

PD-ABT-884

LUTHERAN WORLD RELIEF /  
INTERMEDIATE TECHNOLOGY DEVELOPMENT GROUP-EAST AFRICA

**QUARTERLY REPORT**

(1 APRIL - 30 JUNE 2001)

EMERGENCY ANIMAL HEALTH  
AND  
WATER REHABILITATION PROJECT,  
MARSABIT DISTRICT, KENYA

## **I. EXECUTIVE SUMMARY**

During the period 1 April – 30 June 2001, Marsabit District experienced a change in climatic conditions. The District received significant amounts of rain between end of March and May 2001. The rains were well spread all over the district and led to regeneration of substantial amounts of pasture that relieved the pastoralists and the agro-pastoralists from the devastating effects of the prolonged drought. One other significant consequence was reduction in mobility of the pastoralists and their livestock. The combined effect of availability of pasture and reduction in migration resulted in an improvement in livestock conditions. Consequently, the district entered the recovery phase of the emergency with minimal natural stress to the animals but increased security stress.

Security has been a problem in the district due to highway banditry and livestock rustling over the reporting period. Implementation of the emergency project was also affected by late disbursement of funds that delayed planned activities. However, ITDG-EA has moved fast to recover the time lost.

The report covers the rehabilitation of the remaining six boreholes of the 11 targeted at the beginning of the project, the construction of cattle troughs, community water access points and expansion of water storage capacity through construction of storage tanks. Also covered is development of 35 wells. In total, twenty-eight out of the 35 wells have been attended. Capacity building of Water Users Association and facilitation of creation of an umbrella WUAs are on-going.

After the rains a number of livestock were affected by outbreaks of such infectious diseases as hoof & mouth and hemorrhagic septicemia. This time round, the outbreak caused more concern to the Pastoralists, as the strain of hoof & mouth was the more severe and less common South African type (SAT). A quarantine against movement of livestock was therefore put into effect to check the spread of the diseases. Unlike previous situations, the quarantine was more effective due to the reduced mobility of the livestock.

The project did an inventory of the livestock diseases currently affecting the district in April 2001. Thereafter, the project focused on clinical treatments of animals as well as vaccination against hoof & mouth, Hemorrhagic Septicemia and Enterotoxemia. Other key activities included treatment of worm infestation, provision of multivitamins, antihistamine trypanocidals and antibiotics.

The capacity building of additional paravets was targeted mainly at Laisamis division. All trained paravets are lined up for provision of paravet kits and certificates of participation in training. The capacity building for inter-WUA cooperation is still under discussions. The issues surrounding the umbrella WUA issues are being tackled through workshops with stakeholders. Under the line item of capacity building, those who have received training in water and animal health were taken on exposure tours to learn more from others in similar situations. We have discovered this to be a powerful tool for rural communities because 'It opens their eyes'.

The University of Nairobi has done analysis of the poisoned water at Kargi wells/ borehole. The cause was identified as high but fluctuating levels of Nitrates and traces of many other minerals, including arsenic. Consequently, the wells rehabilitation was re-allocated to other sites in Laisamis division. After considering community request at Kargi, the project excavated the Kargi water pan, bringing the total to 5 as per the original plan. It will address the problem of

safe domestic water at Kargi center. Only tools were to be provided for excavation. During this quarter, most of the work was concentrated in Laisamis division. This is the division that was not covered during the first phase. The division has few if any NGOs working there.

Monitoring of current and previous works has been an on-going exercise. Preparations for undertaking the final evaluation by an external consultant are complete. Hand-over ceremonies are being conducted to mark the end of ITDG-EA involvement at every site where work has been completed. This has been done despite the fact that the community has been working side by side with ITDG-EA. The intent is to impress upon the community that future responsibility for these assets is theirs.

