REPUBLIC OF KENYA
MINISTRY OF DEVOLUTION AND PLANNING

THE PROJECT
FOR
ENHANCING COMMUNITY RESILIENCE AGAINST DROUGHT IN NORTHERN KENYA

FINAL REPORT

VOLUME I: MAIN REPORT

DECEMBER 2015

JAPAN INTERNATIONAL COOPERATION AGENCY
(JICA)

NIPPON KOEI CO., LTD.

KY
JR
15-001

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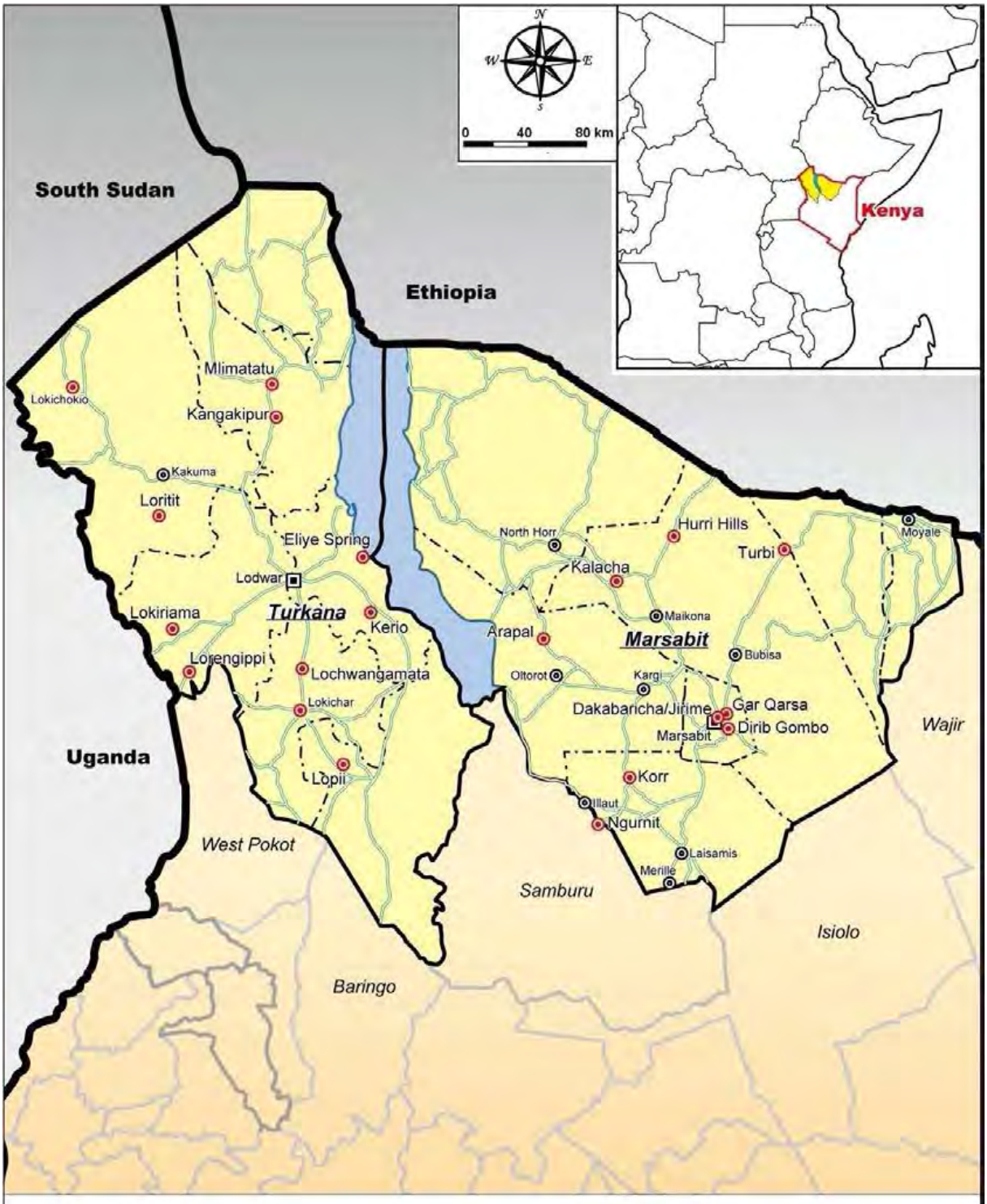
Currency Equivalents (average rate from April to June, 2015)	
US$1.00=	KES95.87
US$1.00=	JPY121.36
KES1=	JPY1.27
Source:	Bank of Tokyo Mitsubishi UFJ for the JPY-US$ rate
	Central Bank of Kenya for the KES-USD$ rate



