Part IV
Lessons in
Each Technical Area

This part describes lessons learnt in the implementation of the sub projects for three technical areas of ECoRAD, namely Sustainable Natural Resource Management, Livestock Value Chain Improvement, and Livelihood Diversification, in addition to lessons derived from activities for Capacity Development of Government Officers.

For Sustainable Natural Resource Management, lessons are for the two sub categories of engineering, and community-based management.

There are five, eight, and one outcomes in Livestock Value Chain Improvement, Livelihood Diversification, and Capacity Development of Government Officers respectively.

Sustainable Natural Resource Management

(Engineering)

19. Strategic provision of water points is an important key

Summary:

- Most of the livestock are adversely affected by non-availability of grazing places in times of drought or dry spell, (shortage of migratory places).
- The key to improving resilience against drought is how to sufficiently prepare the grazing areas for the livestock during drought (extension of migratory routes).
- To extend the migratory route, the following points should be considered and examined strategically:
  (1) Seasonal migratory routes;
  (2) Location of available rangelands which are not fully used in the dry season;
  (3) Geographical limitation of the migratory routes.

Ideal migrating condition in drought year

As explained in Part II, livestock are adversely affected in times of drought only if they have no place to graze.

As shown in the figure below, if the herds had enough span on the chains of the dry season grazing areas, they would not have experienced any hardships or loss in times of drought.

Source: JICA Project Team

Image of Ideal Migrating Condition in Drought Year

The establishment of dry season grazing area is key in drought resilience in terms of natural resource management.

Factors to be considered in establishment of water points strategically

(1) **Seasonal migratory routes**

- It is difficult to trace the actual livestock migratory routes because such routes vary every year depending on the rainfall distribution and growth of forage in rangelands. However, the major patterns and directions of livestock movement can be captured.
- It is noted that such migratory routes differ within different ethnic groups. The migratory routes should be simplified by considering the ethnic groups involved.
- If a water point is established as a relay point between one rangeland to the other it is not necessary to consider the pasture around the water pan. However, if the purpose is to provide a new dry season grazing area with both water and pasture, then the rangeland potential and available pasture should be examined as mentioned in the following section.

(2) **Location of available rangelands with pasture in the dry season**

The available rangeland should be examined and its potential evaluated in terms of the following: type of vegetation, amount of grass, expectation of stable rainfall in the wet season, and so on.

One important consideration is a rangeland located in the mountainous area that is not yet fully utilized due to scarcity of a water source.

Another consideration is a rich rangeland even in the dry season, near a settlement area, that has been utilized as a wet season grazing area.

(3) **Geographical limitation of migratory routes**

Each ethnic group has a limitation of its migratory routes in the context of relations with other ethnic groups. Such conditions may differ by tribe. For example, the Rendille never intrude into the Gabra land to avoid conflicts. However, the Rendille can move their herds into the Samburu land easily, particularly during a drought spell since they have established good relations with each other.

It should be noted that, despite good relations the acceptance of intrusion by other ethnic groups may change depending on the severity of the drought.

The precise methods of selection for water facilities will be described in the following sections.

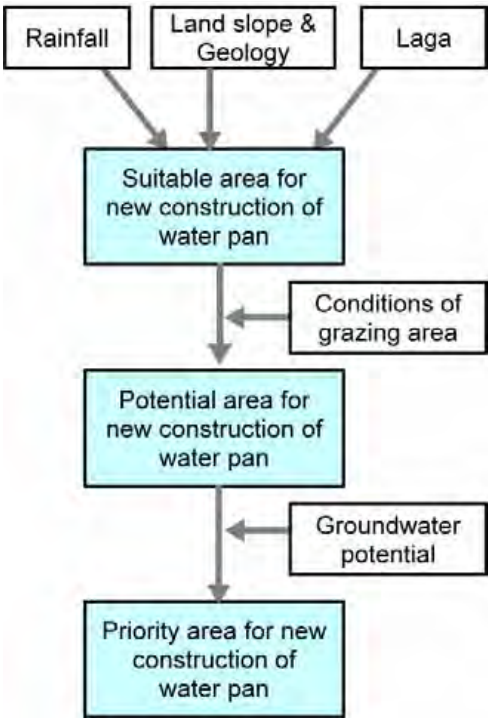
20. How to make "A potential map for water pan development"?

Summary:

- To select a suitable area for a water pan, the following basic conditions are considered:
  1) Rainfall
  2) Land slope
  3) Geological map
  4) Availability of *Lagas* (seasonal rivers)
  5) Seasonal grazing areas
- For each factor above, the suitable condition for water pan should be defined based on both theoretical and empirical considerations.
- Overlap these factors and identify the most suitable areas for the facilities.

Procedure for evaluation of potential

In this guideline, a sample of a study in Turkana will be explained. However, the readers should adjust this method based on their own site's situation. In particular, each threshold in the guideline was set based on the situation in Turkana.

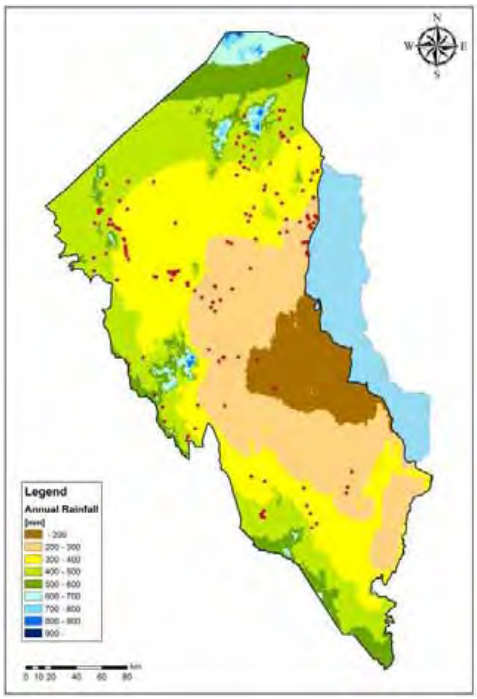


Source: JICA Project Team

Work Flow of Prioritization of Water Pans

- The suitable area for water pan construction is evaluated in terms of these fundamental conditions: 1) rainfall, 2) land slope, 3) geological map, and 4) Lagas (temporary river)
- The potential area is evaluated taking into consideration the conditions of the grazing area.
- The potential area is selected in the grazing areas where pasture is rich especially during the dry season.
- The priority area for the construction of a new water pan is evaluated with reference to the potential of groundwater development with the installation of hand pump.
- If the area has a high potential both for water pan and groundwater development, the priority is given to groundwater because of perennial availability and less construction cost.

Suitable areas for water pan construction in terms of annual rainfall



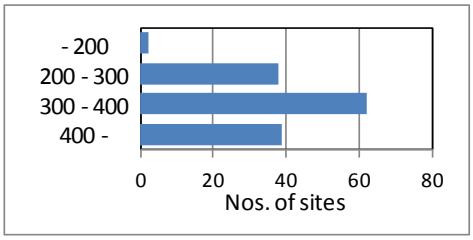
Source: JICA Project Team

Rainfall Distribution and Locations of Existing Water Pans

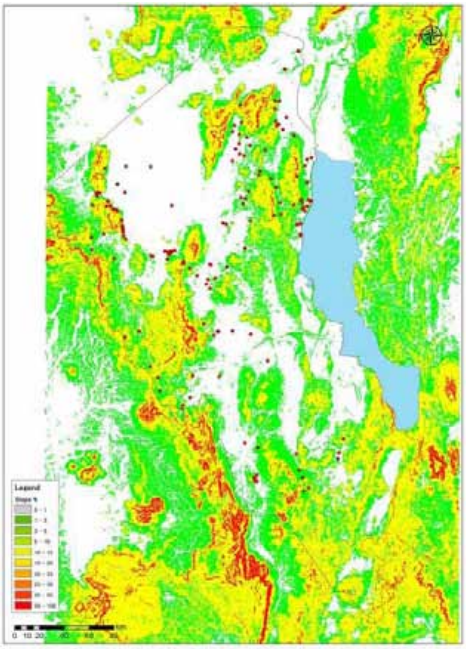
- The existing water pans are mostly concentrated in the area of which annual rainfall is estimated at more than 200 mm/year.
- Around 99% of the existing water pans are located in these areas.

Distribution of Existing Water Pans in terms of Annual Rainfall

less than 200 mm/year	2 sites (1%)
200 - 300 mm/year	38 sites (27%)
300 - 400 mm/year	62 sites (44%)
more than 400 mm/year	39 sites (28%)



Suitable area for water pan construction in terms of land slope



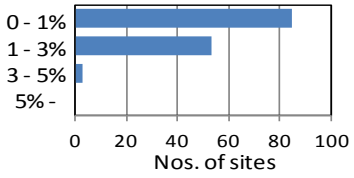
Source: JICA Project Team

Slope Conditions and Locations of Existing Water Pans

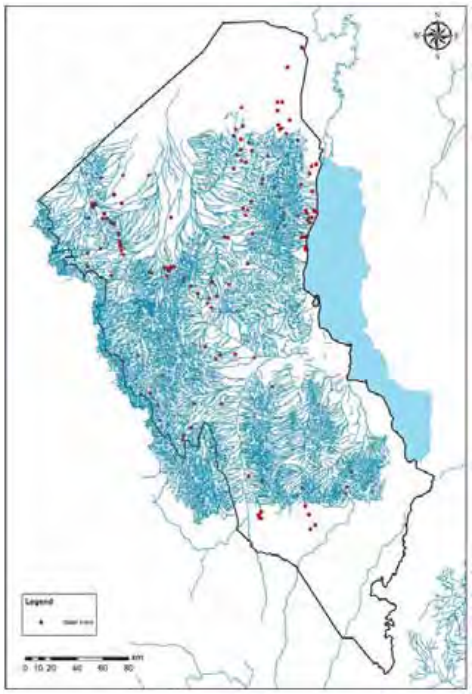
- Existing water pans are mostly concentrated in the area of which the land slope is less than 3%.
- Around 98% of the existing water pans are located in these areas.

Distribution of Existing Water Pans in terms of Land Slope

0 - 1%	85 sites (60%)
1 - 3%	53 sites (38%)
3 - 5%	3 sites (2%)
more than 5%	0 site (0%)



Existing water pans and laggas



- The existing water pans are located along the small seasonal rivers (Laggas), mostly within 100 m from the Laggas.
- All Laggas, including the seasonal streams with small catchment area can be considered as water sources for the water pan.
- Meanwhile, the major rivers, such as the main stem of the Turkwel, Tarach, Kerio rivers and so on are not suitable rivers as water sources especially for the water pan.
- There is no available detailed information of Laggas in the northern and southeastern areas.

Source: JICA Project Team

Laggas and Existing Water Pans

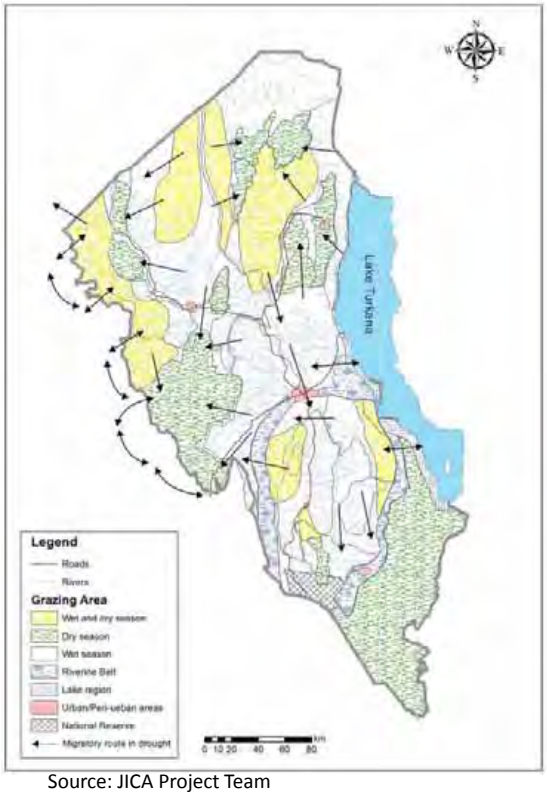
Suitable area for water pan construction in terms of annual rainfall, land slope, geology, and lagas

- The figure shows the suitable areas for water pan construction that satisfies all of the above conditions, rainfall, land slope, geology, and *Laggas* (seasonal river).
- The suitable areas are spread in most of the sub-counties, but Turkana Central Sub-county has a limited suitable area, due to its low rainfall.
- In the other sub-counties, there are many suitable areas in low flat lands.

Source: JICA Project Team

Suitable Areas for Water Pans in terms of Rain, slope, and laggas

Grazing area in which rich pasture is available during dry season



Source: JICA Project Team

Grazing Areas for Dry Season

- The figure shows the grazing area and migratory routes.
- The grazing area is divided into three categories which are:

1) Dry season grazing areas

These areas are currently utilized during the dry season. Both water and pasture are available.

2) Wet/dry season grazing areas

These areas are only utilized during the wet season. During the dry season, water is not available, whereas, pasture is available. When a water source will be developed, then the area can be used during the dry season.

3) Wet season grazing areas

These areas are only utilized during wet season. During the dry season, water and pasture are not available.

High potential area for construction of water pan

Source: JICA Project Team

High Potential Areas for Water Pan

- The suitable area for the water pan construction should be in good grazing areas during the dry season.
- The figure shows such suitable areas, which satisfies the above conditions for the wet/dry grazing areas.
- The areas with high development potential are located in Turkana's northern and western sub-counties, and also scattered in other sub-counties.

Available data and information (Turkana and entire Kenya)

- Annual isohyetal map using the data obtained from the WorldClim - Global Climate Data Version 1.4.
- Land slope map based on the Shuttle Radar Topography Mission (SRTM) data.
- Geological map of Kenya (Ministry of Energy and Regional Development of Kenya, 1987)
- Laggas' map referred in Turkana to United Nations Educational, Scientific and Cultural Organization's Geographic Information System (UNESCO's GIS) data
- Location maps of existing water pans in Turkana referred to Management Information Systems (MISs) by United Nations International Children's Emergency Fund (UNICEF) in 2006 and by Ministry of Water and Irrigation and Oxfam in 2009.
- Wet and dry grazing areas in Turkana based on the UNICEF's MIS, reviewed and modified by the project through field survey and interview to the pastoralists.

21. Water pan, borehole, or other facilities for water points?

Summary:

- In Northern Kenya, there are several water facilities providing water in the dry season and during drought such as: (1) water pans, (2) hand pump operated borehole, (3) mechanical- pump operated boreholes and (4) rock catchment.
- Each of these facilities has its advantages and disadvantages and the planner should understand such characteristics adequately.

Comparative assessment of each water facility type and recommendations based on situations.

The best sites of constructing water pans are as follows:

Advantage and Disadvantage of Water Facilities

Water Pan	
Advantages	**Disadvantages**
- The water pan can provide a large volume of water. In Northern Kenya, the storage volume of water pans ranges from 10,000 to 30,000 m³ - Once the construction is completed, there will be no operational expense required for holding the water. *Small tip:* *The appropriate size of water pan in terms of its cost-performance is 15,000-20,000 m^3 according to an evaluation by the project.*	- The construction cost is relatively higher than the other water facilities. - Sedimentation is the biggest problem for this facility. In the worst case, a pan may lose its effectiveness within several years. - Maintenance expense for de-silting work is too big for the users to manage it by themselves. - Due to scarcity of rainfall and river flow data, pan sites are often selected based on a non-scientific data and information which might lead to wrong decision. - It holds water only for a couple of months due to the high evaporation rate in Northern Kenya. - It is not easy to control the number of users and/or exclude unfavorable users.
Recommended sites for water pans: -Locate them where there can be a sufficient and stable river flow in Lagas in the wet season. - Locate them where there is a large volume of water required. - Locate them where there are no other options applicable.	

Hand –pump operated Borehole	
Advantages	**Disadvantages**
- Stable water supply is expected. - The operation & maintenance cost is low and users can manage by themselves. - Hand pump system uses quite a simple system which the local technicians can manage. - It is easy to control the number of users and exclude unfavorable users. - Its water quality is much better than the water pan.	- There is an inevitable possibility of failure like for a dry borehole. - It cannot pump up from a deep aquifer. For a normal hand-pump, like an Afridev pump, around 50 m is its maximum depth while a special deep pump can do up to 90 m maximum depth. - The volume which it can provide is quite small. Normally, a hand-pump yields from around 0.5 to 2 cu.m/hour. This translates to only around 360 cu.m per month.
Recommended sites for hand- pump operated boreholes: - Locate where there is a small demand for water. - Locate where the groundwater potential is high.	
Mechanical-Pump Borehole	
Advantages	**Disadvantages**
- A stable water supply is expected. - The volume that it can provide is much bigger than the hand-pump. - It is easy to control the number of users and exclude unfavorable users. - Its water quality is much better than the water pan's.	- There is as inevitable possibility of failure, like for a dry borehole. - Its daily operational costs are high and the repair expenses during a breakdown may not be met by some users. - Regular maintenance works are required for its proper operation. - There is a possibility to have saline water in some areas, like in Turkana County.
Recommended sites for mechanical pump boreholes: - Locate where the water demand is comparatively higher than that which a hand-pump borehole can meet. - Locate in an area with a high the groundwater potential. - Locate in an area where fuel, spare parts and other required services are easily accessible. It is not recommended for remote areas.	
Rock Catchment	
Advantages	**Disadvantages**
- Its water quality is much better than the water pans. - There is no contamination of water with livestock feces. - There is an easy control for the number of users.	- In comparison with water pans, its catchment area is quite small at around 100 to 200 m^2. - Its storage volume is small, which is approximately 50 to 100 m^3 - Its construction cost is relatively high in consideration of its cost per storage volume.
Recommended sites for rock catchments: -Locate where clean water is required, and the volume of usage is not so high. - Locate where rainfall is highly expected at its exact location.	

Source: JICA Project Team

Community opinion: Actual experience in Marsabit and Turkana about the provision of water points

In Marsabit County, the project team proposed a plan to construct a water pan in a rich rangeland to the community. However, this community rejected the proposal because they were afraid that a large number of livestock might come from other communities and that their rangeland would be degraded. They accepted the need for a borehole in the area but they did not want to have it as an operational facility due to the need to exclude unfavorable users from their water point.

In Turkana County, an elder tried to refuse the proposal of borehole construction due to the same reason. In this case however, other community members persuaded him and he accepted the proposal.

At the planning stage, it is important to first examine and evaluate the option before finally consulting the community for the final decision.

22. Where should the water facilities be built? In the wet season grazing areas or dry ones?

Summary:

- Dry season grazing areas have water sources as well as rich pastures. This is the reason why livestock herds migrate to dry season grazing areas. Water pans are not required at such places, where water sources have been equipped.
- Wet season grazing areas do not have water sources in the dry season. However, there are a lot of areas where pastures are available even in the dry season. If water sources are developed in any of these areas then it can be turned into a good dry season grazing area.