## **II. PROJECT ACTIVITIES**

### **Animal Health Intervention**

#### **OBJECTIVE # 1:**

To safeguard pastoral livelihood by enhancing animal health services in Maikona, Central, North Horr, Loyangalani and Laisamis Divisions in Marsabit District.
--

#### **Background Information**

Prior to the commencement of the work, a review of the existing diseases and the required drugs was conducted between ITDG and DVO's office in Marsabit District. A brief planning meeting on how to implement the work was held with the DVO's office. The following procedures were put in place:

- The Program Veterinary Officer will verify that all the drugs fit standard specifications before the logistics officer at ITDG receives the drugs.
- The field teams to sign for drugs received and reconcile drugs used at each center before moving on to the next. The teams will also provide the use of drugs to the stores clerk after each excursion. Reconciliation of the drugs used to be done at each operational center. The field teams to record all animals attended, by type, disease, and the quantity of drugs used and signs against all this information in previously prepared forms. At each center, the local paravets signs as community representatives on information given by the service teams.
- Purchases to be done once or at most twice (i.e. the drugs, accessories, paravet kits and vaccines) to ensure smooth campaigns and reduction of overhead costs. All paravets used in the intervention to have undergone paravet training.

## **Clinical Treatments**

### Achievements

*Approximately 53,300 cases targeted during the extension period. 84,338 cases were attended during the previous quarters.*

The animal health intervention targets the following potential cases during the ongoing intervention.

<b>Type of drug/ vaccine purchased</b>	<b>Expected coverage</b>
Vermatin	20,000 cases
Ivomectin	1,200 cases
Multivitamins	4,600 cases
Trypanocidals	2,000 cases
Berenil	3,000 cases
Tryquin	1,500 cases
Vaccinations	21,000 cases
<b>Total expected coverage</b>	<b>53,300 cases</b>

### Constraints

Three key constraints were observed during the intervention period. They include:

- Delay in release of funds for the second intervention phase of the intervention. This caused the intervention to occur during the recovery period of the emergency rather than during the emergency as earlier planned.
- The need to have certificates of analysis of the drugs up front and lack of enter-toxemia in the local market delayed the start of emergency intervention. The vaccine had to be imported.

### **Community Drug Stores**

*To date, the percentage of targeted pastoralists accessing drugs from community drug stores at Forole and Torbi stands at approximately 25% and 45% respectively.<sup>1</sup>*

During the Quarter, no funds were allocated to develop the drug stores further. Monitoring of the performance of the stores is still going on. The performance of the stores has improved since the onset of the rains. The post drought related ailments are being taken care of by the trained Paravets, who access the drugs from the drug stores. The privatization of Paravet services was postponed initially to give room for people to appreciate the services of the trained Paravets and to give the latter adequate time to gain the experiences required for them to provide unquestionable services. However, by close of the last quarter, the paravets had started charging services at the cost of the drugs plus a markup for delivery of services. When the Pastoralists purchase their own drugs, the Paravets charged only for the service. However, the Pastoralists are also relying on the Paravets to know which drugs to purchase. Cases that are beyond the Paravets are being refereed to the DVO in Marsabit. The DVO has in turn made the Paravets the focal point for information collection and dissemination on matters related to livestock diseases and quarantines.

<sup>1</sup> The percentages have been derived from the turn over rates. This is not a precise indicator. As indicated earlier, some of the people purchasing drugs are non-residents. It is also difficult to track down all the paravets and estimate their services. In future, this indicator needs to be revised to capture the progress adequately. The current figures are estimates.

### Impact of the drug stores

The exact number of beneficiaries of the stores is difficult to pinpoint because some of the buyers are from outside the region. Other pastoralists purchase drugs from organizations selling at cost recovery but come for services from the Paravets.

### Sustainability

Several key measures are still being improved to enhance sustainability, they include:

- Rejuvenating management committees through elections
- Improving management, marketing, record keeping, leadership and interpersonal relations imparted during MEM training during the last phase
- Incorporation of membership to the drug stores in order to raise money during the good season to purchase drugs during the drought period. The membership fees will be kept in the drugstore account.
- Continued monitoring of the stores by ITDG-EA
- Requiring that the trained committee members and ex-committee members train the new members after every election.

### Constraints and emerging remedies

The greatest constraint facing the drug supply system is sustainability of the paravets drug kits. From experience it has been found that due to the pastoralist credit system many paravets either sell the drugs without restocking or alternatively give out drugs on credit, a system that undermines their liquidity, resulting in low replenishment rate for the contents of the kits.

To ensure sustainability, it is important to link the paravets with the existing drug stores to ensure easy access of drugs locally by the paravets as well as enhancing monitoring of their activities by project staff. In addition, a set of conditions will need to be formulated for the paravets before issuing the kits to ensure they adhere to some sustainability criteria during their operations. The planned equipping of the 21 paravets in this phase with drug kits will be done under this new procedure to enhance sustainability not only of the paravets kits but the whole drug supply system.

