WASH NEEDS ASSESSMENT FINAL REPORT

"Improve access to clean water, sanitation facilities and quality primary healthcare in Isiolo County, Sub-Counties of Merti, Isiolo and Garbatulla" (M.A.P.S.)

Submitted by:

Ambrose Esa Siwa

Development & Management Consultant

DYNASTY AFRICA CONSULTANTS

Dynasty Africa Consultants
Central Square Building 2nd Floor
P.O. Box 9767-40141
Kisumu Kenya
e-mail: dycon13@gmail.com
Website:

Mobile: +254 714 404 006

E-mail: ambrosiwa@yahoo.co.uk; ambrosiwa@gmail.com

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LIST OF ABBREVIATIONS

ASAL	Arid and Semi-Arid Lands
CBO	Community Based Organization
CDF	Constituency Development Fund
CHAST	Children Hygiene and Sanitation Training
CHW	Community Health Worker
CIDP	County Integrated Development Plan
CLTS	Community Led Total Sanitation
CMDRR	Community Managed Drought Risk Reduction
CTDF	Community Development Trust Fund
DRR	Drought Risk Reduction
DWO	District Water Officer
EC	European Commission
EMCA	Environmental Management Coordination Act
ENNDA	Ewaso Nyiro National Development Authority
FBO	Faith Based Organization
FGDs	Focus Group Discussions
Hh	Household
Ksh	Kenya Shilling
KWS	Kenya Wildlife Services
LVIA	Lay Volunteers International Association
MDG	Millennium Development Goals
M-IDP	Merti Integrated Development Programme
MoPH	Ministry of Public Health
NEMA	National Environmental Management Authority
NGO	Non-Governmental Organization
NSWB	Northern Service Water Board
O&M	Operation and Maintenance
ODF	Open Defecation Free
PHAST	Participatory Hygiene and Sanitation Promotion
RC	Rock Catchment
RWH	Rain Water Harvesting
ToT	Training of Trainers
UNICEF	United Nations Children Fund
WARMA	Water Resource Management Authority
WASH	Water Sanitation and Hygiene
WRUA	Water Resource Users Association
WUA	Water Users Association

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To all I say THANK YOU (*Asante sana*) and God bless.

EXECUTIVE SUMMARY

The project "Improve access to clean water, sanitation facilities and first health quality services in the County of Isiolo, Merti, Isiolo and Garbatulla Sub-Counties (MAPS)", financed by the Italian Ministry of Foreign Affairs, will be implemented in Isiolo County (Merti, Isiolo and Garbatulla Sub-Counties), which is classified as ASAL (Arid and Semi-Arid Lands) and is drawing humanitarian attention because of repeated droughts affecting the area and of socio-economic marginalization that characterizes the region due to political and cultural issues. The project foreseen duration is 36 months and direct beneficiaries will be 55,309 in total.

The project's main objective is to improve living conditions for pastoral communities in Isiolo County, contributing to reach he 7th Millennium Goal on water and hygienic facilities, with a further impact on reducing water borne diseases (especially diarrhoea, 6th objective) and improving maternal and child health (4th and 5th objective). The specific objective is to improve the continuous and sustainable access to clean water (for human and animal consumption) and existing hygiene facilities for the pastoral communities in the three Districts of Garbatulla, Merti and Isiolo.

The WASH assessment was conducted between 11th and 25th September 2014 in three sub-counties of Isiolo, Merti and Garbatulla, the target intervention areas for LVIA. It complements an earlier quantitative assessment conducted in the same areas by LVIA. The assessment collected data through assessment instruments including Household questionnaires, Key informant interviews, Focus Group Discussions and Observation. Community mapping and photographs formed part of information gathering.

The objective of this WASH Needs Assessment was primarily to collect detailed, accurate and credible information on the WASH needs of the communities of Isiolo County (Merti, Isiolo and Garbatulla Sub-Counties), especially relating to health facilities and schools, Town Water supplies and water pans/sand dams/rock catchments, with a special focus on the access of safe drinking water, hygiene behaviours and sanitation.

This report presents field findings and makes recommendations for further action.

Key findings

- With persistent droughts and low community participation level, sustainability of interventions remains a challenge.
- Though WESCOORD which is a technical forum has brought implementers together at county level, field coordination among the actors is weak.
- Community governance structures eg. Village committees, Water, Health and Education committees do exist at every site we visited. However, they remain weak and require capacity building.
- Infrastructure is poor in most areas and this hinders communication and access to intervention areas. Some areas are impassable when it rains.

Water

- Most water supply is derived from groundwater sources ie. Boreholes, shallow wells, sand dams and water pans.
- Water points are community owned apart from Isiolo and Merti Towns which are managed by Isiolo Water & Sewerage Company (IWASCO) and Merti Water Service Providers Association. Borehole systems are mainly preferred.
- There are few emerging WRUAs to manage the catchment areas effectively. The existing ones in Oldonyiro, Kipsing and Merti need capacity building to enable them effectively execute their mandate especially in the management of Sub-catchment Management Plans (SCMPs).
- There are frequent pipe bursts along the distribution lines mainly due to low quality pipes and high pressure through small diameter pipes. This has increased O&M costs for water committees to maintain the lines. The amount of water that is lost due to non-revenue water cannot be gainsaid.
- Sustainability of water projects is possible if implementers sensitize the community on proper water management.
- From the survey conducted by Red Cross and evidenced by field observations, most water points are unprotected and some Boreholes like one at Bulesa was abandoned due to poor quality of water.
- Most water pans have high seepage rate and not reliable for long term water supply.
- The most common water storage system is the Plastic tank of 5-20m3 capacity. Masonry storage tanks have a capacity of 150m3 and would be ideal to serve more people. However cost implications and the quality of the constructions works have to be considered.

Sanitation

- Sanitation coverage in the county is still low. Open defecation is still common in the villages and town peripheries.
- CLTS has not taken root in most parts of the county. According to Red Cross statistics, only 11 villages in Garbatulla and 20 in Isiolo sub-counties have been declared ODF.
- Latrine coverage in the villages is quite low. In some villages like Bulesa the ratio of household per toilet is 55 hh: 1 toilet.

Household survey

- The main sources of water across the sub-counties are borehole (59%) and shallow wells (27%) by mention.
- Majority of the respondents stated that the distance between water points and their homes is less than a kilometer (77%); indicating that water availability may not be the big problem but management of water resources.
- Time taken to draw water from water source is less than 30 minutes (55%).
- Most households consume more than 30 litres of water per day (89%). This emphasizes the water need among households. Water storage is mainly in containers with lids.

- Most households neither treat (68%) nor boil the water (82%).
- Most the sampled households interviewed had covered toilets (66%) while 25% go to neighbors and 9% go to the bush (open defecation).
- 100% of sampled respondents of 44 households indicated that they wash their hands and most of them use soap (93%). If this could be replicated in the wider project area, it will boost sanitation interventions in general and CLTS in particular.
- Garbage disposal is mainly done through waste pits and burning (98% response in 44 households).
- Most common diseases are diarrhoea (27%), water borne diseases (27%), cholera (14%) and typhoid (14%) responses. This was more evident in areas with low latrine coverage.

CONCLUSION

Improving access to safe, adequate and sustainable water supply as well as improved sanitation (hygiene practices) and awareness among pastoralist communities in Isiolo County remain a big challenge for implementing agencies. Local capacity to sustain WASH interventions is still weak. With proper planning and coordination coupled with appropriate technical capability, LVIA will be able to effectively implement WASH activities and subsequently have greater impact in its interventions in Isiolo County.

1. INTRODUCTION

1.1 The Project

The project "Improve access to clean water, sanitation facilities and first health quality services in the County of Isiolo, Merti, Isiolo and Garbatulla Sub-Counties (MAPS)", financed by the Italian Ministry of Foreign Affairs, will be implemented in Isiolo County (Merti, Isiolo and Garbatulla Sub-Counties), which is classified as ASAL (Arid and Semi-Arid Lands) and is drawing humanitarian attention because of repeated droughts affecting the area and of socio-economic marginalization that characterizes the region due to political and cultural issues. The project foreseen duration is 36 months and direct beneficiaries will be 55,309 in total.

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The project aim at reducing vulnerability due to poor accessto clean water and hygienic services of the pastoral communities in Isiolo County by:

Expected Result: 1) Improving access to safe, adequate and sustainable water supply through rehabilitation, restoration and protection of existing water sources and construction/rehabilitation of and roof rain water harvesting scheme in schools/community.

Activities:

1.1. Cleaning/protection/rehabilitation of 21 water sources for domestic and animal use (boreholes, pipelines extension, shallow wells, water pans and sand dams) in the 3 sub-counties;
1.2. Creation, formation and training of 5WRUAs to run the rehabilitated water sources;
1.3. Construction/rehabilitation of 28 Rain Water Harvesting Systems (in schools and in community centres);
1.4. Distribution of Water Pur sachets and jerry cans and awareness-raising on their correct use to 2,000 households during the most critical months of the year, in order to overcome drought emergency;

Expected Result: 2) Improving access to safe and appropriate sanitation facilities through the construction of latrines in targeted public school and community centres and increasing

awareness of hygiene/sanitation practices, especially amongst women with children under five, and populations living in areas prone to cholera, drought, and floods.

Activities:

2.1 Construction of 40 blocks of latrines and hand wash facilities in schools and community centres;
2.2 Formation of 15 School Health Clubs and organization of monthly sensitization meetings with students and teachers on the proper use of latrines, cleanness and good hygienic practices and prevention of communicable transmitted disease;
2.3 Distribution of 30 sanitary kits (in schools and in community centres) to keep the compound clean;
2.4 Creation of 15 village Health Committees on health and hygiene promotion and follow ups;

1.2 Context

For a long time, Isiolo County has been affected by conflict and drought which hinder it from sharing the process of socio-economic development the rest of the Country is benefitting from. In 2013, rains (200% beyond average levels) caused serious damages to infrastructures (schools, health centres, water sources, latrines), with devastating consequences on pastoral communities and their livestock: because of limited access to water and pasture, as well as crop destruction, insecurity has risen. The intervention aims at improving access to quantity and quality of available water through: rehabilitation/reconstruction of water sources and construction of rainwater harvesting systems. Furthermore, it targets improving access to primary health services by constructing latrines and organizing trainings to ToT which underline the importance of correct WASH practices, promoting maternal and child health and reducing the vulnerability linked to poor access to clean water and hygienic facilities of the pastoralist communities of Isiolo County.

The County is sparsely populated (143,294 inhabitants). Economic activities are intimately linked to available natural resources; the area has very low agrarian potential. The only activity which is suitable in such hostile environment is pastoralism. The nomadic or semi-nomadic life style is the most suitable to weather and environment conditions of the area. Targeted beneficiaries amount to 57,150 (20% of the local population). All of them will benefit from sensitization activities on health and sanitation carried out by 15 Health-care facilitators who will be trained on the job; in addition to this, they will access to clean water for human consumption and animal watering, thanks to water points reconstruction/protection. Furthermore, beneficiaries will be thus composed of: 7,250 students (20% of whom female), who will have water in schools, benefiting from rainwater harvesting systems and latrines, as well as from education activities on their correct use; 10,000 people (2,000 households) will benefit from the dissemination of health and sanitation material and Water Pur kits; the ones remaining (11,250 persons) will fetch water from wells and from rehabilitated sources. Indirect

beneficiaries of the action will include 114,560 people (80% of the population), who will benefit from built infrastructures and sensitization activities organized in collaboration with communities.

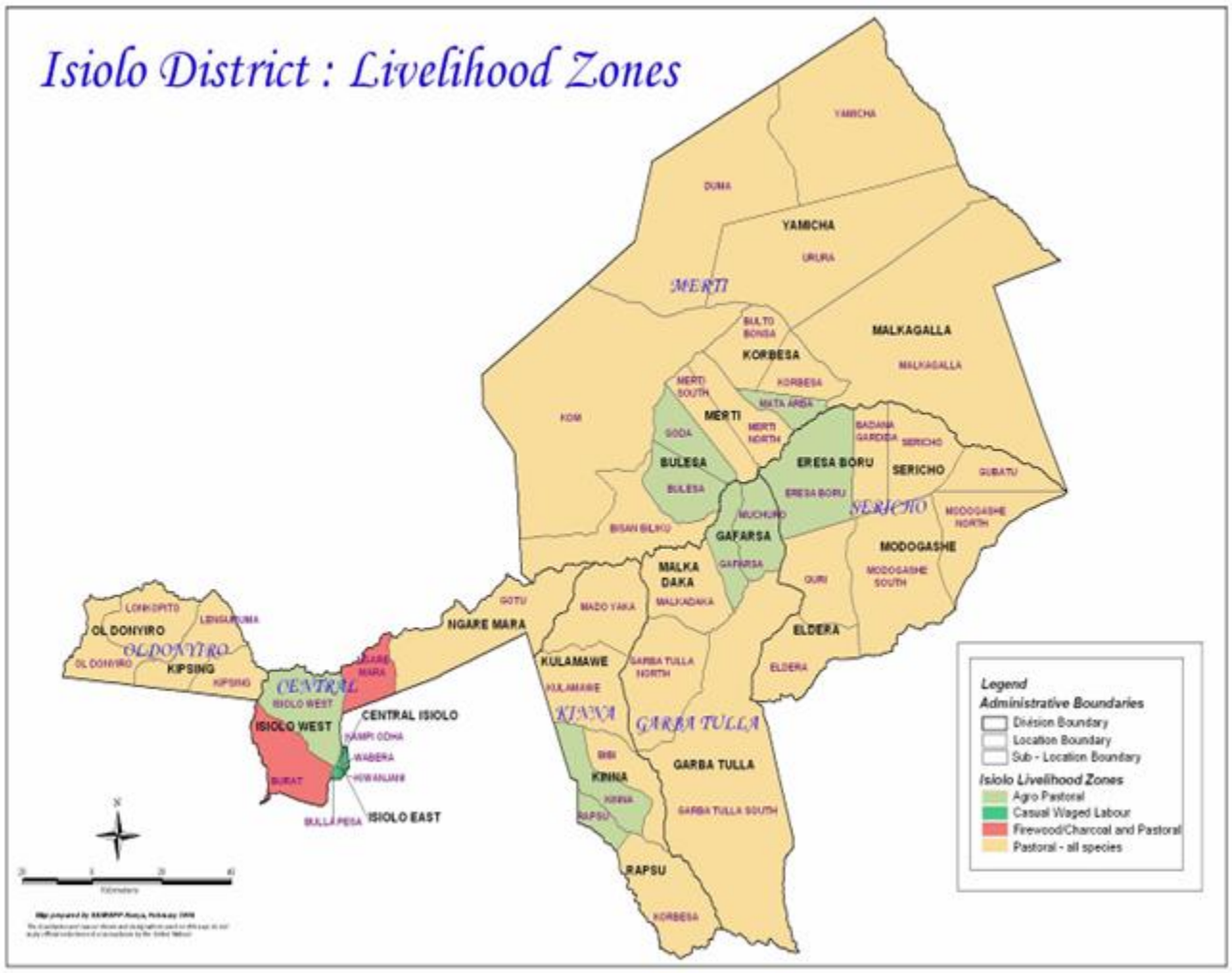

Fig 1: Map of Isiolo showing livelihood zones

Millennium Development Goal (MDG) No. 7 commits countries to halve by 2015 the proportion of people without sustainable access to safe drinking water and basic sanitation while MDG No.4 commits to reduce the under-five mortality rates by two thirds by 2015. Africa disease burden arising from open defecation is enormous and deadly. WHO (2004) estimated that in 2002, about 707,000 people died from diarrhoeal diseases in Africa. Though it is difficult to establish exactly how many of these deaths are directly related to open defecation, it is known that hygiene behaviour and sanitation circumstances play major roles in transmission of these diseases and it is clear that open defecation is an important risk factor to diarrhoeal diseases[1].Kenya Demographic Health Survey (KDHS 2003) estimated under-five mortality as

[1] Kamal Kar and Kirsty Milward (2007). *CLTS Foundation and Institute of Development Studies*

115/1,000 live births. Much of this burden is due to diseases which can be reduced by hand washing: diarrhoeal and respiratory tract infections, caused 16 % of deaths among Kenyan children under five years in 2002–2003 (WHO 2006)
The management of fresh water resources and of services drawing upon water functions central to human life is of critical importance to healthy social, economic, and political well - being. Stresses exerted on the world's water by demand from growing populations with changing consumption patterns, pollution and lack of environmental controls, have pushed water concerns high on the international agenda. Effective water resources development and management is recognized as a key component of "environmentally sustainable development". Poor management of the resource can easily become a brake on socio-economic development[2].

1.3 LVIA Intervention

LVIA's presence in the County contributed to identifying the core problem of the area, that is insufficient access to water for human consumption and animal watering. As a matter of fact, traditional wells are mostly unprotected, resulting in high risk of contamination; similarly, unprotected sand dams and water pans may collapse during floods or when Ewaso Ng'iro River overflows. In addition to this, the vast majority of wells are in poor conditions, thus restraining access to water. Unsafe disposal of faces and incorrect hygienic behaviour engender an increase in diarrhoea morbidity rate in both children (below 5 years old) and adults. In partnership with Caritas, LVIA established a response to the September 2011 drought emergency, through water trucking and distribution of Water Pur sachets in several villages of Isiolo County. Lately, in 2012 and 2013, funding opportunities by OCHA allowed the construction of 12 blocks of latrines and 8 rainwater harvesting systems in Public Schools, as well as the rehabilitation of 3 shallow wells (Nyachis, Hawaye) and 2 boreholes (Merti, Iresa Boru) and the distribution of 60,000 Water Pur sachets and 500 sanitary kits to households. Trainings on natural resources conflict management and resolution were organized and held.

Thanks to the experience which it has acquired locally, as well as consistent and continuous collaboration with pastoral communities both in Kenya and elsewhere, LVIA has shaped and refined an emergency response system which is tailored to the needs of targeted communities, focusing on improved access to water for human consumption and animal watering, as well as seeking to create a management structure/system which may prevent negative impact on the existing local systems. Through a participatory approach, beneficiaries are directly involved with particular emphasis on women representation and active participation, acknowledging that improving access to water resources is insufficient if hygienic behaviour of targeted communities is not addressed, being the primary cause of the most common diseases and infections.

The main problems identified in the area are:

[2] *European Commission (1998); Towards Sustainable Water Resources Management: A Strategic Approach*

1. Inadequate access to safe drinking water
2. Low sanitation coverage (Poor hygiene behaviours)
3. Inadequate health facilities and health care

1.4 Isiolo County

Isiolo County borders Marsabit County to the North, Samburu and Laikipia Counties to the West, Garissa County to the South-East, Wajir County to the North-East, Tana River and Kitui Counties to the South and Meru and Tharaka Nithi Counties to the South-West. The County Headquarters is located in Isiolo Town, which lies 285 kilometers north of Nairobi. The county has an area of 25,700 Km^2 and under the new dispensation of devolved Government is divided into three administrative Sub-Counties, namely Isiolo (with an area of 3,269 Km^2), Garbatulla (9,818 Km2) and Merti (12,612 Km^2). The 2009 Census revealed a county population of 143,294 (out of which 73,694 males and 69,600 females). The population was projected to rise to 191,627 by 2017. With a population density of 6 persons per km2, the county is listed as the second least populated county after Lamu. The annual population growth rate stands at 1.45%. The population translates to 31,326 households with an average size of 5 persons per household. 45% of the population lives in urban areas, relatively high compared to the national figures of 32.3% (Kenya open data). The population consists mainly of Borana, Turkana, Samburu, Meru and Somali. The majority of the population lives in semi-nomadic pastoral communities, relying on cattle as the main source of income and social prestige.
The area has been a zone of conflict between the neighboring nomadic communities fighting for pasture for their livestock. In the rural areas of the county, basic services especially infrastructure and social amenities are poorly established. The areas of survey have poor basic infrastructures such as roads, permanent houses, communication lines, etc.