Suitable site for constructing water pans

The best sites for constructing water pans are whenever:

(1) There are rich pastures consumable in the dry season.

(2) There is currently no other water source during the dry season.

(3) There is enough volume of river runoff expected in *lagas* which form the pan's catchment.

(4) There is a high demand for the water facility by the neighboring community.This should be finally confirmed through a community consultations meeting.

The following table shows the status of development potential for the pans in terms of availability of water and pasture.

Seasonal Grazing Areas and Pasture/Water Availability

	Areas	Wet Season		Dry Season		Which season grazing area?	Development Potential
		Pasture	Water	Pasture	Water		
1	Mountain area	Yes	Yes	Yes	Yes	Dry season grazing area	No need to develop
2	Mountain area	Yes	Yes	Yes	No	Wet season grazing area	High potential
3	Lowland area	Yes	Yes	No	No	Wet season grazing area	Low potential
4	Lowland area	Yes	Yes	Yes	No	Wet season grazing area	High potential
5	Lowland area	Yes	Yes	Yes	Yes	Dry season grazing area	No need to develop

Source: JICA Project Team

From the table above, areas classified in No. 2 and No. 4 have a high potential for water pans.

This means that one of the effective ways of supporting the pastoralists' mobility is to construct pans in the wet season grazing area while the pastures are available.

Water pans constructed by ECoRAD in Marsabit County are located in the wet season grazing areas.

The following figure shows the locations of water pans, which were constructed by the ECoRAD project. As illustrated in the figure, most of the pans were constructed in the wet season grazing area, like the one that is near Marsabit town or major settlement.

Source: JICA Project Team

Water Pans Constructed by ECoRAD Project

Effectiveness of the water pans by ECoRAD project.

According to site observations in the Dololo Dokatu Water Pan in Girib Gombo community, around 12,540 heads of livestock (approximately12, 000 shoats, 40 camels, and 500 cattle) had stayed and grazed around the Dololo's pan for two months from January to February in 2014.

As a consequence of this, grass was conserved in the mountain areas and could have been consumed by livestock, if drought had occurred. Drought resilience has therefore been improved for at least 12,540 heads of livestock for two months by the new pan.

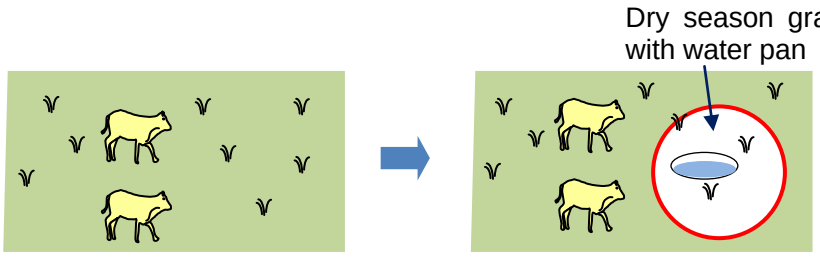
Reference: Is this the Dry Season Grazing Areas or Wet Season Grazing Areas?

The basic essential action of community rangeland management is conservation of dry season grazing area during wet season by the community. To plan and designate conservation area and period, proper recognition and definition of dry / wet season grazing area is very important.

It seems, however, that there is some confusion on how to identify a rangeland as a dry season grazing area. Some might designate a rangeland that is in a mountain as a dry season grazing area. This is because livestock used to migrate to such mountain area in the dry season even if such dry season grazing area includes some rangelands where livestock cannot graze in the dry season due to scarcity of water.

On the other hand, others refer to a rangeland near the settlements as a wet season grazing area because livestock always stay near the settlements in the wet season. It is partially correct, but not fully correct.

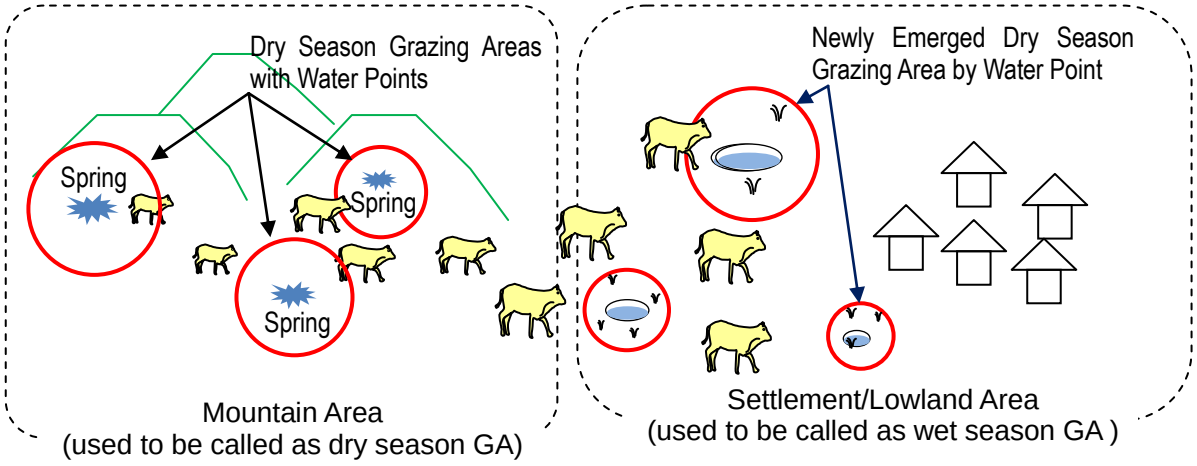
Thus, nowadays, such way of thinking (i.e., it is near a mountain or settlement area) may lead to misunderstanding and confusion. Because of the development of technology at present, several boreholes and water pans were constructed at the mountain area and near the settlement area. Consequently, those facilities produce new dry season grazing areas scattered in all over the counties.



Source: JICA Project Team

New Emerged Dry Season Grazing Area with Water Pan

For example, based from the figure above, if a water pan is constructed near a settlement area, an area around it approximately 10 km in radius, will be converted from a wet season to a dry season grazing area. It means that the emerged dry season grazing area is produced due to the new construction of water pan near the settlement areas. In particular in settlement areas, most of the rangelands are used as wet season grazing areas. But, recently several of the new dry seasons grazing areas have emerged due to construction of a water pan. With this, it cannot be called as a uniform wet season grazing area.



Source: JICA Project Team

Wet Season Grazing Area and New Emerged Dry Season Grazing Area

23. Recommended water structure: JICA-type Rock Catchment

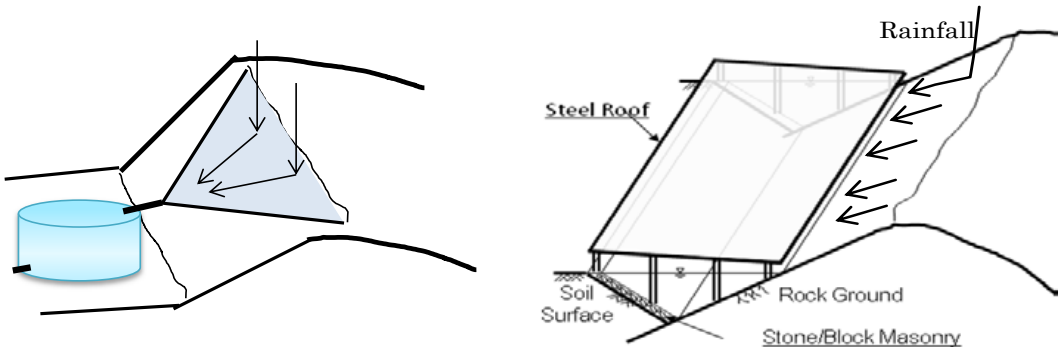
Summary:

- Advantages:
  - The construction cost is 30% less than that of a standard design.
  - It has an easy design and construction for big capacity (750 m^3 or more) of reservoir (normal design is from 50 to 100 m^3 only).
  - Rain water can be collected effectively.
- Disadvantage:
  - Leakage from the bottom walls and rock surfaces might occur. However, this leakage can be stopped with an impervious coating.

Outline of the new Rock Catchment

In the ECoRAD project, a new design of rock catchment facility (hereinafter called as the "JICA-type Rock Catchment") was introduced.

In this type, an underground excavated reservoir was constructed instead of a tank on ground level with the objective of increasing the storage capacity and minimizing construction cost as shown in the figure below.



An ordinary design of a rock catchment

JICA's design

Source: JICA Project Team

Schematic Images of New Rock Catchment Structure

Technical Recommendation

The ECoRAD project designed and constructed a sidewall with wet stone masonry and impervious painting coating. However, it is strongly recommended, subject to budget availability, to use a concrete side wall and apply impervious paint-coating on the rock surface to minimize leakage from the reservoir.

JICA-type Rock Catchment

Salient Features of Lokuchura Rock Catchment in ECoRAD Project

Catchment area of rock catchment	9,500 m^2
Dimension of underground reservoir	Length of 130 m Width (water surface) of 6.5 m on average Effective water depth of 1.8 m on average
Capacity of underground reservoir	750 m^3
Related facilities	- Iron roof with support - Two hand pumps
Estimated beneficiaries	- 25,000 HH-day/rainy season = 120 HH(15 L/HH/day) for 200 days

Source: JICA Project Team

Impervious paint-coating on the bottom and side walls in Lokchura Rock Catchment

24. Solar power is one of the recommended resources in Northern Kenya

Summary:

- The utilization of solar power is one of the effective and recommendable resources in Northern Kenya, in consideration of: (i) economical aspect in the overall project life period, (ii) ecological aspect, and (iii) operation and maintenance aspect.
- In the economical aspect, it was confirmed that the overall expense of a solar pump system was approximately 74% less than that of a diesel pump system based on existing projects.
- The initial cost for solar powered facilities is approximately 4 times as large as that of a diesel operated one. This disparity is however reducing annually.
- It should however be noted that solar power system has limitations in its application for effective use in Northern Kenya.

Best climate for solar system application

The Northern Kenya region, with sunny days dominant throughout the year, and strong sunlight radiation is a suitable place for utilization of solar power systems.

Furthermore, the recurrent drought that poses the biggest risk to life in the region is an ideal condition for operating solar power systems. It means that this system is quite unique as it can harness useful power from the drought situation for use by residents.

Economical feasibility of solar system application

The following table shows a comparison of both capital and recurrent costs for a diesel-run generator power system and that of a solar power system.

This is for Shurr community borehole water supply (Marsabit) where Ecorad installed a new solar power system to an existing borehole previously run by a diesel generator.

As shown in the table, the overall cost of the diesel generator system is 3.8 times that of the solar powered system.

Economic Comparison of the Two Systems

			Genset 25kW	Solar 11.2kW	Genset/ Solar
1	Procurement Cost	Ksh	800,000	3,383,114	**0.24**
2a	Fuel consumption in dry season	Ksh/season	691,200	0	
2b	Fuel consumption in wet season	Ksh/season	153,600	0	
3	Maintainance cost	Ksh/year	72,000	36,000	
4	Life time	year	20	20	
5	Total operation cost for lifetime		18,336,000	720,000	**25.5**
6	Replacement cost	Ksh/10year	800,000	1,107,367	
7	**Total cost (1+5+6)**		**19,936,000**	**5,210,481**	**3.8**

Note: Both cases of the calculations do not include the initial cost and Operations and Maintenance (O&M) cost for the submersible pump.
Source: JICA Project Team

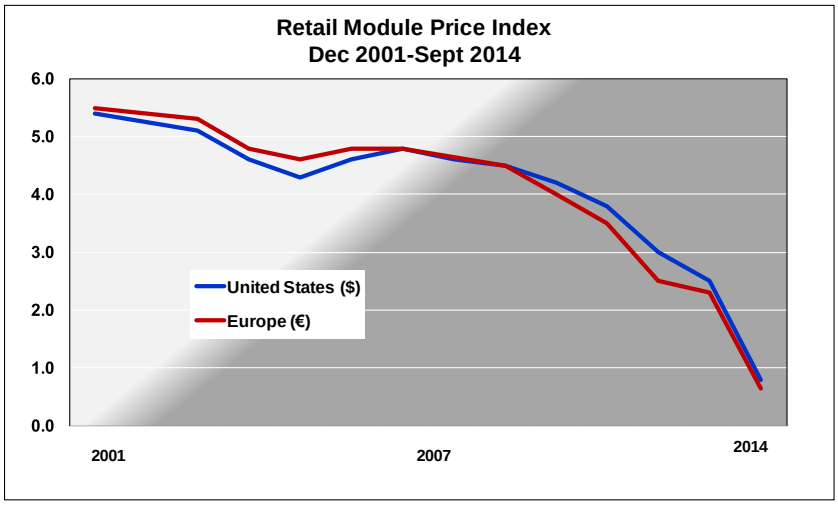
This is just a case study and may be replicated elsewhere in the region where such solar systems have been installed to replace diesel based generators for boreholes operations.

The difference in costs is bound to increase with the continued reduction of the capital cost for solar power systems as shown below.

Present tendency: price down of solar system application

According to available data, the price of solar power modules from 2001 to 2014 dropped drastically in the United States and Europe.

Over this period the prices of solar modules decreased by about 85% and a similar trend has also been observed in Kenya.



Source: Davis & Shirtliff

Price Tendency of Solar Power Module

If, as expected, the prices continue reducing in Kenya, the solar power system will become affordable in terms of the initial investment and be accepted as

the best power source in Northern Kenya.

For reference, it is noted that the cost of oil products in Kenya has risen by more than 50% from 2004 to 2014.

Box. Experience in ECoRAD (solar power systems as income sources)

If appropriately designed as an income generating source, a solar power system can support a community or other stakeholders financially through a continuous generation of revenue.

(1) The solar system in communal borehole.

A solar power system installed in a community in Marsabit generates a community development fund. Using this fund, the community built a classroom which costs around Ksj400,000, and paid the salaries of the teachers.

For details, please refer to the Box "Community Development Fund in Marsabit Assisted by ECoRAD", pages 3 to 24 in Part III.

(2) The solar system in semi-private water-service company in Lodwar

In Turkana, the project installed three sets of the solar power system in boreholes operated by Lodwar Water and Sanitation Company (LOWASCO). As a result of this LOWASCO's electricity bills decreased and made savings in the operational costs.

Based on an agreement between LOWASCO and the county government, assisted by the project, part of the savings from the solar system was transferred and used in repairs and maintenance activities of other boreholes in the county.

For instance, during the period of November 2014 to April 2015, an amount of kSh450, 000 was paid by LOWASCO to the Diocese of Lodwar who have a boreholes maintenance contract with the county government. Such financial support from LOWASCO to the county government for boreholes repairs is expected to be continued for the next 15 to 20 years.

Photos: Solar Power Pumping System in Turkana

(2) A/C Inverter: Solar system generates D/C

The solar power modules generate direct current (D/C), not the alternative current (A/C). Since this is a basic but very important point which governs functions of facilities. Thus the planner should examine the purpose of the usage of the power generated by the solar power system because D/C is not suitable for the use of any equipment. For example, the submersible pump used in a borehole is usually not operated by D/C. There are some pumps which can operate with D/C but they have limitations of range in power, yield, and pumping height.

If D/C equipment is not suitable for the facility, a D/C could be installed to a A/C inverter. The cost at the initial stage and replacement phase may increase drastically because this device is so expensive and less durable than modules.

(3) The system with battery should be carefully planned.

If the system needs to operate at night time, the battery charging system is required. Since a lifetime of a battery is quite short, such as 2-3 years, it is recommended to avoid installing a battery charging system if any other way can be applicable.

The lifetime of the battery is quite short, maybe two to three years, in comparison with that of modules, with 20 years or more. Consequently, the overall expense of the system increases with such periodic replacement costs of batteries.

The system design should be carefully selected after thorough deliberations and analysis. For example, in a water pumping system, one concept is to store water in an elevated tank instead of the electricity charging a battery during daytime. If the borehole's yield and pump capacity allows for water to be pumped at a higher rate than used at daytime, the excess water can be stored in an elevated tank and used in the night.

25. Are there enough water resources in Turkana?

Summary:

- There are still enough water resources in Turkana for human and livestock use. The current water volume utilized from boreholes is only 12% of the sustainable yield in the whole of Turkana County.
- The water quality is one of the constraints if effective usage of water is concerned. Not all the water sources in Turkana are suitable for drinking for human and livestock due to salinity and fluoride.
- The water availability and quality are unevenly distributed in the county.
- The development of groundwater should be planned after detailed examination of such distribution in advance.

Available water quantity in Turkana County

It is estimated that 55,000,000 m³/year of water can be utilized as a sustainable yield in Turkana County, and only 7,000,000 m³/has been used through the boreholes, which is equivalent to only 12.1% of the sustainable yield.

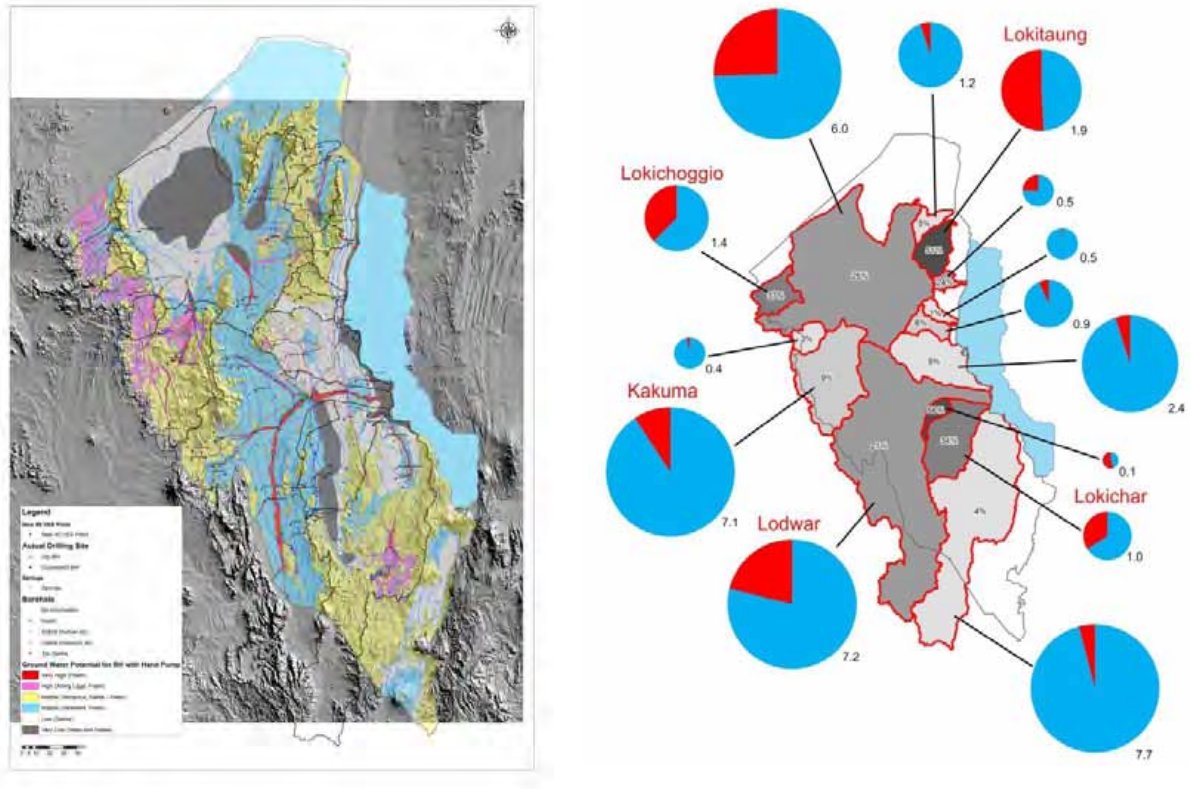
Groundwater Potential in Turkana

Water Budget in Goundwater	Area 68671km^2		
	mm/yr	m^3/d	MCM/yr
(a) Average Rainfall	361	67,918,000	24,790
(b) Renewable Groundwater Recharge	8.0	1,497,900	547
(c) Sustainable Yield	0.8	149,800	55
(d) Present Maximum Pumping Rate	0.1	18,100	7
(b) / (a)	2.2%		
(c) / (a)	0.2%		
(d) / (c)	12.1%		

Source: JICA Project Team

Water potential and its distribution in Turkana County

The left-side figure below is the Turkana Groundwater Development Potential (TGDP) map, formulated in the ECoRAD project through groundwater flow analysis, water balance study, and so on. The map is composed of six-colored zones indicating the groundwater's development potential level from a high potential (Level 5) to low potential (Level 1).