ITDG has conducted an exploratory study on equipping of paravets and the lessons from the study suggest that ITDG should not supply the kits to the individual paravets. The kits should belong to the drug stores from which the paravets can access them at a cost. The cost is to be determined by considering the cost of replenishment in addition to a small mark-up for cost-recovery purposes. This approach will have the following advantages:

- It allows kits to be used according to the prevailing needs
- It facilitates maintenance and replacement of the kits
- It increases the drug store revenue, thereby providing a way of taking care of the drug store care taker
- It ensure contact between the drug stores and the paravets, and therefore increased data collection
- It increases access to information on animal health situation in the district for use by the DVO and others.

The 21 kits are less than the previously proposed 40 kits. The reduction has been facilitated by the change in strategy of equipping paravets and the need to release part of the resources in the kit budget line to purchase equipment such as syringes, drenching guns, cold packs, cold

boxes etc used in the emergency animal health component. Where there are no drug stores like in Laisamis, the WUAs will be the custodians of the drug kits on behalf of the community.

## **Paravet Training**

15 more Paravets from Laisamis division targeted for training in addition to the 64 trained during the last quarters.

During the quarter, Paravets from Laisamis division that had previously been trained by Farm Africa and GTZ were located and a refresher course organized for them prior to their involvement in the emergency campaigns. The training was done in time for the clinical rounds, vaccination and disease control. The following was the distribution of the paravets. The DVO's office in liaison with ITDG-EA carried out the training. The distribution of trained paravets is indicated below.

<b>Centers</b>	<b>Location</b>	<b>Number of Paravets</b>
Oltorot	Mt. Kulal	3
Kamboe	Logologo	1
Kargi	Kargi	1
Ngurunet	Ngurunet	2
Merille	Merille	2
Logologo	Logologo	2
Korr	Korr	4
<b>Total</b>		<b>15</b>

### Impact of the training

By the end of the training, the Paravets gained updated practical and theoretical knowledge and skills on basic control of livestock diseases. The paravets will be in a position of providing animal health services to the pastoralist communities in the target areas. In addition their close proximity to the livestock will afford a better opportunity of early detection of outbreaks of identifiable disease as well as availing a large pool of technically competent personnel on the ground to assist the Veterinary department to deal with such outbreaks.

### Information Dissemination in Animal Health Services

The trained Paravets in Laisamis division will be the focal points on animal health issues and will provide the DVO with the required information. The linkage with the DVO's office is particularly important because of the vast area and the fact that the DVO's office is constrained in terms of resources to verify the outbreaks of contagious diseases. Such diseases require quarantine to restrict morbidity.

### Constraints in the Animal Health Sector

Overall, there were no major constraints for the animal health sector besides those mentioned above. However, the DVO's office seems to have internal administrative bottlenecks that occasionally resulted in conflicting information, especially in reference to prioritization of diseases to be addressed during the intervention.

## **PROGRESS IN THE WATER SECTOR**

### **OBJECTIVE #2**

To improve access to water by human and livestock population in four Divisions by 30% and 40%, respectively, from the current consumption levels of about 60 liters/household/week and 3 watering/week/herd of 50-100 heads, respectively. The achievements on this front are indicated per intervention site basis.

### **Rehabilitation of Water Pans**

*Currently, 100% of the targeted water pans have been desilted and/or expanded. Kargi pan is being desilted as the fifth pan. 4 pans were completely desilted during the previous period.*

Mata-arba, Bubisa (Dambala Ndege), Dosa Wachu and Qarsa Simiti water pans were completed during the previous quarters. All are in use. During previous quarters, the community at Kargi has been requesting for tools to excavate Kargi pan as a safeguard against the intermittent poisoning effect of the water from Kargi wells and Kargi borehole.

The Kargi pan is used for domestic use only while the wells and the Borehole provides water for livestock when the poisoning effect is low. A report of the poisoning, its effects and remedies is attached as an annex.

#### Constraints experienced in excavation of water pans

The already excavated portion of Kargi water pan received substantial amounts of runoff towards the end of March. Consequently manual excavation of the pan was delayed until the water was exhausted at the end of May.