Legend

- Target Counties
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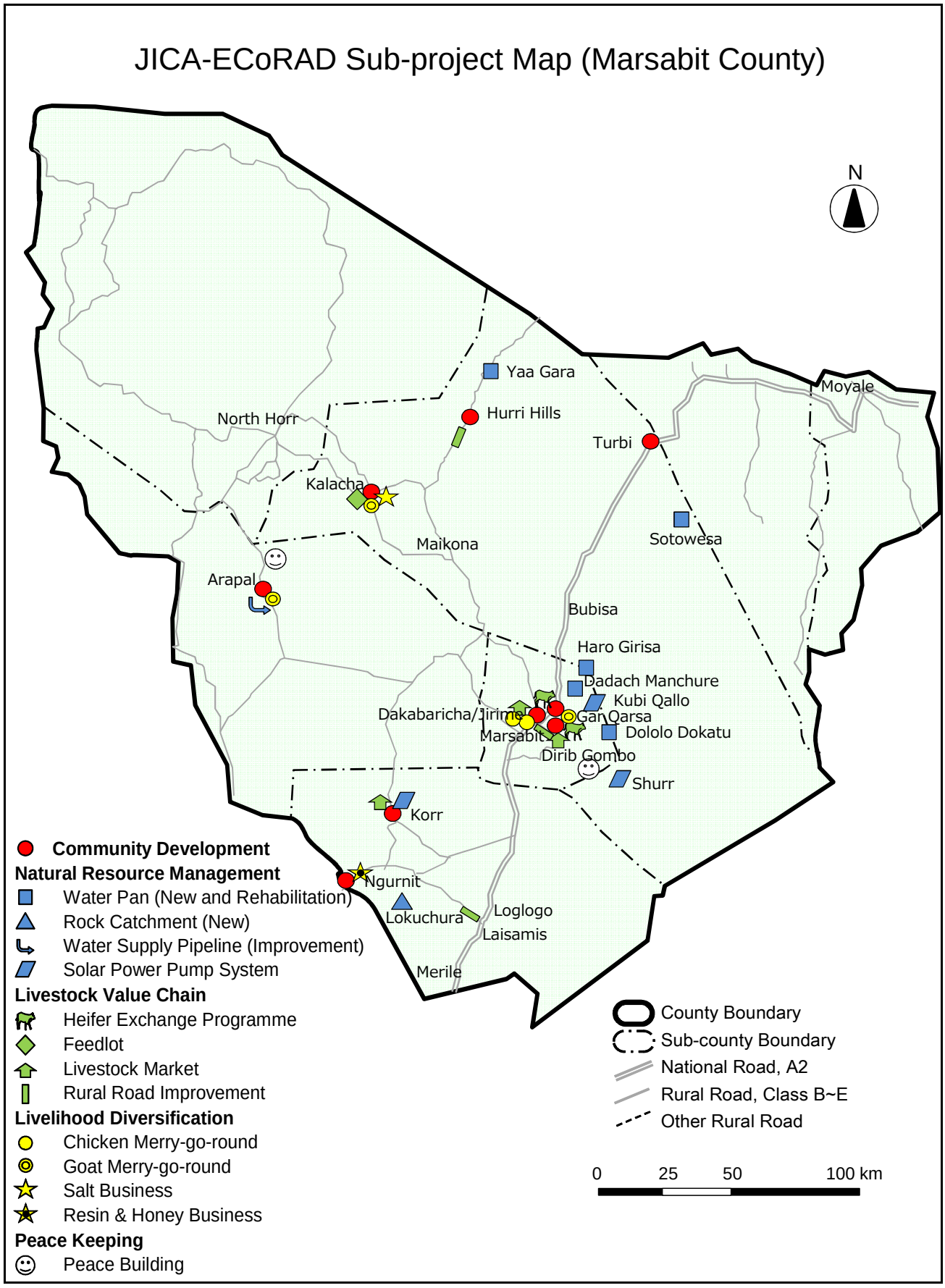
Location Map


JICA-ECoRAD Sub-project Map (Marsabit County)
N
Yaa Gara
Moyale
North Horr
Hurri Hills
Turbi
Kalacha
Sotowesa
Maikona
Arapal
Bubisa
Haro Girisa
Dadach Manchure
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Marsabit
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Korr
Ngurnit
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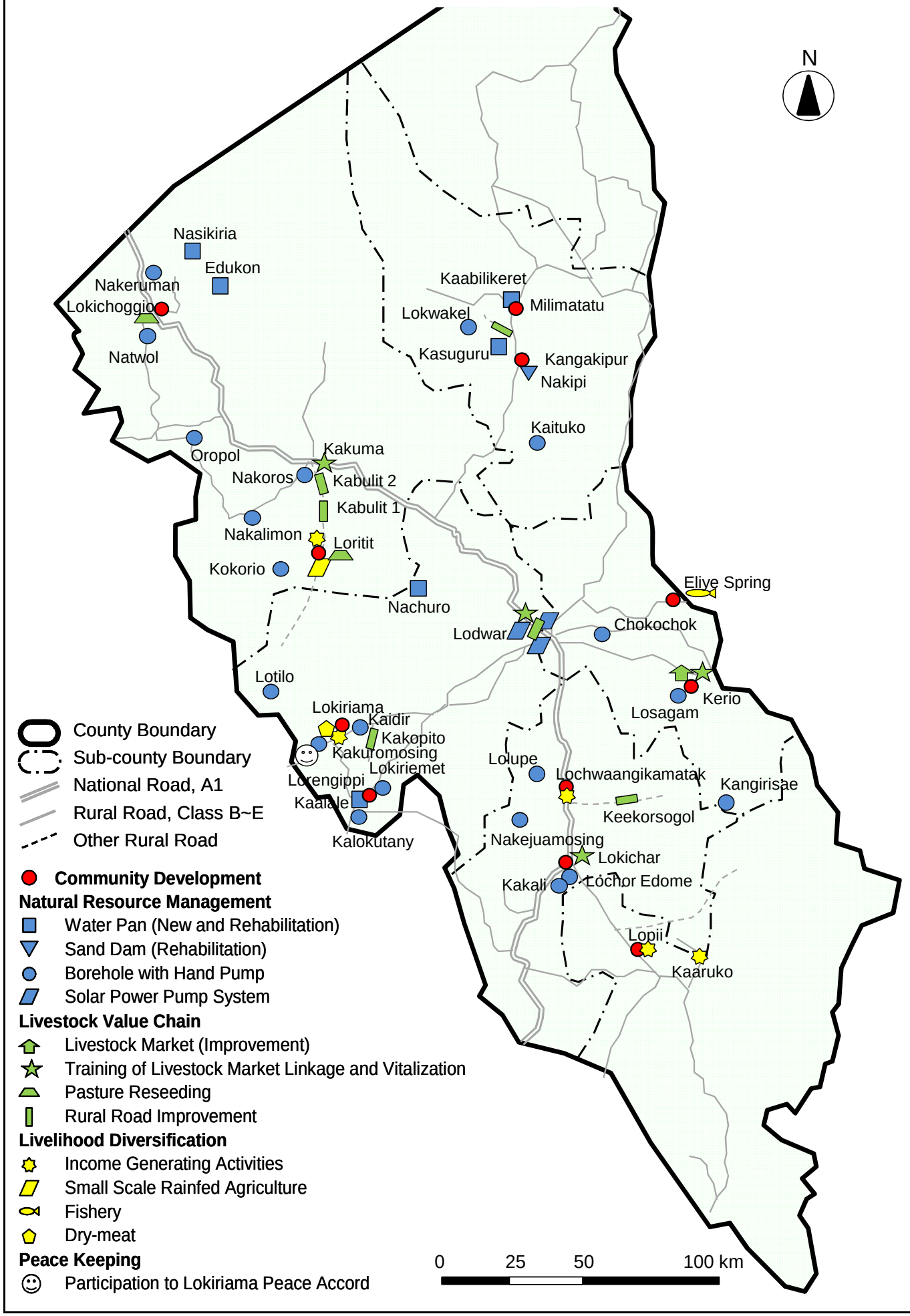
Loglogo
Laisamis
Merile
Community Development
Natural Resource Management
Water Pan (New and Rehabilitation)
Rock Catchment (New)
Water Supply Pipeline (Improvement)
Solar Power Pump System
Livestock Value Chain
Heifer Exchange Programme
Feedlot
Livestock Market
Rural Road Improvement
Livelihood Diversification
Chicken Merry-go-round
Goat Merry-go-round
Salt Business
Resin & Honey Business
Peace Keeping
Peace Building
County Boundary
Sub-county Boundary
National Road, A2
Rural Road, Class B~E
Other Rural Road
0
25
50
100 km

