps Eyrib

Sub-location	Total water gap 10 months	Domestic	Livestock	Agriculture	Seasonal	Wildlife
Eyrib	136,000	6,500	101,500	1,000	26,500	500
Boji	86,500	4,000	65,000	500	16,500	500
Sukela	77,500	3,500	58,000	500	15,000	500
Totals	300,000	14,000	224,500	2,000	58,000	1,500

Because of the decision of the Eyrib stakeholders to develop all new sources near the settlements, the water gap is presented for all uses together on the map.

Figure 7: Location of Water Gaps in Eyrib



Some of the arguments, comments and observations by the stakeholders in response to the IRC/Acacia water gap analysis included:

- Planning for domestic water should take into account the fact that provision of domestic water should be at the settlement/sub-location level. This is because the distances between settlements make it difficult for one settlement to access water from another. Also, settlements are sub-clan based, which makes water management easier than when two sub-clans are involved in the management of one water facility, thus reducing the risk of inter-clan hostilities over water, especially during the dry spells.
- While there is an earth pan in Eyrib, there is no water infrastructure at all in Boji and Sukela;
- Due to the limited options for water infrastructure provision, it might not be realistic to plan small scale agriculture even though this has insignificant impact on the water demand for domestic, livestock and seasonal migration.
- Eyrib sub-location, being the largest settlement in terms of population, has and will continue to have more water demand for both domestic and livestock use than Boji and Sukela. For this reason planning for water distribution among the 3 settlements should be based on the following formula: Eyrib 7; Boji 4.4; Sukela 4 (for both domestic and livestock).
- With the above arguments, the water demand for each of the three settlements which make up Eyrib sub-location was recalculated as shown in Table 4 based on revisions by workshop participants and distributed by settlement according to the agreed rationale above.

On further discussions on the water gap in Eryb, it was agreed that analysis of water gap for livestock should not be confined to the locational/administrative boundaries but should include availability of water from neighbouring sources such as Qoqar, Bilci Bur Bur and Ali Dumar. The water available in these settlements was estimated as follows: Qoqar = $23\text{m}^3/\text{day} = 7,500\text{ m}^3$; Bilci Bur Bur = $20\text{m}^3/\text{day} = 6,000\text{ m}^3$; Alidumal = $20\text{m}^3/\text{day} = 6,000\text{ m}^3$. These have been incorporated as part of the present capacity in Table 2.

5 Water infrastructure planning

5.1 Potential 3R interventions

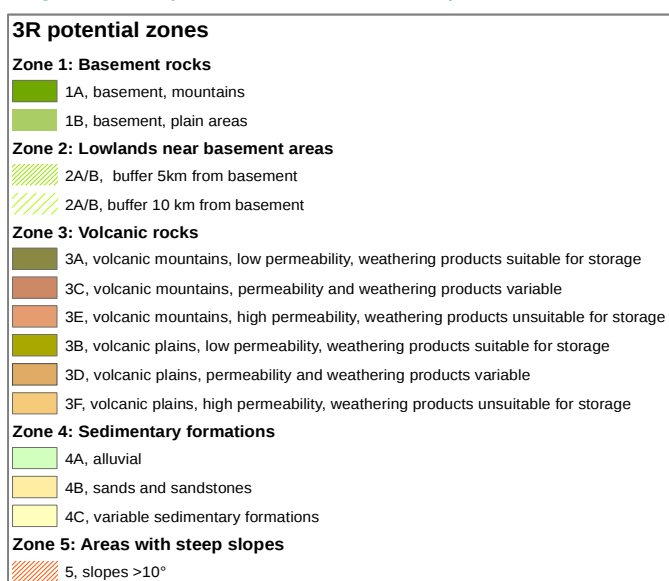
At locations with water shortage the implementation of 3R interventions can help to resolve the shortage by increasing the amount of water that is available in the dry period. For this, several techniques can be selected. Which technique fits best depends on both the types of water demand, and on the physical possibilities for water recharge and retention within the physical landscape. An analysis of the area for potential 3R interventions has produced an area map (Figure 8 and Figure 9), dividing the area in zones where different 3R techniques are most beneficial.

Figure 8: 3R potential zones in the Eyrib area



Source: Acacia, 2013

Figure 9: 3R potential zones in the Eyrib area clarification colour scheme



Source: Acacia, 2013

In the Eyrib target region the following 3R potential zones are present:

- Zone 4A: Alluvium along rivers, variable permeability, potential for shallow groundwater.
- Zone 4C: Variable sedimentary formations, variable permeability and storage potential.
- Zone 5A: Soils with slow surface drainage or stagnant properties.