The climate of the study area falls into two agro-climatic zones, semi-arid (occupying 5% of the area), and arid (30%). The climate in the towns of Isiolo is semi-arid and the median annual rainfall is in the range of 400-600 mm. The climate is hot and dry and the area often subjected to strong easterly winds. The climate is hot and dry and the area often subjected to strong easterly winds.

The greater part of drainage pattern in the area is dominated by the east flowing Ewaso Ng'iro River, which displays a modified dendritic pattern of drainage, well developed within individual river tributaries, especially those that join the main river at acute angle. A rectangular drainage pattern has developed to the west of Isiolo in the Longopito and Kipsing areas, where the major underlying geology is composed of the metamorphic gneisses. These metamorphics have been by deep joints running north-west to north-east.

The county is classified into three ecological zones, namely Semi-Arid, Arid and Very Arid. The zones are:

- Arid zones, where rainfall is between 300 and 350mm covering Central and GarbaTulla;
- Semi-arid zones with rainfall between 250 and 650mm per annum covering the Oldonyiro and Kinna;
- Very arid zone, where rainfall is between 150 and 250mm per annum covering Merti and Sericho;

1.5 Rainfall

The survey area suffers high rainfall intensities with poor temporal and spatial distribution, resulting in short-lived excessive flooding. Under these conditions, rain-fed agriculture is unsustainable. Furthermore, evaporation rates are very high. Rainfall is highly localized, often occurring as abrupt torrential storms sweeping across the area. Monthly rainfall is rather less reliable than perhaps might be expected.

1.6 Evapotranspiration and temperature

During the dry season, almost all the stagnant surface water (ponds, rock pools and swamps) will evaporate. It thus follows that the actual evapotranspiration is extremely high. Monsoon winds blow across the area throughout the year and attain their peak during the months of July to August. They sweep away all the moisture and evaporation is high hence reduced humidity in the district. High temperatures are recorded in the area throughout the year, but there are slight variations in some places due to differences in altitude. The mean annual temperature for Isiolo station, at an altitude of 1,104m above sea level is estimated to be 26.6^0C.

1.7 Physiography

The topography of the area is highly varied, reflecting closely the details of the underlying geology. The physiography of the study area can be categorized into three physiographic units:

- The Basement Ranges.
- The Volcanic Highlands
- The Lowlands, especially of the Ewaso Ng'iro Basin.

1.8 Drainage

The greater part of drainage pattern in the area is dominated by the east flowing Ewaso Ng'iro River. The Ewaso Ng'iro itself is maintained as perennial river by large tributaries flowing generally northwards, recharged in the high rainfall highlands of Mount Kenya and the Aberdares. Therefore, most part of the Ewaso Ng'iro River does not depend on the climate of the area. Four drainage patterns are well represented in the area; radial, dendritic, sub-parallel and rectangular: these patterns are related to the underlying geology and structure. The rivers

contain large volume of flush floods during the rains, but remain dry for most of the year. However, the potential for water harvesting in these valleys is enormous. Generally, river/stream water is not a sustainable source of water in the study area. See figure 2 and 3 below for the drainage pattern and the distribution of the Merti aquifer.

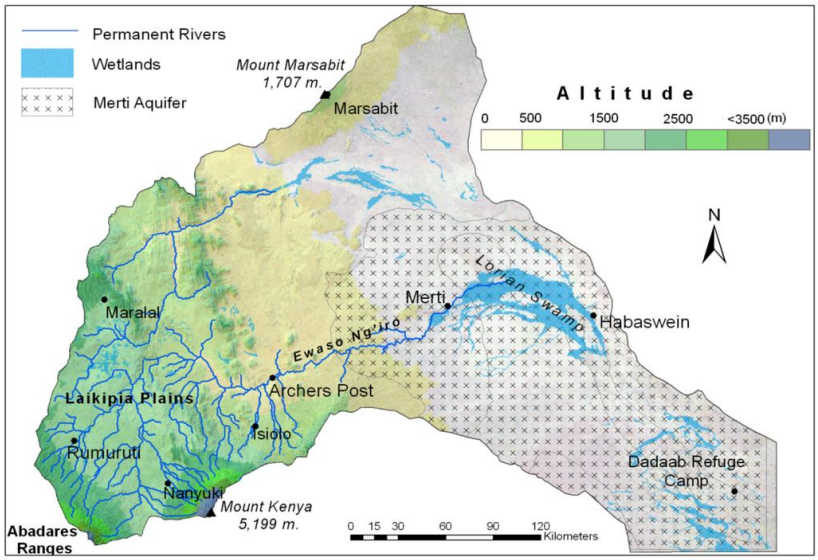

Figure 2: The Distribution of the Merti Aquifer and the flow of Ewaso Ng'iro River

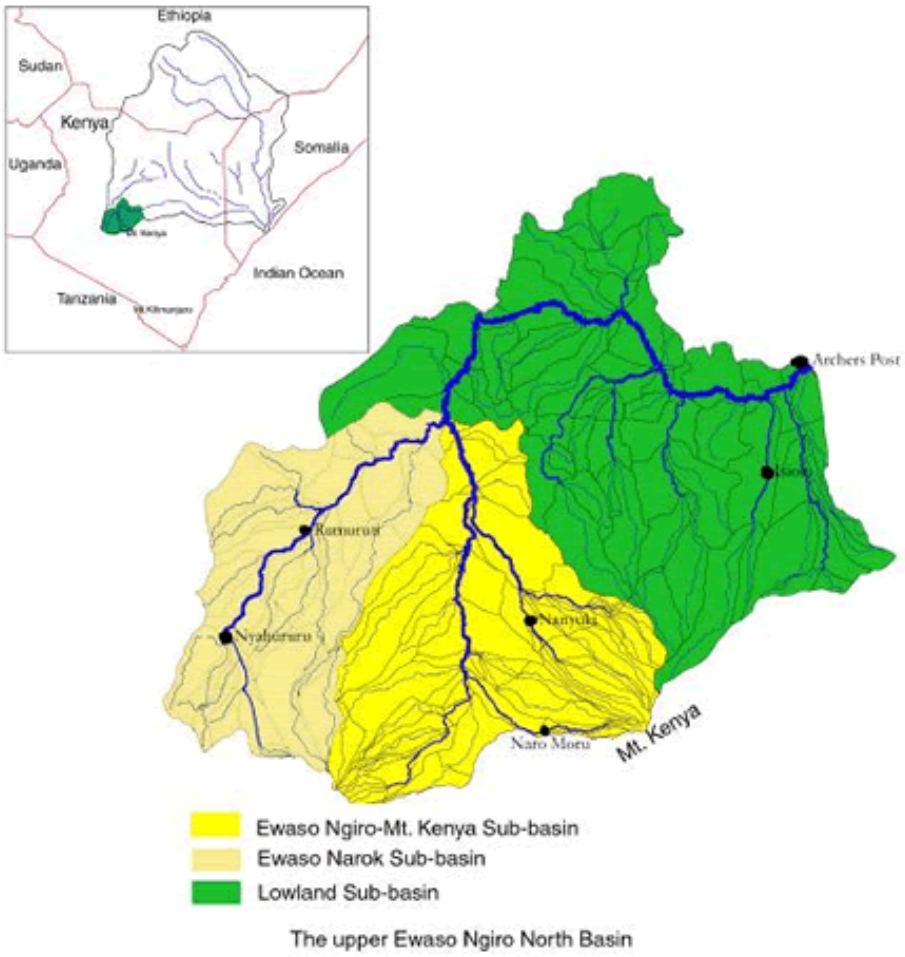

Figure 3: The Ewaso Ngiro Basin

1.9 Water Resources

The European Commission (EC) Guidelines of 1998 for water resources development cooperation is a contribution by EC to translating international consensus of water into actual cooperation activity. The centre-piece of the Guidelines is a "Strategic approach for equitable, efficient and sustainable management of water resources". The approach is based on internationally agreed principles concerning the need to protect the ecosystem, and to extend the health giving and productive properties of fresh water resources equitably, efficiently and sustainably among humankind, with special emphasis on poorer and underserved populations. Chapter 6 of the new Kenyan constitution recognizes access to safe water as a human right.

According to the CIDP, in terms of spatial coverage, about 93 percent of the county area lacks access to safe and clean water to within five kilometers reach. Over 175 (73 percent) villages

rely on water sources that are unsafe and beyond five kilometers which in essence is considered too far for realistic access for domestic water use. Some villages in Modogashe area are about 25 km from the nearest safe water source. The maximum distance cattle can walk without stressing them is 10 km yet 74 percent of the pastoralists walk over 15 km to the nearest water source for livestock.

According to the Minister for Water and Irrigation Mr. Ali Surraw, the current water coverage and access to safe drinking water is not good especially in rural areas. 70% of urban population has access to safe drinking water while only 40% in rural areas have access (meaning 60% of rural households have no access to safe drinking water).

There are three big perennial rivers namely Ewaso Ngiro, Isiolo, and Bisanadi . Rivers Ewaso Ngiro has its catchment area from the Aberdare and drains into the Lorian Swamp. The Isiolo River originates from Mt. Kenya and drains into Ewaso Ngiro River. Bisanadi drain into River Tana. Most irrigation schemes are found along these rivers. Where the site conditions are suitable, floodwater harvesting for communities in the county can be achieved by excavating shallow pans or ponds.

Most of the springs are situated within game reserves, and as such, are not accessible to local people. Older records show a total of 24 springs scattered along major rivers in Isiolo. However, due to degradation, 12 of these springs with negligible flows seem to have disappeared in recent years.

Over 58 percent of the domestic water sources are boreholes, 17 percent are shallow wells (not counting the numerous shallow wells that are dug on stream beds during the dry season), 59 percent of the total number of water sources are operational during the wet season, but only 36 percent are operational in the dry season. Merti, Garbatulla and Sericho areas are poorly served with water sources, particularly during the dry season. In general, water supply in the county can be divided into four majors groups: direct use of natural water sources such as rivers, streams and springs; developed surface water sources, such as earth dams, sand/subsurface dams, tanks and pans, developed groundwater such as wells, shallow wells and boreholes; and emergency water supply by the government using tankers. 58 percent of the sources have saline water hence limiting the availability of palatable water, especially for human consumption.

The existing boreholes in these areas are very scattered and yet presently the communities still largely rely on scarce groundwater extracted from shallow wells dug in the beds of watercourses, especially along river channels. Most of these shallow water sources however rapidly deplete during the dry season: consequently, villagers have to travel increasingly far distances in search of water from the established subsurface dams and boreholes. It is estimated that the daily consumption is about 25 litres per capita, excluding livestock requirements. A borehole with a sustainable yield of $0.5m^3$/hr could thus supply a local

population of 250 to 450 people (depending on the hours of pumping) with a roughly estimated population of about 50,000 people the demand is fairly met at best.

Sand/Subsurface Dams and Infiltration Galleries: Like many ASAL regions of Africa, Isiolo District is criss-crossed by several sand rivers, whose potential for floodwater harvesting and storage has not been fully tapped. In such conditions however, infiltration galleries offer better scope. Expanded utilization of sand/subsurface dams in Isiolo needs to be explored, especially by implementing proper designs to reduce siltation, provide cleaner water and render them less prone to pollution and evaporation losses. Moreover, sand/subsurface dams can be quite cost-effective. There are possibilities for sand/sub-surface dams to positively benefit human and livestock water provision in Isiolo, given the many sand river valleys in the district.

Pans and Ponds: In Isiolo, pans are more commonly used and range in size from about 10,000 to 50,000 m^3. The impact of the El Nino rains has been blamed for the poor status of pans in Isiolo District, as many of them were choked up with silt or breached. Rainwater harvesting and storage in dams and pans can be a feasible solution to water resource harvesting, especially for the supply of water for livestock in County. The need for watering livestock is as important as domestic water, hence water harvesting in Isiolo must take into account both human and livestock water requirements. Hence, there is a requirement of larger structures such as dams, pans and ponds in the area. However, this is an expensive undertaking by local standards.

The main problems with earth dams and pans are siltation, contamination and high evaporation losses. In some instances, seepage can be a problem, while ownership and community management has been a recurrent constraint. Due to the relatively flat land terrain and the high erodability of the soils, off-stream dugout pans on well-selected sites offer opportunities to supply water up to the early part of the dry season, thus reducing the time of livestock water stress by a few months in most parts of the area. Also, sedimentation can be reduced in off-stream storages if effective silt trap systems are provided.

Groundwater Sources

Boreholes*:* Boreholes are the most commonly used source of water in Isiolo area, constituting almost 58 percent of the total number of water sources in the study area. There are boreholes in the area that never yield water and others are closed for various reasons which were not clear to us during the fieldwork. However, others are fully operational under normal climatic conditions throughout the year and others are seasonal. On average, the poor state of boreholes can be attributed to lack of proper community management i.e. lack of a system to organize purchase of fuel for pumping, or procurement of spare parts and repairs when necessary.

Available data shows that borehole depths range from 50-100 m, with the deepest being at 250m. Water yields range from 1 to 18 liter/s, with a median yield of about 9 l/s (MoWRD

2002). However, these flows fluctuate with the seasons, leaving only few of the boreholes operational during the dry season. This may be due to the fact that most of the boreholes are quite shallow and, hence, subject to seasonal hydrological fluctuations, or that there is over-pumping of the aquifers

Hydrogeological studies

A number of studies have been undertaken which provide valuable information for implementers on WASH interventions. In July 2012, Red Cross undertook a Preparatory Water Resources Assessment Study in Isiolo, Garbatulla, Merti sub-counties with good coverage and recommendations some of which have been incorporated in this report. In June 2011, World Vision commissioned a study on eight borehole sites investigation, at four locations in Isiolo District namely Olndonyiro, Kipsing, Ngaremara and West Isiolo. The results of the geophysical site investigations, together with the recommended sites for drilling, are summarised in the Tables below.

Site	Coordinates	Recommended drill depth
1. Rumate	**E37°01.978', N0°36.202'**	**80 m**
2. Lengurma	**E30°37.09.472', N0°37.404'**	**100 m**
3. Lengwenyi	**E37°14.001', N0°33.974'**	**100 m**
4. Ngapaoi	E37°44.269', N0°34.967'	80 m
5. Nasoroi	E37°41.145', N03°30.145'	80 m
6. Lotiki	E37°33.341', N0°23.052'	100 m

Table 1: Recommended BH sites in Isiolo sub-county

1.10 Mapping

There is available information obtained from mapping exercises conducted by other stakeholders. Water point mapping was conducted in 2011 by NWSB supported by Netherlands Development Organization (SNV) types of water points, functionality status, ownership and management, access to services and coverage levels. Some key recommendations were made for improved functionality and management of water resources. Detailed mapping of water resources in all the NWSB coverage area (save for Laikipia and Samburu) was also done by the Rural Focus Ltd Consultants hired by the NWSB with support from UNICEF, COOPI and EC in 2008. This has been presented in the form of a GIS/MIS application interface. However, as the design and plans was that respective DWOs update the database through a centrally placed GIS officer at the NWSB in Garissa, this hasn't been done. Suffice it to say that the database is good information but now obsolete.

Shallow Wells: There are semi-permanent shallow wells (<20 m deep) in the area, most of them traditional hand-scooped holes. This number is usually higher during the wet season

when more water holes (temporary wells) are dug on most of the various streambeds. Most of the wells are used for human water supplies due to their low yields (no data). Another feature is that most of the shallow wells are: (1) not capped; (2) have no pumps; (3) have low yields; and (4) exceed 6 m in depth. In traditional Borana systems, which are practiced to date, steps are made into the well and women line up to reach down and fetch the water manually, through a "hand-me-up" system using containers. This is a slow and laborious activity, and also leads to contamination of the water. Due to the slow water yield women and girls spend long hours extracting small quantities of water. Improvements in well design and management are necessary. Prospects to improve infiltration in sand rivers, e.g., through sand/subsurface dams so as to boost the storage capacity of shallow wells, should also be explored.

Groundwater Occurrence

Groundwater in the metamorphic regions occurs as discontinuous systems formed in weathered zones, joints and fissures. The storage volume in these local aquifers is relatively small: water tables may be seasonal as a result.

Faults and Fissures

Individual aquifers formed within the weathered layer rarely produce yields in excess of $2m^3/hr$. Higher yields can be obtained from boreholes located in "open" faults and fissure zones.

1.11 General Hydrogeology of the Isiolo County

The hydrogeology of the project area is dominated by rock type and physiography. As far as the Basement rocks are concerned, there is no known correlation between lithology and local morphology. Three main aquifer regimes can be identified:

I. The high land: It is suspected that weathering under the relatively "high" grounds is less deep than within the surrounding valleys. The fresh Basement outcrops on the hilltops in the areas characterized by quartzites, granitoid and biotite gneisses. Evidence from a few boreholes and hand dug wells near the Lobarisherek and Mugurnanyori, albeit not very firmly, suggests a relatively high failure rate at sites in the hanging valleys (small mountainous river channel). It can be carefully concluded that groundwater potential on the relatively thinly weathered high land is poor, because of the small catchment size and the lateral drainage towards the lower areas. Small amounts of water will locally be available for some parts of the year in the regolith, possibly as much as 2 m^3/hr immediately following rain. Water levels will fluctuate considerably across the year (responding to both wet and dry periods), and aquifers may become depleted if pumped constantly. Water quality will probably be good, though susceptible to bacterial contamination.

Aquifers in highland regolith may be semi-confined or confined, but are regarded as insufficiently reliable for development as anything but a seasonal water source. They may still be suitable for hand-pump supplies, but not for larger abstraction purposes.

This regime prevails in all the sites located out of the major river basins.

II. The Basement saprolite-saprock aquifer regime of the intermediate and low lands: This regime consists of deeply weathered and/or slightly fractured Basement material. Aquifers will generally be perennial, but seasonal variations in water levels may occur. In areas with limited recharge and/or poorly transmissive weathering products, they will be sensitive to local abstractions. Water quality will probably worsen with increased depth.

   Due to the limited storage volume, water levels may still be variable and seasonally controlled. While yields ranging from 1 to 2m^3/hr is envisaged, the volumes may vary as static water levels fluctuate in response to rainfall patterns. Basement aquifers of this type are likely to be encountered in subdued land, covered at the surface by a thin layer of grey clay soils.