### **Rehabilitation of Shallow Wells**

An additional 28 wells have been addressed

During the previous quarters, wells were rehabilitated at Sagante, Aite, Dirip Gombo and Kargi. The new sites where work is ongoing include Illout, Lontolio, Kurkum, and Alam. Additional sites for the remaining work include Koya, Medarte, Dirip Gombo, Sagante, Losidan and Lekirkir. Among the 28 wells already attended to, 19 new shallow wells were developed and 9 rehabilitated. ITDG has been insisting on heavy community contribution. The heavy community contributions have added additional value and have given ITDG leeway to cover more wells than previously envisaged. The details of the work includes:

#### **Lontolio wells**

Six new shallow wells have been capped and provided each with a reservoir and a trough. The walls have been raised to a level that reduces seepage and backfilling during the rains. Three existing wells have been rehabilitated, bringing the total to 9.

### Impact

The wells are the only source of water for domestic and livestock use in the area. It is estimated that up to 5,000 livestock take water from the wells per day during the dry season as well as catering for about 100 pastoralist families per day.

### Sustainability

The community participation and contribution in the implementation process was overwhelming. ITDG provided skilled labor and building materials, while the community contributed sand, ballast, water, unskilled labor and supervision. A water users association was formed to take care of the wells. Two members of the WUA attended a three-day workshop on the management of wells organized by ITDG and the Department of Water. Owners of the wells pay Kshs 500 per month to the WUAs for rehabilitation of the well. Though owned by individuals, the wells are communally used.

### **Illaut wells**

4 new shallow wells have been capped and provided with water reservoirs and water troughs and 1 pre-existing well was rehabilitated. The well mouth has been raised to a level that reduces backflow.

### Impact

About 2000 animals per day are expected to benefit from the rehabilitation. The wells also serve as the main source of domestic water for the pastoralists.

### Sustainability

4 committee members were trained on management of shallow wells. For the one rehabilitated wells, the owner contributed 20 bags of cement in addition to the other general community contributions of sand, ballast and unskilled labor. A water users association was formed to facilitate proper management of the shallow wells including their maintenance.

### **Oltorot wells**

6 shallow wells have been protected and 5 troughs constructed to replace wooden tree trunk used as troughs. In addition, extended reservoirs were built away from the mouth of the wells to minimize contamination in the wells during watering. All the wells have been raised to reduce back flow.

### Impact

The Oltorot wells are the only wells for miles around and are used by institutions in the area such as schools and the field office of the Kenya Agricultural Research Institute (KARI). The average livestock population utilizing these wells is 15,000 animals and an average of 1,000 people.

### Sustainability

4 committee members of the WUA have been trained to manage the wells. The WUA has put in place a system of rehabilitation through contribution of local materials, labour and collection of water user contributions for purchasing materials during rehabilitation.

### **Kurkum wells**

Six additional wells were capped; troughs and reservoirs were constructed. The walls of the wells were raised to prevent backflow during watering and thus minimize contamination of the well water.

#### Impact

Kurkum is considered the Center for Kargi division because of presence of non-poisonous water adequate for domestic and livestock use. Approximately 500 people and 10,000 animals take water from the wells every day. The wells will serve all the animals in Kargi division during the dry period. A rich-grazing land surrounds the wells.

#### Sustainability

Though the communities in Kurkum live in satellite camps (fora), they are very committed to improving the sustainability of their water resources and have requested for support for protection of more wells. Issues of sustainability were tackled during the previous quarters. The WUAs have been trained to run the wells.

### **Alam**

2 shallow wells have been protected to date. 3 more will be completed soon. This site is close to the Kurkum wells and is expected to support the large livestock and human population in the neighborhood of Kargi due to the toxicity of other wells in the area.

#### Impact

Due to the toxicity of other wells in the area, the community's participation in selection of the wells and provision of locally available resources like sand, ballast and unskilled labor was very high. The wells are expected to provide supplemental watering especially in the dry season for livestock and pastoralists populations.

#### Sustainability

A WUA has been formed and trained on the management of wells. The WUA is now exploring the issues of cost sharing during repairs for the future sustainability of the wells.

### **Construction of Storage Water Tanks**

During previous quarters, three tanks were completed. Three additional 3 tanks are under construction.