JICA-ECoRAD Sub-project Map (Turkana County)



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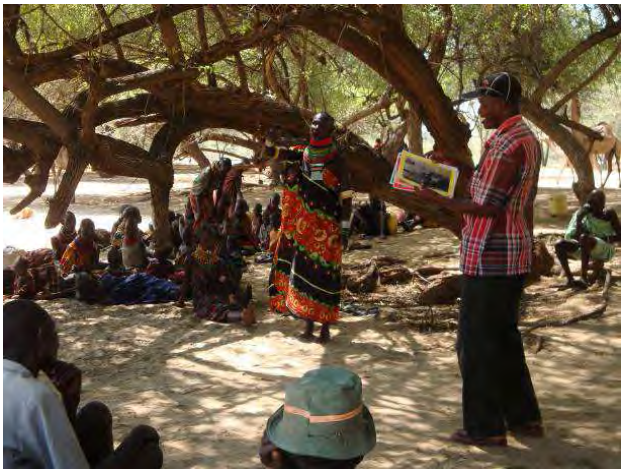
CMDRR Workshop – Milimatatu (Turkana)

CMDRR Workshop –Kerio (Turkana)

Drought Management Committee Training (Turkana)



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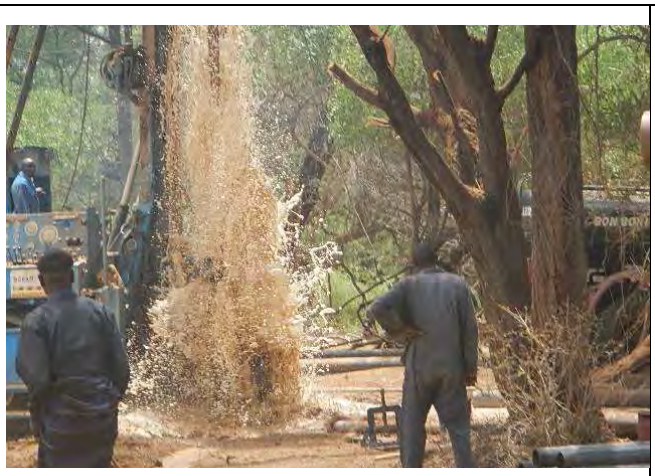

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Dissemination Seminar / Validation Workshop on the Guideline based on ECoRAD's Experiences at the Stage 2 (Nairobi)

EXECUTIVE SUMMARY

1. Introduction

This is the "Final Report" prepared by the Project team in accordance with the Record of Discussion for "the Project for Enhancing Community Resilience against Drought in Northern Kenya (ECoRAD)", defined as the Project, agreed upon between the Ministry of State for Development of Northern Kenya and Other Arid Lands and the Japan International Cooperation Agency (JICA) on January 6, 2012.

Project Purpose and Target group: *The pastoralists' communities' resilience to drought is enhanced in Turkana County and Marsabit Cou*nty. In addition to pure pastoralists, semi-pastoralists who are forced to live in settlement/town areas due to losses from recurrent droughts were also treated as the Project's target groups.

Expected Outputs:

Output-1: Capacity of community based drought management is improved in targeted communities.

Output-2: Sustainable natural resource management is realized in targeted communities.

Output-3: Livestock value chain is improved in targeted communities.

Output-4: Diversification of livelihoods is promoted in targeted communities.

Output-5: Capacity of the government officers to enhance the pastoralists' resilience to drought is improved.

Output-6: The guideline for enhancing the communities' resilience to drought is established.