III. The combined saprolite-saprock-faulted Basement valley aquifer regime: Where significant faults exist, groundwater potential is greatly improved. Two separate aquifers may exist in such a situation: the first within the weathered zone, and a second within the faulted Basement, where preferential *in situ* weathering along fracture planes has occurred. In areas with good recharge, this combination would be capable of 2-10m^3/hr. Water quality would vary immensely according to recharge source: EC values may range from a few hundred to 3,000 S/cm. The mean annual yield exceeds that of weathered Basement aquifers.

See figure 4 below for the hydrogeological formation of Isiolo County.

In addition, it is usually stipulated by the WRMA that the permitted abstraction from a borehole should not exceed 60% of the tested yield: a well-tested at 10m^3/hr may not be pumped at more than 6m^3/hr. The total effective discharge from the Isiolo aquifers via either of the above means is not known. Increased consumer pressure and demand for groundwater will inevitably lead to greater rates of abstraction and aquifer depletion. Possible irrevocable physical damage to the aquifers may result from uncontrolled abstraction.

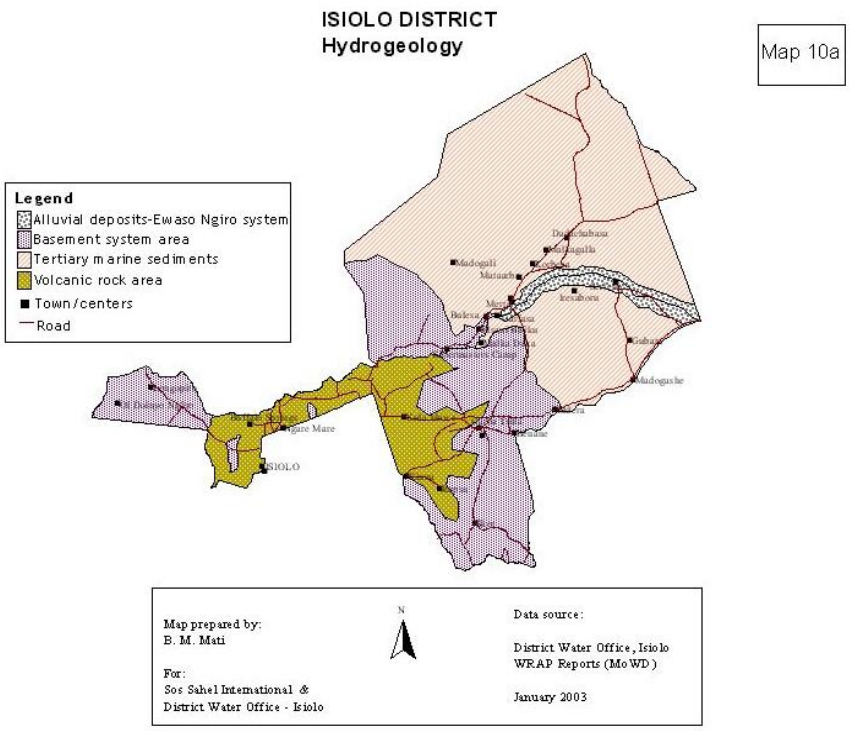

Figure 4: Hydrogeological map for Isiolo County

1.12 Policy framework

National Water Policy in Kenya is outlined in Sessional Paper No. 1 of 1999 on National Policy on Water Resources Managament and Development deals with four specific themes:

- To preserve, conserve and protect available water resources and allocate it in a sustainable, rational and economic way. This role is currently being fulfilled by Water Resources Management Authority established by the Water Act, 2002.
- To supply water of good quality and sufficient quantities to meet the various needs including poverty alleviation, while ensuring safe disposal of waste water and environmental protection. This is the role of Water Services Boards, Water Services Providers and Water Services Regulatory Boards.
- To establish an efficient and effective institutional framework to achieve a systematic development and management of water sector. This is the role of Ministry of Water and Irrigation.
- To develop a sound and sustainable financing system for effective water resource management and water supply and sanitation development. This is the role of Water Services Trust Fund.

The policy justified that handing over ownership of water facility encourages proper operation and maintenance and ownership: facilities should therefore be handed over to those

responsible for their operation and maintenance. Devolution under Kenya new Constitution has wide ranging implications for the water sector as it recognizes that access to safe and sufficient water is a basic human right and assigns responsibility for water supply and sanitation provision to 47 counties. The constitutionally guaranteed right to water provides a strong basis for regulating delivery of services, especially to ensure that this right is progressively realized over time.

1.13 Sanitation

Generally sanitation coverage in the county is poor, especially in the peripheries of the towns and in the villages. As much as 81 percent of the households have pit latrines, 56 percent of those latrines are uncovered. Open defecation by adults and disposal child's feaces in the open is still rampant in most rural areas of the county. Currently only six percent of the household are connected to the sewerage line in Isiolo town. The government is expanding the sewerage ponds in Isiolo town to be able to connect more households to the sewer line. According to the Minister for Water and Irrigation, sanitation in the villages remains very poor. His has been attested by the assessment team who visited 22 sites in Isiolo, Merti and Garbatulla sub-counties.

In efforts to address sanitation issues, the Ministry of Public Health is promoting Community Led Total Sanitation (CLTS) a means of involving the community in promoting hygiene and sanitation in the villages. According to the Minister of Water and Irrigation, CLTS has had good impact in the last 2 years especially in Isiolo sub-county. The county Government is also partnering with a number of NGOs including Action Aid, Red Cross, ACF, World Vision and LVIA to support institutions in promoting hygiene and sanitation and public sanitary facilities. The county has embarked on integrated sewerage systems in Kinna, Merti, Garbatulla, Modogashe and Sericho.

1.14 Objective of the assessment

The objective of this WASH Need Assessment was primarily to collect detailed, accurate and credible information on the WASH needs of the communities of Isiolo County (Merti, Isiolo and Garbatulla Sub-Counties), especially relating to health facilities and schools, Town Water supplies and water pans/sand dams/rock catchments, with a special focus on the access of safe drinking water, hygiene behaviours and sanitation.

Specifically the Needs Assessment was as per the Terms of Reference to:

1) focus on available WASH data analysis, project reports, other NGO's assessments, County Integrated Plans, data from other sources at National and County level;

2) be an analysis of information on NGOs/Government Institutions/Private Actors working at present or in the past in Isiolo County, their key lessons learnt and comment on continuous learning process;
3) draw a picture of the sites in need of a WASH intervention in Isiolo County (health facilities/schools, Town Water supplies and water pans/sand dams/rock catchments), with a detailed map and analysis of the WASH specific needs within the same and the related communities;
4) be a complete and exhaustive analysis of collected information in order to understand the WASH needs, their connection to water borne diseases and allow LVIA to implement the proper project intervention according to projects expected results and activities;
5) suggest proper interventions where needed recommending the most appropriate technologies to be applied.

1.15 Significance of the assessment

The information and understanding gained from this assessment will be used to identify and/or evaluate the selected site of project intervention in accordance with WRMA and Isiolo County Department Responsible for Health.

1.16 Facilitating factors

The major factor that contributed to the success of the survey was the teamwork between the consultants and LVIA Staff. The constant consultations led to positive action especially during data collection and compilation of the report. Another factor was the good network which LVIA has established in the sample areas. The consultant was able to use those contacts as entry points to the assessment areas which made work easier. Finally, the respondents were very cooperative while discussing issues relating to the assessment and gave honest views and suggestions.

1.17 Limitations

There were major no major constraint during the exercise. The only challenges faced included the rough terrain and communication in arranging the interviews at the different sites. Because of poor network, we could not meet some respondents who had traveled out of the villages to tend their livestock. However we managed to get the intended respondents and community members for the meetings and interviews.

2. METHODOLOGY

Prior to commencement of the assessment, consultative meetings were held with LVIA Project Coordinator Maurizia Sandrini to agree on the modalities of undertaking the exercise. These included literature review, confirmation of sites to be visited, and agreement on the sample size of respondents, appointments with key informants, field itinerary and logistics. Continuous consultations were held with LVIA Project Coordinator throughout the exercise; providing useful feedback. Data collection was done by the Team comprising the Lead Consultant, Water Engineer and a Sociologist. The Lead Consultant consolidated the field analysis and compiled the report.

Both qualitative and quantitative research methods were employed to collect data in the three areas. The following instruments/methods were used concurrently:

- Questionnaires: A questionnaire was designed and used to conduct household interviews *(See annex 6.2)*. A total number of 44 households were interviewed in the 22 sites visited translating to 2 per site.

Picture 1: Household interview

- Community meetings: Community meetings were held to solicit different views and opinion of the community members on issues related to WASH needs and activities. They also participated in community mapping of water resources and sanitation facilities as they exist in the locality.

Picture 2: Community meeting and mapping

- Key Informant Interviews: Structured and semi-structured guide questions were developed to discuss and collect information from key informants. A total of 38 key informants were interviewed comprising personnel from County Government, key Government institutions/Ministries and Departments, NGOs, Local Administration and opinion leaders.

Picture 3: Key informant interview

- Focus Group discussions: FGDs were held with a total number of 130 participants who gave varied views and opinion on WASH issues. Each FGD consisted of between 5-10 people.

Picture 4: Focus Group Discussions

- Observation: An observation checklist was developed to capture additional information and to corroborate information gathered from key informants and FGDs. These included physical state of water infrastructure, cleanliness of the sites and villages, queuing time at water points, distances covered to the nearest water points, transportation methods and quality of water at different water points and at household level.

Picture 5: Site visits and observation

2.1 Sampling method

The sampling methods employed for the assessment endeavored to ensure that an adequate sample size would be obtained. It also had to draw a meaningful sample such that valid and relevant comparisons could be made across the assessment parameters. Purposive random sampling was applied across the sample frame. The resulting projected total sample size was 44 households, 38 key informants and 130 participants for FGDs. A total of 22 pre-selected sites were identified for focus based on an earlier quantitative assessment carried out by LVIA. This assessment was to explore more quantitative values to supplement the earlier findings.

2.2 Sample frame

Suitable sampling frames are required for selection of different sampling units. The basis for the assessment was to sample respondents within the geographic intervention areas of LVIA as well as County, Government officials and NGOs who could provide accurate and relevant information. Consideration was given to key stakeholders, partners, community groups (Water, school and Health committees, WRUAs, WUAs) and opinion leaders within the community. Gender consideration was a key component of the sample frame.

2.3 Data collection

A schedule was developed with LVIA to organize the field itinerary and to confirm the sites to be visited according to geographic proximity. The Field Team consisted of Lead Consultant, Water Engineer and a Sociologist. Lead consultant did the key informant interviews, community meetings and FGDs while the Water Engineer concentrated on site visits and technical issues. The third consultant did the household interviews. Each evening, the team met to compare notes and to harmonize the observations and data collected.

Picture 6: Community engagement

2.4 Data synthesis

The structured questionnaire was properly coded for ease of electronic data processing. Data was entered, processed and analyzed using the SPSS (Statistical Package for Social Science) program. The same program was used for data editing and tabulation. Information from Key informant interviews and FGDs was analyzed manually.

3. FINDINGS

This Chapter gives a summative reflection and interpretation of the assessment findings based on the qualitative data, quantitative data and responses from the field including household interviews.

3.1 General

- Most projects have been undertaken during the emergency response and have little community participation which has contributed to dependency syndrome.
- With persistent droughts and low community participation level, sustainability of interventions remains a challenge.
- Though WESCOORD which is a technical forum has brought implementers together at county level, field coordination among the actors is weak. Since the devolution and scrapping of District Steering Group forum, there is yet no formal structure to replace DSG. Many activities are uncoordinated which may contribute to duplication of efforts.
- Community governance structures eg. Village committees, Water, Health and Education committees do exist at every site we visited. However, they remain weak and require capacity building in areas of leadership, Hygiene and Sanitation, schools management and Operation and maintenance (for water committees).
- Infrastructure is poor in most areas and this hinders communication and access to intervention areas. Some areas are impassable when it rains.

3.2 Water

Isiolo County is prone to drought resulting to poor accessibility to clean water. Water shortage is the main cause of severe food insecurity. The water shortage affects women and children most as they have to walk long distance to search for it. The average distance to the nearest water source for most households in the County is three kilometres. Out of 31,326 households in Isiolo sub-county, only 35 percent has access to portable water and 6 % have access to piped water. Scarcity of water in the county has affected women participation in development as they spend time searching for water at the expense of other economic activities. (*Source: CIDP*)

From the field assessment and, the following are key findings regarding water resources:

- Most water supply is derived from groundwater sources i.e. Boreholes, shallow wells, sand dams and water pans. According to Red Cross study, Boreholes in Garbatulla have an average yield of 8.93m^3 per hour. Ground water remains unexploited due to the high costs involved. Springs are not reliable water sources considering there are only two in the county (according to the study).

- Water points are community owned apart from Isiolo and Merti Towns which are managed by Isiolo Water & Sewerage Company (IWASCO) and Merti Water Service Providers Association. Borehole systems are mainly preferred but expensive for the community to operate and maintain.
- There are few emerging WRUAs to manage the catchment areas effectively. The existing ones in Oldonyiro, Kipsing and Merti need capacity building to enable them effectively execute their mandate especially in the management of Sub-catchment Management Plans (SCMPs). There was no evidence of WRUAs in Garbatulla.
- There are frequent pipe bursts along the distribution lines mainly due to low quality pipes and high pressure through small diameter pipes. This has increased Non-Revenue Water and O&M costs for water committees to maintain the lines. In some areas like Erimet, vandalism is common as pastoralists perforate pipes to get water for their livestock.
- Plastic tanks are popular everywhere in the three sub-counties. However they are poorly maintained and in some places they are lying idle or deformed. Some are too low and susceptible to damage by children and animals.
- Sustainability of water projects is possible if implementers sensitize the community on proper water management. In most places, the committees are already charging for use of water for domestic use and livestock. Most committees charge ksh.20 for a 20 lt jerrican and between ksh.2 to ksh.5 for livestock. If these funds are managed well, it would be possible to operate and maintain the systems. Presently almost all collections go towards repairs of leaks, fuel for the gensets and payment for operators.
- From the survey conducted by Red Cross and evidenced by field observations, most water points are unprotected and prone to contamination. Some Boreholes like one at Bulesa was abandoned due to poor quality of water. Communities using the sand dams especially in Kipsing and Oldonyiro are not sensitized on water management practices.
- Most water pans have high seepage rate and not reliable for long term water supply.
- The most common water storage system is the Plastic tank of 5-20m^3 capacity. Masonry storage tanks have a capacity of 150m^3 and would be ideal to serve more people. However cost implications have to be considered.
- The management of water sources by communities is inadequate as most systems are having O&M problems and the committees managing them cannot sustain the systems.

3.2.1 Household survey findings

i) Socio-economic indicators

- 50% of the surveyed respondents indicated that they are unemployed.
- Households rely on small businesses and livestock for livelihood.

- Income levels are low. Majority of respondents (77%) stated that they receive between Kshs 1,000-5,000 monthly income. This leaves very little chances of saving. This may also be the reason why the community may not be able to contribute to development initiatives on cost sharing.
- The areas where households are most vulnerable are food security, water and health.

ii) Water

From the sampled households, the following were the main findings:

- The main sources of water across the sub-counties are borehole (59%) and shallow wells (27%) by mention and water is always available most of the time (mentioned by 68% of the respondents) except during drought and breakdowns. Earth dams accounted for 14%.
- Majority of the respondents stated that the distance between water points and their homes is less than a kilometer (77%); indicating that water availability may not be the big problem but management of water resources.
- Time taken to draw water from water source is less than 30 minutes (55%) and one hour (20%). This is an indication that the water sources in most villages are not very far.
- Most households transport water in jerry cans while others use donkeys.
- Most households consume more than 30 litres of water per day (89%). This emphasizes the water need among households. Water storage is mainly in containers with lids.
- Most households neither treat (68%) nor boil the water (82%).

3.3 SANITATION

Sanitation coverage in the county is low. Sanitation situation is worse in the villages as open defecation by adults and children is rampant in most rural areas. On the whole 81 percent of households have pit latrines and 56 percent of those pit latrines are uncovered. The use of buckets still exists in some *manyattas.* Most urban centres lack sewerage systems and garbage disposal sites. Red Cross in collaboration with MoPH has trained CHWs and Government staff on CLTS, PHAST and CHAST. (*Source: CIDP)*

- Sanitation coverage in the county is still low. Open defecation is still common in the villages and town peripheries (even close to water points as in the case of *laggas* in Oldonyiro and Kipsing).
- CLTS has not taken root in most parts of the county. According to Red Cross statistics, only 11 villages in Garbatulla and 20 in Isiolo sub-counties have been declared ODF.
- Latrine coverage in the villages is quite low. In some villages like Bulesa the ratio of household per toilet is 55hh:1 toilet. Other worse hit centres include Malka Daka

50hh:1toilet (90% do not have toilets), Mata Arba 32hh:1 toilet, Gafarsa 20hh:1 toilet and Dadacha Basa 16hh:1 toilet. Daaba has no toilets and inhabitants go to the bush 2 kms away. The centres with improved sanitation coverage include Tupendane where 75% have latrines, Kinna where 65% have latrines and Merti which has 46% coverage.

3.3.1 Household survey findings

From household survey, the key findings were:

- Most households interviewed had covered toilets (66%) while 25% go to neighbors and 9% go to the bush (open defecation).
- 100% of respondents interviewed indicated that they wash their hands and most of them use soap (93%). However this should not be construed that hand washing is practiced throughout the county as the sample size was minimal.
- Garbage disposal is mainly done through waste pits and burning (98%).
- Most common diseases are diarrhoea (27%), water borne diseases (27%), cholera (14%) and typhoid (14%) responses.

3.4 Findings from selected sites

The assessment mainly focused on 22 sites which had been identified by LVIA in an earlier quantitative assessment. Table 2 elaborates on the field findings and recommended actions. Designs and BoQs for the different structures are found in annex 7.