Figure 10: Indication of the kind of 3R interventions that may be possible in the zones

	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, checkdams, and other run-off reduction /infiltration options	H Closed tanks	G Deeper, confined aquifer groundwater: wells / boreholes
Zone 4A	x			x	x		x	x
Zone 4C	x		?	(x)	x	?	x	x
Zone 4D	x			X		?	x	x
Zone 5A	x					x		

The crosses denote the potential:

x. possible

x. high potential

X. very high potential

(x). limited potential

? unknown

The superscripts denote:

1. Possibly sealing required

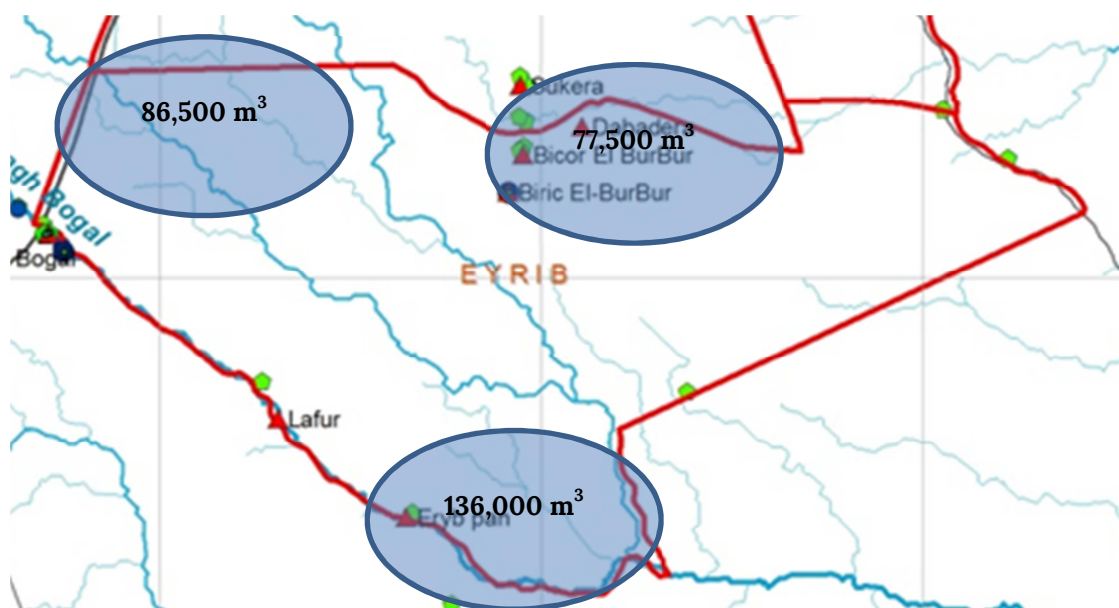
2. Combined with 3B, 3D, 3F, 4C, 4D if impermeable layer is present

This study focuses on shallow groundwater systems; deep groundwater is outside the scope of the 3R study and is only indicated as alternative possibility.

Figure 10 provides an indication of which 3R interventions the most promising interventions may be possible in the area. A more elaborate analysis and description can be found in the assessment report of 2013.

5.2 Recommendations for infrastructure planning

Figure 11: Location of Water Gaps Eyrib



Taking into account the analysis that is summarised in Section 5.1 and the water gap analysis of Chapter 4, the stakeholder meeting agreed on the following:

- Water infrastructure for bridging the gap should be located near the existing settlements for ownership and ease of management, and to avoid creation of new settlements which would

add to the stress on pasture. This is an important statement as it is a deviation of the strategy to plan for rotational wet and dry season grazing lands. It is experienced that creating water sources away from existing settlements will lead to new settlements around these sources, which leads to more livestock and increases the competition over scarce resources.

- Each and every design of infrastructure should take into consideration the fact that the facility would be for both domestic and livestock use.
- For estimating capacity of infrastructure, the following assumptions were agreed upon:
 - Borehole = production rate of 4m³/hr, during 8hr/day, provides approximately 10,000 m³ during a 10 month period.
 - Earth Pan provides 20,000m³ for the 10 month period.
 - Underground Tanks have sizes of app. 100m³. These don't contribute to long term storage, but help to bridge shorter time spans. For example for water trucking.
- There was intensive discussion and debate if newly planned infrastructure should be divided over the different settlements or that it would be better to target one (the major) settlement with priority. It was even suggested if a strategy that aims for abandoning settlements would be preferred. However, because the people from the different settlements belong to different sub-clans it wasn't seen as a politically viable strategy.
- With the above agreements and assumptions, the following tentative infrastructure plan was agreed upon, to cater for domestic, livestock and seasonal migration.