### **Logologo tank; 50,000 liters**

After consultation with the community, a 50,000-litre tank was constructed next to the existing old tank. The original plan was to construct a 70,000-litre tank but big tanks normally have a higher tendency to suffer from structural weaknesses. To improve access to the water for domestic use, a community water point was constructed at the site and a water meter fitted to allow water tariff payment according to the water consumed. A piping system was installed to connect the new tank to the existing lines.

#### Impact on the Community

The impact on the community will be great. The running of the borehole is usually constrained by lack of adequate storage space that forces the water to be diverted for irrigation purposes during watering of livestock. The output from the borehole/ hour is more than can be accommodated by the existing storage. The tank will allow the community to manage their water resources more efficiently.

### Sustainability

The WUA in Logologo, now headed by a woman, was trained during the previous quarters and has shown a marked improvement in terms of management of water sources. It has accumulated funds in the WUAs account since the training. The water meter at the community water point will further improve collections. The WUA charges domestic water at one shilling per every 20L. Most other WUAs don't charge for domestic water.

### **Construction of water tank at Soriadi**

As in Logologo, a water tank of 30,000 liters has been constructed. Soriadi borehole was not operational as the well had no pipes or a genset to pump out the water. For construction to go on, ITDG-EA had to rehabilitate the well and borrow the emergency Genset for Jaldessa II to pump out the water for construction purposes while waiting for the supplies for Soriadi borehole to be delivered to Marsabit from Nairobi. Water troughs for livestock use were also built.

### Impact

The rehabilitation will help in efficient utilization of the water supply at Soriadi during the dry season. Soriadi is a dry season grazing zone.

### Sustainability

The trained Logologo WUA will run the borehole.

### **Construction of a water tank in Laisamis**

A third tank will be constructed at Laisamis township. Initial preparations have been made and the community contribution in terms of hardcore ballast and sand is already in place. The actual work will start the moment Soriadi borehole is completed.

### Expected impact

Laisamis is a major center and domestic water is the main problem. The construction of the tank will facilitate the use of the Laisamis borehole more efficiently.

### Sustainability

In Laisamis, the WUA has also been trained in maintenance of the water works.

### **Rehabilitation of Strategic Boreholes**

During the previous intervention, the requirements of 5 boreholes were addressed. During the current quarter, a survey to re-assess the status of the existing boreholes was undertaken. The assessment covered existing water facilities at Logologo (Le-sanjir), Gudas, Soriadi, Laisamis, Lestima in Logologo, Korr and Merille water supplies. Several changes were made on the strength of the report that UNICEF has wholly or partially rehabilitated the boreholes initially targeted by the project and communicated to UNICEF. Communications with UNICEF throughout this project have not been productive.

### **Soriadi Borehole**

This borehole was targeted in the previous quarters and was run using a wind pump. The wind pump was not operational due to damaged pump rods within the borehole. The wind pump

usually has frequent breakdowns, causing water supply interruptions at times of critical water needs. There was no livestock-watering trough. The borehole is located approximately 28.5 km to the east of Logologo trading center. It is mainly used as a dry season livestock water source. Existing facilities at the site included an old model 20 feet Kijito wind pump and an old leaking 30 cubic meter roofless ferro - cement tank. The following rehabilitation work is on-going;

- Rehabilitation of the well by installing pipes to the well.
- Construction of a water tank of 30,000 liters to serve as a storage tank
- Construction of cattle troughs
- Provision of a mobile genset,

A mobile genset was provided to Soriadi rather than construction of a powerhouse and provision of a fixed genset. This will be crucial considering that this is a dry season grazing area just like Jaldessa. It is vacated during the rainy season. A mobile genset will have the following advantages:

- The cost is less compared to construction of a pump house and placing a stationary genset.
- The mobile set can be hooked onto a Landover and taken to Logologo for storage during the rainy season, when the pastoralists migrate.
- The need for permanent security for the genset at Soriadi will be offset. This is crucial because of the insecurity in the area.
- The genset can be used at Logologo if any breakdown occurs at Logologo. There are 3 boreholes at Logologo.
- The money released from purchasing a mobile set will be used more effectively to rehabilitate and create access to water for more livestock and human population.

The Logologo WUA will maintain this mobile genset.