Project Period:

1) Marsabit implementation period: March 2012 – April 2013,
2) Turkana implementation period: April 2013 – December 2014, and
3) Follow-up and dissemination period: December 2014 –October 2015.

Project Area: The Project target areas were Marsabit County and Turkana County as shown in the Project Location Map.

Selected Pilot Communities and Pilot Sub-projects: The Project team has implemented several sub-projects as pilot trials in the selected 20 communities in Marsabit and Turkana Counties as well as other project activities.

Table Selected Pilot Communities

Marsabit	Korr, Arapal, Ngurnit, Turbi, Kalacha, Hurri Hills, Dirib Gombo, Dakabaricha/Jirime, Gar Qarsa
Turkana	Milimatatu, Kangakipur, Loritit, Lokichoggio, Lokiriama, Lorengippi, Eliye, Kerio, Lochwaangikamatak, Lokichar, Lopii

Source: JICA Project Team

Table List of Sub-projects

Sub-project Name	
Marsabit	Turkana
Natural Resource Management (1) Sub-project of New Construction and Rehabilitation of Water Pan	**Natural Resource Management** (1)Sub-project of New Construction and Rehabilitation of Water Pan
(2) Sub-project of Rehabilitation and up-grading of Arapal Water Pipeline	(2)Sub-Project for Groundwater Development
(3) Sub-project of New Construction of Lokchura Water Rock Catchment	(3)Sub-project of Rehabilitation of Sand Dam

Sub-project Name	
Marsabit	Turkana
(4) Sub-project of Introduction of Solar Power System in Water Pump Facilities	(4)Sub-project of Introduction of Solar Power Pumping System in LOWASCO
Livestock Value Chain Improvement (5) Sub-project of Heifer Exchange Program	**Livestock Value Chain Improvement** (5) Sub-project for Construction, Upgrading and Improvement of Livestock Market Facilities
(6) Sub-project of Kalacha Feedlot	(6) Sub-project of Livestock Market Linkage and Vitalization
(7) Sub-project of New Construction and up-grading of Livestock Markets Facilities and Organization	(7) Sub-project of Pasture Establishment by Reseeding
(8) Sub-project of Rural Road Improvement for Livestock Value Chain	
Livelihood Diversification (9) Sub-project of Chicken Merry-go-round	**Livelihood Diversification** (8) Sub-project of Income Generating Activities
(10) Sub-project of Goat Merry-go-round	(9) Sub-project of Small Scale Rain-fed Agriculture
(11) Sub-project of Resin and Honey Business	(10) Sub-project of Fishery
(12) Sub-project of Salt Business Program	(11) Sub-project of Dry-meat
Peace Building (13) Sub-project for Peace Building	

Source: JICA Project Team

National Policy against Drought in Kenya: "Ending Drought Emergencies in Kenya: Country Programme Paper": The current practical policy paper which is referred to the most by the county level drought coordinators is Ending Drought Emergencies (EDE) in Kenya: Country Programme Paper. This policy stipulates how drought emergencies can be ended by 2022. To operationalise the EDE strategy, the Government is formulating a paper "Ending Drought Emergencies: Common Programme Framework" after a series of discussions between the Government of Kenya and its development partners. It represents the first phase of a ten-year programme to EDE by 2022. This EDE framework has 6 pillars, viz. 1. Peace & security, 2. Climate-proofed infrastructure, 3. Human capital 4. Sustainable livelihoods, 5. Drought risk management and 6. Institutional development & knowledge management.

Progress of Devolution: The new constitution of Kenya was promulgated on 27 August, 2010. Under the previous constitution, public sectors were defined as centralized ones while under the new constitution, they are defined as comprising two levels of government: a national government and 47 county governments Consequently, some national government functions have been devolved to county governments. According to the new constitution, the national government has the mandate for security, foreign affairs, policy and some national infrastructure. On the other hand, county governments are responsible for delivery of all the devolved public services including development activities in their areas of jurisdiction.

2. Natural and Socio Economic Conditions in the TWO counties

Conditions in Marsabit County: It is a vast county covering approximately 12% of Kenya, with variable landscape and climate and a population estimated at 291,166 persons (Kenya Population Census, 2009). It occupies an area of about 70,961 km^2. The Marsabit County constitutes 7 sub-counties of Marsabit Central, Moyale, North Horr, Sololo, Loiyangalani, Marsabit South and Marsabit North.

The County is home to a number of ethnic groups the major ones being Gabra, Rendille, Borana, Samburu, Turkana, Burji, Dasanetch, etc. in the ascending order of numerical intensity. Historically nearly all the ethnic groups depend on pastoralism to a large extent. The Gabra and Rendille communities herd camels as large animal, while the Borana and Samburu largely herd cattle.

The only natural resources found in Marsabit County includes the highland forest found in Marsabit Central sub-county, and extensive pasture spread across all sub-counties. Limited precipitation severely curtails vegetation cover for most of the drier parts of the County. Aridity therefore limits land use for most of the County leading to extensive pastoralism. Critical basic natural resources such as water remain scarce in the County.

Conditions in Turkana County: The County is located in north western Kenya bordering Marsabit County to the east, Samburu County to the south east, and Baringo and West Pokot Counties to the south. It has a total geographical land area of approximately 68,680 km^2.

According to the Kenya Population Census 2009, population in 2009 was 855,399, but this population is project at about 954,133 as at 2012. In terms of composition of ethnic groups, about 99% of the populations are Turkana while the Somali are about 1%. Basically Turkana people tend to keep camel in the central and southern regions, and herd cattle in west and northern areas near the national borders of Uganda and South Sudan.