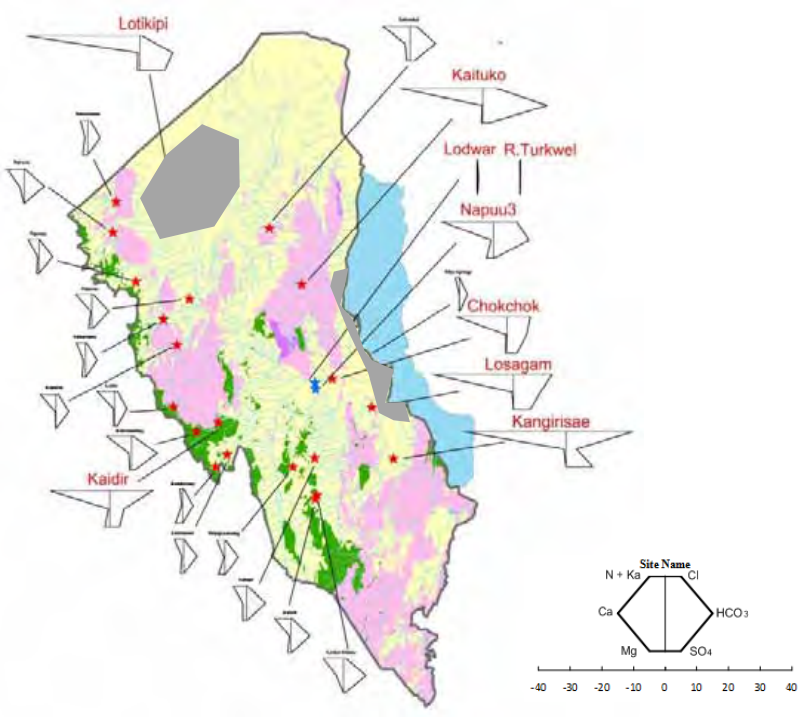
Source: JICA Project Team

Turkana Groundwater Development Potential Map and Current Usage Rate

The figure above at the right-side represents the conditions of water availabilities and percentages of the current usage in volume in each basin. For example, Kakuma basin has 7.1 million cubic meter(MCM) of a sustainable yield and only around 10% is used currently.

Water quality distribution in Turkana County

The figure below shows the distribution status of water qualities, which were obtained at the boreholes. The shapes of hexagons represent the water qualities. If the size of the hexagon is big in width, it means that water is contaminated with undesirable substances. According to the water quality survey and groundwater flow analysis, it was found that there are two significant areas, which are marked in gray color in the figure below, where water quality is anticipated to be not preferable for human use. Although the Lotikipi Plan was identified with huge aquifer by several newspapers, it is regretfully indicating that water quality is not preferable.



Source: JICA Project Team

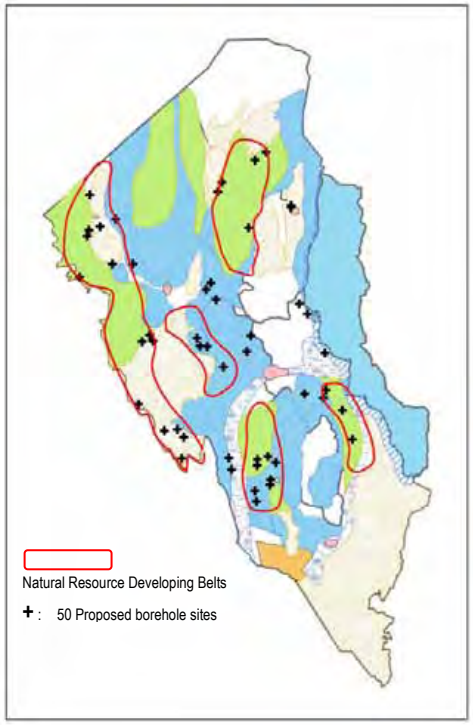
Groundwater Quality Map in Turkana County

26. Where and how to construct boreholes effectively and economically against drought in Turkana?

Summary:

- The ECoRAD project formulated the Natural Resource Development Belts as focal areas for developing boreholes in order to improve drought resilience for livestock and considering the potential of rangeland and groundwater availability.
- Based on the designated Natural Resource Development Belts, ECoRAD identified 50 potential borehole-sites in Turkana. It is highly recommended to develop those potential sites. The development belts and the 50 proposed borehole-sites are shown in the following figure and attached table.
- When drilling boreholes in Turkana, do not drill more than 100 m in depth even if water table is not hit. This is because a deeper aquifer that is more than 100 m may contain saline water or other undesirable contaminated water. Thus, it is strongly recommended to replace the site.

Natural resource development belts in Turkana County



Source: JICA Project Team

Natural Resource Development Belts

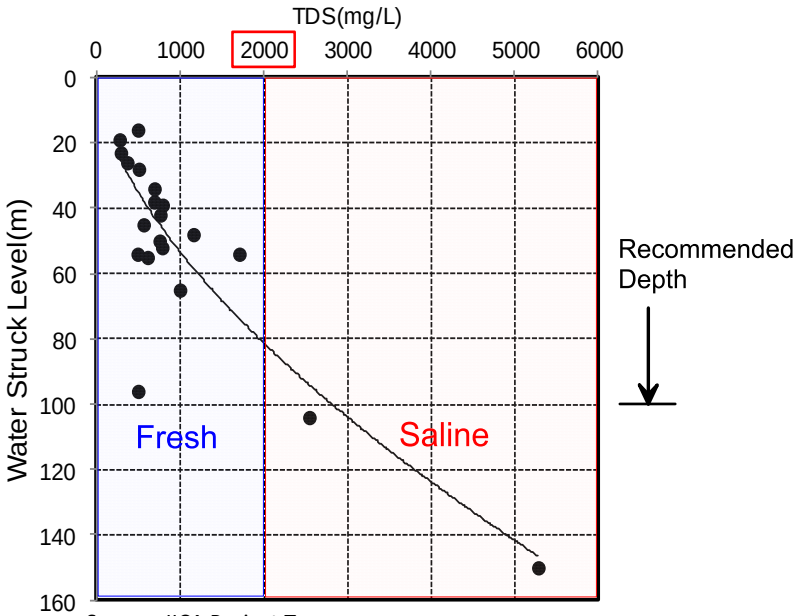
Nowadays, the scarcity of water due to drought does not cause loss to human lives, but still leads to losses in livestock despite development of many boreholes in Turkana.

It is essential to provide effective boreholes for livestock use during drought. In terms of the livestock's survival in drought, the rangeland condition is one of the focal points as well as groundwater potential. The "Natural Resource Development Belts" was formulated based on the rangeland potential map, pastoralists' migratory routes, and the groundwater potential. The detailed procedure of formulating

the development belts should be referred to in the final report. Based on the locations of the development belts, 50 proposed borehole sites were selected. These sites were then finally identified through the results of a hydro geological survey at each point.

Appropriate maximum drilling depth in Turkana County

The following figure shows the relation between the depth of water struck level and water quality, such as Total Dissolved Solids (TDS). The water quality is anticipated to be worse if the water struck level is more than 100 m. Thus, it is highly recommended not to drill deeper than 100 m.



Source: JICA Project Team

Water Quality and Water Struck Depth

Following the above criteria, the ECoRAD project had 20 successful boreholes with water, out of 27 boreholes, which means its success rate was 74%.

Sustainable Natural Resource Management

(Community-based Management)

27. Management system should not be 'ideal' but 'feasible' taking into consideration the capacity of the people.

Summary:

- The system should be manageable by the people judging from their current capacity when the operation and maintenance (O&M) system of water resource is introduced to a pastoralist community, with limited experience and with a mindset of management of communal properties.
- At the same time, the capacity of the people should be developed for better management in the future.
- The stepwise approach should be applied instead of trying to achieve the ultimate goal within a short period.

Trend of water resource management

- Establishment of O&M system for water resource management is essential for sustainable use of the precious resources. It has been proposed to form Water Users Association (WUA) as a formal 'organization' to manage water sources.
- WUA committees are mandated to establish a management system that entails; registration, making a constitution with rules and regulations, financial management and planning.
- Training of the WUA committee is currently based on the standard package for water resource development assistance. This is important and necessary to ensure self-sustainable use of resources, and for nurturing independence from external aid.
- However, introduction and application of the standardized WUA and management systems have largely failed in the pastoral communities in Northern Kenya.
- On the other hand, there are some systems introduced from outside that have been embedded in the pastoral society.
- People are receptive, but it will take time and adequate

steps for new concepts and systems to be accepted, digested, and adopted in the society, especially in the pastoral society where people have different beliefs, attitudes, and customs.

BOX: Adverse effect of introduction of 'ideal' management

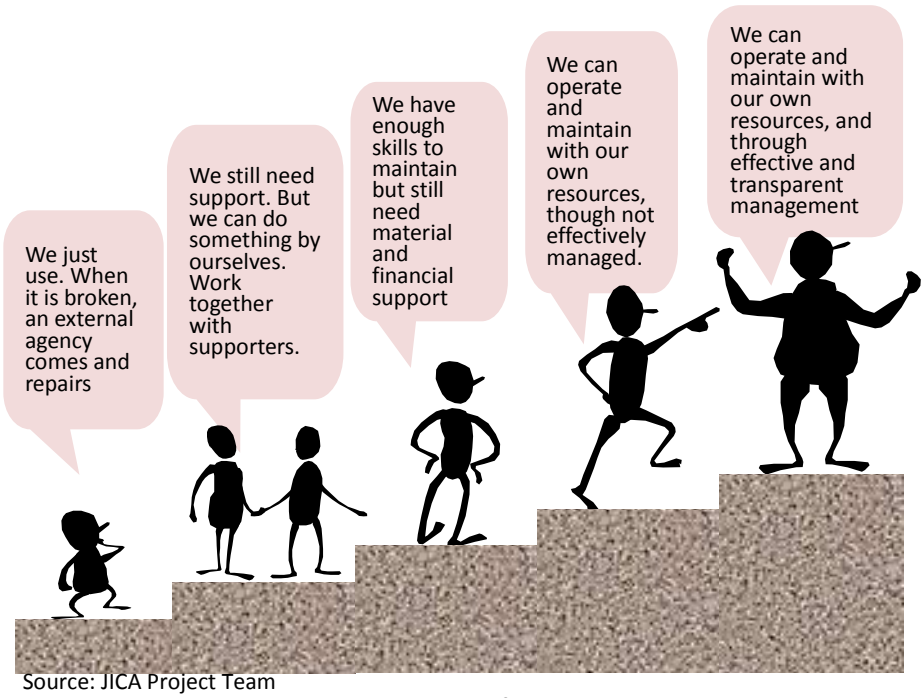
Self-sustainable management is commonly taken as a requirement for water resource development. Community contribution is almost compulsory. But can we say that in any situation?

In Marsabit, water management system was introduced to all developed water sources. Following the responsibility to establish a sustainable management of water source, a fee collection system was introduced for maintenance and further development activities. After the introduction, with close monitoring by the project, one of the communities successfully saved a good amount of money, and decided to use the money to build a primary school classroom. However, as the water management committee accumulated a large amount of money, another group took over its management, with political support and power.

In another case, a WUA committee shared the financial information on fees collection and expenditure with the general public. Whereas this seems prudent, it has its shortcomings because the community members are not in a position to interrogate the information and assess the soundness of the management.

This limitation enabled the committee to misuse the funds through a purported approval by the community.

Development of management capacity

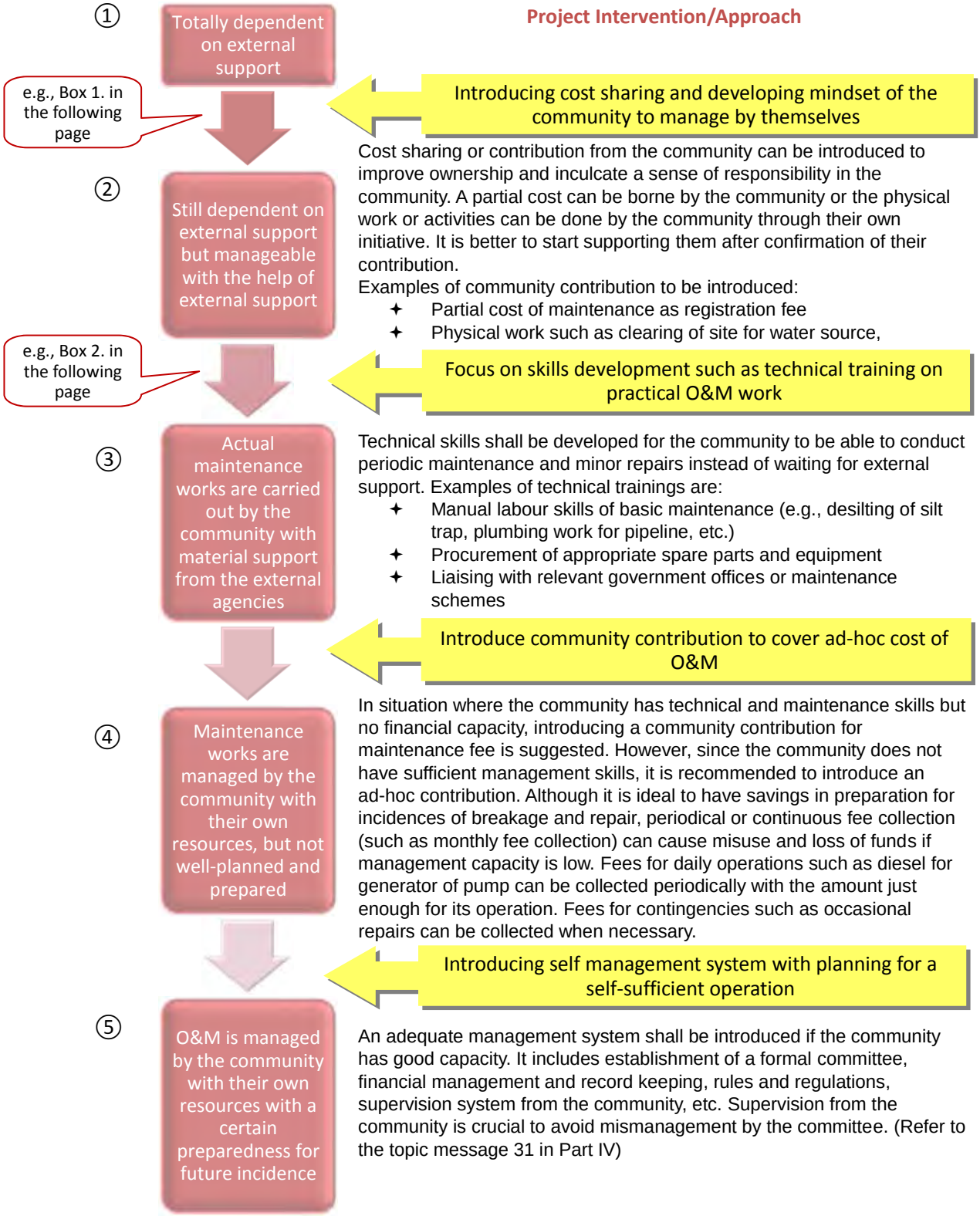


Source: JICA Project Team

Development Stages of Management

Recommended step-wise approach

The following indicates possible interventions/approaches for each stage of the community.



Source: JICA Project Team

Interventions at Each Development Stage of Water Management

Box 1: Example of intervention to transform from "dependent" to "manage with help" (from Stage 1 to Stage 2)

In Turkana, a remarkable number of boreholes have not been used merely due to a simple minor breakage of the hand pump. Thus cost sharing of maintenance was introduced as a precondition of developing boreholes to develop a mindset of self-sustainable management by their own:

- *The project linked the community with the existing maintenance support scheme operated by the Diocese of Lodwar. The scheme supports the repair of hand pump system of boreholes registered under the scheme with annual registration fee of KSh.3, 500.*
- *The beneficiary community was responsible to contribute for the registration fee. Although the amount of contribution is not beyond their affordability, some communities were faced with difficulties in collecting the contribution.*
- *The project followed up the situation of collection in such communities, discussing the importance of maintenance and the O&M scheme. And at long last, all the boreholes that require maintenance were registered with community contribution.*
- *Some of the boreholes utilized the O&M scheme when they had faced minor breakage; consequently people started recognizing the benefits of contributing for maintenance. Some communities started collecting the registration fee for the coming years.*

Although ideally, community should be able to totally manage their own affairs, it may lead to mismanagement if the project imposes a management system with fee collection to bear the repair cost. Instead, a step forward, even a small one, will become their foundation for more sustainable management.

Box 2: Example of intervention for the technical independence (from Stage 2 to Stage 3)

One of the important aspects of maintenance is the skills to perform minor technical repair. This is especially important in the remote area, where it is difficult and costly to call a technician to work on a small repair. Once people get to understand the importance of doing their own maintenance, the next step can be technical skills development, which is not a big monetary burden.

Arapal is situated far from any commercial town, where there is no access to any public transportation. The existing water pipeline system for Arapal was improved and a few local technicians trained on basic maintenance of plumbing works.

They can now identify problems and take necessary actions without relying on technicians from far away. With the support of the project, a small charge for water used was introduced where previously there was none. Although the amount of contribution is small, it now enables the management to purchase minor spares for routine maintenance and repairs.