#### REQUIREMENTS:

1. Fittings
2. A standard 30m<sup>3</sup> Masonry water storage tank
3. An improved standard cattle trough.
4. A 3 phase 415/240 volts, AC, 50H2 genset complete with wall mounting instrumentation/control switch gear and preferably crank started. An Air-cooled 10 KVA genset with a TS3 Lister engine.
5. A high pressure, multistage, centrifugal submersible pump set coupled to a 3-phase 415V Ac 50H2 motor. The pump efficiency should not be less than 60% at the duty point and should be capable of delivery 3m<sup>3</sup>/hr of water against a total head of 110 meters.
6. The above pump set should be supplied with all accessories including a 130 meters long flexible motor cable, 260 meters long relay cables, a pair of splicing kits, a motor control panel and a pair of anti-rust low level electrodes.

#### **GUDAS (Borehole No. C 3819)**

The borehole was drilled 1972 and is located within Gudas sub-location of Logologo location, approx. 14 km to the east of Logologo trading center. It has a total depth of 125.6 meters and a yield of 8.2 m<sup>3</sup> /hr. Facilities at the borehole include an old Burco genset comprising of a 2 cylinder Deutz diesel engine and a MAC generator coupled directly to the engine. A Grundfos SP A-5 -21 submersible pump, 25m<sup>3</sup>-masonry water storage tank, a 10m standard cattle trough and a small 5m long goats' trough. As in other boreholes, a WUA manages the borehole on

behalf of the community. The tank is leaking heavily and the cattle trough is damaged beyond repair.

Recommended rehabilitation measures include

1. Overhaul of the Gen-set engine
2. Construction of a 10 meter long improved standard cattle trough.
3. Replacement of engine fuel lift pump and starter solenoid

The trough will only be constructed if the community contribution is high and if the budget will allow

REQUIREMENTS

1. Piston rings - 2 sets
2. Main bearings - 2 sets
3. Con-rod bearings - 1 sets
4. Overhaul gasket - 1 set
5. Oil filters - 1 no
6. Fuel filter - 1 no.
7. Air cleaner element (oil bath type) - 1 no.
8. Injector nozzles - 2 no
9. Fuel lift pump - 1 no
10. Starter solenoid switch - 1 no
11. Fun belts - 2 no

**LOGLOGO (LE-SANJIR)**

The borehole was drilled in 1958 and is located within Gudas sub-location approximately 800 meters to the east of Isiolo-Marsabit highway within Loglogo trading center. It has a total depth of 85.30 meters and a tested yield of 8 m<sup>3</sup> /Hr.

Facilities at the borehole include an old Burco genset comprising of a 2-cylinder Duetz diesel engine and a MAC generator. A Grundfos SP 5 - 21 submersible pump, a broken down 24ft Kijito wind pump, 70m steel tank, 2 cattle troughs and a communal water point. It is managed by a WUA.

Recommended rehabilitation measures:

- 1 Overhaul of the Gen-set engine
- 2 Provision of a stand by Gen-set

REQUIREMENTS

1. Piston rings - 1sets
2. Main bearings - 1 sets
3. Con-rod bearings - 1 set
4. Overhaul gasket - 1 set
5. Oil filter - 1 no
6. Fuel filters -1 no.
7. Air cleaner element ( oil bath type) - 1 no
8. Injector nozzles - 2 no.
9. Fanbelts-2no

### **LOGOLOGO B/HOLE NO. 1 (C1758)**

The borehole is located within logologo trading centre and is managed on behalf of the community by Loglogo W.U.A. Facilities at the borehole include a 30m<sup>3</sup> masonry storage tank, 2 watering troughs, a pump house, an old HR3 lister genset, a submersible pump set and a new perkins standby gen-set. Currently the W.U.A have sent the generator of this HR3 gen-set for re-winding.

#### **REQUIREMENTS**

A 3-phase 415/240 Volts, AC, 50Hz generating set complete with wall mounting instrumentation/Control switchgear. An air-cooled, 19KVA TS3 Lister engine preferably crank started is highly recommended as the genset prime mover. A high pressure, multi stage, centrifugal borehole pump set, 3 phase, 415 volts, AC, 50Hz with an efficiency of not less than 60% at the duty point is recommended. The pump capacity shall be 8m<sup>3</sup>/hr against a total head of 110 meters. The pump set shall be supplied with all its accessories including 130 meter long flexible motor cable, 250m relay cable, a pair of splicing Kits, a motor control panel and a pair of anti - rust low level relay electrodes.