3.4.1 Merti Sub-County

Site	Water issues	Sanitation issues	Recommended action
Merti Sub-county			
1. Biliqo Marara Population: 100 hh (400) Livelihood: Pastoralist This center is in Merti sub county about forty kilometers from Merti center on the way to	Water sources: *Lagga* (Ewaso Ngiro) and Bore hole There is an existing water supply system financed by NWSB. Water was supposed to be pumped to two water kiosks in the center but unfortunately the well dried up and	Ratio of hh to no. of toilets: 3hh: 1 toilet Red Cross built 3 four-door latrines at Kom Primary school. Arid Lands Programme built 32 latrines at the centre	Priority 1: Excavation of 1 new shallow well. It costs Ksh.493k to excavate a shallow well. See BoQ in annex6.8.6. Priority 2: Installation of hybrid solar pumping system. It costs 2.8m Ksh to rehabilitate and fit a BH with solar pumping

Isiolo.	kiosks are not functioning. People use donkeys to fetch water 3 kms away. There is also a water connection to Kom primary school (196 pupils, 7 teachers). The school has 2 rainwater harvesting facilities ofplastic tanks and a few gutters but not properly installed. There is a dispensary with 1water tank (10m3) and gutters which are not properly fixed there is also a staff quarters with a storage tank which require proper fixing. The dispensary has good catchment for an extra water tank. There is a water committee in place.	When it rains, sanitation is poor. Water gets contaminated and water borne diseases are common especially diarrhoea. During dry spells, water scarcity is experienced and water is contaminated Households do not boil water. Wild animals share water with human beings.	system, See BoQ in annex 6.8.2. Priority 3: Connection of water to the dispensary from the primary school Survey needed to determine the costs. Priority 4: Training of water committee on management and O&M. Priority 5: Additional 1 storage tank (RWH) of 10m3 for the dispensary. It costs Ksh.84,000 for a new plastic water tank.
2. Bisan Biliqo Population: 400 hh Livelihood: Pastoralists This center is located about ten kilometers from Biliqo Marara on the way to Merti	Sources of water: Borehole The river water is usually very turbid and is expensive to treat hence the community prefers the borehole source. The borehole engine which was installed by Northern Water Board has some mechanical problems and requires immediate attention. CDF bought the machine. Water is pumped into 2 tanks(10m3) and distributed by gravity. There are 6 kiosks and 6 household connections. The Primary school with 500 pupils and 9 staff is	The school has 5 double-door latrines. The Health centre has 2latrines. Red Cross brought slabs (the community claims they are of low quality). No toilets have been constructed despite RC asking community to dig pits.	Priority 1: Repair of the borehole generating set. Cost of repair to be determined after inspection. A hybrid system is preferred and would cost Ksh.2.8 million (see BoQ in annex6.8.2). Priority 2: Water connection to the primary school. Cost to be determined after survey.(Guide: a 6 km extension will cost Ksh.3.9 million – see BoQ in annex6.8.1). Priority 3: A new storage plastic tank (50m3) for the borehole water source.

	near town water supply (600m away). There are 2 functioning RWH tanks. ACF put up RWH facility at the Primary school (gutters and the plastic tanks). The health facility has water connection from the community line with 1 tank. There is a water committee in place comprising 11 members (3 Female, 8 male).		Estimated unit cost with support stand and base is Ksh.550,000. Priority 4: 1 RWH storage tank (10m3) complete with gutters for the health centre. Priority 5: New rising main for the borehole. (Survey needed). Priority 5: Fencing of BH compound. Priority 6: Training of water management committee.
3. Dadacha Basa Population: 626 hh (3756) Livelihood: Pastoralists	Water source: Bore hole Alternative source: Ewaso Nyiro river – 25 kms away. Water is pumped from a BH(230m deep) built by the Chinese in 2010in Halango 17 kilometers away (with 1 tank and 1 kiosk) and pumped into a 100m3 tank. A booster pump delivers water to a 50m3 elevated tank in town. The health center is connected to the town water supply. It has 1 RWH tank and a good catchment for more rain water harvesting. Dadacha Basa primary school has no water connection but has a good catchment area for rain	The centre has 40 toilets with a ratio of 16 hh:1 toilet. Some households have garbage pits and burn the litter. The health facility has only one 1-door toilet which is overused (they need to have 4). The Primary school has 2 VIP latrines and 1 for staff.	Priority 1: Solar for the booster recommended to reduce running costs. Davis & Shirtliff supplies solar pumps and gensets. A hybrid system costs around Ksh. 2.8m. See annex 6.8.2for specifications. Priority 2: Construct four 2-door latrines at the school and two 2-door at the heath facility. A twin pit latrine costs Ksh.103,000. See BoQ in the annex6.8.4. A design is provided under separate folder attached to this report. Priority 3: Provision of gutters at the health center for the existing water tanks.

	water harvesting. LVIA constructed a RWH facility and donated pipes to connect the school to town water system. ACF also constructed RWH in the school but guttering was poorly installed. Frequent pipe bursts resulting to high O&M costs. County Government has assisted with 1600 litres of diesel. High running costs (200 lts of diesel costs 25,000ksh and lasts only 6 days; Transport for fuel costs 2,000ksh per trip to the machine; Operator uses motorbike which costs 500ksh per trip and he charges 600ksh per trip – on pumping days the cost rises to 1000ksh; Pipe repairer charges 600ksh). The water committee is in place. They charge 5ksh per 20 litre jerry can but all revenue is used for O&M and no savings are realized. They suggested installation of private connections and abolish the kiosk. Red Cross did 17 km piping from BH to the centre. NWSB put up kiosk and elevated tank. The Dispensary has one RWH tank; 3 solar panels		Priority 4: Rehabilitation of distribution mains to increase coverage and access to individual connections. Investigation recommended to determine costs. Priority 5: The current water committee of 13 members (5F, 8M) is new and needs training on management and O&M. (The old committee was trained by Red Cross).

	are all spoilt. Cordaid promised solar pumping system 3 years ago and have not fulfilled the promise.		
4. Malka Galla Population: 280 hh (1400) Livelihood: Pastoralists	Water source: Bore hole and shallow wells. The borehole is 25 kilometers away at Dadachalafe. The main challenges are frequent bursts and leakages along the pipeline .A number of BHs were drilled in the area but water was found to be salty. High O&M costs (piping costs 40 litres per session; Operator is paid 1000ksh per trip; plumber charges 500ksh per day of repairs). County Government supplied 1000 litres of diesel in June. Water charges: 5ksh for a 20 litre jerrican. This community has some shallow wells where the community fetches water. However when it rains the area gets flooded and the wells get filled up. The dispensary has 1 storage tank of 10m3 but not connected to the roof. Gutters in place but require minor repairs and alignment.	The centre has 50 toilets. Ratio: 6hh: 1 toilet. Some residents go to the bush for defecation. The Dispensary has one disused toilet and the school has 2toilets (4-door). The Primary school has four 4-door latrines – sufficient for the institution.	Priority 1: Rehabilitate the BH and install solar pumping system to mitigate high O&M costs.Further survey needed on the pipeline. Hybrid system costs Ksh.2.8m – see annex6.8.2 for specifications. Priority 2: Replace existing pipes with class E pipes. Increase air valves along the pipeline. Investigation to determine costs. Priority 3: Construct a bigger storage facility of 50m3. Cost estimate with platform and elevation Ksh 700,000. Priority 4: Connection of water to the school and the health center. Survey needed to determine the costs. Priority 5: Training of water management committees. Priority 6: Drill a new BH for Malka Galla and separate the 2 communities. Survey needed to determine suitability and costs.

	Malka Galla Primary school with 385 pupils have 5 tanks with gutters. There are two parallel committees one for Malkagalla and another for Dadachalafe.		
5. Korbesa Population: 689 hh (3444) Livelihood: Pastoralists	Water source: Shallow wells. Water quality not good (water smells according to community members). Korbesa BH built by Afya Plus next to Merti BH. Tanks constructed in the hills. Water from the new BH pumped to tank. From tank by gravity to Mata Arba then to Korbesa as last destination. There is no pumping system in place and the line to the tank has been vandalized. There is no water supply in this center and people have to trek for at least 5 kilometers to the shallow wells to access water. The health center has a $10M^3$ water tank nicely placed. There is a maternity wing with a good catchment for rainwater harvesting. Korbesa Primary school with 434 pupils (195 boys and 239 girls) has 6 storage tanks of 10m3 capacity; 4 of them not functional due to faulty	The centre has 80 toilets. Ratio: 9 hh: 1 toilet. The dispensary has 3 toilets (3-door). IWASCO provided slabs for latrines. Red Cross supplied aqua tabs (Purr) and slabs. Some households have garbage pits and burn litter. Korbesa Primary school has low latrine coverage but the Kenya Red Cross is already on the ground constructing 2No. four-door toilets. Any intervention could be duplication.	Priority 1: Possibility of solar pumping using hybrid system. Cost estimates in the annex6.8.2. Priority 2: Provide one more storage tank of 10m3 to be placed at the maternity wing. Cost: Ksh.84,000. Priority 3: Install a 24m3 plastic tank in the school. Cost: Ksh.135,000. Rehabilitate 4 existing tanks. Priority 4: Rehabilitation of vandalized line to the tank. Assessment needed to determine costs. Priority 5: Rehabilitate Korbesa shallow well. See BoQs in annex 6.8.6.

	gutters and no connections. 1 masonry tank of 30m3 is not in use.		
6. Mata Arba Population: 400 hh Livelihood: Pastoralists	Water source: Water pan, shallow well and River Ewaso Ngiro This center which is only 12 kilometers from Merti has no water and is currently on water trucking. There is an existing water pan which has dried up. In use for 4-5 months and polluted with algae when in use. Predators, donkeys and wild animals share the pan with human beings. Alternative source is the Ewaso Nyiro river 3kms away. It takes 3 hours to draw water from the river. Diseases are common – diarrhoea and common cold. Shallow wells are about ten kilometers away. Problem is that the river changes its course frequently. There is only one community water tank (10 m^3 plastic) which has a puncture. There is a 10m3 water tank at the dispensary which is being used for water trucking.	There are only 6 toilets in the *manyattas.* Ratio: 32 hh: 1 toilet. Open defecation is common. There are two four door toilets being constructed at the school (260 pupils) being supported by Kenya Red Cross. LVIA constructed toilets and water tanks at the school. Red Cross constructed toilets. The school committee of 11 (5M, 6F) is in place. The school has 260 pupils.	Priority 1: Provision of a community storage tank of 50m3 with a stand and shelter. Priority 2: Provision of 2 10m3 rain water harvesting tanks for the school complete with gutters and stands. Priority 3: Connect gutters to the 10m3 tank at the dispensary. Priority 4: One toilet (4-door) at the health centerand one 4-door latrine at the water point.

	There are two 10m3 water tanks at the primary school which have punctures. There is also good catchment for two extra tanks.		
7. Bulesa Population: 500 hh Livelihood: Pastoralists	Water source: Bore hole There is an existing water supply whereby water is pumped from a borehole 5km from the center. The water is pumped to 3 storage tanks on a nearby hill and then distributed to the center and the nearby Goda settlement 6kms away. There are 6 water kiosks in the town. There are five Gensets of which only one is operational. The remaining four require repairs. The community is no longer using water kiosks as they have resorted to individual connections. VSF Swiss did the piping and constructed a 10m3 tank at the centre. Bulesa Primary school with 452 pupils is connected to the town water supply has 1 RWH storage tank built by Red Cross. The secondary school with 90 students is newly built by CDF with one tank connected to the water supply line. A water committee of 7	There are 90 toilets at the centre. Ratio: 55hh:1 toilet. Most inhabitants go to the bush to relieve themselves. A few households have garbage pits but most resort to open throwing. The Dispensary has 3 toilets built by WSTF. The Primary school has 3 latrines. The secondary school has 6 toilets. There are two committees for Health and the school in place.	Priority 1: Installation of solar or electrical energy as an alternative to gensets. See annex6.8.2 for specifications and cost for hybrid pumping system. Priority 2: Rehabilitation of 4 generating sets. Assessment needed to determine costs. Priority 3: Repair of Goda storage tank which is leaking. Priority 4: Replacement of existing control panels. Cost to be determined after inspection. Priority 5: Training of committees on management, PHAST and CHAST and O&M (for water committee).

	members (3F, 4M) is in place.		
8. Merti	This center has a water supply whose source is a borehole. They have stopped using water kiosks and instead have one thousand connections. They are also supplying water to the existing institutions. All the schools and the health center are well catered for with water. Merti Water Service Providers Association is providing water to 20,000 people with 1200 individual connections of which 1000 are metered. They have 2 BH (only 1 functional), 2 gensets and a total of 5 storage tanks. High water demand so rationing after every 2 days. An additional BH has been sited. Need for solar pumping system to reduce O&M costs. According to PHO Abduba Diba. leakages and contamination is common in some areas of Merti town. Donors: Afya Plus – drilling BH at Korbesa. UNICEF – 2 gensets and	The latrine coverage in the sub-county is about 46%; Open defecation still common in villages bordering the forest. Sanitation coverage in Merti town is fairly adequate. Sanitation problem in the periphery of Merti town. There are pits with no slabs (Red Cross promised 3000 slabs but only 300 built. Poor waste disposal in the villages. CLTS being introduced. Problem of drainage system at the Health facility (2 sceptic tanks have collapsed).	Priority 1: Extension of pipeline to Lakole and Godo Rupa. Survey needed to determine costs. Priority 2: Installation of solar pumps. Hybrid system preferred. Specification and BoQ in the annex6.8.2. Priority 3: Capacity building for water management committee (Training on O&M, Legal issues arising from Water Act and EMCA). Exposure tours for Water committees and MWSPA Priority 4: Water treatment for consumers in Merti town. Purr or Aqua tabs recommended. Priority 5: Piping system needs unblocking at the Health facility. Investigation to determine the costs. Priority 6: Repair of 6 tanks at the Health facility. Inspection to determine the costs. Priority 7: Connect RWH storage tanks at the Health centre to the town supply line.Survey to determine the costs. Priority 8: Intensify CLTS in

	pipes. Action Aid – BH (collapsed) and water kiosks. WSTF – pipes, fuel. LVIA – Capacity building (management and governance) Merti Health centre has only 2 functioning tanks (6 are non- functional and 1 leaking). No water problem as they are connected to the town supply line. RWH is not possible as roofs are made of asbestos.		villages bordering the forest and peripheral villages bordering Merti town. Priority 10: Recommendation from earlier assessment: Construct 3 double-door latrines for male students and 2 double door for teachers at Al Rahman Primary school.

3.4.2 Garbatulla Sub-County

1. Kinna Population: 3000 hh Livelihood: Pastoralists and agro-pastoralists	Main sources of water in this center are raw water from the nearby Kanchoradi spring and a bore hole which serves only about 5% of the population. There four water kiosks connected to the borehole water supply and one does not have water due to technical reasons. Kinna primary school with a population of 770 pupils is not connected to the water supply and has only two four door toilets. The spring water is contaminated and unhygienic for cooking for	2000 hh (60%) have toilets. Open defecation around the water catchment is a challenge especially at Medina manyatta where there are no toilets. Red Cross and World Vision have done sensitization to CHWs. Kinna primary school with a population of 770 pupils is not connected to the water supply and has only two four door toilets. Kinna Health centre has	Priority 1: Connection of borehole water to the primary school and construction of a 1 masonry tank of 50m3. Priority 2: Install two 10m3 storage RWH tanks complete with gutters and basement for Kinna Primary school. Priority 3: Install one 10m3 RWH storage tank for maternity wing at the Health centre. Priority 4: Treatment for the raw water and at household level. Purr or

	pupils. Pupils bring water from home. Water quality from the spring is poor and only used for washing clothes. Plan International did the 1.5 km piping but the system is blocked and gravity water supply is problematic. Water borne diseases (amoeba and typhoid) are common. The health center is connected to the borehole water supply and has two toilets. Water quality from the spring is poor and only used for washing clothes. Plan International did the piping. Kenya Methodist University (KEMU) is experimenting ultra violet rays for water treatment as a pilot project to serve the Administration Police line and if successful will be extended to the *manyattas.* World Vision supplied aqua tabs to households. 25 hh have individual water connections. Red Cross have piped water from the BH to the main tank and to 4 kiosks in the *manyattas* (3 functional and one not in use).	2 toilets. It serves an average of 100 patients daily. The Health centre has 1 RWH tank with no gutters. Two other plastic storage tanks are dysfunctional. There is one hand washing facility at the centre. The only incinerator at the health facility is full and waste disposal is not properly done. There is a Health Committee of 9 (3F, 6M). They have sensitized the community on health education and hygiene at hh level.	aqua tabs recommended. .

	There is a water committee in place. They charge 360ksh for 3000 litres.		
2. Duse Population: 210 hh (1600) Livelihood: Pastoralists	The source of water is a borehole 14 kilometers away in Bibi Moriti. It has a generating set and 8km piping was recently rehabilitated with assistance from KRCS. Frequent pipe bursts due to poor quality pipes. The water quality is good (according to the area chief, it is so clean that it is considered the cleanest in Garbatulla sub-county and the community calls it glucose). There are 4 operational water kiosks and two cattle troughs. The committee charges 5ksh for a 20 litre jerry can. There is no water at the newly built hospital. The school has 3 RWH storage tanks connected to the line. The 20,000 lts storage tank at the town centre is not used as Red Cross changed to direct distribution to kiosks. There is a water committee of 20 members (11 M, 9 F) in place. Water charges: 5ksh for 20lts	There are 32 toilets at the centre. Ratio: 7 hh: 1 toilet. The school has 8 toilets while the hospital has no toilet. Garbage collection is only done along the road by the County council. At hh level, some individuals have waste pits for disposal. Red Cross promised to supply slabs but not yet delivered. Health and School Committees in place.	Priority 1: Installation of 1 hybrid solar system as an alternative to diesel engine. Design and BoQ in the annex6.8.2. Priority 2: Connection of water to the dispensary and the primary school. Survey needed to determine the cost. Priority 3: Repair of the leaking storage tank at the health center. Priority 4: Construction of 1 extra water kiosk. See annex 6.8.3for BoQ and design. Priority 5: Install one 10m3 RWH storage tank complete with gutters and base at the Primary school. Priority 6: Construct 2 two-door latrines at the Health center and install two 24m3 storage tanks at the health centre. Cost estimate – Ksh.135,000. Priority 7: Training for the new members of the water management committee and also for school and dispensary committees. Priority 8: Fencing the storage tank 4 kms away.

	jerry can. Donors: ACF – water trucking ASAL Programme – Built the BH KWS – Piping and storage tank Red Cross – rehabilitation of pipes; built kiosks; ENNDA - Conversion to solar pumping system. World Vision – plastic tanks (220 lts capacity) for 100 hh.		Survey needed to determine cost.
3. Badana Population: 250 hh (1500) Livelihood: Pastoralists	The source of water for this center is a borehole 34 kilometers away in Iresa Boru. Water is pumped to a tank with 48m3 capacity. Water is used both for domestic and livestock. There are frequent breakdowns and this is a big challenge to the community due to the long distance involved and lack of funds for operation and maintenance. This being a new project, there is no connection to the school and the health center. The school has 3 No. 10m3 tanks. A 50m3 capacity tank is damaged and the 10m3 capacity tank is leaking. Children carry water from home to the school.	Sanitation in the village is poor – lots of donkey dung spread all over. There are only 30 functioning toilets in the village. Ratio of 8hh: 1 toilet. Open defecation is common on the periphery of the village. The dispensary has only 1 toilet (2 doors). The school has 6 toilets but only 2 (4-door) are functioning. There are no waste pits both at the dispensary and the school.	Priority 1: Connection of water to the school and the dispensary. Survey to determine piping costs. Piping to the dispensary can be connected from the kiosk. Priority 2: There is only one generating set serving the two communities of Iresa Boru and Badana hence need for an extra one. BoQ for BH in the annex6.8.2. Priority 3: Install 1 RWH storage tank of 10m3 with gutters and base for the dispensary. . Priority 5: Build cattle trough for livestock s that they do not share water point with humans.