Table 6: Tentative infrastructure planning for Eyrib sub-location

Infrastructure type	No	Total capacity for bridging dry periods of 10 months (m ³)	Sub- location	Uses
Earth pan	5	100.000	Eyrib	Domestic, livestock, seasonal migration
Borehole	1	10,000	Eyrib	Livestock (too saline for human consumption)
Closed tank	1	100	Sukela	

The following considerations are underlying the proposed infrastructure interventions of Table 6:

1. All the 5 earth pans and 1 borehole are located near the Eyrib settlement as it is the largest and fastest growing settlement, according to the area Chief. This view is supported by the CRS Project Manager, who wishes to see Eyrib sub-location supplied with adequate water as a matter of priority before moving to the smaller settlements.
2. After much debate, it was decided that the planned Closed Tank in the KALDRR-WASH program should go to Sukela since it is the only sub-location in the Eyrib area, with no form of water infrastructure. The tank would be used for harvesting surface runoff during the wet period and water trucking during the dry spells.
3. On the short term not all the infrastructure will be implemented. In the context of the KALDRR-WASH project the construction of a Closed Tank and a new Water Pan are foreseen. The workshop participants realise that the estimated water-gap will not be bridged on a short term and accept this as part of the pastoralists' reality. It asks for mitigation with stringent measures in the area of water governance and water management, including private/public water trucking and close monitoring of realities as they unfold.

4. Looking forward, it may be possible in future to dialogue with the County Government for use and ownership of any water facility that may be left behind by road contractors.
5. The 3R possibility for shallow wells in the Eyrib area has never been investigated and should be assessed for its potential.

6 Water governance

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

6.1 Existing water governance structures

Related to the present decentralisation process and the creation of counties, the present status is that Wajir County is in the process of registering the Wajir Water and Sanitation Company whose roles and responsibilities were not yet clear. However, according to a member of the County Task Force that has been charged with the formation of the Company, it is envisaged that the Company will be responsible for the management of all water resources and will be an umbrella organization for all water service providers in the County. In this capacity, it will provide county level policy, regulations and governance oversight as well as technical and financial support to water provision actors. The Water Company would be accountable to the County Government. Currently, administration of water governance is as follows:

- Issues of access at the community level are governed by Water User Associations (WUAs) and/or Water Management Committees.
- Water resource management Authority– WRMA which is in charge of water resources and their allocation.
- Water service provision is the responsibility of Water Service Providers who include both private and public water points.
- Monitoring is the responsibility of: Northern Water Service Board; WRMA; District Water Office.
- Conflict Resolution is the responsibility of facility level water committees supported by the committee's constitutions.

6.2 Effectiveness of water governance structures

In terms of effectiveness, the workshop made the following observations:

- There are inter-clan and political interference in the workings of the WUA/WMC which in turn affects their work and effectiveness, making them weak.
- The water governance institutions are in practice not in line with the water act; in many cases the law is ignored.
- WRMA has not been active at the local level and NWSB has not operationalized the provisions of the water act of 2012 such as putting in place legally recognized water service providers and helping to form WUAs as prescribed by the act.
- The WMCs are weak and more or less under the direction of the clan elders rather than being governed by the water act.
- High illiteracy levels making it difficult for people to understand and demand their rights.

6.3 Challenges regarding water governance

- User groups or sub-clans receive preferred treatment due to the clan culture and local politics.
- Corruption, because there is poor upward and downward accountability.

- Inadequate water results in conflicts, especially during dry spells when the more influential and 'richer' community members use their positions to get more water than others (including trucked water), resulting in inequity.

Suggested solutions include:

- Establishing clear accountability mechanisms to ensure that people understand that they should hold their leaders and the proposed Water Company to account, like:
 - Proper audit mechanism.
 - Upward and downward accountability Forums.
 - Meter water usage.
 - Instituting punishment for abuse: e.g. fine, refund and jail.

6.4 How to improve water governance and management

- Sensitize communities and water users on the water act (2012) and encourage that they hold their WMC to account.
- Build the capacity of all key actors: WMCs, DWO and WSP in order to build a common understanding.
- Increase transparency around political and community interests.
- Iron out conflicting issues and interests among the leaders.
- Operationalize the water act to optimize service provision and operationalise institutional structures - WRUAs, WSPs.

6.5 Action Plan 2014

It is recommended that priority should be given to the development, agreement and operationalisation of accountability mechanisms. This includes the sensitisation of communities (and the elder system) to understand their rights and obligations in ensuring that constitution is respected and enforced by all water actors. As part of the mechanism, unaccountable officials should not only be voted out but should also be subjected to a punishment regime such as being made to repay and also subjected to the court system.

Much will depend on how the (high-level) initiative of the Wajir Water and Sanitation Company will develop and how the responsibilities for the different actors will be redefined, but once this becomes operational, the company should monitor the activities of the WMCs.