### **LAISAMIS BOREHOLE**

The borehole, located 3.5 km to the east of the center, serves Laisamis divisional headquarters. The borehole has a Lister- Perkin genset and a Perkins genset (both in a good condition), a 3.5 km 2" rising main, a 30m<sup>3</sup> masonry tank and a distribution system that covers only a few parts of the residential areas.

The Ministry of Environment and Natural Resources manages the operations currently but wants to hand-over the management to the Laisamis community after the finalization of the procedures. About 50% of the center's population cannot access water due to a limited distribution network and the lack of water Kiosks, despite the fact that the borehole has adequate water. In order to improve on water distribution and accessibility, the following has been recommended.

1. The construction of 50m<sup>3</sup> masonry water storage tank on a hill approximately 150 meters to the north of Manyatta Sambamba.
2. The construction of a 500m 2" GI rising main to branch from the existing rising main at the Laisamis Baraza Park to serve the proposed new tank above.
3. The laying of 150m 2" GI distribution pipeline from the proposed storage tank to a proposed water kiosk at Manyatta Sambamba.
4. And the construction of a community water point at Manyatta Sambamba.

The heavy pipe work was a constraint to rehabilitation of the water supply until the Ministry agreed to take the responsibility.

### **MERILLE BOREHOLE**

The borehole is located about 2 Km to the east of Merille trading center and is managed by Merille W.U.A. on behalf of the community. It has a total depth of 50m and a yield of about 4.5 m<sup>3</sup>/hr. The Lister LPA3 has been breaking down frequently. Generally, the Lister LPA and LPW series have not been performing very well in the district. As such a stand by genset is recommended for this borehole.

#### **REQUIREMENTS**

A 3 phase 415/240 volts AC, 50H<sub>2</sub> generating set complete with wall mounting instrumentation/control switch that is preferably crank started is recommended. The genset should have a minimum power rating of 19KVA. The recommended Gen-set prime mover is a preferably air cooled Lister TS3 diesel engine.

### **TANKERING OF EMERGENCY WATER**

No tankering was done during this period.

## **CAPACITY BUILDING IN THE WATER SECTOR**

### **Shallow Wells**

During the quarter, four members per water users association with shallow wells were trained during a workshop for shallow well users. This training covered all Laisamis WUAs as this division has received no previous training. Consequently, they are behind on management issues compared with WUAs in the rest of the project area.

### Impact

A total of 19 participants were trained. The following areas were targeted: Kargi, Kurkum, Oltorot and Lontolio. The training was done in conjunction with the Water Department of the GOK. The training was for 3 days and covered the following areas:

1. G.O.K. policies in the water sector
2. Types of shallow wells, sources and their operation procedures
3. Maintenance of various shallow wells sources
4. Concept of self reliance in water management
5. Water quality, health and hygiene
6. Management of shallow wells sources, traditional ownership, access and control.

**Training on Borehole management** is currently underway and will cover water users associations from the newly rehabilitated boreholes. The training will be reported in the next report.

### **Capacity building of the umbrella Water Users Association**

The best managed WUAs, Dirib Combo and Aite, are taking the lead in the Umbrella WUAs issue. A stakeholder's workshop has already been held to map out the way forward. Among the key elements of the umbrella WUAs is the added capacity of running the mobile gensets, the issue of organizing effective management, the issues of contributions to the Umbrella WUA by the individual WUAs. The thorny issue of pooling old spares has not been resolved because of resistance from some members. The issue of a Umbrella WUA has elicited a lot of interest among development agencies, the government ministries and the individual water users associations. Though moving ahead, this is one issue that cannot be handle within the project duration as earlier envisaged. One key area of concern is the locus of the umbrella body in reference to the Water Act. The Ministry feels that it has inadequate jurisdiction over it. The issue now boils down on whether it should be registered as a cooperative, a private company, a committee like the rest of WUAs.

### Constraints experienced in the Water Sector

- The need for relocation of rehabilitation work from four out of the five boreholes that had been targeted.
- The need for adequate time for resolving issue related to the umbrella WUA

#### **COMMUNITY CONTRIBUTION**

At all the sites where work is ongoing, ITDG has solicited for maximum community contribution. The financial equivalent of community contribution is being tabulated and will appear in the next report.