	The dispensary with patient attendance of 20 per day has only 1 tank with 5m3 capacity built by community but no water. Challenges: High O&M costs due to leakages. Repairs cost 600ksh at a time; Transport on motor bike costs 1000ksh per trip. Not enough water for livestock. Water committee in place. Water charges – 3ksh per 20 lt jerry can. School and Dispensary have committees. Donors: CDF – built dispensary Action Aid and Safaricom Foundation – piping from BH and storage tank in town. Action Aid – 50m3 capacity water tank for the school. County Government – fuel for Genset.		Priority 7: Train water committee on O&M and WRM. Priority 8: A BH has been surveyed 10 kms away with enough water. Explore possibility of drilling. BH drilling costs in the BoQ in annex6.8.2. Priority 9: Household connections. Survey to ascertain costs.
4. Iresa Boru Population: 60 hh Livelihood: Pastoralists	This community is sharing the same borehole with Badana and water is pumped from the borehole 13 km away. It is pumped to an elevated tank and is distributed to seven water kiosks of	The village has 100 latrines. Ratio of 4hh: 1 latrine. The majority either share with neighbours or go to the bush. The dispensary has 2 toilets (2-door). There	Priority 1: Connection of water to the dispensary and the new Malka Masa primary school. Can be connected from the kiosk. Survey to determine costs. Priority 2: Provide solar pumping to replace diesel

	which only 2 are functioning. The water quality is good. Alternative source is Ewaso Nyiro river 10 kms away and sand dams. Water is not connected to the school and the dispensary. There are two RWH storage tanks at the dispensary (one built by MIDP through Cordaid and the other by Action Aid). Two masonry tanks of 20m3 are installed at staff quarters. There is one 5m3 tank which is not functional. Malka Masa primary school with 430 pupils which is new has no water and no kitchen. Pupils carry water from home to the school. A water committee is in place. They charge 2ksh for a 20 lt jerry can; 5ksh per cow and 1 ksh for shoats. Most of the collection goes to O&M, repairs of the pipeline and transportation of fuel which costs 100ksh per trip. At times they have to use donkeys. LVIA did training on conflict management. Challenges: High O&M costs due to leakages (County Government assisted with	are many bats causing health scare. Fumigation needed. Malka Masa Primary school has no latrine. Pupils go to the bush to relieve themselves. The school has no kitchen and cooking is done in the open. This is a health hazard for pupils.	engine or install hybrid system. Cost element in the BoQ in annex6.8.2. Priority 3: Install 1 RWH storage tank and rehabilitate the existing 10m3 tank at the dispensary. Cost of tank Ksh.84,000 excluding transport and basement. Priority 4: Repair the masonry tank and install 1 10m3 RWH storage tank at Malka Masa Primary school. Priority 5: Construct 1 two-door latrine at the Dispensary. Priority 6: Construct Four 2-door latrines (2 for boys and 2 for girls) at the Primary school. Priority 7: Repair 5 existing kiosks to ease overcrowding at water points. Cost to be determined upon inspection. Priority 8: Capacity building for the water management committee. Priority 9: Construct one 2-door latrine at the cattle troughs. Priority 10: Explore possibility of connecting the dispensary line to the town supply.

	fuel). One water source is serving 2 communities of Badana and Res Aboru. Low pressure from the BH (it takes 5 hrs to pump from BH to the storage tank). Overcrowding at kiosks		Priority 11: Explore possibility of private connections.
5. Mochuro Population: 222hh (1334) Livelihood: Pastoralist	The water source is a borehole 1 km away which serves two other centres namely Kombola and Garfasa. It is then distributed to three water kiosks and four individual connections. There is a 50m3 storage tank and its roof has collapsed. The tank for cattle trough is broken. Mochuro primary school with 270 pupils has been connected to the main line. The school has also 1 tank of 10m3 capacity but broken and no RWH facility. Mochuro dispensary has been connected to the main line and has a 10m3 capacity water tank. No RWH facility. Challenges: 1. The water quality is salty and has a lot of fluoride which affects the teeth. 2. Water tank is cracked and leaking. 3. Existing pipeline not durable – of ¾ inch and	The centre has 30 toilets. Ratio of 7 hh: 1 toilet. Some toilets are already filled. The soil is soft and latrines collapse and fill fast. Open defecation is common around the centre. There was cholera outbreak in 2009 and 2010. Some hh have individual waste pits. The dispensary which serves 3 locations (Mogale, Kombola and Muchoru) has no toilets. Open defecation in the bush. A Health Committee exists. The school has 2 toilets (2 –door). Pupils and teachers share the toilets. No waste pits. There is a school committee in place.	Priority 1: Repair the collapsed 50m3 storage tank. Costs to be determined after investigation. Priority 2: Install one 10m3 storage tank complete with gutters for the dispensary. Priority 3: Construct two 2-door latrines for the dispensary. Priority 4: Construct two 2-door latrines for the primary school. Priority 5: Rehabilitation and extension of existing mains so that people can have individual connections. Survey needed to determine the costs. Priority 6: Install one 24m3 storage tank for livestock. Existing one is broken down. Cost of 24m3 tank is Ksh.135,000. Priority 7: Construction of a store for the pump house

	bursts under pressure. There is a water committee in place. They charge 2ksh for a 20 lt jerry can and 500ksh for individual connections. There is a school committee in place. Donors: Red Cross – Genset (functioning) ACF – Construction of pipeline and cattle trough. County Government – 600 lts of diesel.		Priority 8: Three locations share the water system and all burden is left on Mochuro water committee. There is need to streamline the management committees to facilitate sharing of responsibilities. Priority 9: Capacity building for school committee (schools management); Water committee on O&M and leadership and Health committee and community on hygiene promotion. Priority 10: The water is salty and has a lot of fluoride. Need for chemical analysis.
6. Gafarsa Population: 624 hh (5900) Livelihood: Pastoralism	This center has water which is pumped from Mochuro six kilometers away. It is rationed at two days per settlement. This leads to conflicts at times. Women wait for up to 15 hours to fetch water. The quality of the water is salty. Alternative source of water is River Ewaso Ngiro and laggas. Challenges: • Frequent leakages and bursts • Water not enough for the settlement • Waiting time at	Sanitation in this village is poor. There was cholera outbreak in 2000. Open defecation is common. There are very few waste pits. There are only 30 toilets at the centre. Ratio of 20hh per toilet. Observed children defecating near the storage tank. Gafarsa Primary school has 4 toilets (4-door); 3 were built by FH and 1 by community. Abagarse school has 3	Priority 1: Connection of water to Abargase primary school (2 kms). Cost to be worked out after survey. Priority 2: Install 2 RWH storage tanks of 24m3 capacity for Abargase primary school. Estimated cost – Ksh.135,000 each. Priority 3: Construction of 4 two-door latrines for Abagarse primary school. Priority 4: Install 2 RWH 10m3 storage tanks for the dispensary. Priority 5: Rehabilitation of existing water supply system (6 kms). BoQ for

	source too long • Masonry storage tank leaking • Damage to pipeline by wild life There is connection to Gafarsa Primary school with 745 pupils and the dispensary. There are four tanks at the school which have not been connected to the roof catchment. The health center has four storage tanks and only one of 30m3 is connected to the water supply. The other 3 are of 10m3 capacity. There is also a new primary school (Abargase) with 105 pupils and does not have any WASH facilities. Donors: Egyptians built the BH in 1991. Red Cross – bought Genset in 2006. World Vision – to sink BH for livestock and promised to fit with solar but not yet done. Built cattle trough and cattle dip. FH – built toilets for schools.	toilets but not in use.	6km extension is in annex6.8.1. Priority 6: A 2.8 km connection to Mochuro needed. If WV puts up the tank, LVIA could do the pipeline. LVIA to consult with WV.
7. Malka Daka	This center has currently no water since the only	Sanitation is very poor at the centre. More than	Priority 1: Rehabilitation of existing shallow well or

Population: 500hh (2500) Livelihood: Pastoralist	shallow well 5 kms away which was serving the area has dried up. A bore hole was drilled by WV near the river but the water had some foul smell. The county Government has promised to sink a BH (not yet). There are five water kiosks which used to serve the community but require rehabilitation. There is also a masonry tank which also requires rehabilitation. There is Malka Daka primary school with 320 pupils and a dispensary which are connected to the community water supply but no water available. It has no RWH facility, Donors: ACF – tank repair; big tank at the dispensary. Red Cross – tanks at the school. World Vision – sank BH but no water. FH – built 2 toilets (2-door) at dispensary.	90% of residents do not have toilets – only 10 toilets and some are filled. Ratio: 50hh per toilet. Open defecation common. The dispensary has 2 toilets (2-door) and no waste pit. The school has 1 toilet which is filled up.	construct a new one. BoQ for shallow well in annex. Priority 2: Install hybrid pumping system. BoQ in annex6.8.2. Priority 3: Rehabilitation of rising main and distribution mains Priority 4: Install two 10m3 RWH storage tanks complete with gutters for the dispensary. Priority 5: Install two 10m3 RWH storage tanks complete with gutters at Malka Daka Primary school. Priority 6: Construct four 2-door latrines at the Primary school. Priority 7: 400 metres connection from main tank to the school needs repair. Survey to determine costs. Priority 8: Provision of water treatment chemicals at house hold level.
8. Barambate Population: 160 hh (1400) Livelihood: Pastoralist/cosmopolitan	The centre has water from 8 shallow wells 200 metres from town (5 protected wells and 3 unprotected wells). There are 2 more shallow wells for livestock.	There are 35 toilets in the village. Ratio: 5 hh: 1 toilet. 3 years ago Red Cross promised to bring slabs but not yet. People dug	Priority 1: Rehabilitate well and Install hybrid system to serve community and dispensary. Costs of shallow well and hybrid system in annexes6.8.6

	The water quality is ok. No BH in existence. Alternative source is Ewaso Ngiro river 10 kms away .ACF provided hand washing tank. According to the Chief of Barambate, there is a well 6 kms from the village which is considered a miracle well due to abundance of water. When it rains flood water fills the well and hence it needs raising the walls."Mado" means shallow well; "Yaka" means baobab tree. The Health centre has 1 tank with 15m3 capacity and 1 extra one for EWH by UNICEF but no gutters. Challenges: ▪ Contamination of water by baboons. ▪ Floods usually cover open shallow wells. ▪ Likelihood of contamination at source ▪ The center has expanded and some households are far from the source ▪ Breakdown of	holes which have become a hazard as donkeys fall into them. Some hh have waste pits. The dispensary handles 15-20 patients daily. The dispensary has only 1 toilet (2-door).	and 6.8.2. Priority 2: Piped water for the primary school from existing well or a new one. Survey to determine costs. Priority 3: Construct four 2-door toilets each for the school and dispensary. Priority 4: Rehabilitate Madoyaka shallow well 6 kms away and raise the walls. Cost of shallow well (BoQ) in annex6.8.6and design in different attachment to this report. Priority 5: Extension of water to the far end of the center and communal water points for the local community and a manyatta 1 km away. Survey needed for costing. Priority 6: Raising wall of 2 wells so that water from lagga does not spill into well during heavy rains. Investigate for costing. Priority 7: Fencing open shallow wells. This can be done by community as part of their contribution Priority 8: Construction of waste pits in the village, school and dispensary. This can be done by community.

	hand pumps due to constant pumping. The local health center has water connected from one of the shallow wells. The local primary school has no water connection and has very low latrine coverage i.e .three one door toilet one each for teachers b boys and girls. There is a water committee in place. They do not charge for water from shallow wells. Donors: 1. FH – cleaning and rehabilitation of 2 wells; well protection (2); 2 cattle troughs 2. ADS – installing hand pumps 3. ACF – Genset pumping from well to dispensary (200 metres). 4. CDTF – well protection and 2 hand pumps.		

3.4.3 Isiolo Sub-County

1. Tupendane Population: 600 hh Livelihood: Agro-	The village is served by 2 BHs one kilometer away. One BH is not functioning. The BH water is salty. Some hhs go to fetch	The village has adequate latrine coverage (75% have toilets) and most hh have waste pits. According to the	Priority 1: Install one solar pumping system to reduce O&M costs. Cost of solar system in annex6.8.2.

pastoralists/cosmopolitan. The village was settled in 1953 with inhabitants mainly from Wajir, Marsabit and Moyale.	water from nearby Isiolo river (500 metres away). The local community has piped water with individual connections. The metered connections pay 500-1000 ksh monthly depending on usage. The kiosks have been closed The Dispensary is connected to the local water supply and has a 100m^3 and 15m3 storage tanks. The water quality is good (clean water). It has good catchment for rain water harvesting. Kilimani Primary school has 4 plastic tanks (one is cemented). There is a water committee in place. Donors: 1. UNICEF – provided the tank and hand washing facility. 2. MoH – provided the second tank. 3. Red Cross – training on sanitation and hygiene.	residents interviewed, there is no more open defecation. There are 6 CHWs in the village – each covering 20 hhs. The community is willing to share costs of putting up latrines. The dispensary has 1 toilet (2-door) and a waste pit. The Primary school has 2 five-door toilets – one for boys and the other for girls. The nursery school has no toilet.	Priority 2: Guttering for the 2 RWH tanks at the dispensary. Priority 3: Provision of water treatment chemicals at household level Priority 4: Training for water committee on O&M; and community sensitization on hygiene and sanitation. Priority 5: Construct two 2-door latrines for the nursery section.
2. Bulla Pesa Dispensary Population: 2000 hh (catchment for the dispensary) Livelihood: Agro-pastoralists/cosmopolitan	The dispensary built through CDF is in Isiolo township and the licensed water service provider is Isiolo Water and Sewerage Company Limited. The dispensary is complete but has no staff. It has a good	The dispensary has no waste pits.	Priority 1: Installation of 2 10m3 RWH storage tanks at the dispensary. Priority 2: Construct 2 two-door latrines for staff at dispensary.

	catchment for rain water harvesting.		
3. Erimet Population: 280 hh (5000) Livelihood: Agro-pastoralists/cosmopolitan	This center draws water from a nearby borehole. Water is used mainly for domestic use although the community claims they used to irrigate kitchen gardens but the pipeline was vandalized during the clashes. The water quality is ok. Alternative water source is Isiolo river. The dispensary has water connected from the bore hole 1 km away and 3 plastic water tanks for roof catchment (1m3, 5m3 and 10m3). The main tank is cracked. The village has a water committee of 18 members (15F, 3M). Erimet primary school has water connected from the community water supply and two plastic water tanks one with a bullet hole which can be repaired. The school has 1 ferrocement tank (50m3) and 2 plastic tanks (10m3 and 5m3). The school has a committee of 12 (5F, 7M). There is a communal water point (kiosk) where people buy water at two shillings for a 20 liter jerrican. It is managed by a Women	The centre has 56 toilets of which only 27 are functioning serving only 10% of the population. 90% have no toilets and go to the bush for defecation. A few hhs have waste pits. The dispensary has 2 toilets (2-door) and 2 hand washing tanks. The dispensary has a committee of 9 members (5M, 4F). The school has 2 modern toilets (4-door), 6 iron sheet toilets (2-door) and 1 tin sheet toilet (3-door).	Priority 1: Repair of two ferro-cement community storage tanks. Assessment to determine damage and costs. Priority 2: Install one 10m3 storage tank to replace one damaged by bullets. Priority 3: Repair of vandalized pipes. Assessment to determine costs. (Community willing to share costs).

	Group.		
4. Daaba Population: 500 hh (2500) for Daaba Juu. The other villages are: Etop, Daaba centre, Ngapo and Nakuprat) Livelihood: Pastoralist	This community draws water from a bore hole which is solar powered to 2 tanks (50m3 and 10m3). There is a shallow well used for livestock. Water is connected to the primary school and a newly constructed dispensary which has a good catchment for rain water harvesting. Gutters have been fixed but no tank. There is a wind mill which has remained non-functional for the last 15 years. Daaba Primary school has 2 tanks drawing water from the line. Daaba dispensary is new and not yet opened. It has 1 tank of 1.9m3.	Sanitation is poor. There are no toilets in the village and people walk 2 km to the bush to relieve themselves. The terrain is rocky and digging toilets is difficult. The dispensary has 1 toilet (3-door) and not yet in use. The Primary school has 2 four door toilets for boys and girls	Priority 1: Installation of hybrid pumping system for Nakuplat BH. BoQ in annex 6.8.2. Priority 2: Construct a shallow well for Daaba Juu. Cost in BoQ annexed6.8.6. Priority 3: Construct 2 kiosks for Daaba center. Design and BoQ for kiosk in annex6.8.3. Priority 4: Provision of 4 hand washing facilities for the school and 2 bathrooms for girls. Priority 5: Install one 10m3 RWH storage tank complete with gutters at dispensary.
5. Kipsing Centre population: 80 hh Community population: 406 hh Livelihood: Pastoralist	This center has a newly constructed water supply (BH using solar) and is distributed to five water kiosks where the community pay 100 shillings per month for the water. Caritas put up 3 kiosks. Red Cross dug a sand dam which is not functioning. KLMC sank Rukumpai BH in 1972 but not in use. It has lots of water that can serve whole of Kawalash. Longopito: 10 sand dams	Sanitation around the lagga is poor. Open defecation is common The centre has 15 toilets which translate to 4hh per latrine. Kipsing community have 59 latrines in use and 64 being excavated The school does not have good toilet coverage (only 2 iron sheet toilets)	Priority 1: Rehabilitation of Rukumpai BH. Resurvey needed to determine costs.Installation of solar powered pump for the borehole. Priority 2: Construct 1 new sand dam at Supeshan with an infiltration gallery and a hand pump and fencing. Priority 3: Construction of new Lupus lagga sand dam with an infiltration gallery and a hand pump and fencing. See BoQ in annex

	by ALP, Catholic mission and ACK; 8 water pans. Water is connected to Longopito primary school (2 tanks by RC and 4 tanks by ACK) but is controlled by the Catholic Church. Longiriai sand dam which has never harvested water. Lupus lagga- an existing sand dam installed with a hand pump but the water is not adequate for the local community. Supeshan lagga - has good potential for a sand dam. Again it should be noted that the ground water potential in this area is very low and water pans are the most reliable sources of water. Nantundu water pan - There are two water pans in this area one which was recently excavated. The water is used both for domestic and livestock consumption wild animals are also consuming the water. The sources are not protected. There is a health center with its own water supply from a nearby shallow well. There is also Kipsing primary school which is connected to the water supply and has good water		6.8.8. Priority 4: Rehabilitation of Longiriai sand dam and fencing. See annex 6.8.8. Priority 5: Additional one 20m3 storage tank at Lengurma (Mutunyi) rock catchment. Priority 6: Two extra storage tanksof 24m3 capacity at Mokori RC Increase the catchment area of RC Fencing of the area of the RC. Priority 7: Extension of piped water to the secondary school. Survey recommended. Priority 8: Extension of piped water from the school to the market (500 metres) and from market to secondary school (500 metres). Priority 9: Construction of four 2-door latrines at the secondary school. Priority 10: Construction of 2 two-door latrines at the market. Priority 11: Capacity building for dam and RC committees on Management of water resources, leadership and O&M. Orientation for

	harvesting facilities. There is a newly constructed Kipsing secondary school with only one storage tank and is not connected to the water supply. Three shallow wells provide water for the centre. SW 1- from tank at GSU to Ntepes to shamba (1.2 km); SW 2 –from lagga to centre to Kipsing primary school (1.6 km); SW 3 from Sieku to dispensary (800 m) and salty. Rock catchments: Mokori RC – tank 50m3 – Arid Lands; Main source of clean water but not adequate for the big population. Kawalash RC – 2 tanks of 100m3 capacity each – Red Cross; Nomotonyi RC (Longurma) 50m3 Action Aid and climate change – tank. Kipsing WRUA – 40 members (18F, 22 M) Nalepo WUA – 20 members (10F, 10M)		WRUAs and WUAs on catchment management and WRM respectively.
6. Oldonyiro	Main sources of water are BH, shallow wells at the center, sand dams at the center and Raap, Ewaso Ngiro river and rainwater 2 BHs functional- Action	Water from Ewaso Ngiro is contaminated and requires treatment. Sanitation coverage is relatively low and Open defection is common	Priority 1: Replacement of engine with hybrid pumping system. Priority 2: Replacement of current pipes at Raap with class E pipes.