Concretely for 2014, the proposals are to:

- Facilitate the formation and registration of WUA/WMC.
- Link WUA/WMC with the proposed company to enable them to work out an operational modus.
- Putting in place accountability forums.
- Build the capacity of water management committees (WMC) on sustainable water resource management.

The County Government and Caritas Garissa are seen as leading organisations for the action plan.

7 Water service management

7.1 Existing water service management strategies and challenges

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

- o Water service management is governed by the provisions of the water act and includes management by:
 - o WSBs who occasionally act through the district water office at the district level.
 - o 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.
 - o The water committees are responsible for tariff setting for domestic and livestock use, and for ensuring equity in access to water.
 - o In Wajir and other arid lands areas, the committee integrates both modern and traditional management systems with the elders taking responsibility for conflict resolution.
 - o Water committees are accountable to both the water users who elected them and to the traditional elder system.
 - o While the water committees are responsible for tariff setting for public water services, private water truckers set tariffs for, and manage privately trucked water. In both cases, the tariff is set according to type of use, i.e. domestic or livestock. In the case of livestock, the tariff is again set according to the type of livestock.
 - o Operation and maintenance should be the responsibility of the WUAs and Water Management Committees but in most cases, in Wajir and other arid lands districts, NGOs and the district water office do step in to support the operation and maintenance of water facilities, especially of boreholes and for de-silting of earth pans.
 - o The Water Act is not fully followed, partly because institutions like the WSB and WRMA lack the capacity to cover their regions and therefore are locally not present.
 - o The WUA is hardly supervised or supported by the WSB and has for example resulted in lack of a billing system, where this is required according to the Water Act. (Tariffs are set by the community; billing is according to use (domestic, livestock).
 - o WSB uses private tankers to supply water.
 - o A lot of water is unaccounted for.

7.2 How to improve water service management

- Governance
 - Use the devolved governance system as an opportunity and prepare the County Water Bill in line with the provisions of the national Water Act, 2012.
 - Complete the formation and registration of the Wajir Water and Sanitation company;
 - Improve/rehabilitate existing water infrastructures.
 - o Operations
 - Train a rapid response team, local technicians and mechanics and the WMC on basic maintenance.
 - Build the capacity of WUA and the staff of the proposed water company.
 - Monitor and regulate water service provided,

- Make sure that water bills will be paid in time and look into modernisation of payment system to improve transparency, including metering of water usage.
- Build a local stock of spare parts.
- Penalty for misappropriation.

7.3 Action Plan 2014

Priority should be given to the management arrangement for the water services, including O&M responsibilities and a system for financial management. Users should play an important role in holding the WMC to account, including the role of the elected members.

The county water office should have a leading role in this.

8 Capacity building

8.1 Existing capacity gaps

The Eyrib stakeholders observed that following the ongoing decentralisation of the government system in Kenya, roles and responsibilities in the areas of water governance and water service provision are being realigned and redefined. Therefore, it is not possible to identify or pinpoint the exact capacity gaps. Nevertheless, some capacity gaps were identified at 2 levels:

- o At the community level the Water Management Committees (WMCs) have the following gaps:
 - o They are not trained in their roles and responsibilities.
 - o They are not registered.
 - o They have no constitution to guide their operations.
 - o They have no financial management and bookkeeping skills.
 - o They have no bank accounts.
 - o There are no clear election procedures to guide the users in electing WMC members and as a result the water users do not 'own' the WMC and the WMCs are therefore not accountable to the users.
- o At county level it was noted that:
 - o There are no well-defined structures for management of water resource and water service provision.
 - o The water, environment and sanitation coordination body (WESCOORD) is weak.
 - o The devolved system is not clear on roles and responsibilities for water provision and water resource management.

8.2 Opportunities

The following opportunities can be leveraged to work on the identified gaps:

- o This water master plan (WMP).
- o The devolved governance system and political will.
- o The proposed water company.
- o Strengthening of WESCOORD.
- o Presence of NGOs willing to work in Eyrib.

8.3 Action Plan 2014

Identified priorities for 2014 are:

- Strengthening of WESCOORD to be an active partner for experience sharing and lesson learning.
- Expanding the membership of WESCOORD to include community members.
- Capacity building of the WMC on financial management, O&M (including tariff setting).

CRS/Caritas Garissa will lead the capacity building action plan with support from the District Water Office.