28. Involvement of the community from the planning stage

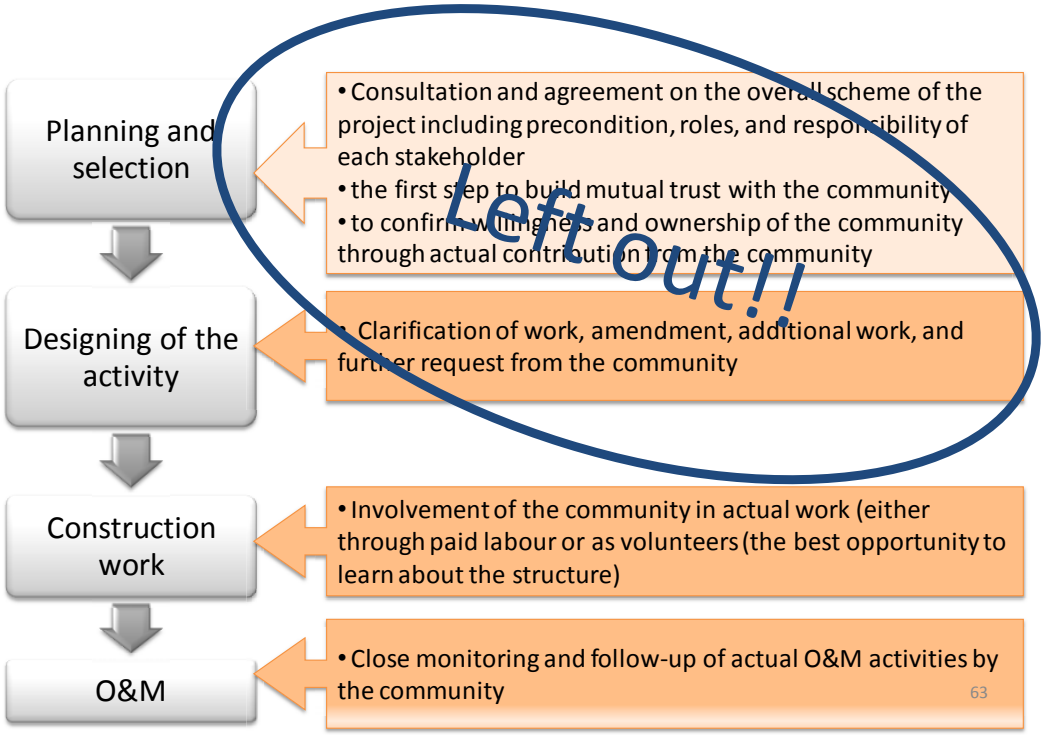
Summary:

- Sustainability of O&M of water-related structures highly depends on the initiative and involvement of the community. In order to enhance their ownership and sense of responsibility, it is important to involve people from the beginning.
- Management needs can be generated from the community itself, if the intervention meets its desperate needs, when the community is involved from the beginning of the decision making and when the method and approach are appropriate.

Involvement of the community at each stage of implementation

Although the importance of involvement of the community for project sustainability is obvious, not many implementers have been fully embraced it.

The diagram below summarizes the necessary involvement of the community in each step of water resource development.



Source: JICA Project Team

Interventions at Each Development Stage of Water Management

1. *Planning and selection of the site/activity*

Consultation and agreement on the overall scheme of the project including precondition, roles, and responsibility of each stakeholder (between donor, contractor, and community) is the first step to build mutual trust with the community. In order to confirm willingness and acceptance of the community to participate actively in the project, it is preferable to define preconditions for support.

For example, prioritization of the potential project sites can be made based on the communities' commitment and contribution such as clearing of the site, collection of locally available materials, or contribution for cost sharing in advance. The project selected can then be from the community that meets these requirements.

Confirm the level of needs and commitment before selection or starting the work in form of actual contribution from the community but not verbally.

2. *Designing of the activity*

Explanation of the project design details to the community can enhance their ownership by enhancing their understanding of the structure (especially the parts and technologies related to Operation & Maintenance).

Several requests may be made by the community at this stage. It should be clarified to them on the limitation of budget and the need for their contribution to ensure that the donor support goes to the major project components that the community has no capacity to undertake.

3. *Construction work*

The best opportunity to learn about the structure is to participate in the actual work. The community can be involved either through paid labour or to volunteer as their community contribution.

Although the latter option is preferable, it may depend on the situation. If the community is desperate and not self-reliant, it is still feasible to provide incentives for works at the initial stage to enable

them experience the actual work.

Even though the ultimate goal of the project is for the community to fully contribute and be able to maintain the project by themselves, availing of incentives at the initial stage for their participation is acceptable.

4. O&M

Actual O&M activities by the community should be closely monitored until they are adopted by the community to a certain extent. A one-off training is not enough and hands-on training is crucial.

Periodic monitoring, facilitation of operations and problem resolution when issues arise are all important roles to be played by the supporting agencies in order to establish a sustainable O&M system in the community.

Box: Difference observed in community contribution as precondition depending on the needs and situation (Experience in ECoRAD Project)

In the ECoRAD project, contribution of the registration fees for the maintenance scheme was set as a precondition for borehole development. Through observation of community contributions for borehole management, it was found that there are three important factors that affect water resource management, namely:

i) Water scarcity or people's demand for water;
ii) Social organization of water users; and
iii) Economic situation or income generation.

Differences were observed from the communities in their contribution depending on the combination of factors as categorized below.

i) Needs	*ii) Social organization*	*iii) Economic situation*	*Contribution*
High	*Strong*	*Relatively good*	*They took the initiative to contribute their own money for the registration. Money was collected from the majority of community members, each paid a small amount. Regular water fee, such as monthly fee, was not charged because people thought this may cause conflict amongst the community members.*
High	*Strong*	*Weak*	*Most of the users are pastoralists who do not have cash income. They asked for financial support from outside to pay for their registration. One was supported by a construction company, and the other was funded by a politician. Currently, management committees of both boreholes are charging water users at KSh.50 per month to serve as funds for the next registration.*
High	*Weak*	*Relatively good*	*Registration fee was contributed by a few rich members of the community, who became the core members of the management committees. Water fee is collected monthly, and the committee decides how to use the money.*
Relatively low	*Not strong*	*Weak*	*Collection of money for registration faced difficulties. The community is not organized because homesteads are scattered in a vast area. People are using different water sources such as rainwater and shallow wells. Lack of income generation makes it difficult for them to contribute money for the registration. Moreover, there is no effective and functional money collection system in place.*

29. Liaise with the existing O&M scheme as a step of realistic development of O&M capacity

Summary:

- Where sustainable and self-sufficient maintenance by the community is not feasible, existing scheme of O&M shall be applied as a step forward.

Background-current situation of boreholes

Paradigm of development and external support on water resource development has been shifting from increasing the number of boreholes to sustainable use of boreholes.

Establishment of new boreholes and increase in their number has been the priority in drought mitigation for decades. As a result, whilst the number of boreholes has increased, some boreholes have been abandoned or unused due to breakdown of hand pumps.

In Turkana County, 90 out of 511 boreholes are non-operational and 45 are non-functional. This is due to vandalism, insecurity, equipment problem, low yield, and borehole collapse. A good number are left unattended with breakage of the hand pumps. This means that a large number of boreholes can be revived if proper O&M system is established.

Whilst importance of O&M of boreholes has been emphasized, it has been difficult for the community to fully manage the maintenance on their own. Even the government that was expected to take care of them after installation could not manage as the number increased.

Although establishment of O&M functions has been included in the current project of borehole establishment, effective maintenance has not been developed.

Feasible O&M under the current situation

There are situations where communities do not have enough capacity to manage the maintenance of boreholes by themselves, and where maintenance needs are beyond the control of the government.

It is recommended that an O&M scheme is introduced with partial contribution from the community while the rest of the requirement is provided through external support.

In terms of borehole pump management, some unique maintenance service schemes were found available in Turkana. The Diocese of Lodwar has been operating a cost sharing O&M scheme for borehole hand pumps. Under the scheme, genuine damages and breakage of hand pumps can be repaired without any extra charge, as long as the community or a water resource management body registers the borehole with annual fee of KSh.3, 500.

The role of the project intervention is to ensure registration under the scheme, by encouraging the community to make contribution and linking the community with the scheme so when problems arise they are fixed by them.

Any similar scheme can be utilized. Preferable conditions of the scheme to be applied are:

- The scheme is established and embedded in the local system, and shall be operated for a certain period of time (not a project base of 2~3 years)
- The scheme itself is functioning and capable to handle maintenance work. If it relies on a short-term project, it is not sustainable.

The box below introduces examples of the schemes. Advantages and disadvantages of each scheme should be examined and applied based on the suitability in the target area.

Box: Examples of schemes to be applied

1). Donor funded scheme

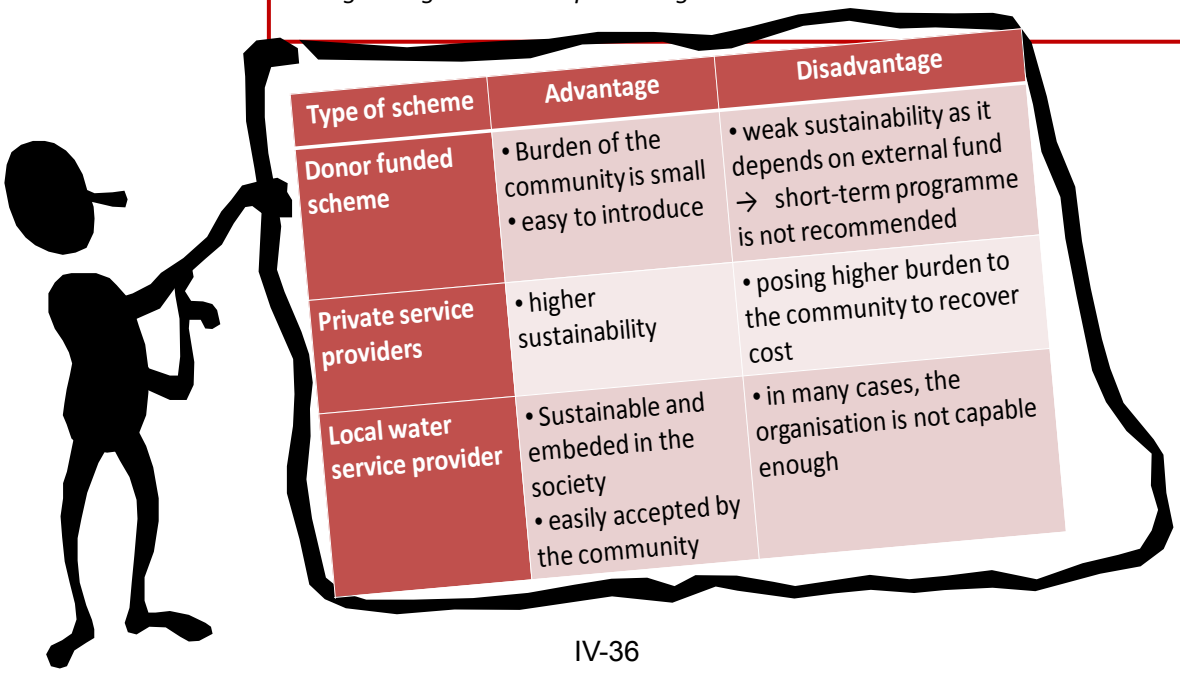
Some donor-funded programmes provide maintenance scheme with cost sharing, as mentioned in the case of the Diocese of Lodwar. Scheme should have aspect of cost sharing or designed to enhance management by the community, such as training of the community on daily care, identification of problems, and communication with relevant agencies. The advantage of donor-supported scheme is that the burden of the community is small, thus it is easy to start with, especially for a community not familiar with doing maintenance on their own. A disadvantage is the weak sustainability if the programme depends on external funds. Therefore, a short-term programme is not recommended.

2). Private service providers

Contracting out the maintenance service to a local private service provider has higher sustainability. A disadvantage of getting a private sector is posing higher burden to the community as they may need to recover the cost.

3). Local water service provider

In Turkana, there is another available scheme, although covering only the Lokichoggio and Lokichar areas. The scheme is provided by the water service providers (WSPs), registered as local community-based organization (CBO) under the Water Service Regulatory Board. These WSPs have a scheme of borehole pump maintenance service without any charge from the borehole management body, utilising their revenue from water tariff collected through their water service delivery. This kind of service is sustainable and highly recommendable as long as it functions properly. However, in the case of Turkana, both WSPs have not been able to spare enough fund for borehole repair having a list of boreholes with outstanding maintenance and rehabilitation needs. In such case, the scheme itself should be enforced to be sustainable. Ideally, the scheme should be taken over by the government having enough budget or a local private agent can be established.



Type of scheme	Advantage	Disadvantage
Donor funded scheme	• Burden of the community is small • easy to introduce	• weak sustainability as it depends on external fund → short-term programme is not recommended
Private service providers	• higher sustainability	• posing higher burden to the community to recover cost
Local water service provider	• Sustainable and embeded in the society • easily accepted by the community	• in many cases, the organisation is not capable enough

Approaches of introducing the scheme

A major constraint of O&M by the community is confirmation of their willingness. The O&M scheme shall be introduced to enhance their ownership and sense of responsibility. The following approaches can be taken for its smooth introduction:

- Registration to the O&M scheme should be set as a precondition for the development of a borehole. A preparatory meeting with the target community should be organized to agree on the conditions for registration.
- Ideally, the selection and implementation of the project sites should be finalized once the contribution of registration fee is confirmed. This may however still be done in consideration of the engineering work schedule (programme).
- The bottom line is to confirm actual collection of registration fee before installation of borehole pumps. In the latter case, where the fee collection is done after drilling, follow-up action is necessary. If the project cannot afford to follow-up the fee collection, it is would then be prudent to start the drilling only after getting the confirmation of its payment.

Box: Experience of ECoRAD Project

The ECoRAD project, applying the abovementioned approach, attained the following results.

Out of 19 boreholes that require maintenance of hand pump, 16, which is all except in those areas with insecurity, contributed and registered under the O&M scheme. Some have already carried out some maintenance work through the scheme. Other communities have even started collecting money for renewal of registration for the coming years after the end of this contract period.

Although this approach is not totally sustainable, as it still relies on external support, it may be the most practical and realistic way for O&M of the boreholes in the current situation.

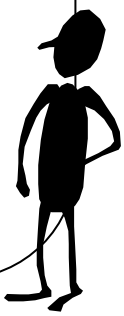
30. Fee collection for O&M should not be introduced indiscriminately

Summary:

- Collection of fee for O&M is necessary for self-sufficient operation of water sources. However, when the community is not capable enough, fee collection can be misused and users can be exploited.
- Different approaches should be applied for optimal operation depending on the capacity and social structure of the target community.

  Possible options are as follows:
  - No fee collection but contribute when problem occurs;
  - Collect fee only for daily operation; and
  - Periodical fee collection to prepare for emergency.

  Each option has an advantage and a disadvantage and can be applicable or not depending on the capacity of the people.



Difficulties of fee collection in pastoralist community

Mismanagement and misuse of money is common where management capacity of the community is weak. It is often seen in the context of pastoralist community in Northern Kenya as well.

The situation is however unique and more complicated in the pastoralist community in Northern Kenya due to the following reasons:

- First, in addition to the lack of management capacity, people have no concern over the money they pay in exchange for water. This is mainly because their priority is to get water, and besides, they do not have the concept of communal fund (money to be used for the community). This means that as long as they can get water, they are not concerned about the money they paid and thus no attention is given to the management of the money collected.

- Secondly, even if they try to pay attention to the collected funds, they do not have enough means and capacity to supervise the management. As a consequence of this, financial records can be easily manipulated and distorted.

- Lastly, fee collection can be justified even if it is not appropriate, since many external agencies encourage and introduce fee collection. Since people cannot judge the appropriateness of the fee collection system such as fair amount and rates it can be controlled by a few people leading to exploitation of the community.

Box: Experience of the ECoRAD Project

Considering the capacity of the communities in handling communal funds, the project did not introduce fee collection for the maintenance of hand-pump boreholes which do not require operational cost.
However, some of the committees, having knowledge of the case where water fees are collected for boreholes, discussed this with the community and decided to charge water fee. They convinced people to contribute money saying it entails maintenance cost. Although it is true, the rate decided was far more than the necessary amount. Some community members mentioned that they agreed with the fee because they were told that the project asked for maintenance cost, which was just made-up.

Alternative options to be applied

Where capacity of the community is low, introduction of a complicated fee collection system is not only difficult but can cause negative impacts.
The following alternative interventions can be applied depending on the situation of the community.
Options 1 and 2 are suggestions to be applied for immediate needs, even though ideally they should be prepared in advance so that they can react timely in case of a problem in order to have stronger resilience. Preparation is important especially during drought when people struggle to get cash.

Option 1:

Fee or contribution can be collected, not periodically, but only when faced with a problem to avoid having custody of the money that is at risk of misuse. In this option, timely repair is impossible as it takes time to collect money after the problem is identified. If the problem is very critical, e.g., they cannot get water, people can manage to generate cash (sometimes those who can afford the money contribute it as their own mutual

supporting system).

Option 2:

If operational cost is required (e.g., fuel for generator to run the pumps), collection of fees is done to be just enough for the operation. Misuse of money will be minimized in this situation, because if the management misuses the fund, operation will be interrupted and people won't get water.

Option 3:

Periodic fee collection can be introduced as a preparation for an emergency as well as normal maintenance.

The current management and supervision capacity in pastoralist communities is inadequate to prevent misuse of funds. If periodic fee collection is introduced, close and persistent monitoring will be required.

Neither a one-off training nor simple visits for supervision can develop their capacity.

Financial management system should be established through practical operation and actual problem solving. Preventive management system can also be introduced to minimize mismanagement.

The following section introduces some of the methods to be applied to simplify the management and to prevent mismanagement.

31. Approaches of introducing fee collection for O&M when applicable

Summary:

- When the community is responsive or has a foundation to manage communal properties, it is recommended to introduce fee collection for sustainable O&M. However, the approach should be cautious as public funds universally have a high risk of misuse.

This section introduces some tips in introducing fee collection and management to the communities who do not have enough experience in managing communal funds. The tips emphasise on prevention of misuse of funds.

- **Tip 1. Divide roles amongst different people, not to concentrate power on limited people**
- **Tip 2. Fee collection methods depending on the structure of water source and users**
- **Tip 3. Introduce prevention of mismanagement mechanisms.**

- ***Tip1: Divide roles amongst different people, do not concentrate power on a few people***

The following roles should be taken by different persons:

- fee collector,
- one who records,
- one who keeps cash,
- one who has the cash box key, and
- supervisor.

Keep the cash in a safe place!!!

Prepare a box with 2-3 padlocks and keys kept by different responsible persons.

- ***Tip2: Fee collection methods depending on the structure of water source and users***

Water fee collection and financial management methods differ depending on the type of water source and different WUAs due to the complexity of water supply connections and variety of users. A fee collection system at the water source varies depending on the costs of O&M to be covered, range of users, number and location of water supply points, and capacity of the community.

When there is a major operation cost that is closely related with the amount of water used such as fuel cost for a generator for a borehole pumping system, the water tariff is set based on the consumption. Alternatively, when there is no major constant operation cost, a fixed amount of fee can be charged over a certain period of time.