3. Understanding Drought and Drought Resilience

In terms of the rainfall patterns in Northern Kenya, Marsabit and Turkana have similar conditions. A year is generally divided into four seasons: long rain season from March to May, followed by the long dry season from June to November, then short rain season between mid-November and early January, and finally the short dry season from January to March. In a normal year, the long dry season which lasts for about six months is regarded as the most difficult period.

Recognition of Drought and Preparedness: Drought is identified by the lack of rainfall in a rainy season. For example, the long dry season lasts for six months, if it fails to rain in the following short rainy season, and falls in the following long rainy season, the dry period may extend up to 11 months. This is recognised as a single-year drought. Since rainfall is unpredictable, pastoralists cannot forecast whether a drought will last for a single year or multi-years. In other words, no one can predict a drought, as it comes gradually, but ends abruptly as soon as it rains.

Based on this understanding, the pastoralists always expect the rain but tend not to start preparatory activities for drought, because they do not have to do anything when rain comes. Then, when they recognise that a severe drought has come it becomes too late because the situation has reached a point of no return. This is the pastoralists' perception of preparedness, making resilience building difficult.

Movement for Daily Grazing: Livestock herds basically migrate between a home village and grazing areas in a year. In a dry season grazing area, the herds move daily between a water source and rich pasture areas within interval days of watering. An example of movement in dry season grazing area and acceptable interval days of watering livestock is shown below:

Table Interval of Watering and grazing distance of Livestock in Northern Kenya

	Wet Season	Dry Season	Distance[3)]
Cattle	3-4 days	2-3 days	10 km/day
Camel	No drink[1)]	12-14 days[2)]	20 km/day
Sheep & Goat	No drink[1)]	3-4 days	7 km/day

Note 1):There is moisture in fresh grass in wet season, which is enough for camel and shoats.
Note 2): This is for Rendille Camel. In case of Somalia Camel, it is only 5-6 days under the Northern Kenya climate.
Note 3): Under normal conditions (with grazing) of stress level in dry season.
Source: JICA Project Team based on the results of interviews with pastoralists

Migratory Pattern in Drought: Herds usually stay near their village during the rainy season. When the rainy season is over, and the dry season comes, herds start to move to the dry season grazing area (hereinafter referred to as 'dry season GA') where pastures and water are available even in the dry season. If pasture or water is exhausted in the first dry season GA, they move to the next dry season GA. More specifically, if herds cannot find a pasture within the range of ten(10) to twenty(20) km radius from the water source (limitation of daily movement), they will start to migrate to another dry season grazing area. When rainfall comes, and the dry season is over, herds go back to their home

village, and stay there for the whole of the rainy season.

In a normal year, herds go back to the home village before their dry season grazing areas are exhausted in a dry season. However If herders do not receive rain at the end of the dry season, this means that it is the start of the drought. The herders then have to move to the next dry season GA. Herds move to another dry season GA as long as they have their next place to go. However, if they do not have their next place to go, due to physical limitation or territorial limitation which causes a conflict with adjacent ethnic group, the livestock start to die. This is livestock's death in a typical drought case.

Approach and Intervention to enhance drought resilience: The approaches and interventions to improve drought resilience proposed in the Project were four; namely 1) improving the situation of normal time (base-up); 2) minimising the impact of drought (mitigation); 3) increasing the capacity of recovering (bounce back/ quick recovery) and; 4) further development to self-sustainable society (transformation). For better understanding, please refer to Section A3.2.1 in the Main Report.

The base-up approach means improving living conditions during the normal period so that the situation would not deteriorate to a critical level during drought. Through base-up activities, increased stock of wealth and property are used during drought.

The mitigation approach: Even if the state of living is the same during normal period, taking certain measures can minimise the impact of drought not to reach the critical level of damage. Though the mitigation measures will take effect when the drought starts, they should already have been taken during the normal period. It would be too late to take action once drought starts.

The bounce back/quick recovery approach enhances the capacity of people to recover from the drought's damage to the pre-drought state. Some measures can help recover faster after the drought.

The transformation approach: The rebuilding of their living is not just to recover to the pre-drought level, but also for them to develop further. To do so, a possible intervention is to build the capacity of community members to think how they can develop their community better than before in all aspects including natural resource management, livestock value chain, and livelihood diversification. This may include social structural change, not only individual change.

4. Project Activities

4.1 Selection of Pilot Communities and Pilot Sub-projects

Selection of the 20 Pilot Communities: In the Project, the 20 pilot communities, as described above, were selected based on the following rules and allocation procedures shown in the following table.

Table Selection Rules and Allocation of 20 Pilot Communities

	Marsabit County	Turkana County
(1) Unit of community*	Location basis	Sub-location Basis
(2) Based on Security condition and reachable distance	7 districts --> 4 districts (Marsabit Central, Marsabit North, Laisamis, Loyangarani)	6 sub-counties --> 6 sub-counties
(3) Based on a policy of Equal Distribution to ethnic groups or sub-counties	Rendille area = 3 communities Gabora area = 3 communities Borana area = 3 communities	Turkana North = 2 communities Turkana West = 2 communities Turkana Central = 2 communities Loima = 2 communities Turkana South = 2 communities Turkana East = 1 communities
(4) Based on road access and on aspect of three(3) technical areas, such as natural resource management, livestock value chain and livelihood diversification (Details should be referred to Annex A4)		

* Details should be referred to in Section 4.2 in this report and Annex B

Source: JICA Project Team

Selection of Sub-project: In total, the 24 sub-projects mentioned in the previous section were selected based on the community action plans (CAPs) which were formulated by communities in CMDRR workshops at proposed project sites.