9 Action Plan 2014

The action plan for 2014 is summarised in Table 7:

Table 7: Action Plan Eyrib 2014

Component	Proposed Action	Priority for 2014	Estimated budget requirement	Responsibility
Water infrastructure	- New water infrastructure to be located near the existing settlements only. - Each and every design of infrastructure should take into consideration the fact that the facility would be for both domestic and livestock use.	- Water pan Eyrib with volume of 20,000 m³ - Closed tank at Sukela with a volume of 100 m³	- Kshs.6.5 million - Kshs.1 million	CRS/Caritas Garissa
Water Governance	- Agreement and operationalization of an accountability mechanism. This includes: - Sensitized communities (and the elder system) which understand their rights and obligations in ensuring their constitution is respected and enforced (including ensuring that unaccountable officials are not only voted out but are also subjected to a punishment regime such as being made to repay and also subjected to the court system) - Monitoring of the activities of the WMC by the proposed water company, the district water office and other support organizations	- Facilitating the formation and registration of WUA/WMC - Linking WUA/WMC with the proposed company to enable them work together and understand - Putting in place accountability forums - Capacity building/training water management committees (WMC) on sustainable resource management		- County Government - Caritas Garissa
Water Service Management	- Policy development which involves preparing County Water Bill in line with the provisions of the national Water Act, 2012 - Water service provision which includes: - Formation and registration of Wajir	- Financial management - O&M; and, - Management arrangement of water services		County water office

	water company and capacity building of the company – Capacity building of WUA – Improvement of infrastructure • Monitoring and regulating water service provision • Strengthening O&M services by: – Training a rapid response team – Training local technicians and mechanics – Capacity building of WSP on basic maintenance – Establishing local stockists for spare parts • Tightening Payment system by: – Modernize payment system – Regulate payment – Metering water system – Penalty for misappropriation			
Capacity Building	- o Capacity building of all structures at county and community level that are responsible for water governance and water service management, including O&M - o Capacity building of the County Water Company	- o Expanding the membership of WESCOORD to include community members - o Facilitating dialogue and consultations between WESCOORD and Netwas for capacity building program		• CRS and Caritas Garissa supported by the District Water Office

Annexes

Annex 1: Summary Report from Working Groups WMP workshop (Dec. 2013)

Existing Governance structures	Conflict Resolution	Effectiveness of water governance structures	Challenges regarding water governance	How to improve water governance and management	Action Plan	Priorities: what targets do we want to achieve in 2014	Responsibility for achieving target
Issues of access at the community level are governed by: WUAs Water Management Committees Water resource management – WARMA which is in charge of water allocation Water service provision is the responsibility of WSBs represented at the local level by the District Water Office responsible for water service provision	Conflict Resolution Committees supported by the committee's Constitutions	Inter-clan and political interference in the workings of the WUA/WMC, thus affecting their work. Institutions not in line with the water act; ignorance of the law. WARMA not present at the local level. NWSB has not operationalized the provisions of the water act, 2012. High illiteracy levels making it difficult for people to either conceptualize or demand their rights.	Nepotism/biasness against some user groups due to clanism and power competition. Corruption, leading to poor upward and downward accountability. Solution Clear accountability mechanism – ensuring that people are sensitized to understand that they should hold their leaders to account (downward) while account upwards to the Water Company. Proper audit mechanism. Accountability Forums. Metering water usage. Institute punishment e.g. fine, refund and jail.	Sensitize communities on the water act, 2012, and their rights and obligations under the water act, 2012, in holding WMC to account. Build the capacity of WMCs. Synchronize political and community interest. Operationalize water act to optimize service provision. Good planning. Iron out conflicting issues and interests among the leaders. Institutionalizes the structures – WRUAs, WSPs, WMC/WUAs; High level trainings.	Downward: Agreement and operationalization of an accountability mechanism. This includes: <i>Sensitized communities</i> (and the elder system) which understand their rights and obligations in ensuring their constitution is respected and enforced (including ensuring that unaccountable officials are not only voted out but are also subjected to a punishment regime such as being made to repay and also subjected to the court system).	Facilitating the formation and registration of WUA/WMC. Linking WUA/WMC with the proposed company to enable them work together and understand. Putting in place accountability forums. Capacity building/training water management committees (WMC) on sustainable resource management.	County Government. Caritas Garissa.

Existing Governance structures	Conflict Resolution	Effectiveness of water governance structures	Challenges regarding water governance	How to improve water governance and management	Action Plan	Priorities: what targets do we want to achieve in 2014	Responsibility for achieving target
Monitoring is the responsibility of: Northern Water Service Board ; WARMA; District Water Office				for water actors and managers in order to build common understanding	<i>Monitoring of the activities of the WMC by the proposed water company, the district water office and other support organizations</i>		

Capacity Building				
Existing Gap	Opportunities	Improvements	Target for 2014	Responsibility
Community level WMC not trained; not registered; no constitution; no election procedures; no finance management and bookkeeping; no ownership of WMC by the community; no bank account. County level No well defined structures for management of water resource and service provision; Weak WESCORD; Devolved system not clear on roles and responsibilities for water provision and water resource management; appropriate technologies for the Wajir context not adopted in water provision.	This water master plan (WMP); the devolved governance system/political will; the proposed water company; strengthening of WESCORD; presence of NGOs willing to work in Eyrib; exploring all available to select most appropriate infrastructure for Eyrib.	Strengthening of WESCORD to be an active partner for experience sharing and lesson learning. Capacity building of the WMC on financial management, O&M (including tariff setting).	Expanding the membership of WESCORD to include community members Facilitating dialogue and consultations between WESCORD and Netwas.	CRS and Caritas Garissa supported by the District Water Office.