#### **FINAL EVALUATION**

The terms of reference for the final evaluation have been completed and shared with OFDA in Nairobi. Similarly, the evaluators have been short-listed based on desired criteria. All were given weighted marks to arrive at the best option among the 10 candidates. The following criteria were used:

- Should have at least a Masters in Social Science or rural development
- Experience in disaster preparedness and mitigation in pastoral areas
- 7 years experience in community based project implementation and management
- Knowledgeable in animal health issues
- Knowledgeable in water intervention issues
- NGO experience
- Experience in project evaluation/monitoring
- Good writing skills
- Has the necessary tools of the trade

## **ANNEX: LABORATORY REPORT ON INVESTIGATION OF ACUTE BOREHOLE WATER POISONING IN KARGI MARSABIT, KENYA**

### **Introduction:**

This is a report of an investigation of a case of acute livestock poisoning by borehole water in Kargi, Marsabit. The history indicated that the borehole was out of use for 3 years around the 1998 *El Nino* period. It was thereafter rehabilitated by a non-governmental organization to assist the community but when animals drank the water, they died. In one day, about 7,000 animals comprising of shoats, cattle, camels and dogs died within the course of 1 hour after drinking the water. Some pastoralists reported mortality rates up to 90% and this made them abandon the borehole. No deaths were reported in donkeys and humans but they were mildly affected. The major clinical signs were methemoglobinemia (chocolate brown blood), muscular weakness, ataxia, brown mucous membranes, pain, gastrointestinal corrosion, cooked appearance of internal organs, swelling and rapid decomposition of the carcasses. Most pregnant animals aborted within 24 hours and the fetuses were covered with a fibrinous membrane. Toxicity of the water was enhanced by increased environmental temperature.

### **Objectives:**

This investigation was undertaken with the objective of determining levels of various toxicants in Kargi borehole water, diagnosing the cause of death and coming up with a solution to the problem to enable continued use of the borehole.

### **Investigation procedures:**

Immediately after the incidence that killed over 7,000 animals, water was sampled and submitted to the Department of Public Health, Pharmacology and Toxicology of University of Nairobi and to the Government Chemists for analysis.

A team of investigators including a toxicologist, an analyst, officials of Community Education Concern (CEC), local leaders, community elders and affected pastoralists, visited the area for a thorough investigation. A thorough history and relevant information was obtained using a questionnaire and more water samples collected from the Kargi borehole and neighboring wells for analysis of toxicants. Various standard analytical procedures were employed in the determination and quantification of suspected toxicants in the water samples.

### **Results:**

A list of the various toxicants detected and their levels in the water samples is given in the table below:

<b>TOXICANT</b>	<b>CONCENTRATION</b>	<b>MAXIMUM LIMIT ALLOWED IN DRINKING WATER</b>
• Sodium ions	• 193.7 ppm	• 200 ppm
• Potassium ions	• 14.6 ppm	
• Nitrates	• 450 & 950* mg/l	• 45 mg/l
• Arsenic	• 66.8 & 0.0* ppb	• 0.05 mg/l
• Selenium	• 4.4 & 2.8* ppb	• 0.01 mg/l
• Lead	• 0.01 ppm	• 0.05 mg/l
• Fluoride	• 0.71 ppm	• 1.5 mg/l

The levels of the toxicants varied at different sampling time in the course of the day.

**Conclusions and discussions:**

The levels of arsenic, selenium, lead and fluoride are too low to cause acute toxicity although the levels were not constant at varied sampling times. Nitrates concentrations were 5-10 times the WHO recommended upper limit of concentration in drinking water. Based on the clinical signs, post mortem and chemical analysis, nitrates were probably the main cause of death. The level of toxicants in Kargi borehole water may be fluctuating according to season and environmental temperature. The water is safe to the animals when the toxicant levels are low. Nitrates/nitrites poisoning is treatable by injection of 1% methylene blue in isotonic saline. Poisoning by the other toxicant are also available eg. arsenic toxicity is treated using BAL. We suggest that the presence of the toxicants especially nitrates be regularly checked before giving the water to large groups of animals. A quick screening test can be employed on site. There seems to be an inconsistent underground source of contamination.