	Aid bough Genset for town supply now transformed to solar; VSF Swiss – piping from BH to community kiosk at the centre; Twale primary school – fetch water 5kms away. The secondary school and the health center do not have any connections. The engine which serves the shallow well has broken down and is in dire need of repair. Ngorika sand dam - There is an existing sand dam which requires rehabilitation. The ground water potential is very poor in this area and even a new one will help in improving water storage. Ngorika rock catchment - There exists a rock catchment in the area but very small. Rehabilitation which includes expansion of catchment area and additional storage tanks is recommended.	near water points (laggas). MoPH and Red Cross have conducted sensitization campaigns on hygiene and sanitation.	Priority 3: Construct one rock catchment at Tale hill. Survey recommended to determine catchment area, slope etc. Priority 4: Connection of water to the secondary school and health center. Survey recommended. Priority 5: Pumping of raw water from the river to Tuale primary school. Survey recommended. Priority 6: Anchor of shallow well pipeline at the river bed crossing. Priority 7: Rehabilitation of Ngorika sand dam and installation of hand pump. BoQ for sand dam in annex 6.8.8. Priority 8: Rehabilitation of Ngorika RC. Cost of RC to be determined after survey. Priority 9: Construct one 2-door latrine at the lagga. Priority 10: Sensitize community on PHAST and CHAST. Priority 11: Train WRUAs and WUAs on catchment management and WRM respectively.

Table 2: Site findings

3.5 Institutional framework

For the success of the development goals of Isiolo County, many groups and institutions are involved in the implementation of different activities directed towards achievement of the set targets e. County vision, Vision 2030 and MDGs. These stakeholders have different mandates and roles, and given an enabling environment and supportive policy guidelines, achievement of these goals is possible.

3.5.1 Key stakeholders

In the course of the assessment, a number of key stakeholders with whom LVIA can collaborate and work with were identified. Collaboration with these stakeholders would make it easier for LVIA to achieve its intended development objectives.

i) The County Government

The County Government stands out as the most pivotal institution to foster development in the sub-counties through devolved structures. The guiding principle of Isiolo County Spatial Framework is that development should be sustainable and is about improving well-being and quality of life by integrating social, economic and environmental objectives in the context of more efficient use of natural resources. The Spatial Framework aims to deliver sustainable development through geographical area specific strategies. The purpose of the framework is to ensure that what is done whether in the public and private sectors in is integrated and sustainable, and that actions within an area support each other and jointly move towards a shared vision for the county. This can only be achieved through collaborative working and the vertical and horizontal integration of policies both at the national and county level.

The successful completion of 2010 referendum which paved way to the promulgation of a new constitution ushered in a new era in Kenya. Chapter 11 of the Kenyan New constitution required devolved Government leading to creation of 47 counties in the country. It has also given priority to development planning as the foundation upon which the county budgets will be based on. A County Integrated Development Plan (CIDP) has been developed to guide development initiatives in the county. This offers an opportunity for development agencies to synchronize and harmonize their plans with the CIDP to avoid duplication of efforts.

Below presents a summary of the main development issues and problems affecting the county, their causes, development objectives and potential strategic thrusts by sectors as captured by the CIDP.

Sector	Sub-sector	Function of County/National Government	Issues	Causes	Development Objectives	Immediate Objective/Targets	Potential Strategic Policy Thrust
Environmental Protection, Water and Housing sector	Water	Soil and water conservation; Water and sanitation; Storm water management;	Inadequate access to safe drinking water	Persistent drought ; Poor water harvesting; Pressure on water points from large livestock herds. High salinity of underground water; Long distance to water points	Safe and clean water for all	Connect 50% of households with piped water 2017; To reduce the average distance to water points from 3Km to 1Km by 2015	Surface run off harvesting; Roof catchments; Construction of small, medium, big dams and pans; Rehabilitation and sinking of new boreholes/wells; De-silt existing water points; Provide credit to households to harvest roof water catchment; Investment in water treatment plants; Construction of weirs for underground water recharging.

Table 3: Summary of development issues

ii) The Northern Water Services Board (NWSB)

Northern Water Service Board is one of the seven Water Service Boards formed in Kenya in the year 2003 under Section 51(ii) (b) of the Water Act 2002. It covers an area of 244,860km2 which is about 43% of the country. The Northern Water Service Board operations cover 35 Districts

across in northern Kenya. These fall within the 7 counties of Isiolo, Garissa, Laikipia, Mandera, Marsabit, Samburu and, Wajir. 19 of these 35 Districts fall in North Eastern, 9 in Eastern and 7 in the Rift Valley Provinces of the Republic of Kenya.The Board is responsible for the efficient and economical provision of water within its area of jurisdiction as authorized by the Water Services provision license as mandated by section 53(1) of the water Act 2002. Part of the Drought Contingency Plan for Isiolo that was prepared by the NWSB is shown below. The NWSB ensures that all WSPs are duly registered and licensed and that they conform to the requirements.

Legal framework and institutional reforms in the Water Act 2002

The Water Act 2002 provides the reformed legal institutional framework for the management and development of water resources and the provision of water services. The Water Act makes the Water Services Boards (WSBs) the sole mandated authorities to obtain the licenses for the provision of water services, in the area of their jurisdiction. The Water Act's addressed the weaknesses that face the water industry and segregate policy making bodies with those who implement the service delivery and the expectation of the efficiency in terms of time and quality of both the water and sanitation as commodity and the services that go with its delivery.

Contingency Plan Prepared by the NWSB for Isiolo County in response to the 2011 Drought

i) Short and medium term interventions

- Equip drilled boreholes at LMD, Kiwanjani, Garbatulla health centre, and Sericho
- Water tankers; more water trucking required especially outsourced water tankers, DWOs should be funded to hire water tankers
- Water tanks like collapsible water tanks for ease of storage after drought.
- Fuel subsidies for borehole water systems and water tankers in all districts
- Strengthen borehole water scheme maintenance unit at county level
- Standby gensets and submersible pumps for operational borehole water schemes.
- Hand pumps for shallow wells used for domestic water supply in permanent shallow well area like those visited by the NWSB team
- Collaborate with line ministries like livestock to assist pastoralists e.g. Livestock off take to start before animal body condition deteriorates further.

ii) Long term interventions

- Construction of Mega Dams and sub-surface dams to harvest surface runoff, especially on large creeks (laggas) across the county
- Strengthen and cluster borehole water schemes to benefit from economic of scale in water resource management, acquisition of spare parts and water metering.

- Control settlement because settlements infringe into grazing lands causing land denudation, soil erosion and depletion of vegetation for energy and building materials
- Range reseeding and controlled grazing through livestock ministry and other stakeholders.
- Educate communities on:
  - The need to keep smaller herds that is commensurate with land carrying capacity.
  - Water conservation, protection and thrifty use of this resource especially water pans that capture surface runoff, which can easily get contaminated.

iii) Water Resource Management Authority (WRMA)

The Water Resource Management Authority (WRMA) is a state corporation under the Ministry of Water, Sanitation, Environment, Natural Resources and Irrigation established under the Water Act 2002 and charged with being the lead agency in water resources management. The roles of WRMA include issuance of water extraction permit and monitoring utilization and management of water resources (quality control) in their jurisdiction. Therefore interventions concerning structures as boreholes, shallow wells and dams have to be vetted by WRMA.

Stakeholder participation in Water Resource management at the local sub-catchment level is anchored around the formation of community based WRUAs, made up of water users and riparian owners interested in proper management of water resources. WRMA is in charge of formation and building the capacity of WRUAs on the management and preservation of catchments. In conjunction with Water Services Trust Fund (WSTF), established under the Water Act 2002 (section 83) to assist in financing water services in underserved parts of Kenya, WRMA has developed the WRUA Development Cycle (WDC) as a framework to channel investment into water resource management at the local level.
Through WRUAs, WRMA also supports the WUAs in the management of water projects.

iv) Environmental Management and Coordination Authority (EMCA)

This is a statutory body formed in 1999 by an act of parliament. The Environmental Management and Coordination Authority is in charge of environmental monitoring and provision of advice environmental sustainability. All water and related structures eg. boreholes, dams, earth-pans and civil works have to be vetted by EMCA through approved Environmental Impact Assessments.

v) The Ministry of Water, Sanitation and Irrigation

The Ministry is mandated to provide WASH services at county level and gives technical support to implementing partners and to ensure there is consistency with standards approved by the Ministry. It also offers backstopping to the community for sustainability. Other players compliment the Ministry's efforts. In the current state and according to the Chief Water Officer

Fayo Galgalo, sanitation issues have not been adequately factored in the current plans for WATSAN in the county as focus has been mainly on livelihoods (food security and water resources) as priority areas. The county Government is young and with limited budget, it is trying mainstream WASH activities within the county and to roll out programmes that will address WASH concerns at institutional and community levels. The Ministry has developed a 5-year strategic plan that fits into the CIDP.

The main challenges faced by the Ministry include inadequate financial resources, unclear structure of coordination at county level, community participation and insecurity.

vi)The Ministry of Public Health

The Ministry is mandated to provide sanitation services within the county. Sanitation coverage remains low in the county and open defecation is still rampant in the villages and peripheries of the towns. The Ministry is spearheading CLTS as a means of sensitizing the community on hygiene and sanitation both at household and community levels. From the assessment it was evident that the Ministry is actively engaged in a number of activities in the county. These including the promotion of CLTS, provision of hand-washing facilities in institutions (schools and health centres) and PHAST/CHAST in collaboration with implementing NGOs particularly Red Cross.

vii) NGOs, FBOs and Private sector

NGOs, FBOs and Private sector play a big role in complimenting the Government in undertaking development initiatives. In Isiolo county, a number of NGOs, Churches and Private sector players have contributed towards supporting community projects. See table 4.

viii) The Community

The community remains the biggest beneficiary and stakeholder in the process of development. They hold the key to sustainability of projects. Community participation and ownership of the interventions is therefore important for sustainability to be realized.

3.6 Community participation and governance

From the assessment, the community has embraced the support offered by various institutions and organizations in the implementation of WASH interventions. However, participation remains low in terms of management and sustainability of the interventions. Many water infrastructure and sanitation facilities are not functioning due to negligence or lack of skills for Operation and maintenance. In all sites visited, there are Water, Health and Education committees in place an indication that the community can organize its institutions to support development initiatives. However it was evident that these committees require further capacity

building to make them more effective and accountable. It was also noted that participation has been affected due to unclear approach by implementers on emergency response versus development mode. Dependency syndrome has resulted out of this unclarity.

Within its institutional mandate, the Government has handed over the management of Water resources to the community through WRUAs who are in charge of the management of catchment areas within the county. The assessment revealed that only two sub-counties of Isiolo (Oldonyiro and Kipsing) and Merti had established WRUAs. Merti Town has an active Water Service Providers Association. However water committees exist at every site that was visited.

3.7 Coordination, partnership and collaboration

For effective implementation of WASH activities, partnerships, collaboration and coordination are essential. From the assessment, it was evident that institutions and partners do exist that can enhance LVIA's work in the county. Previously there was the District Steering Group (DSG) which was very effective in coordinating activities at District level. However with the new devolution and establishment of counties, a structured county development forum with a functioning secretariat is yet to take shape. Presently WESCOORD stands out as the best coordination forum in the county, bringing together a number of actors in the WASH sector.

3.7.1 Water and Environmental Sanitation Coordination (WESCOORD)

This is the nationally mandated forum that is convened by the DWO and brings together all the WASH Actors in the district to discuss water issues and make plans. In the context of devolution, this is now being managed at the Sub County level. The WESCOORD at the sub county level is supposed to feed into the National WESCOORD. As, Isiolo County is prone to severe drought and was one of the most affected counties in the 2011 drought, there are cases where the National or/and Sub National WASH Cluster can be triggered to boost Government effort during such emergencies. This is chaired by UNICEF, with either the Government or an INGO Co-chairing. The District Steering Group (DSG) formerly chaired by the Arid Lands Resource Management Program, plays a pivotal role to bring actors across sectors together in these arid regions. Amongst the key things that formerly top their agenda are early warning systems for drought, floods and conflicts and food security. These sessions are held periodically or ad hoc and are chaired by the County Commissioner.

3.7.2 Partners

Some of the NGOs and FBOs operating in the County that LVIA could partner with in the execution of WASH activities include: Action Aid, MID-P, Action against Hunger (ACF), KRCS,

Catholic Development Office, UNICEF, World Vision, Food for the Hungry(FH), VSF Swiss and ACK. A number of institutions are also involved with WASH activities in the county. These includeWRMA, ENNDA, NWSB, CDF, Climate Change, UNICEF, CTDF, KWS andArid Lands Project. In promoting Public Private Partnership (PPP), LVIA can work with private sector players including Conservancies, Safaricom Foundation.

	Partner	Intervention	Areas already active
1	World Vision	BH solar; Storage tanks; Nutrition; Aqua tabs; classrooms	Oldonyiro, Ngare Mare; Daaba; Kinna; Gafarsa; Duse; Malka Daka
2	Action Aid	Storage tanks; Toilets; Genset; Pump house; Piping;	Daaba; Oldonyiro; Badana; Garbatulla.
3	Kenya Red Cross	Sanitation (latrines; slabs); Aqua tabs; Storage tanks; BH/gensets; Piping; Capacity building ; Sand dams, rock catchments; shallow wells	Biliqo Marara; Dadacha Basa; Kinna; Muchoru; Malka Daka; Gafarsa; Oldonyiro and Kipsing; Ngare Mare; Kilimani; Bulesa; Kulamawe; Korbesa and Sericho.
4	Action Against Hunger (ACF)	RWH roof catchment; storage tanks; Water trucking; Piping; Gensets; Nutrition; Ceramic filters.	Bisan Biliqo; Kinna; Duse; Muchoru; Barambate.
5	Food for the Hungry	Toilets; Well protection; Storage tanks;	Kinna; Gafarsa; Barambate; Erimet
6	APHIA Plus (Imarisha)	Borehole	Korbesa
7	VSF Swiss	Storage tank; Piping	Bulesa
8	M-IDP		E
9	ADS	Hand pump	Barambate
10	Catholic Diocese		
11	UNICEF	Gensets; Toilets	Merti; Erimet
12	Arid Lands Project	Sanitation (latrines); Restocking	Biliqo Marara
13	Northern Water Service Board (NWSB)	Storage tanks; Piping; Kiosks; Fuel; Gensets; Dam rehabilitation	Biliqo Marara; Dadacha Basa; Merti;
14	CDF	Classrooms; Dispensary	Bisan Biliqo
15	Climate Change	Borehole; Pump house; Toilets; sand dams;	Dadacha Basa; Mata Arba; Bulesa; Oldonyiro
16	CTDF	Classrooms	Kinna
17	ENNDA	Solar Genset	Duse
18	KWS	Storage tank; Piping	Duse

Table 4: Partners

3.8 Challenges to implementation

- ***Dependency syndrome:*** Isiolo County is prone to drought and hence the need for emergency response is inevitable. Many donors have readily joined in the efforts to provide relief aid. In the process, development activities slag during the emergency period as more efforts are put on rebuilding livelihoods. The challenge is that the community has not differentiated between emergency and development modes and are always seeking for assistance; and development agencies have not sensitized the community on the connection between emergency and development. As a result, community participation has remained low and is bound to affect sustainability of the interventions.
- ***Infrastructure:*** The rough terrain in most parts of Isiolo County hinders accessibility. During rainy seasons, most roads are impassable. Communication network is another challenge as information does not reach some areas in time.
- ***Field coordination:*** Despite having a working WESCOORD forum, field coordination remains weak as agencies adopt individual approach and yet they are dealing with the same community. This at times sends mixed signals to the community and there is the risk of duplication of efforts.
- ***Drought:*** Persistent drought remains a big challenge to development initiatives as the community's vulnerability persists.

4. CONCLUSIONS AND RECOMMENDATIONS

With 71 percent of the county population living below the poverty line (less than a dollar per day) according to World Bank), there is need to develop programmes directed at addressing acute poverty especially among the pastoralists. This is partly because of insecure land tenure system compounded by breakdown by traditional land management system as well climate change effects and incidences of insecurity. (*Source: CIDP).*

4.1 Recommendations

From the findings of the assessment, the following recommendations are made for LVIA and other actors to consider:

Groundwater remains largely unexploited. To supplement existing studies already undertaken, groundwater investigation should be undertaken to determine groundwater occurrence in the county. Storage of rainwater in dams and pans is feasible especially for livestock. Run-off catchment should be explored to avoid wastage after heavy rains. As recommended by the Red Cross study, detailed hydrogeological and geophysical investigations should be executed to establish most promising location for water sources. Alternative water sources should also be studied where existing sources are inadequate to meet the water demand. In order to make a comprehensive analysis, more data from WRMA should be obtained and analyzed with the aim of upgrading water resources data base. It is further recommended that continuous validation and updating of the water resources data base be carried out.Piping of water from the sources or alternative water sources should be done where suitable the water sources exist to reduce the distance to the communities to within the 2 km threshold and hence adhere to SPHERE standards (2011).

Water demand remains high. For community systems, large capacity tanks should be considered to minimize long travel to water points. RWH should be considered potential water source especially in institutions.Communities using sand dams should be sensitized on water management practices to prolong water retention periods and maximize the use of existing water resources. Shallow wells are relatively cheaper to maintain and suitable as they have good water quality. Borehole water is saline in most cases. Water quality analysis should be done to ascertain suitability for human consumption.

Generators incur high O&M costs and are not environmentally friendly. The introduction of solar pumping system or hybrid (Genset fitted with solar) is a viable option. The Genset is then used as a stand-by system.Shift from diesel to solar will cut operation and maintenance costs will enable committees to raise funds for repairs and expansion of facilities.

Most water points are unprotected. Existing water points should be fenced to minimize access by animals and pollution due to defecation. Where possible, water treatment should be done at community and household level.

The Water Act 2011 recognizes WRUAs as the main players in water resources and supply. WRUAs should be capacitated to play a bigger role in the management of water resources at sub-catchment level. It is recommended that apart from the existing WRUAs in Kipsing, Oldonyiro and Merti, WRUAs be formed in Garbatulla and an additional one in Merti. This will ensure sustainable management and conservation of water resources. It is advisable that since WRUA's domain is more on Natural Resource Conservation, Water Conservation and Environmental Protection at sub-catchment level, WUAs be strengthened to support the village-based Water Committees in managing water resources at village level. Individual Water committees can also be assisted depending on their unique local needs.