Annex 2: List of Participants WMP Eyrib workshop, 10 and 11 December 2013

No.	Name	Title	Organization
1	Daud Hashi	District Water Officer, Wajir South	Water
2	David M. Kerabu	District Agriculture officer	Department of Agriculture
3	Simon Lekartiwa	District Livestock Production Officer	Livestock department
4	Mohamed Akale	District Warden	KWS
5	Daud Y. Guliye	Task Force Member	Wajir Water Company
6	Ibrahim Sheik	WASH Advisor	WASDA
7	Ismail Ali Abdille	Program Officer	District Pastoral Association
8	Willick Otang'o	WASH Technician	Save the Children
9	Mohamed Musa Ali	Community Mobilizer	Caritas Garissa
10	Benson Mwariga Mwarongo	PHPO	Caritas Garissa
11	Adan Abdi Farah	Eyrib WUA	Eyrib
12	Abdullahi Abbas Ali	Eyrib WUA	Eyrib
13	Mohamed Hassan Husein	Eyrib WUA	Eyrib
14	Abdi Noor Farah Gore	Eyrib WUA	Eyrib
15	Mohamed Arab Hussein	Eyrib WUA	Eyrib
16	Mohamed Barreh Abdullahi	Chief	Eyrib Location
17	Styvers K. Kathuni	Project Manager - WASH	CRS
18	Steve Mathenge	Driver/Mechanic	CRS
19	Gabriel N. Njiru	WASH Coordinator	Caritas Garissa
20	Alice Wanza	Accountant	Caritas Garissa
21	Daniel Kiptim	Water Technician	caritas Garissa
22	Rene van Lieshout	Senior Program Manager	IRC
23	Margaret Ombai	IRC Consultant	Tacitus Ltd

Annex 3: Outcome of the "Financing sustainability" workshop - October 2014 – Habaswein

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 with the annual budget based on the Life-cycle Cost Approach (LCCA).

On 21st, 22nd and 23rd of October, a LCCA workshop was organised in Habaswein by CRS, 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 set of representatives from national and local government and civil society actively participated in this workshop.

During the workshop, the activities as described in the Wajir 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 December 2013, was presented to the participants. The following comments and additions were provided by the participants:

- 5% growth rate is usually considered in health sector in Wajir for planning (instead of 3.2% as used to calculate Domestic Water Demand in the report). This is based on the polygamous nature of families and low use of family planning methods in this Muslim dominated area.
- A set of new infrastructures have been built in the area:
 - o A new borehole has been drilled and equipped by the county government in Eyrib,
 - o CRS/Caritas Garissa have constructed a 20,000m³ earth pan at Eyrib,
 - o CRS/Caritas Garissa have constructed a 100m³ underground masonry water tank at Sukela
 - o As the Wajir County rolls out private service provision in water services management, it was noted that some boreholes had been drilled by the

community through community contribution e.g. Kursin and Dadajabula. The participants felt that it will be problematic to hand over such boreholes.

- Regarding water management and regulations, the following comments were made:
 - o The WUA doesn't pay taxes on water directly but in other forms e.g. taxes on electricity bills generated from pumping water etc.
 - o Local elders and WMCs continue to manage water points in most areas of Wajir including Eyrib area
 - o Enforcement of the by-laws has been a challenge since the community members are not aware about them
 - o Transparency and accountability has been lacking amongst most WMCs. Some community members have also tried to replace a WMC committee in an attempt to improve transparency. However, an example was given of a community that replaced a committee only for the new committee to embezzle funds after a few months.
 - o Communities were reported to be removing water meters with the notion that they would receive then more water. This was a misconception by the community on the function of water meters.

3-Activities and budget for 2015

On day 2, participants elaborated on the activities for the year to come, related to the water master plan. On day 3, 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 LCCA. 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 question which organization/stakeholder is responsible for the activity.