Fee collection for domestic use may be different from that for livestock use. Structures of the water supply facility also determine the fee collection method; an accurate but complicated fee collection system may not be feasible at a water source when there are several water supply points with mixed users.

Simple management methods should be introduced to WUAs where basic capacities, such as literacy level of members, are relatively low.

The following table summarizes the advantages and disadvantages of different water fee collection systems, in particular the condition of the water source and other factors.

Advantages and Disadvantages of Different Water Fee Collection

Collection Method	Advantage	Disadvantage	Suitable Situation to Apply the Method
Daily collection	Able to collect actual amount against use. Charges fairly even for those who use it temporarily.	Need to assign a person who will collect fee every day at the site; this would entail additional cost. More work and complexity in recording daily payments in small amounts. Higher risk of mismanagement at the time of collection.	When seasonal short-term users are the majority. If there is a collector who can adequately handle the daily recording.
Monthly collection	Simpler in collection and recording. Less risk of mismanagement of the collections as fee can be collected by the treasurer and officials with receipts.	Difficult to set the fee for seasonal and short-term users.	When the users are almost fixed for relatively longer term.
Fee as per consumption	Fair and able to collect exact amount per consumption. For livestock use, the number of livestock can be counted instead of measuring water consumption.	Difficult to determine the consumption of each user when there is no device to measure the consumption. Capacity of the collector is required to calculate the fee per use. Need to assign a person to measure the consumption or count the livestock.	When it is necessary to collect fee based on water consumption to cover the increased cost. When the operator can account the estimation of consumption based on the number of livestock. When there is an appropriate device to measure the consumption.
Fixed charge	Simple in collection and recording.	Difficult to judge the adequacy of fee. Less equity and fairness as the charge is same for all regardless of consumption.	When there is no major operational cost to be covered as per increase of consumption. When all the users can agree on the fixed amount. When the rate per use is too complicated to be handled by the community.

Source: JICA Project Team

Tip3: Introduce preventive system against mismanagement.

Example 1: Introduction of a money collection box

To reduce the risk and temptation of misuse of funds, collection boxes and saving box can be introduced. A saving box has three locks whose keys are each held by three different officials apart from the treasurer while the box is kept by the treasurer so that it can only be opened when all of them are present. Payments by users are put directly in the collection box by the payer under the operator's observation and not handed to him.

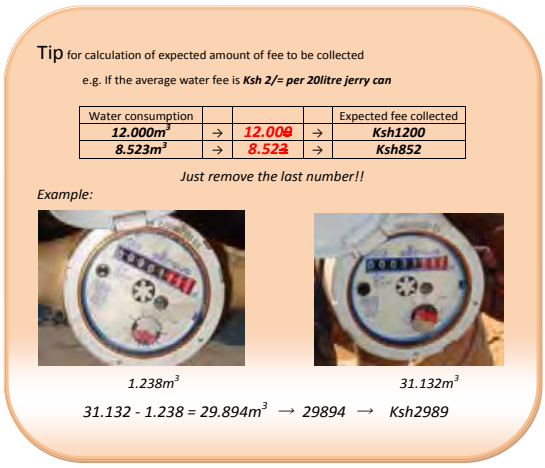
A collection box has a lock and the key is kept by the treasurer. He opens the box only when the operator brings it to him for counting and recording in his presence.

Although these preventive measures are not perfect against misuse, they reduce temptation because the procedure is more complicated.

Example 2: Installation of a water meter

Water meters can be introduced to determine the adequacy of water tariff and fee collection against water usage.

Considering the case of watering livestock, it is not practical to charge water fee based on a water meter since some livestock groups take water at the same time from the troughs. Water meters are therefore used to estimate the approximate amount of money expected to be collected in a certain period of time that can be calculated from the water consumption and for setting tariffs. This enables the WUA as well as the community to estimate the expected revenue to be collected from water sales. It thus works as a tool to prevent mismanagement and misuse of funds as well as against wastage of water. This however still requires a certain level of understanding for the people to be vigilant.



Source: JICA Project Team

Calculationof Expected Water Fee

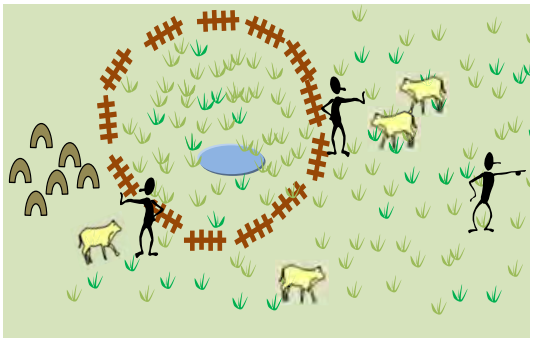
32. Amalgamation of introduced system into customary social system

Summary:

- Communities' traditional institutions are crucial especially in resource management where they have previous experience and way of managing natural resources.
- On the other hand, modernisation, formal systems by the county and state government, and noble systems introduced by external agencies have been influencing their traditional society.
- Even though the traditional system should be respected and taken as an effective system, changes are still inevitable.
- It is important to seek a way to collaborate with the local system by supporting them to adopt other systems to survive in the changing society with macro influence.

Aba Herega system in Borana communities

Different communities living in Marsabit have their own traditional natural resource management systems. The most widely practiced system is the '*Aba Herega* System' in Borana communities, where an owner of the water pan is appointed as *Aba Herega* by the whole community living in a given location (locally called '*dedha*'). The *Aba Herega* is thus charged with the responsibility of water distribution and enforcement of related by-laws at a given pan/dam. This position is normally held or given to a male and is often a powerful and respected position.



Aba Heregas supervise the use of water and pasture around the water source on a daily basis with the help of two to three village elders who support supervision at the site. They serve the community on a voluntary basis.

Needs of formal legitimate system

Being a part of the state, it is inevitable for pastoralists to be involved in national and county governing systems. national government systems such as administrative chiefs have control with certain authority that is superior to the traditional system, often without formally recognizing the

local traditional system.

With regarding to water resources management, the Water Act 2002 established the Water Resources Management Authority (WRMA), that regulates the structures to manage water resources. Management of water resources are supposed to be delegated to the community through the formation of Water Users Association/Water Resource Users Association by formal registration by the government.

For a community organization to receive funds or support from government or donor agencies, it often requires formal registration and a management structure including financial management put in place.

Combination and collaboration between conventional community organization and formal legitimate system

In the above mentioned situation where traditional systems and official systems co-exist, combination and collaboration of these systems is necessary. While the legitimate formal organization might be introduced, traditional authority and system would still have a strong influence on the people. The people also trust this system.

On the other hand, the traditional system and organization needs to harmonise and align itself with the formal system in order to be recognised by official agencies and to receive public support. As a way to function effectively in these circumstances, the formation of a formal legitimate organisation that involves the traditional system is recommended.

For example, *Aba Herega* System should be incorporated in the formal WUA. *Aba Heregas* and their elders take the lead in the management of water resources, while WUA committees can liaise with formal authorities and external organizations. For the external organizations, even though their contact can be WUA committees, they should understand the traditional system incorporated therein.

Box: Aba Herega in WUA of Water Pans

In the case of the ECoRAD project, relation with Aba Herega, whilst forming the WUA, is critical for the following O&M activities. Where Aba Herega is fully involved and respected, newly introduced management has worked better. Better management of pan has been observed in the sites where Aba Herega System is incorporated in the management system. Communities' activities such as fencing of water pan with their own available resources, partial desilting of the pan, and hygienic management of the pan including cleaning of animal drops have been initiated by the community under the leadership of the Aba Herega together with the WUA.

Livestock Value Chain Improvement

33. Livestock market conditions and potentials in Marsabit and Turkana

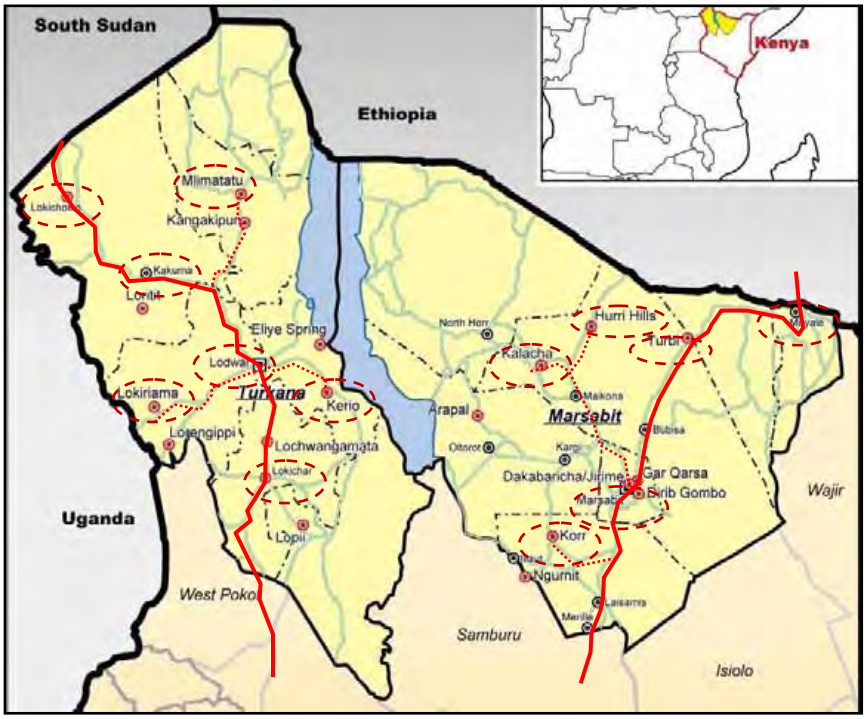
Summary:

- There were so many projects that were implemented by the donors and government for the establishment of the local livestock market. However, in many cases, those activities did not fully meet the projects' intended objective..
- The livestock market conditions in Marsabit and Turkana County were studied and summarized in view of: (1) livestock migratory movement, (2) identification of ethnic groups, (3) road access, and (4) security situation.

Improvement of the livestock market value chain and the revitalization of the livestock market are focal issues in Northern Kenya. Although the county government and donors have built several livestock markets, these market facilities are not always utilized efficiently.

The project team studied the livestock market conditions in Marsabit and Turkana in terms of: (1) livestock migratory movement, (2) identification of ethnic groups, (3) road access, and (4) security situation.

The following drawing indicates the relationship between major towns for livestock activities and major roads.



Source: JICA Project Team

Livestock Markets and Main Access Route

The livestock information and observations, which were obtained through actual site observations and interviews with the livestock market stakeholders in the project are summarised in the following table.

Livestock Market Conditions and Potentials in Marsabit

Town	Livestock Potential	Condition about Livestock Trade	Location / Access to Town
Marsabit County			
Marsabit Town / Jirime	Very high	- Currently, this is the center of the livestock trade in Marsabit County. From this town, several trucks depart to send the livestock to the capital area. However, the traffic to the capital is not so active due to the current road condition in A2 national highway road. - All of the ethnic groups have their business in this town. - Marsabit market has livestock constantly; however, it seems that there are more animals in the wet season due to the pastoralist's migration pattern.	It is quite a good location for livestock trading due to its location along the A2 national highway. When the pavement construction of this A2 road is completed, Marsabit's livestock market is expected to experience a drastic improvement.
Moyale	High	- This town is currently a big trading point around Kenya/Ethiopia border. The animals going to Ethiopia pass through this town, in particular, camels which are in high demand in Ethiopia. - Moyale is a town of Borana. - In the dry season, a lot of Borana's and Gabra's livestock migrate and graze around the Moyale area. - Ethnic conflicts (Borana/Gabra) sometimes occurred around this town in the past, and had always influenced the trading activities.	It is a good place for livestock trading due to its location that is near the national border and along the A2 national highway to Nairobi. When the pavement construction of the A2 road is completed, the livestock market will have an improvement.
Turbi	High	- Currently, this town has a livestock market, but not so active. It is strongly expected to be another trade center in Ethiopia. - This is a town of Gabra. - In the dry season, a lot of Borana's and Gabra's livestock migrate and graze near this town. - Ethnic conflicts (Borana/Gabra) sometimes occurred around this town in the past, and had always influenced the trading activities.	- Ditto -
Korr	High, but takes time	- Currently, this town has a good seasonal center of livestock trade (in the wet season only). However, further development is not expected unless the road access to/from the A2 road is improved. - This is Rendille's town. - In the wet season, there are so many livestock around this area. But most of the livestock migrate to the southern area in the dry season.	Currently, its poor accessibility is the only obstacle to livestock development. Because there are lots of animals during the wet season, the road access is too muddy. There is also no road improvement plan, so the development of the market will take time.
Ilaut	High	- Currently, this town has a good livestock center for Rendille and Samburu's livestock. - Although there is a rustic market facility, many people, not only for the livestock but also for other commodities gather for trade/business. - This is Samburu's/Rendille's town.	Currently, bad accessibility is the only major obstacle for their further development.

		- This is located in the dry season grazing area, but even in the wet season, livestock comes from other area looking for a good price for the trade. Thus, there are always livestock around this area from Rendille and Samburu area.	
Kalacha	High but takes time	- There is a good potential for the livestock trade, in particular, for the Gabra people. - In the dry season, many of the livestock, mainly from Gabra, gather at a spring in this town. However, there is no active livestock market currently in this town. - Due to the current bad accessibility, market development is not expected unless the road is improved. - This is Gabra's town.	Although there is a high potential for the livestock market, in particular for the Gabra in the dry season, there are no currently any active livestock activities. There is no road improvement plan, so the development of the market will take time.
Hurri Hill	High but takes time	- This has good potential for livestock trade, in particular, for the Borana and the Gabra people. - In the wet season, a lot of the livestock of Borana and Gabra gather in this area. - Due to the current bad accessibility, market development is not expected unless the road is improved.	- Ditto -

Source: JICA Project Team

Livestock Market Conditions and Potentials in Turkana

Town	Livestock potential	Condition about Livestock Trade	Location / Access to town
Turkana County			
Lodwar	Very high	- Currently, this town is the center of the livestock trade in Turkana county. There are several trucks from the capital during the high trade season. However, the traffic to the capital is not so much developed due to the current road condition on the national highway. - Throughout the year, the livestock gather at this market every day.	It is the best place for livestock trading due to its location. When pavement construction is completed (presently the plan is being formulated), Lodwar livestock market will have a drastic improvement.
Lokichar	High	- Currently, this town is one of the major trading points in Turkana South. - However, the development of livestock is stagnated due to the road access..	It is a good place for livestock trading due to its location, i.e., near the county border to the south. When the road pavement improvement is completed, the livestock market will also have an improvement.
Kakuma	High	- Currently, this town is the livestock center around Loima area. - Due to the big consumption area in Kakuma, the demand of livestock is constantly high. - However, presently, there is no active trade with the external traders.	It is a good place for livestock trading due to its location and the large number of consumers in Kakuma Town. When the pavement improvement is completed, the livestock market is also expected to be improved.
Kerio	High	- Currently, this town is one of the prominent livestock centers around the south side of the Turkana Lake area. It is highly expected to be developed due to the market facility	Currently, the access to the main road is not so bad even in the rainy season. When the connections and relations with external traders are established, significant increase of trade will be

		improvement by the project to accelerate the trade with external traders. - Although the markets in Turkana operate every day, Tuesday is the market day in Kerio market, which attracts many merchants that sell many kinds of commodities.	expected in this market.
Lokichoggio	High but takes time	- There is a good potential for livestock trade, in particular, with the South Sudan people. - However, due to the current security situation, market development is not expected unless such conflict is alleviated to some extent.	Although currently, there is a high potential for livestock market, it is not so much active in this town. Peace building activities are highly required.
Milimatatu	Medium but takes time	- There is a good potential for livestock trade, in particular, for the animals from Northern Turkana's sub-county area. - This town is located in a seasonal migratory route between the Turkana lake area and the rich dry season grazing area in Northern Turkana and Kibish area. - Due to the current bad accessibility, market development is not expected.	Although currently, there is a high potential for livestock market, there is no active livestock market in this town. There is also no road improvement plan, so the development of the market will take time.
Lokiriama	Medium but takes time	- There is a good potential for livestock trade, in particular, with the Uganda people. - In the dry season, a large number of livestock migrates to this area that results to a high potential of supply. - However, due to the current security situation, the market development is not expected unless such conflict is alleviated to some extent.	Although currently, there is a high potential for livestock market, there is a not so much active livestock market in this town. Peace building activities are highly required.

Source: JICA Project Team

34. Livestock market tendencies: selling and buying

Summary:

- Basically, the livestock market in Northern Kenya has a tendency of supply and demand.
- The high supply period is from January to March, while the low supply period is from April to July.
- The high demand period is from July to September, while the low demand period is from January to March.
- As mentioned above, there is an obvious mismatch between the supply and demand during the period from January to March. If this mismatch is solved, livestock trade in Northern Kenya could be improved well.

Seasonal tendency of supply and demand of livestock in Northern Kenya

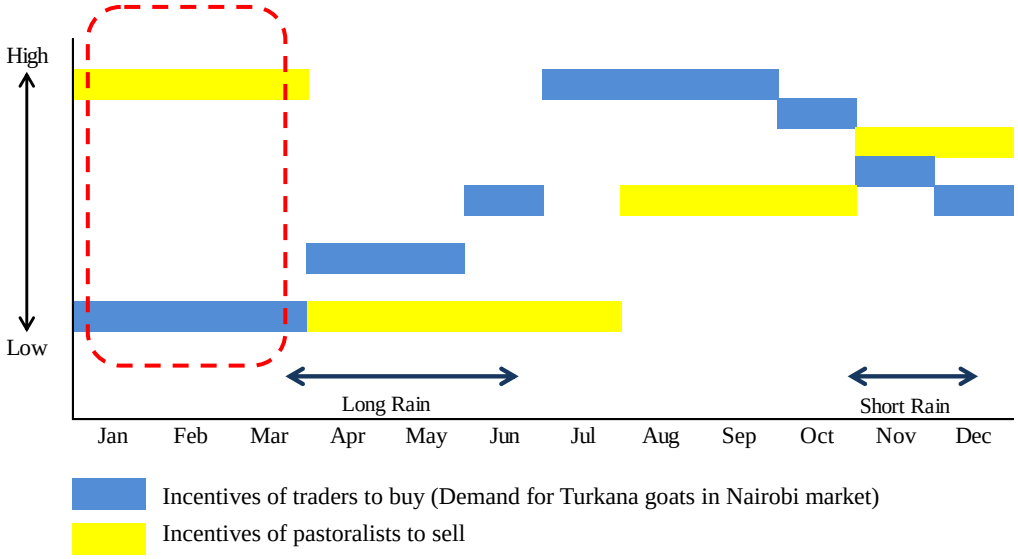
The following major and typical trend of the livestock's supply and demand was actually observed in Turkana County by the project's livestock experts. However, similar trend can be seen in other arid and semi-arid land (ASAL) areas of Northern Kenya.