Functional water, health and education committees should be formed and existing ones strengthened to allow protection and effective management of the water points and minimize contamination and pollution of water sources as well as promoting hygiene and sanitation practices. From the assessment most committees require capacity building on management, hygiene and sanitation and schools management. Village committees need to be trained on conflict management as the county is conflict-prone. Local artisans should be identified and trained to support O&M functions. Sustainability could be a reality if the community is sensitized on the difference between emergency and development modes. Already people are paying for water at an average of 20ksh per 20 lt jerrican and upto 500 ksh for individual connections. Therefore community contribution is possible if the community is sufficiently sensitized.

There is low sanitation coverage across the county. CLTS should be promoted in the villages through sensitization. CHWs could play a big role in the sensitization exercise. For the low latrine coverage, the community should be sensitized and supported to build latrines. Open defecation should be discouraged through sensitization. The communities should be sensitized on how to maintain personal hygiene to prevent the spread of water borne diseases from faecal contamination.

Private Public Partnership should be encouraged to involve more players in WASH activities. Already conservancies and other companies eg. Safaricom are involved.

Despite participating in WESCOORD meetings, lack of coordination at field level was very evident during the assessment. A structured forum should be established at county level (similar to the former District Steering Group) to address overall county planning and coordination. WESCOORD should be structured with a functioning secretariat to support the

WASH sector. Sharing of plans and information and joint monitoring would enhance service delivery by the different actors.

4.2 Proposed interventions

From the field assessment and based on the beneficiary needs, the water sources and sanitation facilities proposed for LVIA to consider for intervention in Isiolo county are found in Table 2. It is important to note that in most cases, further hydrological survey will be needed to arrive at accurate designs and Bills of Quantities. LVIA targets the following water structures and sanitation facilities as per the logframe: 21 water sources (BHs, shallow wells, Dams, Sand dams, springs, RWH roof catchments and rock catchments), 28 RWHS and 40 sanitation facilities, together with the establishment/upgrading of 5 WRUAs. These can be selected from the recommendations made in Table 2.

5. REFERENCES

The following documents were consulted and provided valuable information in the course of this assignment.

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j) Study on eight borehole sites investigation in Olndonyiro, Kipsing, Ngaremara and West Isiolo – World Vision 2011.
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Team in Garissa, Wajir, Mandera and Marsabit Counties, (NWSB)

6. ANNEXES

6.1 Terms of Reference

TERMS of REFERENCE

for a WASH Need Assessment to be held in the framework of the project

"Improve access to clean water, sanitation facilities and first health quality services in the County of Isiolo, Merti, Isiolo and Garbatulla Sub-Counties (MAPS)"

(AID number 010191/LVIA/KENYA)

Project implemented by: LVIA and CCM

In partnership with:

WRMA and Isiolo County Department Responsible for Health

Funded by: MAE

August 2014

Brief Description of the Project

The project "Improve access to clean water, sanitation facilities and first health quality services in the County of Isiolo, Merti, Isiolo and Garbatulla Sub-Counties (MAPS)", financed by the Italian Ministry of Foreign Affairs, will be implemented in Isiolo County (Merti, Isiolo and Garbatulla Sub-Counties), which is classified as ASAL (Arid and Semi-Arid Lands) and is drawing humanitarian attention because of repeated droughts affecting the area and of socio-economic marginalization that characterizes the region due to political and cultural issues. The project foreseen duration is 36 months and direct beneficiaries will be 55,309 in total.

The project's main objective is to improve living conditions for pastoral communities in Isiolo County, contributing to reach he 7th Millennium Goal on water and hygienic facilities, with a

further impact on reducing water borne diseases (especially diarrhoea, 6th objective) and improving maternal and child health (4th and 5th objective). The specific objective is to improve the continuous and sustainable access to clean water (for human and animal consumption) and existing hygiene facilities for the pastoral communities in the three Districts of Garbatulla, Merti and Isiolo.

The project aim at reducing the vulnerability due to poor access to clean water and hygienic services of the pastoral communities in Isiolo County by:

Expected Result: 1) Improving access to safe, adequate and sustainable water supply through rehabilitation, restoration and protection of existing water sources and construction/rehabilitation ofroof rain water harvesting scheme in schools/community.

Activities:

1.5. Cleaning/protection/rehabilitation of 21 water sources for domestic and animal use (boreholes, pipelines extension, shallow wells, water pans and sand dams) in the 3 sub-counties;
1.6. Creation, formation and training of 5 WRUA-s to run the rehabilitated water sources;
1.7. Construction/rehabilitation of 28 Rain Water Harvesting Systems (in schools and in community centres);
1.8. Distribution of Water Pur sachets and jerry cans and awareness-raising on their correct use to 2,000 households during the most critical months of the year, in order to overcome drought emergency;

Expected Result: 2) Improving access to safe and appropriate sanitation facilities through the construction of latrines in targeted public school and community centres and increasing awareness of hygiene/sanitation practices, especially amongst women with children under five, and populations living in areas prone to cholera, drought, and floods.

Activities:

2.4 Construction of 40 blocks of latrines and hand wash facilities in schools and community centres;
2.5 Formation of 15 School Health Clubs and organization of monthly sensitization meetings with students and teachers on the proper use of latrines, cleanness and good hygienic practices and prevention of communicable transmitted disease;
2.6 Distribution of 30 sanitary kits (in schools and in community centres) to keep the compound clean;
3.1. Creation of 15 village Health Committees on health and hygiene promotion and follow ups;

Brief Description of the Context

For a long time, Isiolo County has been affected by conflict and drought which hinder it from sharing the process of socio-economic development the rest of the Country is benefitting from. In 2013, rains (200% beyond average levels) caused serious damages to infrastructures (schools, health centres, water sources, latrines), with devastating consequences on pastoral communities and their livestock: because of limited access to water and pasture, as well as crop destruction, insecurity has risen. The intervention aims at improving access to quantity and quality of available water through: rehabilitation/reconstruction of water sources and construction of rainwater harvesting systems. Furthermore, it targets improving access to primary health services by constructing latrines and organizing trainings to ToT which underline the importance of correct WASH practices, promoting maternal and child health and reducing the vulnerability linked to poor access to clean water and hygienic facilities of the pastoralist communities of Isiolo County.

The County is sparsely populated (143,294 inhabitants). Economic activities are intimately linked to available natural resources; the area has very low agrarian potential. The only activity which is suitable in such hostile environment is pastoralism. The nomadic or semi-nomadic life style is the most suitable to weather and environment conditions of the area. Targeted beneficiaries amount to 28,650 (20% of the local population). All of them will benefit from sensitization activities on health and sanitation carried out by 15 Health-care facilitators who will be trained on the job; in addition to this, they will access to clean water for human consumption and animal watering, thanks to water points reconstruction/protection. Furthermore, beneficiaries will be thus composed of: 7,250 students (20% of whom female), who will have water in schools, benefiting from rainwater harvesting systems and latrines, as well as from education activities on their correct use; 10,000 people (2,000 households) will benefit from the dissemination of health and sanitation material and Water Pur kits; the ones remaining (11,250 persons) will fetch water from wells and from rehabilitated sources. Indirect beneficiaries of the action will include 114,560 people (80% of the population), who will benefit from built infrastructures and sensitization activities organized in collaboration with communities.

Brief Description of LVIA's work in the area

LVIA's presence in the County contributed to identify the core problem of the area, that is insufficient access to water for human consumption and animal watering. As a matter of fact, traditional wells are mostly unprotected, resulting in high risk of contamination; similarly, unprotected sand dams and water pans may collapse during floods or when Ewaso Ng'iro River overflows. In addition to this, the vast majority of wells are in poor conditions, thus restraining access to water. Unsafe disposal of faces and incorrect hygienic behaviour engender an increase in diarrhoea morbidity rate in both children (below 5 years old) and adults. In partnership with Caritas, LVIA established a response to the September 2011 drought

emergency, through water trucking and distribution of Water Pur sachets in several villages of Isiolo County. Lately, in 2012 and 2013, funding opportunities by OCHA allowed the construction of 12 blocks of latrines and 8 rainwater harvesting systems in Public Schools, as well as the rehabilitation of 3 shallow wells (Nyachis, Hawaye) and 2 boreholes (Merti, Iresa Boru) and the distribution of 60,000 Water Pur sachets and 500 sanitary kits to households. Trainings on natural resources conflict management and resolution were organized and held.

Thanks to the experience which it has acquired locally, as well as consistent and continuous collaboration with pastoral communities both in Kenya and elsewhere, LVIA has shaped and refined an emergency response system which is tailored to the needs of targeted communities, focusing on improved access to water for human consumption and animal watering, as well as seeking to create a management structure/system which may prevent negative impact on the existing local systems. Through a participatory approach (PICD), beneficiaries are directly involved, with particular emphasis on women representation and active participation, taking into consideration/acknowledging that improving access to water resources is insufficient if hygienic behaviour of targeted communities is not addressed, being the primary cause of the most common diseases and infections.

The main problems identified in the area are:

4. Inadequate access to safe drinking water
5. Poor hygiene behaviours
6. Lack of sanitation and medical facilities

Purpose of the WASH Need Assessment (NA)

The objective of this WASH Need Assessment will primarily be the collection of detailed, accurate and credible information on the WASH needs of the communities of Isiolo County (Merti, Isiolo and Garbatulla Sub-Counties), especially relating to health facilities and schools, Town Water supplies and water pans/sand dams/rock catchments, with a special focus on the access of safe drinking water, hygiene behaviours and sanitation.

The information and understanding gained from this assessment will be used to identify and/or evaluate the selected site of project intervention in accordance with WRMA and Isiolo County Department Responsible for Health.

Specifically the Need Assessment will:

6) focus on available WASH data analysis, project reports, other NGO's assessments, County Integrated Plans, data from other sources at National and County level;
7) be an analysis of information on NGOs/Government Institutions/Private Actors working at present or in the past in Isiolo County, their key lessons learnt and comment on continuous learning process;

8) draw a picture of the sites in need of a WASH intervention in Isiolo County (health facilities/schools, Town Water supplies and water pans/sand dams/rock catchments), with a detailed map and analysis of the WASH specific needs within the same and the related communities;
9) be a complete and exhaustive analysis of collected information in order to understand the WASH needs, their connection to water borne diseases and allow LVIA to implement the proper project intervention according to projects expected results and activities;
10) suggest proper interventions where needed recommending the most appropriate technologies to be applied.

Topics to be covered

As the objective of the Need Assessment is to gather information on the WASH needs of Health Facilities/Schools and Water Sources (sand dams, water pans, rock catchments, boreholes, shallow wells) identified by LVIA in Isiolo County, the information needed will include the following main areas:

SOCIAL ANALYSIS

1. Demographic data on the communities in Isiolo sub-county, including population data, number and size of villages (no. of households), size of households and living arrangements, socio-economic profiles and livelihoods, and so on;
2. The access of the communities to protected water sources, including: % of the population with access to protected water sources, distance to water sources, water collection and waiting times, water quality and so on;
3. The water sources currently being used by the communities to meet their needs for water, including the distance to those sources, the reliability and quantity of water provided by those sources, water quality and so on;
4. The average water consumption per capita per day;
5. Household use, treatment, storage and handling of water, including quantities used;
6. Hydrogeological information, including aquifers and their exploitation, changes to groundwater levels, use of managed aquifer recharge (MAR) techniques, and so on;
7. Community leadership and management structures (e.g. water committees, existing WRUAs, etc.);
8. How to involve the community;
9. Potential water sources for exploitation for domestic water supply;
10. County Government policies, how the deregulation will affect the management of water (i.e. who will replace NWSB?), where can the ONG collaborate with the government and is the deregulation helping sustainable interventions, etc.;
11. National standards for water and sanitation provision and hygiene promotion, and for related areas (e.g. exploitation of ground water resources).

TECHNICAL ANALYSIS

1. Suggested rehabilitations for sites (solar pumps, hand pumps, submersible pump, tanks etc...) and possible water treatments (UV, osmosis, chlorine etc…);
2. Water Quality;
3. Analysis on the failure of previous rehabilitation interventions and on supposed mistakes made in the past. Suggestions for a different approach;
4. Examples of good practices and working systems that can be replicated in future;
5. A comprehensive technical analysis of selected Town Water Supplies:
   - From extraction (i.e. if submersible pump: Yield of water source (m3/day), Static water table, Expected dynamic water table, distance to source, distance and elevation from source to tank, total pumping head (pump level), feasible for solar pump?)
   - To distribution (meters of pipe needed, number of kiosks in place or in need of rehabilitations)
   - Reasons of system brake down;
   - Suggest possible interventions;
   - Take data on pressure along selected system to evaluate possible extensions;
   - GPS points and elevations;
   - Contact all actors from government (i.e. NWSB) or NGOs (i.e. World Vision) involved in the Town Supply, understand if rehabilitations are still ongoing or on hold, time schedule and possible collaborations. Have some pre-agreement on the planned activities on Town Supply;
   - Running costs of the system and analysis of the committee.
6. Consider a possible rehabilitation of old Boreholes or the drilling of new ones especially in Malka Galla;
7. Estimate cost for these interventions;
8. For every school and health facility chosen for RWHS complete a Bill of Quantity which will be used to prepare technical specifications for a possible tender;
9. The defecation practices of the communities, access to latrines and sanitation coverage;
10. The types of latrines used in the communities and those types promoted by other NGOs, agencies and the relevant line Ministry;
11. The hygiene knowledge, behaviours and cultural believes in the communities;
12. Other NGOs and agencies implementing WASH interventions in Isiolo, Merti and Garbatulla sub-county? Information on previous WASH interventions implemented in Isiolo sub-county;
13. The assessment should include logistics information, which should be gathered in coordination with LVIA TEAM:

    ii. Available local resources
    iii. Items available from local markets and prices.
    iv. Accessibility to the potential project sites – security, road conditions (e.g. are the roads passable for trucks?), how will the rainy season affected the project.
    v. Availability of skilled and qualified masons, water mechanics, contractors and so on.

14. Any other information pertinent to WASH programming and developing funding proposals for future Interventions that can give continuity to LVIA's Intervention in the area. Including possible connections, contacts to develop future policy and cooperation with NGOs, Donors, government, etc...

Methodologies and Tools

The Consultant will present a WASH Need Assessment proposal which will:

1) define the methodologies and data collection tools to be used in the Need Assessment for collecting information from communities, health facilities/schools and Governmental Institutions/Ngo-s (to be reviewed to be reviewed with LVIA's Project Coordinator and Country Representative);
2) detail a plan for the Need Assessment implementation, scheduling meetings/interviews/focus group discussions with stakeholders and field/visits and related logistic needed;

Time frame

The assessment is expected to be conducted during the month of August 2014, and the time allocation is set up for 21 days broken down into the following activities:

- preparation of the assessment document, questionnaires, data review and information;
- meeting with major institutions/Wash NGOs in Isiolo;
- collection of data, information and meetings in the project areas;
- report writing;
- presentation of draft report;
- review of the draft report;
- finalization of the report.

Location

The WASH need assessment will be organized and carried out in Isiolo, Merti and Garbatulla Sub-Counties. LVIA will supervise the process. Specifically, the Consultant will report to LVIA Country Representative and LVIA Project Coordinator, with whom the Consultant will be expected to work closely.

LVIA will facilitate and coordinate the assessment process, pay the professional fee and other related costs (food, accommodation, and transport to and from the project area) and review the methodology and other outputs of the assessment.

Terms and Conditions

- Though the interested Consultants are expected to provide a budget for the exercise, LVIA will consider proposals that are within the approved rates as per its policy on professional fees;
- LVIA will cover the cost of the Consultant's travel to Isiolo (and back after the end of the assessment). Food and accommodation expenses must be quoted separately in the proposal;
- 40% of the consultancy fee will be paid into the indicated bank account designated by the Consultant at the beginning of the activity, the balance (60%) will be paid when the need assessment report has been finalized, delivered and approved by LVIA Project Coordinator;
- The consultant shall be responsible for his/her income tax (withholding tax) and insurance during the assignment.

A contract will be signed by the Consultant upon commencement of the assessment which will detail additional terms and conditions of service, aspects of inputs and deliverables.

Application process

One expert is required. All expression of interest should include:

- Cover letter (short letter addressing the WASH need assessment criteria)
- Technical Proposal (brief presentation of the Consultant, with particular emphasis on previous experience in this kind of work; profile of the Consultant to be involved in undertaking the assessment; proposed tools and methodology to be used, assessment design to be described, understanding of ToR, the task to be accomplished and draft assessment framework and plan)
- Financial Proposal (cost estimates of daily Consultancy fees, including accommodation, food and transport costs)

Applicants should apply to the following e-mail addresses:

lviakenya@yahoo.itand **lvia.rpa.ea@gmail.com**

The consultant should use his/her computer.

LVIA will evaluate the proposals that are within the approved rates as per its policy on professional feesand award the assignment based on technical and financial feasibility.

LVIA reserves the right to accept or reject any proposal received without giving reasons.

6.2 Guidelines for questions and household questionnaire

"IMPROVE ACCESS TO CLEAN WATER, SANITATION FACILITIES AND FIRST HEALTH QUALITY SERVICES IN THE COUNTY OF ISIOLO, MERTI, ISIOLO AND GARBATULLA SUB-COUNTIES (MAPS)"

Introduction

I am assisting LVIA to collect information on "Improve access to clean water, sanitation facilities and first health quality services in the County of Isiolo, Merti, Isiolo and Garbatulla Sub-Counties (MAPS)" .All the information you provide will be kept confidential and will not be linked to you without your approval. If you feel uncomfortable you are free to stop the discussion at any time. I will take notes during the discussion for purposes of documentation and the session may take about 30 minutes or less. I am also ready to answer any questions that you may have. With your permission, I hope I can now start the discussion.

SECTION 100: GENERAL INFORMATION

101: Date of interview …….

102: Name of interviewee……Contact……..

103: Interview duration……Start: ……End: ……Duration: ……..