Figure 1: The Life-cycle costs of water services

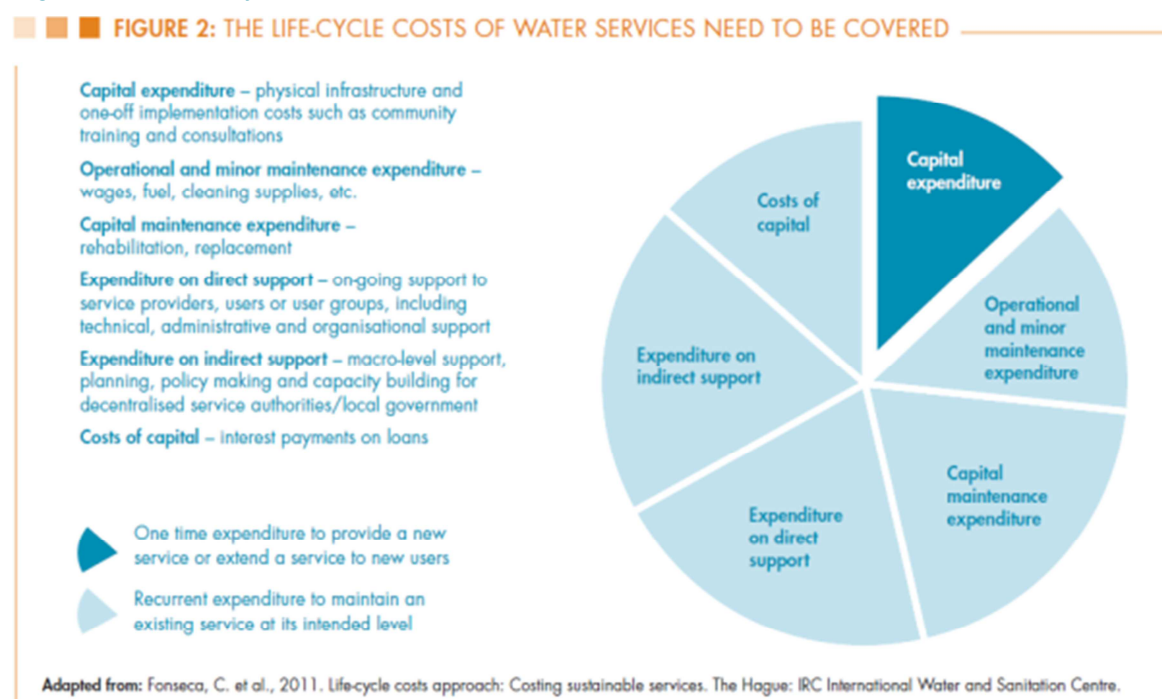


Table 1: Budget per cost category

Cost category	Total costs (in KES) in 2015	Costs per person (KES/ person) in 2015 (based on an average population of 3,500 people)
Total capital expenditure	81,349,500	23,243
Operation and minor maintenance costs*	0	0
Direct support costs	2,491,400	712
Indirect support costs	0	0
Total	83,840,900	23,955

* 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	Install elevated storage tanks (steel) of 50 m ³ in Eyrib	2	3,500,000	7,000,000
A2	Technical survey for borehole potential in Boji	1	120,000	120,000
A3	Water pan construction of 45,000 m ³ in Sukela	1	35,000,000	35,000,000
A4	Water pan construction of 45,000 m ³ in Boji	1	35,000,000	35,000,000
A5	Technical survey for borehole and shallow well potential in Eyrib	1	150,000	150,000
			sub-total A	77,270,000
B - WATER GOVERNANCE				
B1	Registration of the WMC with social services and link with WAJWASCO (owned by County Gov.)	1	50,000	50,000
B2	Organize public baraza through area chief and sensitize on accountability and transparency + county water bill	3	25,000	75,000
B3	Formation of conflict resolution committee (5 people)	1	0	0
B4	Technical study to map the aquifer	1	250,000	250,000

B5	External audit of the WMC (operational & finance)	1	50,000	50,000
B6	Monitoring & evaluation of WMC by the County Water Office + key stakeholders (3 people)	4	100,000	400,000
			sub-total B	825,000

C - WATER MANAGEMENT				
C1	Training of the County "Rapid Response Team": 2 x technicians, 2 x mechanics, 2 x plumbers and 2 x electricians (15 days)	1	884,000	884,000
C2	Procurement of maintenance tools and spare parts for the "Rapid Response Team"	2	1,850,000	3,700,000
C3	Recruitment of 1 x operator + 2 x clerks for the WMC	1	0	0
C4	Training of 2 x operators (technical) + 2 x clerks (accountancy) - for 2 days	1	75,000	75,000
C5	Install water meter at every pipe outlets	2	50,000	100,000
C6	Installation of water meter on the borehole	1	29,500	29,500
			sub-total C	4,788,500