Pastoralists' incentive to sell (normal year)

- Pastoralists' incentive to sell increases in January since the beginning of the school year means a need for cash. On the other hand, the purchasing desire of the general consumer is diminished with the increase in spending. Furthermore, forage becomes extremely scarce during the dry months of January, February, and March. The livestock begins to lose weight, and the pastoralists' incentive to sell increases as it becomes more difficult to keep the animals.
- The livestock begins to gain weight from April through July when the wet season begins and when the pasture conditions improve. The pastoralists have less incentive to sell. The wet season is also the time for births and mating.
- When the wet season ends around August, the body-weight of the livestock has increased and the pastoralists are relatively eager to sell,

as the improved condition of the livestock means an increase in the price per head.

- The incentive to sell is high during the Christmas season when the general demand increases and prices rise accordingly.



Source: JICA Project Team

Supply and Demand in Turkana Livestock Markets

Livestock traders' incentives to buy

- Turkana goat is popular in the Nairobi market because of the good quality of its meat. However, during the months of January, February, and March, its predominance in the Nairobi market is diminished due to strong competition from the relatively large-sized goats from the Northeastern regions. There is also a decrease in the large-scale traders' incentives to buy.
- As the condition of the livestock improves with the onset of the wet season around April, the decreased incentive to buy of traders now begins to see an improvement.
- Although it depends on the rainfall condition, the traders' incentive to buy increases after the wet season ends around July to October. Also, this is when the livestock is in good condition because of an increased bodyweight. As the demand increases, so does the price per head. During this period, there is an increase in the number of large-scale traders transporting goats to the Nairobi market.
- Although this also depends on precipitation during the short rainy season in November and December, livestock generally begin to lose

weight and also lose the competitiveness against the other regions in the Nairobi market. As selling in the Nairobi market becomes more difficult, the traders' incentive to buy begins to diminish.

Imbalance in supply and demand in livestock market

In addition to the tendency of fluctuation of supply and demand in the livestock market, quantitative balance should be seized for the proper understanding of the markets.

The figure below shows the results obtained from the study of the Lodwar livestock market in 2012 and 2013. The figure indicates the monthly total livestock offered and the total livestock sold at the sale yards. In particular, regarding the number of shoats traded in Lodwar in 2012, the total offered (supply) was far more than the total sold (demand). One of the reasons may be that the price offered by the buyers is too low to settle in the trade.

Source: JICA Project Team

Offered and Sold Animals in Turkana Livestock Market

In this figure, it is also observed that there is a sudden increase of demand in the period from July to October 2013.

Points to be improved in livestock trade

1) Livestock management of appropriate trade timing with forage

The timing of the gap between the demand and supply may be improved, if it is possible to control the decreased body weight with supplemental feed such as crop residues, leguminous tree pods, and hay, in the short rainy season (from October to December) when the shortage of the feed begins. As a result, it will be possible to raise the price of the goat and the number

of the deal of the goat. This kind of activity anticipates a synergetic effect produced by other programs in terms of linkage activation of the livestock markets and the enforcement of the drought resilience practices.

To improve the current situation, the following programs need to be implemented, hopefully, not only in the short run but also in the long term.

Possible programs:

(a) Reseeding program
(b) Rangeland management
(c) Improvement of livestock health through veterinary supports
(d) Livestock off-take training program for producers
(e) Feedlot program
(f) Training producers on feed conservation techniques e.g. hay stacking during the wet season for feeding during the dry season.

2) Market linkage and vitalisation

As shown in the figure on the unbalanced condition of trading, supply exceeds demand in certain times. To improve such unbalanced conditions, external traders, such as traders from Nairobi, should be linked to the local livestock market continuously and constantly. However, there are several obstacles which make the external traders unwilling to go to local markets. The major obstacles are:

- Off- and on-load facilities, such as loading lump, holding pen, etc., are not available in the local market. Thus, Nairobi traders cannot send their truck to such local market.
- Market day is not specified. Consequently, the livestock are not gathered in one day and the traders' truck are obliged to stay for several days for filling up their truck with animals. Facility improvement is inevitable.

Possible programs:

(a) Livestock market facility modernisation program
(b) Livestock off-take training program for Livestock Market Association (LMA)
(c) Livestock market linkage and vitalisation program (including market day setting)
(d) Heifer exchange program (see the next chapter)

Proper consultations and organization of the marketing programme is required between the traders and LMA officials.

Address security concerns in the area.

3) Livestock market information improvement

Since all the livestock producers are keen on the livestock selling price in the market, they seem not to be sensitive about price fluctuation and its trend. Even for those who know that the information is important in the livestock market for the producers, distribution center's buyers, meat processors, retailers, and exporters, it has not yet been shared well by LMA that collects the data.

The following are sample programs for improving the current situation of market information.

Possible programs:

(a) Livestock information collection and sharing reinforcement program
(b) Livestock producers' association establishment and capacity development program
(c) Livestock broadcast program by radio

Based on the concepts and approaches mentioned above, there were several livestock value chain programs implemented in the project.

35. How to vitalise the livestock trades in Northern Kenya: Heifer Exchange Programme

Summary:

- The ECoRAD project tried to find a way to facilitate pastoralists to sell their castrated animals at peak value in the market.
- The project had innovatively formulated the “Heifer Exchange Program” in Marsabit in which the project provided heifers for pastoralists at the regular market price to motivate pastoralists to sell their castrated animals for obtaining funds for new heifers.
- Throughout the implementation of the program in Dirib Gombo's livestock market from January to August 2013, it was estimated that there were at least 667 heads of castrated shoats brought and sold in the markets in exchange for the project’s heifers. This was equivalent to 46% of the total number of animal sales, i.e., 1,435 heads, in the market in that period. Thus, it was confirmed that the program almost doubled the total livestock sales.

Why vitalisation of livestock trade is necessary?

The improvement of the livestock market value chain and the vitalisation of the livestock market are focal issues in Northern Kenya. However, possession of livestock is prestigious in pastoralist societies since time immemorial. They do not sell their livestock unless they need immediate cash for specific reasons, such as for buying food, education fees, etc.

The pastoralists wish to keep livestock in their hands for as long as they can. According to an interview survey by ECoRAD, only 1% of the interviewees responded that they sold their animals to earn cash to be able to buy new animals.

However, such an attitude may lead to the following disadvantages in terms of the natural resource management and the livestock market trading in Northern Kenya:

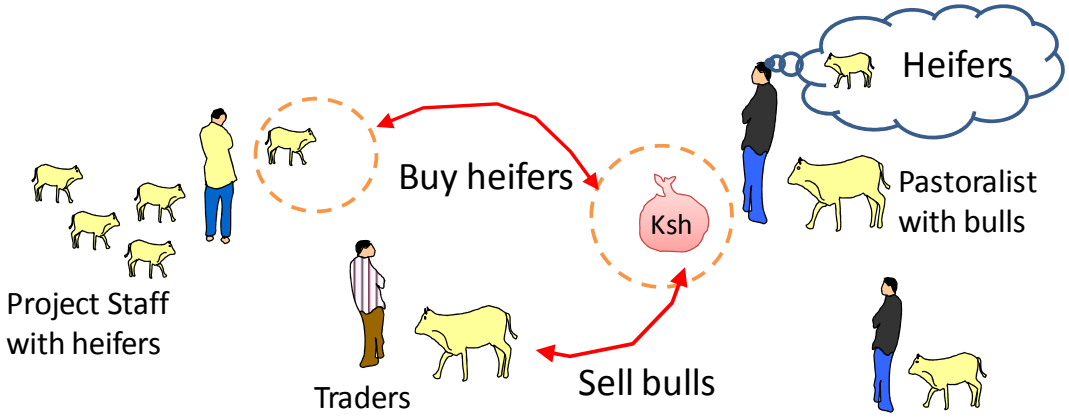
- Old castrated animals kept by pastoralists decrease their market value year by year.
- Old animals do not have strong resilience against drought and are the

first to die during drought.

- While the castrated animals consume water and fodder in the fields, they contribute nothing to animal reproduction. Thus, if herds of old castrated animals are dominant in Northern Kenya, the county's overall livestock productivity will be reduced; water and fodder will be consumed with no contribution relation to the prosperity of the offspring.

What is Heifer Exchange Program?

The project aimed to vitalise the livestock market trading in Marsabit by introducing the "Heifer Exchange Program".



Source: JICA Project Team

Schematic Image of Heifer Exchange Program

Procedure:

(1) The project buys the heifers and sells them in the market at normal prices.

(2) The pastoralists who wanted to buy the heifers could bring their livestock and sell them in the market to obtain cash for the heifers.

(3) The pastoralists who sold the livestock could buy the heifers from the project.

(4) In addition, the pastoralists who wanted to have cash for their basic needs such as food and school fees, can avail of the market in the program, which attracts pastoralists who want to buy heifers.

(5) The market will have more livestock trade and become vitalised.

Effects of the Program: livestock trade in the market increased almost twofold under the Program

During the period of eight months from January to August 2013, the project had been providing heifers, as shown below, in Dirib Gombo's Livestock Market.

Sold Heifers by the Program in ECoRAD Project (January-August 2014)

	(1) Number of heifers provided by the project and bought by pastoralists [heads]	(2) Average selling price of heifer [KSh/head]	(3) Required number of castrated shoats to be exchanged for heifer [heads] =(2)÷4,868*	Estimated number of castrated shoats to be sold in the market in exchange for heifers [heads] = (1) x (3)
Camel	**22**	51,477	10.57	233
Cattle	**85**	25,688	5.28	448
Shoats	**266**	4,728	0.97	258
				Total 939

**: Market selling price of a castrated shoat is assumed at KSh4,868 based on survey data.*

Source: JICA Project Team

The above number of 939 heads was estimated based on the assumption that all persons obtained cash by selling their castrated "shoats". However, it was actually found out that there were several persons who obtained cash from other income sources; the percentage of such persons was 29% according to an interview survey made by the project.

Taking such persons into consideration, it was estimated that 667 heads (939 x 71%) of castrated shoats had been sold in the market.

During the eight month period of the program, the total number of shoats sold in the market was 1,435 heads. Without the program, which enabled the people to sell 667 shoats, only 768 (1,435-667) shoats would have been sold. It means that the program increased the total number of shoats from 768 to 1,435, equivalent to an 87% increase.

Effects of the Program: livestock productivity Is increased

As explained above, the program allowed the pastoralists who wanted to have heifers to sell 667 shoats in the market. In other words, through the program, the project has extracted at least 667 castrated shoats from the rangeland, and replaced them with the above number of highly productive animals without forcing it on the pastoralists.

Consequently, the livestock's productivity has increased significantly due to the program. As a result of this the castrated animals which only consume grass in rangeland and do not contribute to productivity were replaced with heifers, which produce offspring and milk. In addition, the livestock's mortality during the drought improved as a result of exchanging the old animals with young heifers, which have strong resilience against drought.

36. "Reseeding Farm" is one of the recommended low cost and easy activities for the community.

Summary:

- In Northern Kenya, there are not many activities that can be introduced and successfully developed on a voluntary basis by the community., both in terms of human and financial resources, One easily implementable activity for livestock issue against drought is to establish reseeding farms.
- Objectives of the reseeding farms are:
  1) To provide hay for livestock during dry seasons.
  2) To produce seed for sale as income generation by the community and for the expansion of pasture area.
  3) Pasture establishment by reseeding to promote business activities as part of the revitalization of the livestock market.

The reseeding farm program provides rain-fed growing grass field, which is surrounded by spiny twigs in order to prevent the animals from grazing inside during the growth period, in particular, during the rainy season.

In the ECoRAD project, the Lokichoggio, Loritit, and Kangakipur community people decided by themselves to try to establish a reseeding farm based on the action lists of their "community action plan (CAP), which were formulated in the CMDRR workshop and follow-up training on drought management committee, without external financial support. Thus, the project did not provide any financial support but only technical advice on their activities.

Advantages and disadvantages of this activity

The advantages are:

- The required technique for reseeding farm is simple such that ordinary pastoralists can learn and apply it.
- The required expense is also so little that the groups who wanted to start the activity can afford it. The only required essential materials for reseeding are the seeds, which are sometimes distributed by the

Ministry of Livestock, free of charge. Apart from the seeds, the only other requirement is manpower for building the fence and spreading the seeds.

- In Turkana, reseeding business has been operated successfully in a few sites and it was started only through the community's manpower and initiative. The people can see such good examples of success and could easily understand what they need to do..
- It can provide a learning site (demonstration plot) to the pastoralists on pasture production, conservation, and pasture utilisation.

Photos: Community people participated in the reseeding activities on a voluntary basis for building the fence and spreading the seeds in their reseeding farm plot.

The disadvantages are:

- Strong leadership of the area leader, such as location chief, ward administrator or any other influential leader, is required to prevent the pastoralists from getting into the reseeding plots with animals for grazing.
- The growth of grass in the reseeding farm depends on the natural rainfall and the success of the activity is significantly influenced by the weather condition. Thus, these activities could not have good results especially if the activity had only one or two rainy seasons during the project period.
- The benefit of a reseeding farm is not as big as other activities which are implemented at a high cost, especially if the size of the farm is limited.

Key issues for success

Most pastoralists have the tendency of grazing their animals to a rich rangeland without regard for who will take care of the pasture in the

reseeding farm and what effort they ought to put into it. In such a case, a conflict will most likely arise between the pastoralists and the reseeding farm group. This is a crucial diverging point which determines whether the reseeding activity will be in vain or successful. If a good mediator can manage to solve this issue, the reseeding farm can be sustained for a long time.

If such strong leadership is lacking, one of the other options is to establish a reseeding plot within individual compounds where no other people can intrude. In the case of Kangakipur Community, in the ECoRAD project, the community people made reseeding plots in this manner to avoid conflicts with others.

Through this approach the pasture would be improved when it rained. Even though the size of the plot is small and the overall effect is limited, certain benefits could still be realised by the individuals due to their own initiative. This could also provide a learning site and opportunities for awareness of the pastoralists on forage production, rangeland conservation, and effective pasture utilisation.

37. Establishment of a good organisation for livestock is an important key

Summary:

- The Livestock Market Associations (LMAs) is surely a focal actor for the livestock market activities. The LMAs collect livestock fees, maintain the facilities, and take part in other important activities. The strengthening of LMAs is crucial for the long-term operation of the livestock markets.
- In addition, the pastoralists (livestock producers) and traders should be trained and strengthened.
- Looking at the composition of the LMA members, it is noted that there are some cases where LMA committees consists of only traders, and not pastoralists. In such a case, the operation of the livestock markets by LMAs might be biased based on the traders' benefits and may even hinder the livestock trading between the traders and the producers.
- To avoid this situation, strong producer associations should be formed by the pastoralists so as to improve their bargaining power.

Proper composition for good function of LMAs

The focal organisation for communal livestock market activities is the LMA, which collects the livestock fees, maintains the facilities, and takes part in other important activities. An active livestock market needs a well-organized LMA for its long-term operation.

However, in some LMAs, all the committee members are traders and pastoralists are not included. In such case, there might be some possibility that the operation of the livestock markets by LMAs might be biased based on the traders' benefits. Thus a proper composition of the LMA that includes both pastoralists and traders is strongly required for the benefit of both parties.

Strengthening the pastoralist's bargaining power through the establishment of their own organization

In order to increase the pastoralists' bargaining power and maximize their

benefits in the communal livestock markets, it is important to organize the pastoralists for the livestock market activities against the traders.

Box. Experience in Kerio Livestock Market in ECoRAD Project

In the current condition of the Kerio livestock market, the project advocated and assisted the pastoralists to formulate their own organisation for improving their profit.

The pastoralists, who mainly stay in Kerio Town, gathered and formulated a pastoralists' group for the livestock trade, so-called *Kerio Livestock Producers Association*.

After the establishment of the *Kerio Livestock Producers Association*, the following benefits were observed:

- The *Kerio Livestock Producers Association* collected market price information from the other markets in Turkana, and tried to apply it on the market prices in Kerio's livestock market in their negotiations.
- Their mindset was significantly improved to compete with the traders for better prices and more profit. They are more confident now that their profit should be protected and produced by themselves.

In addition to the capacity development of the organisation in Kerio livestock market, the project improved its existing rustic facilities into modern and effective facilities, through the provision of loading and off-loading ramp, iron holding pens, shade houses, and marketing stalls. Such development approach, on both social economic and physical aspects, has been so effective in introducing a new system or organisation in the community. Such new physical input in the livestock facilities has fostered a positive outlook for the community in terms of building self-reliance for their livelihood matters.

Photos of the improved Kerio livestock market.
An overall view (left side) and the new loading ramp (right side)

Livelihood Diversification

38. Selection of livelihood measures: need to consider socioeconomic conditions and categorisation of measures ~ planning aspect

Summary:

- Livelihood measures are economic activities that are affected by socioeconomic conditions. It is important to analyse the socioeconomic conditions in selecting the livelihood measures.
- Livelihood measures can be categorised as 1) livestock utilisation type, 2) local resources utilisation type, and 3) provision of necessary goods type. It is useful to examine the relationship between socioeconomic conditions and categorisation for better selection of the livelihood measures.

Socioeconomic conditions

Livelihood measures are affected by the socioeconomic conditions in the surrounding areas. Livelihood activities are economic activities by nature, and this is true even for the pastoralists in Northern Kenya. These activities are normally regarded as different from economic-based life in other parts of the world. The socioeconomic condition in Northern Kenya is not relatively good compared with other parts of the country; however even within Northern Kenya, the conditions are diversified.

Therefore, it is important to examine first the socioeconomic condition of the country. Major items to be surveyed are as follows:

Road, transportation frequency, mobile phone coverage, nearest populated town and distance (as market areas), availability of local resource, current measure of livelihood, population of target area

An image of how the socioeconomic condition affects livelihood opportunities is shown in the next page. In areas with good socioeconomic conditions, there are lots of economic opportunities, meaning that livelihood measures are more available. On the other hand, in places where socioeconomic conditions are worse, it may not be easy to diversify livelihood measures and careful selection of measures within the local capacity is needed from the viewpoint of sustainability.

Good socioeconomic condition
Roads are well developed, frequent transportation, close to economic center, mobile phone coverage, etc.

→ More possibilities of economic opportunities = more livelihood chances
IGA/business activities, chicken keeping, etc.