4.2 Outline of CMDRR Approach

CMDRR Approach refers to a process in which a community is actively engaged in identifying, analysing, and evaluating disaster risks, with the aim of reducing people's vulnerability and enhancing their capacities. In a CMDRR process, communities are facilitated and assisted to carry out disaster risk assessment, draw a disaster risk reduction strategy, and prepare a Disaster Risk Reduction (DRR) Community Action Plan (CAP), followed by implementation of the plan by a Drought Management Committee (DMC) to be established in a community. In the context of disaster management, the CMDRR framework is regarded as offering new thinking (paradigm) since it aims at building resilient communities not only in terms of physical assets or secured livelihoods but also in terms of the capacity and mentality of the communities.

Objectives in application of CMDRR Approach in the Project

- Empowerment of the communities to take own initiatives to reduce the risks associated with hazards and disasters by extension, rather than relying on relief aid,
- Evolving the communities as partners by shifting from emergency response to a more proactive systematic approach of preventing, mitigating and preparing for drought, and
- The process to be embedded in the community by being merged with the traditional customs.

Disaster Risk Reduction Assessment and Community Action Plans: CMDRR workshops have been implemented in the selected 20 communities. DRR assessments were executed and CAPs were prepared in each community through the workshops by the participants comprising of community elders, administrative chiefs / assistant chiefs, women group leaders, youth group leaders and so on. In Turkana, based on the experience from Marsabit, CAPs were prepared for two different purposes, such as (i) a plan with external financial support, and (ii) a plan without external financial support (with their own resources). The following are the points raised through DRR assessment of the two counties.

Table Summary of the Results of DRR Assessment in Marsabit and Turkana

Marsabit County	Turkana County
- All the nine communities selected "drought" as the 1st priority hazard. And all the communities selected "tribal conflict" as the 2nd priority. - Most of the communities raised the necessity of water source development. - Significance of conservation of environment was pointed out.	- 10 communities, except Lopii, selected "drought" as the 1st priority hazard to be considered and that mostly affects village life. The Lopii community selected "insecurity" as their 1st priority hazard. - "Human diseases", "livestock diseases", and "conflict/insecurity" were selected as 2nd priorities.

Source: JICA Project Team

Proposed Roles and Functions of the DMC in the Project: In consideration of the abovementioned objective, the committee is expected to primarily serve as a kind of secretariat / umbrella committee in a community to deal with all the drought related issues. The committee shall collaborate with other existing committees and groups in implementation of each particular activity such as the water management committee for water resource development.

Formation of DMC was done by the sub-contracted NGOs both in Marsabit and Turkana. They first approached the chiefs, then requested to hold public *barazas* (meeting), and decided on the members of DMC in the public *barazas* with the consent of the attendants. The unit of 'community' for Marsabit is the Location, and that for Turkana is Sub-location, reflecting lessons learnt from the activities in Marsabit as Location seems larger than the size of an appropriate community.

Taking into account that actual existence and functionality of the existing committees differ in different areas, new committees were formed in the area where there were no existing committees while existing committees were revived.

DMC Training and Post Training Activities: Trainings to encourage implementation of activities by the DMCs were conducted through the following steps.

Steps of activity development and Training programmes

Step 1. Training on basic functions of DMC & Activities based on Early Warning System (EWS)

Session 1. Early Warning System and roles of DMC (Component 1)

- Early Warning System
- Roles and action to be taken based on the warnings by the EWS
- Roles of the DMC in the normal situation

Session 2. Technical trainings on actions to be taken for

- Mitigation of the drought situation with initiative of the DMC based on the warnings of the EWS (Component 2), and
- Community's collective action to enhance preparedness (Component 3)

Step 2. Raising awareness of the community on the EWS and actions to be taken (Component 2), and Trial of the Community's collective action to enhance preparedness (Component 3)

Step 3. Technical trainings on the actions to be taken by individuals/groups (targeting community groups involving the DMC members) during the normal situation or less severe situation (Component 4)

Step 4. Dissemination and training on individual based activity (Component 4)

4.3 Sub-projects of Three Major Components

As a result of the selection process as shown earlier, the following sub-projects in this program were selected and implemented. These are summarized in the table below and the detailed information is shown in Table B4.3.1, B4.4.1, and B4.5.1 of Main Report.

Natural Resource Management:

Table Summary of Sub-projects for NRM

Sub-Project	Marsabit	Turkana	Activities implemented	
			Facility improvement	O&M activities
Borehole construction	-	20	Ground water potential survey Drilling and well development Hand pump installation with animal trough construction	Support in registering under the existing O&M scheme of Diocese of Lodwar with community contribution Training on maintenance of hand pump and mitigation of negative impacts
Water pan construction	3	2	Construction of new water pan and related facilities, such as intake, inlet channel, silt trap, spillway etc.	Formation of WUA Training for de-silting and maintenance of the facility Training of O&M, organizational development, and rangeland management Monitoring of operation and maintenance work
Water pan rehabilitation	2	4	De-silting and shaping. Construction of additional pan (Cascade system) and other related facilities	
Sand dam rehabilitation	-	1	Rehabilitation of damaged portion and improvement of existing sand dam and related facilities	Improvement of operation and maintenance system through training program to the community

Rock catchment construction	1	-	Construction of a rock catchment with related facilities and underground reservoir with roof, hand pump, spillway and drain	Strengthening WUA through training and actual operation
Water pipeline rehabilitation	1	-	Laying additional pipes, and construction of related facilities such as water storage tank, trough etc to improve water availability	Strengthening WUA through trainings, introduction of maintenance fund and training of local plumbers on minor repairs
Solar power system for borehole	3	3	Installation of solar power generation system Rehabilitation of pump system	Strengthening WUA/LOWASCO through trainings and actual operation to establish adequate fee collection and financial management of maintenance fund