D - CAPACITY BUILDING				
D1	Training of WUA/WMC on Water management: financial management (bookkeeping + banking) + Leadership + O&M + Roles and Responsibilities of the members + role of WajWesco - for 5 people during 3 days	2	123,500	247,000
D2	Training of WUA/WMC + Key stakeholders on devolved water system & shifting responsibilities from the National to the County government - for 20 people during 5 days	1	446,000	446,000
D3	Advocacy training towards the community members and CBOs (about 20 people for 1 day) on new role and responsibilities + changes in policy	1	21,000	21,000
D4	Training of local suppliers (5 people for 1 day) on spare parts	1	28,200	28,200
D5	Organizing and facilitating exchange visit for community members (3 days for 10 people)	1	215,200	215,200
			sub-total D	957,400

TOTAL	83,840,900
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Table 3: Budget per cost category, including suggestions by participants

WATER MASTER PLAN - Eyrib location						
ACTIVITIES AND BUDGET 2015 Date: 22/10/2014 - By IRC, CRS and stakeholders						
		Number (in 2015)	Unit cost (KES)	Total cost (KES/year)	Cost category	Who is responsible?
A - INFRASTRUCTURE						
A1	Install elevated storage tanks (steel) of 50 m3 in Eyrib	2	3,500,000	7,000,000	CapEx	CDF/NGO/CG-W
A2	Technical survey for borehole potential in Boji	1	120,000	120,000	CapEx	NGOs/CBOs (impl.)/CG-W (lead)
A3	Water pan construction of 45,000 m3 in Sukela	1	35,000,000	35,000,000	CapEx	CG-W (lead)/NWSB/Nat. Water. Cop/Nat. Irr. Board
A4	Water pan construction of 45,000 m3 in Boji	1	35,000,000	35,000,000	CapEx	CG-W (lead)/NWSB/Nat. Water. Cop/Nat. Irr. Board
A5	Technical survey for borehole and shallow well potential in Eyrib	1	150,000	150,000	CapEx	County Water Office (lead) / Communities (shallow wells)
			sub-total A	77,270,000		
B - WATER GOVERNANCE						

B1	Registration of the WMC with social services and link with WAJWASCO (owned by County Gov.)	1	50,000	50,000	ExpDS	Chief/Community
B2	Organize public baraza through area chief and sensitize on accountability and transparency + county water bill	3	25,000	75,000	ExpDS	Chief/DWO/CSOs
B3	Formation of conflict resolution committee (5 people)	1	0	0	ExpDS	Chief/DWO/Community
B4	Technical study to map the aquifer	1	250,000	250,000	CapEx	DWO/CWO/Chief/Community/WRMA
B5	External audit of the WMC (operational&finance)	1	50,000	50,000	ExpDS	DWO/External auditor/WUA
B6	Monitoring & evaluation of WMC by the County Water Office + key stakeholders (3 people)	4	100,000	400,000	ExpDS	CWO (lead)/Key stakeholders/CSOs
			sub-total B	825,000		
C - WATER MANAGEMENT						
C1	Training of the County "Rapid Response Team": 2 x technicians, 2 x mechanics, 2 x plumbers and 2 x electricians (15 days)	1	884,000	884,000	ExpDS	County Water Office, NGO
C2	Procurement of maintenance tools and spare parts for the "Rapid Reponse Team"	2	1,850,000	3,700,000	CapEx	CWO, NGOs, NDMA
C3	Recruitment of 1 x operator + 2 x clerks for the WMC	1	0	0	OpEx	WMC/Community
C4	Training of 2 x operators (technical) + 2 x clerks (accountancy) - for 2 days	1	75,000	75,000	ExpDS	CWO, NGOs

C5	Install water meter at every pipe outlets	2	50,000	100,000	CapEx	CWO, NGOs
C6	Installation of water meter on the borehole	1	29,500	29,500	CapEx	WMC
			sub-total C	4,788,500		
D - CAPACITY BUILDING						
D1	Training of WUA/WMC on Water management: financial management (bookkeeping + banking) + Leadership + O&M + Roles and Responsibilities of the members + role of WajWesco - for 5 people during 3 days	2	123,500	247,000	ExpDS	County gov. Dept of water / NGOs
D2	Training of WUA/WMC + Key stakeholders on devolved water system & shifting responsibilities from the National to the County government - for 20 people during 5 days	1	446,000	446,000	ExpDS	County gov. Dept of water / NGOs
D3	Advocacy training towards the community members and CBOs (about 20 people for 1 day) on new role and responsibilities + changes in policy	1	21,000	21,000	ExpDS	County gov. Dept of water / NGOs
D4	Training of local suppliers (5 people for 1 day) on spareparts	1	28,200	28,200	ExpDS	County gov. Dept of water / NGOs
D5	Organizing and facilitating exchange visit for community members (3 days for 10 people)	1	215,200	215,200	ExpDS	County gov. Dept of water / NGOs
			sub-total D	957,400		