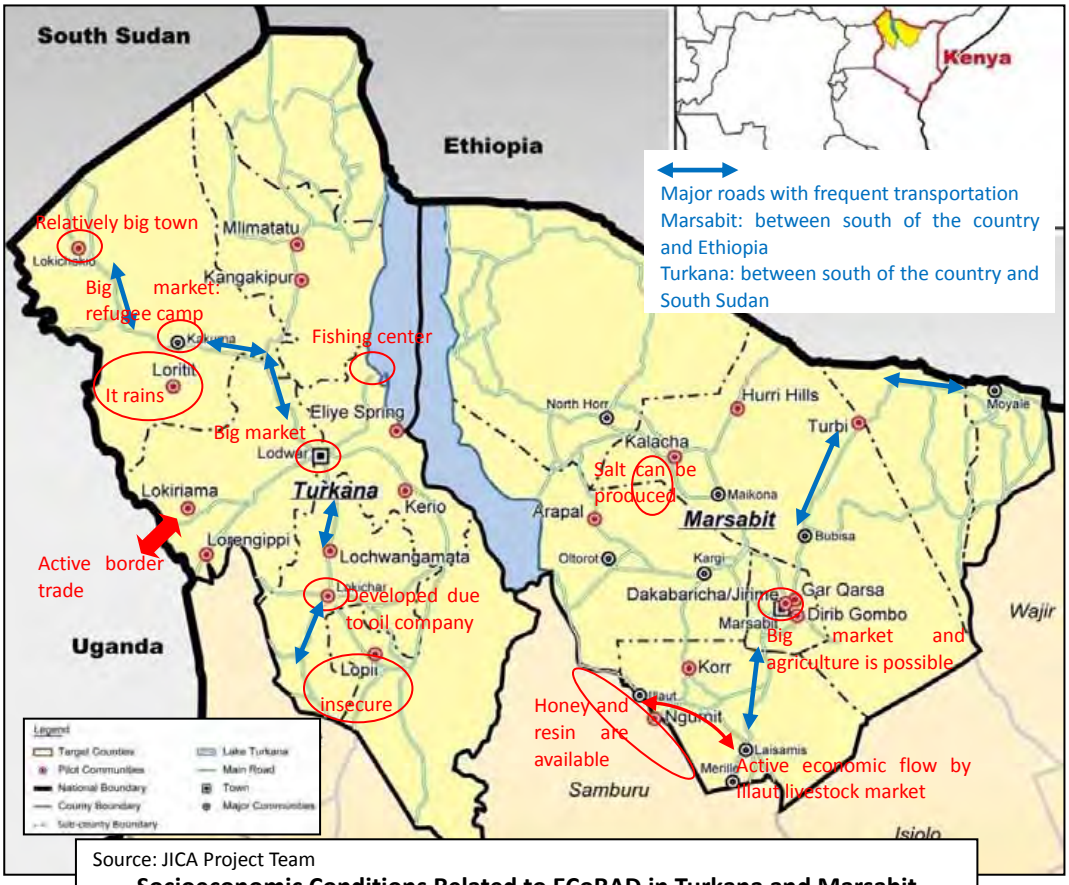
Worse socioeconomic condition
Less frequent transportation, far from economic center, out of mobile phone coverage, etc.

→ Less possibilities of economic opportunities = less livelihood chances (need special consideration)
Livestock-related measures, simple retail shop, etc.

Source: JICA Project Team

Socioeconomic Conditions and Livelihood Measures

Needless to say, lack of security affects economic activities so much because the community cannot easily move, leading to very few opportunities to mobilise resources. Such areas may not be recommended for selection as target areas for livelihood diversification in a short-term project. In the long run, establishment of secure areas is an indispensable element for economic activities. According to the ECoRAD experiences, the following map shows a rough image of the socioeconomic conditions in Turkana and Marsabit counties related to the selected 20 pilot sites.



Source: JICA Project Team

Socioeconomic Conditions Related to ECoRAD in Turkana and Marsabit

Categorisation of livelihood measures

Livelihood measures can be categorised depending upon their contents. Based on the JICA Project Team experience, the categories of livelihood measures in Northern Kenya are proposed as follows: 1) livestock utilisation, 2) local resources utilisation, and 3) provision of necessary goods, although there are possibly more categories. The livestock utilisation measures use of livestock, which is relatively familiar to pastoralist (except chicken). The local resources utilisation measures include use of locally available natural resources that are sources of income. The provision of necessary goods measures are activities of providing goods needed for human consumption in the local areas.

Close linkage between socioeconomic condition and categorisation

Depending on the socioeconomic conditions, livelihood measures differ from one place to another. Therefore, livelihood measures should not be introduced without examining the extent of socioeconomic condition which affects a particular livelihood measure.

Taking the subprojects as an example, the relationship between socioeconomic conditions and categorisation is shown in the table below.

Categorisation of Livelihood Measures and Socioeconomic Conditions

Categorisation	Livelihood Measures (tried in the subprojects)	Considerations on Socioeconomic Condition
Livestock utilisation	Chicken "merry-go-round"	Chicken is in demand basically in town. Pastoralist in the remote areas may not eat it.
	Goat "merry-go-round"	Basically, this can be applied in places where goats are kept.
	Processing of livestock product (dry meat)	Basically, this can be applied in places where goats are kept: If they want to sell the goats, proximity to town matters.
	IGA-livestock trading	Basically, this can be applied where the goats are kept. However, places between areas with more pasture and towns with livestock market are better.
Local resource utilisation	Resin Honey	Places where this resource is available, e.g., close to forest areas.
	Salt	Basically, only close to Chalbi Desert where this resource is available.
	Small-scale rainfed agriculture	For rainfed, at least some rain is expected such as in the west part of Turkana, even in Marsabit Town. Or, agro-pastoralist zone
	Fishery	Basically, only along Lake Turkana, but places near

Categorisation	Livelihood Measures (tried in the subprojects)	Considerations on Socioeconomic Condition
		fish market places (= sending products to downstream) like Kalkol or fish market such as Lodwar (close to consumer places) are preferable.
Provision of necessary goods	IGA – retail shop	Basically, any community where people live. Pay attention to population, proximity to town where goods are procured, and frequency of transportation.

Source: JICA Project Team

It is recommended that measures should be chosen considering the above points for types and individual measures as per local conditions.

To enhance resilience in Northern Kenya, livelihood diversification is very important. It contributes to the enhancement of resilience by hedging risks and cushioning negative drought impacts as well as recovering early through on other livelihood measure besides their livestock keeping activity, or even through several measures (ultimately by money or food). What kind of livelihood measures can be added or selected is always a question. Individual livelihood measures could be many even in Northern Kenya. Thus, it is important to understand the kinds of livelihood in a holistic way in order to make proper plans for livelihood diversification. Measure should not be limited to the ones tried in the ECoRAD Project. More measures that have potential in both Turkana and Marsabit are shown below;

Gum and resin, aloe, natural salt, honey, wild fruits, firewood, gold/precious stones mining, crashing stone for construction materials, fishery, small-scale agriculture, hay production, chicken, milk production, skins and hides, dry meat, weaving of mats and baskets, charcoal, alcohol, petty itinerant, kiosk-based trade, livestock trade

39. Inputs of assistance: need to reflect beneficiaries' capacity and cultural role ~ planning aspect

Summary:

- In designing the contents of livelihood assistance, the level of capacity and cultural role of beneficiary are important issues to be analysed.
- Capable community people can operate more livelihood measures with complicated contents, but less capable people can do few measures with simple transaction.
- Cultural role and the gender aspect on livelihood activities also need to be considered such as empowerment of women's capacity.

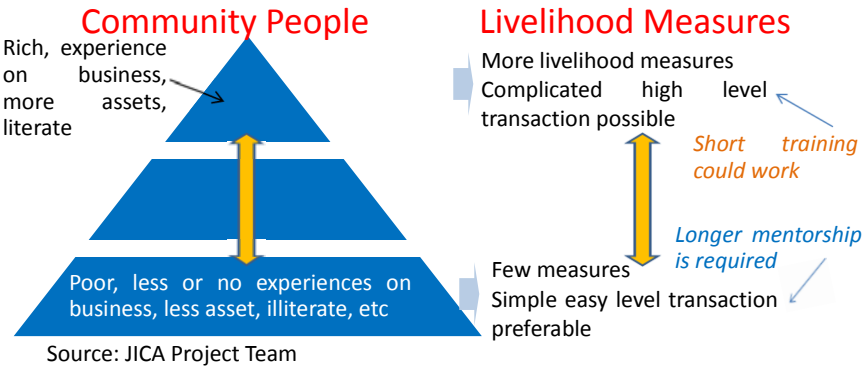
Level of capacity of community people on livelihood activities

It is also important to know the level of capacity of community people on livelihood activities and to reflect this in the assistance activities. Below are the main items which should be studied.

Literacy, gender (male and female and their role in proposing livelihood measures), level of current livelihood measures, experiences of business

Best suited interventions and inputs must be proposed considering the level and kind of livelihood measures that can work for a certain capacity level of people with reference to social status and the form of assistance they need.

The following image shows how the level of capacity of community people affects the livelihood measures and their assistance.



Source: JICA Project Team

Capacity of People and Livelihood Measures

The JICA Project Team observed that there are really diversified community people even in the pastoralist community in Northern Kenya. There are some people who have experienced business in a good way mainly in semi- or settled areas; on the other hand, there are certain people who are illiterate and have not thought about money. The former can diversify more livelihood measures, but the latter can not. Relatively complicated business transaction can be handled by the former, but activities for the latter should be simple. In terms of the mode of assistance, short training or financial support is sufficient for the former, but long-term mentorship and interaction is required to build the capacity for the latter group. As such, it is important to analyse the capacity of people in shaping up the livelihood related assistance.

Box

- Example of different 'takeaway' from business training

For income generating activities (IGA) retail shop group members in Turkana, the same business training was done. Interestingly, 'takeaway' from the training for the members in Lokiriama was much more than for the members of other areas. This may be because the Lokiriama groups had past deep experiences on retail shops, therefore, they understood the basics of business, which made their learning so deep, although the other group members learnt simple business ideas depending on their capacities.

- Example of adoption based on different stages of capacity

A salt group in Marsabit had not started VICOBA even though the training was done. The reason was that VICOBA was a bit complicated and they wanted to concentrate on salt business first. As time went by, their salt business gradually became successful and the group members seemed to acquire more experience. Then, when the group money had grown, they started VICOBA using the said money. This indicated that they seemed to acquire capacity through salt business first, and then expanded their activities for VICOBA.

Cultural role and the gender aspect of livelihood activities

The other point is that cultural role may affect the livelihood measures. For example; chicken has not been considered as fit for consumption from conventional pastoralist view. Thus, in remote areas where conventional thinking remains, chicken rearing may not be recommended (there is no market for eggs and meat, too).

In addition, small business activities are basically considered as roles of women. In the ECoRAD Project, most of the target group members are women for these small business activities as well as chicken rearing (although men were also included). If men are proactively targeted, things may not work properly. Such cultural role and gender aspects should also be fully accommodated although there are always exceptions.

40. A must aim: capacity development of beneficiaries ~ procedural aspect

Summary:

- Unlike relief or humanitarian aid, capacity building is a must for livelihood diversification.
- Recommended procedures for self-reliance building are 1) identification of livelihood measures, 2) participatory planning, 3) provision of initial training, and 4) provision of mentorship and ad hoc inputs.
- Effective tools are 1) exchange visits and 2) study (exposure) tours.

Important basic understanding: capacity development

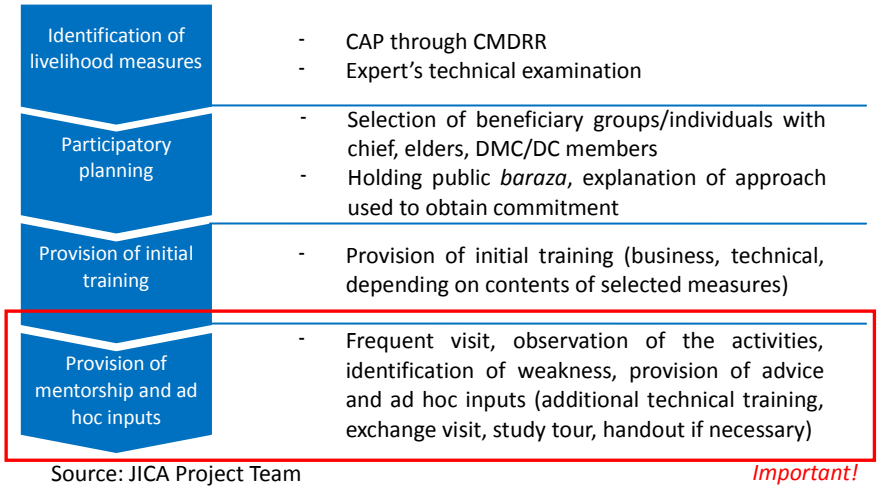
Unlike relief or humanitarian aid, capacity building of community people is a must for livelihood diversification because livelihood measures are managed by them even after the assistance is over. If introduced measures could not be handled sustainably by the community people, they could not get benefits indicating that resilience is not enhanced. Therefore, it is basically inappropriate to just give handouts unless the capacity of the target people is high. Unfortunately, it seems that community people, especially in Turkana, have gotten used to receiving relief type of aid at present; hence, people tend to require immediate grant or handout, regardless of their capacity. To strengthen the capacity of community people, persistent long-term encouragement is indispensable for livelihood diversification.

Recommended procedure of livelihood projects to build self-reliance

Based on the JICA Project Team experience, the recommended procedure to promote self-reliance building is shown in the figure in the next page.

The first step is the identification of livelihood measures. Contents of community action plan CAP through CMDRR approach, if it is available or formulated, can be checked to know whether livelihood related plan is included or not. Technical examination through site visit by livelihood

experts is also needed to identify viable technical livelihood measures considering the abovementioned issues such as socioeconomic conditions and capacity of community people. Comprehensive examination of both results is desirable to come up with an idea of the livelihood measures.



Source: JICA Project Team

Recommended Procedure of Livelihood Projects

Second step is participatory planning once the idea of livelihood measures to be assisted is identified.

Third step is the provision of initial training. Depending upon the contents of selected livelihood measures, either business or technical training (or both) is provided.

"Fourth step is the provision of mentorship and ad hoc inputs. This step is critical and crucial to build self-reliance.

Fourth step is the provision of mentorship and ad hoc inputs. This step is critical and crucial to build self-reliance. After provision of initial training, their activities are monitored and observed through frequent and regular visits. Once a weakness is identified, advice or necessary additional training can be done. Effective tools (shown below) can be introduced at this step based on the observation. Here, handout can also be given as long as commitment of the people is confirmed and growth by this input is judged to be expected.

The above steps are indicative, and may not be exactly followed. As long as the concepts behind the procedure are understood, any modification is possible. Important concepts behind this are 1) participatory community engaged in decision making on selection of both livelihood measures and beneficiaries together with the involvement of experts from technical point of view, 2) possible aftercare with additional inputs as required, and 3)

fostering self-reliant attitude of community people as catalyst by means of outsiders' position.

Box: Example of Following the Procedure in ECoRAD ~ Chicken Merry-go-round in Marsabit

Explanation of the contents of assistance, submission of application (step 2)

Provision of chicken and chicken house to the beneficiaries groups (Step 3)

First technical training (Step 3)

Through monitoring and mentorship, poultry keeping technique was identified as weak area (Step 4)

Additional technical training focusing on weak area is given (Step 4)

Accelerated transfer of chicks to subsequent members.

Effective tools

Mentorship activities (fourth step) are really important and effective. Throughout the projects/programs, activities of the communities are monitored; their weakness is identified, if any; necessary advice based on the knowledge from the training is given; additional ad hoc inputs such as additional training on weak areas, exchange visit, and study tour can also be provided. In this step, the following tools are particularly effective:

"Mentorship activities (fourth step) are really important and effective. In this step, the following tools are particularly effective.

- *Exchange visit*
- *Study (Exposure) tour*

Exchange visits (one element of Pastoralist Field School)

It is effective to conduct inter-group meetings among the groups on same assistance project/program, or even similar programs under other initiatives to learn from each other (good practice of the same activity in the same region). This will provide learning opportunities among themselves (teachers are community people, and learners are community people, too).

Study (exposure) tours

People in the communities of Northern Kenya have very little opportunity for exposure on advanced cases related to livelihood measures. To provide incentive or motivation, or even learn technical things, it is

effective to take groups to show advanced cases.

Box: Example of Tools Used in ECoRAD

Exchange Visit – Goat Women Group in Marsabit


As one of the capacity development measures, two women groups were taken to advanced women groups (which are not in the goat program) to get motivated.

Members were motivated to accelerate VICOBA and monthly contribution.

Exchange Visit – IGA (retail shop) groups in Turkana


To give an opportunity to learn their business activities between themselves and use the opportunity to improve their own business activities, one group visited another group in different place.

One group (host) is better off than the other visitor group and the latter had a lot to learn from the former.

Study Tour – Honey Groups in Marsabit


The groups were taken to Kerio Valley Development Authority to see the advanced honey transaction.

Some technical learning and means of motivation for using new containers.

Study Tour – Fisher Groups in Turkana


To learn how advanced the area where fishery is active and give an opportunity to get some ideas for the improvement of their fishery activities, the groups were taken to Kalokol.

Some members have started going to Kalokol and do commission fishing learnt from the tour

41. Contents of assistance: need for customisation based on kinds of livelihood measures ~ technical aspect

Summary:

- Required trainings, mainly technical training and business training, are different depending upon the kind of livelihood measures.

Different knowledge required

Depending on the contents of the livelihood measures, the required knowledge is different. Therefore, it is important to customise and provide the required trainings and mentorship activities based on the livelihood measures to be assisted. The following table shows the required trainings depending upon the kinds of livelihood measures.

Required Trainings Depending Upon the Kinds of Livelihood Measures

Example of Livelihood Measures	Required Trainings
Measures that require skills including chicken, goat, dry meat, agriculture, fishery, honey (when sieving technique is required), and more.	Technical trainings in each area Poultry keeping, improved technique of dry meat, farming/fishery practices, honey sieving
Measures that intend to sell products and get profit such as retail shop, livestock trade, salt business, honey business, and any other measures which involve business elements.	Business/entrepreneurship training Cost and benefit, market, risk, business planning

Source: JICA Project Team

Livelihood measures that require technical skills need technical training. On the other hand, measures that may not need specific technical knowledge but are more related to sales of products demand business/entrepreneurship training. There are measures which often need both elements (e.g., measures producing technical products and earning profit by sales). According to the project's focus, the points to be emphasised must be analysed, and the necessary inputs should be decided.

42. Technical considerations from ECoRAD experiences ~ technical aspect

Summary:

- Technical consideration is different from one measure to another. It needs careful observation.

Technical consideration based on the ECoRAD experiences

Technical considerations are different from one measure to another, therefore lessons obtained from the ECoRAD experiences may not be generalised for all other institutions. However, at least when similar livelihood measures are to be selected for assistance, the lessons learnt will be useful. Hence, lessons from three livelihood measures are noted.

Chicken “merry-go-round”

The subproject provided chicken (mainly improved breed, Sasso) to a group. The first recipients who received the chicken kept them and let some to hatch eggs to increase their numbers; then, the newly hatched chicks are given to another member. Chickens are distributed until all members of the group get their chicken.

As most members were experiencing technical difficulty of rearing improved breed of chicken, progress of the project was slower than planned. Some of the major technical difficulties they suffered were:

- Chick mortality due to night and morning colds in Marsabit Central;
- Issue of hygiene like cleaning of poultry houses which could bring recurrence of infectious diseases;
- High feeding costs for rearing improved breed; and
- Frequent diseases occurrences and unavailable of medication


Multiplied Chick and Transfer

On the other hand, if members could be patient to acquire all techniques, this improved breed produces huge income. In fact, some individuals

acquired substantial skills in poultry rearing and were seriously taking the activity as a source of livelihood. Therefore, lessons learnt are; to emphasise individual chicken rearing more than the group system, and to give frequent advice on the specific technique identified as above until they fully acquired the skill. As to the chicken itself, the improved breed is promising as a livelihood measure because it has a high demand in Marsabit Town. However, it should be noted that this improved breed may not be needed in the remote area where the population is low, meaning that demand for poultry products is low.