Source: JICA Project Team

Livestock Value Chain Improvement:

Table Summary of the Sub-projects for Livestock Value Chain

Sub-projects	Facility / Capacity Development
(a) Marsabit County	
Sub-project of Heifer Exchange Program	- Initial investment of purchasing heifer - Trainings on traders, LMA, and DMC
Sub-project of Kalacha Feedlot	- New construction of feedlot, and irrigation pipeline - Trainings on committee members, and technical training of plumber for O & M works
Sub-project of New Construction and up-grading of Livestock Markets Facilities and Organization	- Dirib Gombo livestock market (new) - Jirime and Korr livestock market (up-grade)
Sub-project of Rural Road Improvement for Livestock Value Chain	Road pavement improvement with gravels and concrete surface lining
(b) Turkana County)	
Sub-project for Construction, Upgrading and Improvement of Livestock Market Facilities	- Improvement of Keiro livestock market. - Improvement of road access with drifts at *laggas*
Sub-project of Livestock Market Linkage and Vitalization	- Trainings on LMA officials for livestock information system. - Training on Kerio market members
Sub-project of Pasture Establishment by Reseeding	- Technical training for establishment of reseeding farm Exposure tours to an existing farm - Arrangement of seed provision between the ministry of livestock and community

Source: JICA Project Team

Livelihood Diversification:

Table Summary of Sub projects for Livelihood Diversification

Sub Project Sites		Contents of Sub Project	No. of Groups	Activities
Marsabit	North: Kalacha	Salt Business	1	Entrepreneurship/VICOBA training and mentoring activities
		Goat Merry-Go-Round	4	Provision of goat, goat technical/VICOBA training and mentoring activities
	Central: Dakabaricha/ Jirime	Chicken Merry-Go-Round	8	Provision of chicken and poultry houses (only representative), chicken technical /VICOBA training, and mentoring activities

	Central: Gar Qarsa	Goat Merry-Go-Round	9	The same as above
	South: Arapal	Goat Merry-Go-Round	2	The same as above
	South: Ngurnit	Resin Honey Business	3	Entrepreneurship/VICOBA training and mentoring activities (improved containers, exposure tour)
Turkana	West: Loritit	IGA <Livestock trade>	1	Entrepreneurship training, and mentoring activities
		Small scale rain-fed agriculture	1	Agriculture technical training, experimental plot, and mentoring activities
	Loima: Lokiriama	IGA <Livestock Trade&Retail Shop>	2	*Livestock trade*: the same as above *Retail shop*: entrepreneurship training and mentoring activities
		Dry meat	1	Dry meat technical training
	Central: Eliye	Fishery	2	Fishery technical training, entrepreneurship training and mentoring activities including exposure tour
	South: Lochwaangikamatak	IGA <Livestock Trade&Rtail Shop>	2	The same as above
	East: Lopii (Lopii center& Kaaruko)	IGA <Retail Shop>	2	The same as above

Note: mentoring activities include ad hoc additional training, exchange visit and study (exposure) tour.

Source: JICA Project Team

4.4 Turkana Water Potential Study

A study on the potential of water resources was carried out to provide primary suggestions for strategic water development planning in Turkana. The study includes preparation of water potential maps for ground water development and surface water development. The following table summarises the study contents.

Table Summary of the Turkana Water Potential Study

Groundwater Potential Study	Hydrological Environment Water Quality of Groundwater Recharge Mechanism and Aquifer System Regional Groundwater Flow and Sustainable Yield Natural Resource Development Belts and Proposed 50 Borehole Sites
Surface Water potential study	Water Pan Potential in Priority Grazing Area Proposed are for Developing Water Pan in Lotikipi Plain

Source: JICA Project Team

4.5 Peace Building

Sustainable natural resource management and drought resilience in Northern Kenya are closely related with peace building, where conflicts between different ethnic groups occur when resources are scare especially during drought. Peace building programmes were conducted to mitigate conflict that can contribute to enhancing drought resilience through amicable use of resources. In particular, the peace building programme regarding Dololo Dokatu water pan was taken up due to the conflict raised between Borana and Gabra communities appealing ownership of the rangeland surrounding the water pan.

The programmes conducted through the Project are summarised below and shown in Table B4.6.1 of Main Report.

Table Summary of Peace Building Programmes in Marsabit

Area	Programme/activities
Dirib/Jaldesa, Shurr and Songa communities	1) Joint public Baraza, 2) Training of Kenya Police Reservists (KPR), Training of Peace committee, natural leaders, chiefs and women opinion leaders 3) Intercommunity meeting 4) Intra community dialogue 5) Peace Marathon 6) Monitoring
Arapal and Gas area (Gabra, Rendille and Samburu communities)	1) Baseline survey 2) Inter community Children Peace Camps and Friendship for Peace twinning of Children (2 times) 3) Inter-Community Holiday Exchange Peace Program (2 times) 4) Formation of Peace Club 5) Inter-community Children and Parents twinning (3 times) 6) Training of Trainers for Peace Educators (1 time) 7) Post Project Survey

Source: JICA Project Team

In Turkana County, the Project supported Lokiriama Peace Accord Commemoration in Karamoja Cluster (participants from Kenya, Uganda, Ethiopia and South Sudan) as a part of the International Day in partnership with NDMA, USAID, and other agencies.

4.6 Capacity Development of Government Officers to Enhance Pastoralists Resilience to Drought

Outline of Capacity Development: Capacity development on government officers to enhance pastoralists' resilience is one of the major pillars in the ECoRAD project. In the ECoRAD Project, this capacity development was implemented at the following two stages.