104: Study Area/Sub county: (Circle appropriate one) 1.Isiolo 2. Merti 3. Garbatulla

SECTION 200: DEMOGRAPHIC INFORMATION

201: Sex of respondent (Circle where appropriate)

1. Male 2. Female

202. Livelihood: 1. Pastoralist 2. Agro-pastoralist

202a: Category: 1. Urban 2. Rural

203: Age of respondent (Circle where appropriate)

1. 15 -19 years **2**. 20-24 years **3**. 25-29 years **4**. 30-34 years **5**. 35-39 years **6**. 40-44 years **7**. 45 years and above

203b: Marital status (Circle where appropriate)

1. Single (Never married) 2. Widow 3. Widower 4. Divorced 5. Married with children 6. Married with no children (Circle where applicable)

204: What is the highest level of education that you have attained? (Circle where applicable)

1. Primary 2. Secondary 3.College 4.University 5. None (Never went to school)

205: Size of house hold: How many children do you have? (Circle all responses that apply)

S/N	Own children	Circle here
205	0-1	1
205	2-4	2
205	5-7	3
205	Above 7	4

206. Family status: How many dependants do you have? (Circle all responses that apply)

S/N	Dependant(s)	Circle here
206a	0-1	1
206b	2-4	2
206c	5-7	3
206d	Above 7	4

207. Housing/shelter: What kind of housing/shelter do you live in with your family? (One answer only)

S/N	Housing/Shelter	Circle here
207a	Traditional houses	1
207b	Grass roof/mud walled	2
207c	Iron roof/mud walled	3
207d	Permanent/public house	4
207e	Iron roof/iron walled	5
207f	Other (specify)	6

SECTION 300: SOCIAL ECONOMIC INDICATORS

301. Employment status (Circle responses that apply)

S/N	Type of employment	Circle here
301a	Employed in informal sector	1
301b	Informal sector and self-employed	2
301c	Employed in formal sector	3
301d	Unemployed	5

302. Sector of employment/engagement (Circle responses that apply)

S/N	Sector	Circle here
302a	Commercial/Trade	1
302b	Livestock	2

302c	Agriculture	3
302d	Environment	4
302e	Other	5
302f	Not applicable	7

303: What is your main source of livelihood/income? (Circle responses that apply)

S/N	Source of livelihood/income	Circle here
303a	Farming	1
303b	Petty trade	2
303c	Charcoal burning	3
303d	Livestock	4
303e	Other (specify)	7

304. What is your monthly income? (One answer only)

S/N	Income	Circle here
304a	1000 – 5000 ksh	1
304b	5000 – 10000 ksh	2
304c	10000 – 20000 ksh	3
304d	Above 20000 ksh	4

305. What are your monthly expenses?(One answer only)

S/N	Expenses	Circle here
305a	1000 – 5000 ksh	1
305b	5000 – 10000 ksh	2
305c	10000 – 20000 ksh	3
305d	Above 20000 ksh	4

306: In which areas are you most vulnerable? (Circle responses that apply)

S/N	Constraints	Circle here
306a	Health	1
306b	Food insecurity	2
306c	Education	3
306d	Employment	4
306e	Security	5
306f	Other (specify)	6

SECTION 400: WASH (WATER)

401: What are the main sources of water? (Circle responses that apply)

S/N	Water sources	Circle here

401a	Piped water	1
401b	Shallow well/spring	2
401c	Borehole	3
401d	Dam (earth dam/sand dam)	4
401h	Rain water harvesting	5

401i: Is water available at all times? Yes 2. No
Explain:……..

402. What do you use water for? (Circle responses that apply)

S/N	Water uses	Circle here
402a	Domestic	1
402b	Livestock	2
402c	Farming	3
402d	Other	4

403. What is the distance covered to the nearest water point?

S/N	Distance	Circle here
403a	0-1 km	1
403b	1-2 km	2
403c	2-3 km	3
403d	3-4 km	4
403e	4-5 km	5
403f	Over 5 km	6

404. How do you transport water from water points?

S/N	Transportation of water	Circle here
404a	Jerry cans	1
404b	Donkey carts	2
404c	Other specify	3

405. How long does it take to collect water (including travel to and fro, waiting)?

S/N	Time taken to collect water	Circle here
405a	Less than 30 minutes	1
405b	1 hour	2
405c	2 hours	3
405d	3 hours	

405e	4 hours	
405f	More than 4 hours	

406. How much water do you consume per day?

S/N	Water consumption	Circle here
406a	0-5 litres	1
406b	5-10 litres	2
406c	10-20 litres	3
406d	20-30 litres	
406e	Over 30 litres	

407. How do you store water in the house?

S/N	Water consumption	Circle here
407a	Jerry can	1
407b	Container without lid	2
407c	Container with lid	3
407d	Other (specify)	4

408. Is the water treated? 1. Yes 2. No

409. Do you boil water for drinking? 1. Yes 2. No

SECTION 500: HYGIENE AND SANITATION

501: What type of toilet do you use? (Multiple answers apply)

S/N	Type of toilets	Circle here
501a	Uncovered pit	1
501b	Covered pit	2
501c	VIP latrine	3
501d	Open air (bush)	4
501e	Other (specify)	5

502. Do you wash hands before and after eating/visiting toilet? 1. Yes 2. No
Give reason:…….

503: How do you wash your hands?

S/N	Hand washing	Circle here
503a	Using soap	1
503b	Using ash	2
503c	Other (specify)	3

504. How do you dispose of garbage?

S/N	Garbage disposal	Circle here
504a	Garbage pit/Burning	1
504b	Throw in the garden	2
504c	Other (specify)	3

505. Which common water borne diseases exist in the village?

S/N	Water borne diseases	Circle here
505a		1
505b		2
505c		3

408. What other challenges do you face in the household?

……
408a: How have you managed the challenges?
…….

409: Is there anything you would want to tell me in relation to what I have been asking you on WASH?
…….
……

THANK YOU.

6.3 Key informant Guide Questions – LVIA staff

1. Why did you choose Isiolo County for the Project?
2. Staff capacity to implement the Project?
3. Partnership and Collaboration: Who are potential collaborators/partners?
4. What are the foreseen challenges in implementing this programme? What are the major risks/dangers associated with the implementation of the Project?
5. Potential impact on the livelihoods of targeted communities?
6. What mechanisms have been put in place to monitor the Project?
7. What are the prospects of replicability and expansion of the programme? How sustainable is the approach/strategy?
8. What sustainability measures will you put in place to safeguard the beneficiaries after project end? Exit strategy.

6.4 Key informant Guide Questions

County Government officers, WARMA, Ministry of Water, Ministry of Health, Ewaso Ngiro Development Authority; NGOs; Local Administration (Chiefs)

A. Government institutions

1. What is your role in the implementation of WASH activities in the County? What has been your contribution? What has been the level of beneficiary/community participation?
2. What do you consider as the main WASH needs in the community?
3. What are the main WASH interventions/preferred sources and technological options appropriate for the community and for replication? Potential water sources for exploitation? Give reasons for the answer. How can we improve access to safe, adequate and sustainable water supply in the county?
4. What have been the main challenges in implementing WASH activities? Probe: insecurity, distances, cultural practices, water quality
5. Which institutional structures exist for the management and sustenance of WASH facilities? Available technical expertise?
6. Collaboration with other actors/agencies? In which areas? How can the collaboration be improved? Role and relevance of LVIA in implementing WASH activities?
7. Any other suggestions for LVIA on how to improve the implementation of the project?

B: School Heads/PTAs/Health Committees

1. Explain your roles and responsibilities.

2. What WASH activities are carried out at the institution?

3. What institutional structures have been put in place for the management of WASH activities? Do you have technical capacity to undertake WASH activities? Probe…

4. What are the main WASH needs? Are existing structures adequate? If not what needs to be done to improve WASH interventions?

5. What are the main challenges in the implementation of WASH interventions? How can these challenges be addressed?

6. Any suggestions for LVIA and other development agencies to support the WASH implementation in the sub county?

6.5 Focus Group Discussions (FGDs)

WRUAs, Water Committees, School committees and Health Committees

1. Explain your organization: How and why you were formed? Structure, activities and roles.
2. What do you perceive as the main WASH needs in the sub county? Are existing WASH structures adequate for your WASH needs? Probe further…why (for answer given).
3. What role have you played in the implementation of the WASH activities in the School/Health facilities/County?
4. What management capacity do you have to undertake WASH activities?
5. Are you aware of relevant policies supporting WASH interventions? Water Act, EMCA etc.
6. What are the main challenges facing the implementation of WASH activities? How can they be solved?
7. Any suggestions for LVIA and other development agencies to support the WASH implementation in the sub county?

6.6 Observation check list

i) Existence and use of toilets and waste pits

ii) Waste disposal methods

iii) Hand washing practices – soap in the house etc.

iv) How is water stored? Is water boiled for drinking?

v) Existence of water borne diseases – diarrhoea, dysentery etc.

vi) Type of water structures and usage – sand dams, springs, roof catchments, water pans etc.

6.7 List of persons contacted

A: Key informants

SN	Name	Institution	Designation	Contact (if available)
1	Mr. Ali Surraw	County Government	Minister for Water & Irrigation (CEC)	
2	Mr. Fayo Galgalo	County Government	Chief Water Officer	
3	Mr. Bashir	County Government	Director of Water	
4	Mr. John Kinyanjui	WRMA	Regional Director	
5	Mr. Abdullahi H. Kella	WRMA	Water Quality & Pollution Control Officer	0720 481 302
6	Enrico Gorfer	LVIA		0733 623 230
7	Maurizia Sandrini	LVIA	Project Coordinator	
8	Mr. Adaka	County Government	Water Officer Merti	
9	Mr. Ali Abdullahi	County Government	Water Officer Isiolo	
10	Mr. David Mbwiria	County Government	Water Officer Garbatulla	
11	Mr. Meshack Owira	Kenya Red Cross	Project Coordinator	
12	Mr. Gibson Kimani	World Vision	County Coordinator	
13	Mr. Philemon Bwanawoi	World Vision	Project Officer (Food Security)	0722 665 101
14	Ms Rahab Mburunga	Action Aid		
15	Mr. Charles Kiilu	Food for the Hungry	Capacity Building (CB) Officer	
16	Ms Lydia Kathure	Food for the Hungry	CB Officer	0727 059 539
17	Fr. Munene	Garbatulla Catholic Church	Priest in charge	
18	Mr. Ali Jarso	Biliqo Marara	Chief	0724 553 251
19	Mr. Dima Ali	Bisan Biliqo	Chief	
20	Mr. Nuro Sima	Dadacha Basa	Chief	
21	Mr. Ibrahim Kuti	Mata Arba	Chief	
22	Mr. Abduba Diba	Merti sub-county	Public Health Officer	
23	Mr. Franklin Mureithi	Merti Health Centre	KRCH Nurse	0725 451 814
24	Mr. Daudi Mohamed	Kinna Sub Location	Assistant Chief	
25	Mr. Daudi Halake	Bibi Sub location - Duse	Chief	
26	Mr. Hassan Chakaso	Badana Location	Chief	0711 120779
27	Mr. Hassan Dibo	Iresa Boru Location	Chief	0717 546 367
28	Mr. Adan Abgudo	Gafarsa Location	Ex-Chief	
29	Mr. Hussein Gufu	Malka Daka Location	Chief	0723 796 043
30	Mr. Abdullahi Kote	Modoyaka Location-	Chief	0707 942 714

		Barambate		
31	Mr. Wako Iribo	Barambate Primary school	Head Teacher	0725 750 636
32	Ms Asha Abdirahman	Tupendane Dispensary	CHW	
33	Mr. Mahat Ali	Bula Pesa	Senior Chief	0721 237 977
34	Mr. Richard Luusa	Isiolo Sub-County	PHO	0721 241 882
35	Mr. Reuben Lemakima	Longurma &Kipsing Locations	Chief	0718 459 212
36	Mr. Francis Lekula	Longopito Location Oldonyiro	Chief	0729 976 315
37	Mr. Salad	M-DIP	Administrator	
38	Abduba Diba	Merti sub-county	PHO	

B: Focus Group Discussions

SN	Respondents	Group	Contact
1	Kiya Galma – Chairman	Biliqo Marara Village committee	
2	Abdirashid Ali – Secretary	Biliqo Marara Village committee	
3	Gedi Kalla – Vice Chairperson	Biliqo Marara Village committee	
4	Dahabu Kamboso – Treasurer	Biliqo Marara Village committee	
5	Guyo Jaldera – Elder	Biliqo Marara Village committee	
6	Ali Boru Roba – Elder	Biliqo Marara Village committee	
7	Abdi Kabakasa – Elder	Biliqo Marara Village committee	
8	Mohamed Kalla – Elder	Biliqo Marara Village committee	
9	Mohamed Abdulla – Elder	Biliqo Marara Village committee	
10	Ibrahim Galgalo – Elder	Biliqo Marara Village committee	
11	Haji Mohamed Adan - Chairman	Bisan Biliqo Water Committee	
12	Yusuf Dika – Vice Chairman	Bisan Biliqo Water Committee	
13	Mohamed Kampicha - Member	Bisan Biliqo Water Committee	
14	Abdi Abukala – Member	Bisan Biliqo Water Committee	
15	Ibrahim Mohamed – Member (Youth)	Bisan Biliqo Water Committee	
16	Abdikadir Wario – Chairman	Dadacha Basa Water committee	
17	Kipsing Abdi – Member	Dadacha Basa Water committee	
18	Siad Bagaja – Member	Dadacha Basa Water committee	
19	Abdi Sora – Member	Dadacha Basa Health committee	
20	Habibo Abdi – Member	Dadacha Basa Health committee	
21	Mohamud Alkano – CHW	Dadacha Basa Health committee	
22	Salad Hulufu – Secretary	Malka Galla Water committee	
23	Osman Yusuf – Treasurer	Malka Galla Water committee	
24	Fatuma Galgalo – Member	Korbesa Health committee	
25	Asli Jattani – CHW	Korbesa Health committee	
26	Wako Boru – Elder	Mata Arba Community	
27	Adan Guyo – Elder	Mata Arba Community	
28	Abdi Kotola – Elder	Mata Arba Community	

29	Dida Wako – Elder	Mata Arba Community	
30	Ali Kanato – Elder	Mata Arba Community	
31	Nuro Abado – Elder	Mata Arba Community	
32	Hussein Dubba – Elder	Mata Arba Community	
33	Boru Bidu – Elder	Mata Arba Community	
34	Jatani Boru – Elder	Mata Arba Community	
35	Mohamed Abado – Member	Mata Arba School committee	
36	Adan Salesa – Member	Bulesa School committee	
37	Abduba Ndambala – Member	Bulesa School committee	
38	Abdirahman Shane - Chairman	Bulesa Health and School Committees	
39	Adan Boru – Member	Bulesa Health Committee	
40	Bonaya Mollu – Member	Bulesa School committee	
41	Guyo Tadicha – Chairman	Merti Water Service Providers Ass.	
42	Jarso Guyo –Treasurer	Merti Water Service Providers Ass.	
43	Abdulahi Jirma – Committee member	Merti Water Service Providers Ass.	
44	Tume Kini – Vice Chairperson	Merti Water Service Providers Ass.	
45	Yusuf Adan – Committee member	Kinna Water Project	
46	Rahma Mohamed – Chairlady	Kinna Health Committee	
47	Wako Buyo – Chairman	Kinna School Committee	
48	Kassim Kulicha – Chairman	Duse Water Committee	
49	Abduba Boru – Committee member	Duse Watr Committee	
50	Salad Buko – Committee member	Badana Water Committee	
51	Kula Jaldesa – Committee member	Badana Water Committee	
52	Yusuf Jillo – Committee member	Badana Health Committee	
53	Ali Gufu – Committee member	Badana Health Committee	
54	Ibrahim Abakula – Committee member	Badana School committee	
55	Alo Jarso – Elder	Badana Community	
56	Abdi Wario – Elder	Badana Community	
57	Mohamed Dera – Chairman	Iresa Boru school committee	
58	Abdurashid Adan – Member	Iresa Boru school committee	
59	Yakob Dida – Member	Iresa Boru water committee	
60	Dahabo Abdikadir - Member	Iresa Boru Water committee	
61	Halima Adan - Member	Iresa Boru school committee	
62	Mukhtar Abduba - member	Iresa Boru Water committee	
63	Abdullahid Mahad - member	Iresa Boru water committee	
64	Soroba Roba - Chairman	Mochuro water committee	0715 639 647
65	Ibrahim Abduba – Secretary	Mochuro water committee	
66	Hussein Abdalla - member	Mochuro water committee	
67	Mohamed Guyo - member	Mochuro school committee	0728 245 402

68	Wako Kiyoye – member	Mochuro school committee	
69	Malicha Bilali - member	Mochuro school committee	
70	Dabaso Uka – Elder	Mochuro village	
71	Wako Galma – Elder	Mochuro village	
72	Bonaya Racha - Chairman	Gafarsa Water committee	
73	Jarso Abado – Member	Gafarsa Water committee	
74	Happy Guyo – member	Gafarsa Water committee	
75	Habiba Abduba – member	Gafarsa Water committee	
76	Abela Osman – member	Gafarsa Water committee	
77	Guyo Duba – Treasurer	Gafarsa Water committee	
78	Somo Jirmo - member	Gafarsa Water committee	
79	Ali Guyo- Chairman	Gafarsa School committee	
80	Dika Dida – member	Gafarsa school committee	
81	Hussein Roba – member	Gafarsa School committee	
82	Sadia Hille – member	Gafarsa school committee	
83	Kalo Adan Bonso – member	Gafarsa School committee	
84	Godana Watu – member	Gafarsa school committee	
85	Diramu Boru – member	Gafarsa School committee	
86	Halima Abduba – member	Gafarsa school committee	
87	Galgalo Sora – member	Gafarsa School committee	
88	Ali Kalla – member	Gafarsa school committee	
89	Hussein Abdi - member	Gafarsa School committee	
90	Somo Jirmo - Chairman	Abagarse School committee	
91	Adam Huka – member	Abagarse school committee	
92	Hussein Golicha – member	Abagarse School committee	
93	Halima Roba – member	Abagarse school committee	
94	Mahamud Sora – member	Abagarse School committee	
95	Diba Mamo – member	Abagarse school committee	
96	Mamo Samoi - Chairman	Gafarsa Health Committee	
97	Hassan Boruso – member	Gafarsa Health committee	
98	Abdullahi Fayo – member	Gafarsa Health Committee	
99	Asili Bariza – member	Gafarsa Health committee	
100	Madina Huka - member	Gafarsa Health Committee	
101	Mohamed Diba - member	Malka Daka water committee	
102	Hassan Kocha – member	Malka Daka water committee	
103	Boru Laga – member	Malka Daka water committee	
104	Mohamed Gura – member	Malka Daka Health Committee	
105	Ade Galgalo – member	Malka Daka school committee	
106	Mohamed Diba – member	Malka Daka school committee	
107	Salesa Abduba – Elder	Malka Daka community	
108	Marian Adan – Elder	Malka Daka community	
109	Hussein Salesa – Elder	Malka Daka community	
110	Salad Tadicha - Chairman	Barambate water committee	
111	Alkano Kacho – member	Barambate water committee	

112	Abdi Mohamed – Secretary	Barambate water committee	
113	Abdullahi Roba – member	Barambate Health committee	
114	Dida Abakiri - member	Barambate school committee	
115	Bishar Abdi - Chairman	Tupendane school committee	0787 664 014
116	Paulina Nakusi - member	Erimet Water & Health Committees	0725 018 691
117	Mary Chichi- member	Erimet Health committee	
118	Rose Apua - member	Erimet water committee	0770 22 1723
119	Agnes Akiru - member	Erimet water committee	
120	Joseph Leyato - member	Daaba water committee	
121	Francis Lochuch - member	Daaba water committee	
122	Mary Nater - member	Daaba school committee	
123	Soita Lejale - Chairman	Nalepo water committee - Kipsing	0727 070 299
124	Wilson Lejale - member	Kipsing WRUA/Nalepo WUA	
125	Kuterei Lemantile - Chairman	Kipsing WRUA	
126	Simon Eturen - Secretary	Kipsing WRUA	
127	Joseph Nairewa - member	Nalepo WUA – Kipsing	
128	Lawrence Epeyo - member	Nalepo WUA – Kipsing	
129	Veronica Lengrinus - member	Oldonyiro water committee	0718 091 593
130	Simon Mugo - member	Oldonyiro water committee	