Goat "merry-go-round"

Similar to the subproject of chicken, this subproject aimed at providing goats to target groups; increase numbers of goats; and share the offspring with group members. Under this subproject, Galla goat was used as the improved breed which is famous for producing substantial amount of milk under extensive grazing system, and is said to survive better in the Kenyan arid and semi-arid areas.

Unfortunately, multiplication of Galla goats was very low and the system was not fully operational as planned in terms of speed. Since the concept itself was positively evaluated by members, only the performance of this goat breed was an issue. There were continuous reports of frequent abortions among pregnant Galla goats. This could have been as a result of disease outbreaks, weak Galla goats brought in the project, and/or poor care provided by the members possibly because it was a free gift Its important to note that Galla goat may not be suitable in the cold areas like Gar Qarsa.

Lack of necessary vaccinations and medication together as well as veterinary personnel in the target areas (groups) hampered the acceleration and multiplication of kids.

Provision of Galla Goats and Distribution of Female Kids

One of the technical lessons is that the condition of the breed and/or individual goat should be carefully observed before provision and only healthier ones should be distributed (local goats which can perform better in the cold area are also options other than improved breed). Government extension services are also important. Veterinary personnel and modern agricultural laboratories for disease diagnosis are recommended to be put in place by county government as countermeasures against the outbreak of disease(s).

Small-scale rain-fed agriculture

This subproject was meant to assist target groups to conduct small-scale rain-fed agriculture in their localities by taking advantage of the rainy season. The Project provided agricultural technical training and technical advice and hands-on learning on farming practices expected to be employed in individual farms. Major technical learning by the members was mainly on line planting whose benefits include not only incremental production but also easy farming practices (easy movement inside the field, flood water can easily flow through the field without affecting plants). For places where rain-fed agriculture is still conducted in a primitive way like in Turkana, this line planting technique has not yet been fully applied and is useful.

Difference between Line Planting and Broadcasting in Experimental Plot

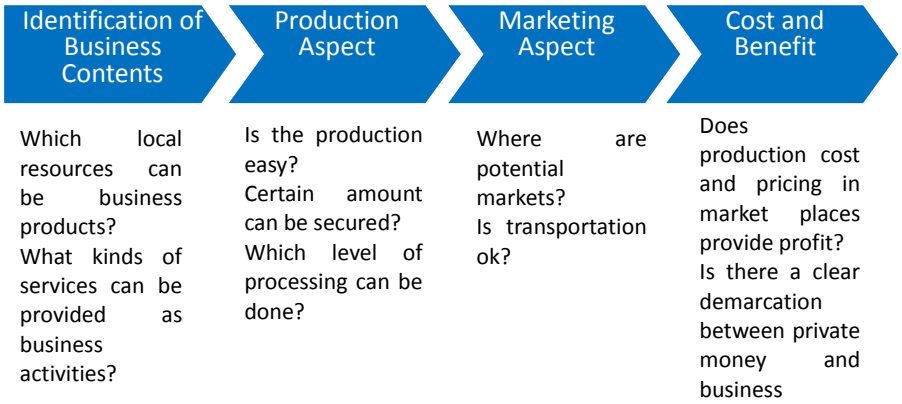
43. Business-related lessons: aspects of identification, production, market, and cost and benefits ~ technical aspect

Summary:

- Business-related lessons can be relatively and easily generalised. It is important to apply the simple business framework (identification, production, market, and cost and benefit) to analyse the weakness and give mentorship to the weak area.

Consideration of business-related livelihood measures

Unlike the above technical considerations, business-related lessons can be easily generalised in order for other institutions to use them. In planning on how to assist the business activities and provide mentorship, the following framework should be taken into consideration.



Source: JICA Project Team

Framework of Business Activities

The first point in the framework is identification of business contents to be assisted. The points which have already been discussed earlier, such as capacity of community people, socioeconomic conditions in and around the areas, and availability of local resources are important in order to identify business contents.

The second, third, and fourth points are important aspects of business activities. Once business contents are identified, these three points should be analysed; and weakness, which is expected to be improved, must be examined within the local context. Once weakness is identified,

assistance can be concentrated on such weakness. Through mentorship activities, the cycle to improve business activities using this framework (identification of points needed to be improved -> inputs -> monitoring and observation -> identification of weakness where further improvement is needed -> additional input) is recommended.

Box: Example of Business Assistance in ECoRAD with Analysis Using the Framework

Honey Business in Marsabit

Identification of Business Contents | Production Aspect | Marketing Aspect | Cost and Benefit

Honey is available, and they did in a preliminary way.

This aspect is identified for improvement.
New containers to attract more customers were introduced.

Salt Business in Marsabit

Identification of Business Contents | Production Aspect | Marketing Aspect | Cost and Benefit

Salt is available, and their commitment is high.

This is the critical aspect.
New markets in the northern area where salt is needed were identified.

IGA activities in Turkana

Identification of Business Contents | Production Aspect | Marketing Aspect | Cost and Benefit

They did it in their own way

IGA - livestock trade - separate wallet for business

IGA - retail shop – bookkeeping

Most of the members replied that they learnt the importance to differentiate between money for business and money for household purpose.

Most importantly, all aspects in the business cycle should be experienced by the members within the assistance period, which leads to sustainability of their business activities. For example, in the salt business assisted by ECoRAD in Marsabit, the target group experienced all the aspects in the business cycle from collection of salt to market delivery and collection of sales (money). Before the ECoRAD assistance, they could not imagine where the potential markets are and how to transport salt bags. Once the

JICA Project Team showed them the identified markets, and how to use locally available lorry to carry salt bags to markets, they were able to do all the aspects of the business cycle by themselves. However, if an institution just provides equipment which only an outsider can operate and repair, their business activities may be active only during the particular period of assistance and will end up once the institution is gone. This situation should be avoided in the project/program design.

New technology also helps in their business activities. Remarkably, they have already used to mobile phones to get market information. Several members of IGA (livestock trade) and fishery groups said that they used their mobile phones to get market information. The mobile phones are not provided by the project but came from their own pockets/initiatives. In this sense, mobile phone coverage expansion in Northern Kenya seems to contribute greatly in their economic activities.

44. Other issues: handout provision and other impacts ~ technical aspect

Summary:

- Provision is acceptable or even effective as long as ownership of handouts is secured; and provided handouts are positively used by people to lift their current level of livelihood activities a little bit upward.
- Through this assistance, the enhancement of group cohesion and gender/youth consideration are expected.

Handout provision

As discussed earlier, provision of handout itself is not a bad option and even ECoRAD provided chicken, chicken houses, and goats to the community people. Generally however, ECoRAD tried to provide less or no handouts and grant (money) and emphasised on the provision of knowledge and capacity development. An important concept behind this is that provision is acceptable or even effective as long as ownership of handouts is secured and provided handouts are positively used by them to lift their current level of livelihood activities a little bit upward. Well-designed provision together with mentorship and training activities is good. However, it is not desirable that handouts foster just dependency and lose the community people's self-reliant attitude. In Northern Kenya, dependency has already prevailed perhaps due to past relief aid. Livelihood activities need the community's efforts because they are economic activities. Economic situation is always changing. Only people who proactively think and behave can successfully continue their livelihood activities over time. For successful livelihood activities, building self-reliant attitude in community people is indeed indispensable. In this regard, harmonisation of the approach is required among institutions related to assistance (e.g., prohibiting easy handout provision).

Other positive impacts expected

Through the ECoRAD experiences, the following are seen as other positive impacts:

Group cohesion

Most of the members evaluated group cohesion positively through group work. For the goat subproject, although goat transfer is at low pace, group cohesion was enhanced. Also, some members of business-related subprojects started to understand good points of group work such as collective action and VICOBA. Basically, pastoralists are independent; therefore, group work cannot be expected much. However, the JICA Project Team could say that groups do function for relatively smaller groups i.e. around 20~30 members who have the same economic interest. However, careful thought on group issues while designing the contents of the livelihood measures is still needed. In particular, it is recommended that benefit and profit are basically designed for individuals rather than for a group. Group mechanism can work for assisting and helping each other, e.g., for cases where collective action is required (joint procurement) and for fundraising (VICOBA/"merry-go-round").

Gender and youth

As argued earlier, livelihood activities in most cases are handled by women. Through the ECoRAD assistance, women have been empowered through ownership of chicken/goat and involvement in decision making on the given assets. They have also been empowered by economic success of business activities. Thus, livelihood assistance contributes to gender issues if women are selected as beneficiaries of livelihood assistance and given something such as ownership and small success (e.g., earning money).

Youths who are educated tend to do IGA business activities. In Turkana, youth groups conduct livestock trade. They might take more risks and try new things. Youths are also assisted through livelihood assistance.

Ownership of Goats by Women ~ ECoRAD Experience

In Northern Kenya communities, ownership of livestock is mainly by men. By giving women goats in the project through goat merry-go round program was a major milestone. In this sense, women members have felt the ownership of the goats as well as having a say on enjoyment of their benefits like milk. Men appreciate importance of the project by allowing their women to participate in it since benefits are shared by them as well.

45. Fundraising for community people: start within current capacity ~ technical aspect

Summary:

- Stage-wise approach is important as well in terms of fundraising for livelihood measures. At the initial stage, livelihood measures must be planned at a level which the community people can handle. At later stage, it can be considered to increase the capital gradually.
- As forms of fund raising, "merry-go-round" and VICOBA are good tools for the initial stage. Applying to existing fund institutions is one way for the later stage.
- Drought Fund Kitty can be one of the ideas at the group level to be used for cushioning negative impact by future drought.

General recommendation

To start and continue the livelihood activities, funds are required. However, in most cases, community people in Northern Kenya do not have much fund for both initial and operational investment. At the same time, it should also be considered that community people may not have enough experiences in managing money matters because pastoralism does not require money in the general sense. Below are the recommendations.

At the initial stage, livelihood measures must be planned at the level which the community people can handle within their current capital. Although the amount is low, at least community people who do livelihood activities have some money. And some have already started small business with their money. When a certain measure is assisted, activities must be set at a level where they can start and operate without relying significantly on new inputs.

At a later stage when their activities become stable, it can be considered to expand their business gradually as their capacity and capital grow, but not abruptly. Because they get used to the current operation and fund management, failure in the usage of money is expected to be minimal.

As discussed before, if the capacity of the community people is judged to be high enough, measures which require certain amount of money can also be considered.

Fundraising

Next issue is how to raise funds. In general, there are few financial institutions in Northern Kenya. Accessing the fund is not easy for the community people. The following two ways are possible:

A way to raise the fund where there are no financial institutions is to collect money from community people within their proximity. There are very good tools for this purpose: Merry Go-round (grant) and VICOBA (Village Community Banking which is loan).

"Merry-go-round" and VICOBA

A way to raise the fund where there are no financial institutions is to collect money from community people within their proximity. There are very good tools for this purpose, namely, Merry-Go-Round (grant) and Village Community Banking (VICOBA) (loan), which are measures of fund raising in a group.

"Merry-go-round" is a first good step to start. In fact, "merry-go-round" is widely implemented in Northern Kenya, which is a system where group members contribute money and give it to another member as grant.

The purpose is mainly for some social occasions or some sudden events where a particular member needs some money. This can also be used as a capital for their livelihood activities.

VICOBA is a further developed form of "merry-go-round". Under VICOBA system, a group lends contributed money to a member, and a member must return the money with interest within a certain period of time. This is actually a kind of self-operated bank and considered a good financial source. However, it must be noted that VICOBA has pros and cons for its introduction as summarised in the table below.

Pros and Cons of VICOBA

Pros	Cons
● As long as the community people understand, it is good to raise fund and increase group money in remote area such as Northern Kenya. ● Members can access both initial and operational fund easily. Ownership increases because of the members' money.	● This is a loan, therefore not so high interest rate and short repayment period are recommended. ● Calculation is complicated, sometimes the community people cannot understand. ● VICOBA can be introduced together with some kind of IGA (only money without explanation on how it could be used would not work).

Source: JICA Project Team

These two tools require the formation of group and group collective action. Strong groups tend to be successful.

Linking to existing fund schemes

Another way is to link the community people to existing institutions, which provide fund schemes and consider sustainable rather than time-bound projects, for applying fund. They normally do not possess information on

which institutions can disburse funds; therefore, information dissemination to remote area is also important by the facilitators. Candidate schemes are Constituency Development Fund (CDF), Women Development Fund (WDF), Youth Fund (YF), or even formal banking if they can manage. There may be other drought-related specific funds available or to be established. Most of these schemes require group application. Forming groups is a prerequisite.

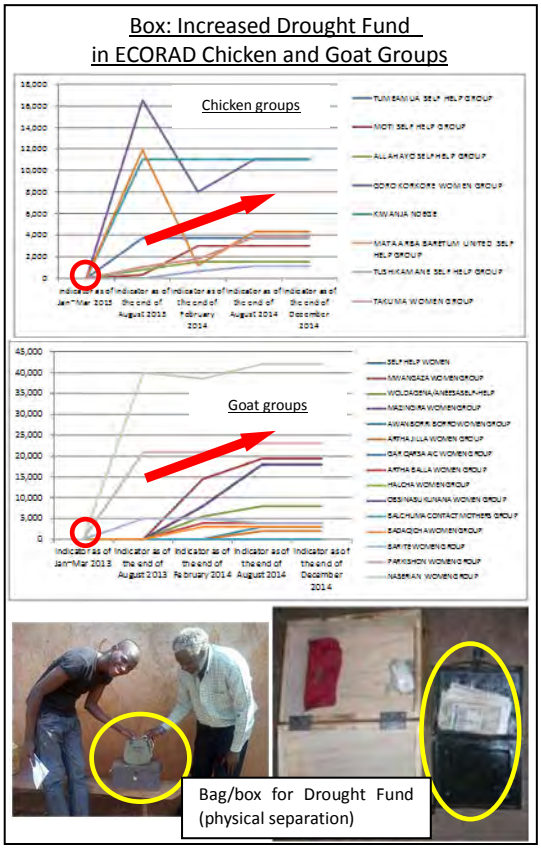
Input by projects/programs

Once their commitment is confirmed, projects/programs could provide grant or loan. This has been already discussed several times earlier, it is not a good idea, to just provide grant without confirming their commitment and ownership, and mentorship activities, possibly leading to foster dependency.

Drought Fund

One of the trials that ECoRAD did is to establish Drought Fund Kitty especially in Marsabit. This Drought Fund intended that some amount of money be saved in the group's savings account/box to prepare for the negative impact of future drought. For chicken and goat "merry-go-round" subprojects, usage of Drought Fund was planned to buy the initial set of chicken and goat to restart the "merry-go-round" cycle again. Currently, at least some money (several thousands to more than ten thousand shillings) is saved and kept aside for future drought. Technically, physical bag/box only for this purpose is recommended to be used because money does not have color and easily misused. This could also be saved in the same group fund box promoted

Box: Increased Drought Fund in ECORAD Chicken and Goat Groups



by VICOBA (with three keys which are kept by different members).

According to general pastoralists' mindset, it is said that they do not understand money without concrete purpose of usage; and may not have a clear image of future events. Thus, this trial was a challenge in order to create new culture in them. Based on the results of the end-line survey, the members seemed to understand the purpose of Drought Fund properly (they said "this money is used when future drought occurs and when the groups suffer from it"). Since the subprojects started, no severe drought has occurred, and therefore it is early to judge whether this Drought Fund works. However, such saving culture should be fostered and promoted in Northern Kenya as one of the ways to enhance resilience; therefore, the JICA Project Team recommended and introduced Drought Fund for small livelihood groups taking the long-term perspective into consideration.

Gender Aspect: Empowerment of Women by Fundraising in the Project

Since men have ownership of livestock, trading business of livestock is one of men's main roles in pastoral culture. By this, women in Northern Kenya used to have less opportunity to have transaction with external society. Recently, small income generating activities have been exercised by women. Due to the introduction of fundraising activity by the project, the target women were able to have cash in hands which could be used in their own decisions. With such cash, some women's groups strengthened their relations e.g. for mutual support, and some were empowered together with enhanced their business capacity.

- Fund for social safety net: Because of the actual practice of the activities, especially the groups in Kalacha and Arapal seemed to have more cohesive actions than before. The groups had a social fund that could be used in terms of emergencies. In Arapal, the members contributed money if one of the members gave birth and the same applies if a member lost a relative. In Kalacha, the groups had social fund meant to cater for the welfare of the group members.
- Group empowerment: Some groups have started their business inspired by the mentoring and group strengthening activities by the project. The Naserian women group had bought goods and the goods were later divided among the group members so that they can sell on behalf of the group.

Capacity Development of Government officers

46. Necessity of capacity development of the county government officers

Summary:

- It is important to develop capacity of county government officers on elaborated CMDRR approach, development planning, and technical lessons.
- Government officers who need training are administrators (Sub county, Ward, and Village) and officers in related technical ministries.
- It is desirable that officers are trained to think by themselves and be able to customize approaches fitted to local conditions rather than just apply standardised approaches.

Necessity to develop capacity of the county government officers

The ECoRAD project conducted the on-the-job training in implementation of the sub projects, the CMDRR trainings, and several seminars and workshops as the activities of this component. As the result of the devolution, the county government is now responsible for development in the county. Since the process of the devolution started after the project had begun, the project was not able to fully involve the county government staff. Even at the time of preparing this guideline, the county structure has been yet fully established. Furthermore, since some of newly recruited county government officers do not have enough experiences and knowledge for working with community, they need basic trainings in order to be good facilitators for communities. Therefore, there is a strong need that the county government officers be trained further to enhance community resilience against drought in Northern Kenya.

Necessary fields and subject officers for capacity development

Necessary fields of the trainings are the issues shown in this guideline, namely 1) basic understanding on drought, drought resilience, and community, 2) lessons for better community-based drought management including general and specific topics, e.g. elaborated CMDRR approach and development planning, and 3) lessons in each technical area. Subject officers of these trainings are administrators (Sub county, Ward,

and Village) and officers of related technical ministries. Administrators are important because they are the ones working with the community people day-to-day basis, especially from the viewpoint of community resilience. Training to the technical officers of technical ministries is also necessary because basic understanding of the general pastoralist world and how to deal with it are must knowledge when they provide technical assistance the communities.

Importance to build self-reliant capacities of the county officers

Unlike the other part of Kenya, there are lots of relief and development assistances, which have different characteristics by nature. And these assistances often use standardised approaches. Officers who handle these assistances effectively and efficiently are the county government officers. Therefore, it is desirable that officers are trained to think by themselves and be able to customize approaches fitted to local conditions rather than just apply standardised approaches.