- Stage-1 (February 2012 – February 2015)
  In Stage-1, capacity development was mainly performed through an on-the- job basis in the course of pilot projects implementation. In addition to such training approach, several development trainings were made at ad-hoc basis in seminars and workshops.

- Stage-2 (February 2015 – October 2015)
  In order to improve government officers' capacity for drought response and management, in particular, in terms of community based drought risk management, a specific capacity development training plan was formulated and implemented in the ECoRAD project.

Table Capacity Development (Stage 2) in Nairobi, Marsabit and Turkana

	Stage 2-1	Stage 2-2
Title	Title: Training Workshop on Community Based Drought Management to County Government Staff	Dissemination Seminar / Validation Workshop on the Guideline based on ECoRAD's Experiences
Objectives	To provide basic knowledge of CMDRR or other participatory community planning methods to county governmental officers, in particular newly recruited officer, for their future works in community. And also it was aimed to provide applicable and useful new technology in Northern Kenya, such as solar power system.	- To disseminate accumulated lessons learnt in the Project to all the stakeholders of drought resilience workers in Northern Kenya - To verify contents of the guideline of ECoRAD in light to participants' understanding and experiences
Date	Turkana in February 2015, and Marsabit in April 2015	Marsabit, Turkana, and Nairobi in the late July to the early August 2015

Source: JICA Project Team

5 Results, Lessons Learnt and Recommendations

5.1 About Community

The first important lesson that has to be shared is proper understanding of 'Community' in Northern Kenya. Detailed findings are shown in the guideline, and the main ones are summarised below.

Distinctive ideas and attitudes of pastoral communities in Northern Kenya:

The specific context of Northern Kenya has been influencing their culture and society. It is important to recognise the following five points:

- What is important for the pastoralist is what actually happens rather than unpredictable inconceivable issues;
- They have strong identity with clans while they live independently;
- Traditional leadership is not always the same as the expected leaders in development activities depending upon what kind of role and functions are given;
- The perspective and understanding of the pastoralist people in Northern Kenya is different from what people from outside expect; and
- In the drought that affected Northern Kenya, people have been living together with external support and have developed their ways of utilising it for their survival.

Considering the above, therefore, it is necessary to understand the characteristics of the target community correctly prior to making a plan for community resilience.

Different features and customs of different tribal communities:

Tribal customs and social structures also affect how the community adopts functions of resilience. Where there is a traditional, social and governing system, the newly introduced system can work when the two do not conflict with one another and could be easily accepted if it is merged with the traditional system. It is therefore important to understand the community system. For reference, the characteristics of the four major tribes in Marsabit and Turkana are shown.

Table Characteristics of Major Four Tribal Communities in Marsabit and Turkana

Borana Community ● Strong 'Gadha system' = identity of Borana people. ● Aba herega functions as a part of their governing system. ● Gadha system,is relatively well merged/incorporated with the modern administrative system. ● Cattle holding community = semi-settled in highland	Turkana Community ● Council of elders as a decision making body. ● No strong governing system and people are more autonomous. ● Administrative system has been relatively merged with traditional system. Administrative system often prevails over the traditional.
Gabra Community ● A strong traditional governing system called 'Yaa' in each clan where elders of households form a council of elders known as 'Dabela'. ● A cohesion system of loaning camel called 'Maal system'	Rendille Community ● Camel holding = highly mobile. ● Strong clan identity (Yaa system) but no authority existing in larger community ● Things are decided through discussion of elders. ● The traditional prevail over the government administrative system.

Source: JICA Project Team

5.2 Drought Management Committee and CMDRR Approach

The crucial issue learnt from the former projects on CMDRR and DMC was from the sustainability of the committees. In order to overcome this difficulty, the Project has taken approaches to develop self reliance of the committee. The fundamental approach taken through the Project was encouraging the committees to start their own activities without substantial material and financial support.

Results:

- An evaluation study was conducted in Turkana at the end of the project interventions to assess contribution of DMC functions to enhancing community resilience, as well as to analyze critical factors that influence on the level of success of the DMC in community resilience. The quantitative results of the endline study indicate that DMCs have been well recognized by the community with a certain level of understanding on their roles. Disparities were observed mainly due to existence of physical activities or projects in the area. Where there are visible projects such as water resource development or other infrastructure improvement, people have recognised the role of the DMC/CDC supervising the Project implementation.
- Through the analysis of the DMC functions, it was found that four factors; (1) leadership in the community, (2) structure of the community, (3) influence of external support and (4) level of development of the area have significant influence on the activeness of the DMCs as well as communal activities in the community. The following shows the results of analysis of the contributing factors on DMC functions.

Table Analysis of contributing factors on DMC functions in Turkana

	Lokichoggio	Loritit	Milimatatu	Kangakipur	Lokiriama	Lorengippi	Eliye	Kerio	Lochwaa	Lokichar
leadership	High	Mid	Low	High	Mid	Low	Low	High	Low	Low
Community structure	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Low	Low
External influence	Large / Neutral	Middle / Neutral	Middle / Negative	Small / Neutral	Small / Neutral	Small / Negative	Small	Small	Large / Negative	Large / Neutral
Level of development	High	Low	Low	Low	Low	Low	Mid	Mid	Mid	high
Judgement from the above factors	Mid	Mid	Low	High	Mid	Low	Mid	High	Low	Low
Observed activeness	Mid	Mid	Low	High	Mid	Low	Mid	High	Low	Low

Source: JICA Project Team

Lessons Learnt and Recommendation:

(1) Customised Approach: CMDRR approach has been developed and mostly implemented in foreign countries. It was found that application of an externally developed approach should be carefully customised when it is introduced in the context of northern Kenya where there are several crucial differences from the area where the approach was developed. The Project identified significant characteristics in different level of the society; distinctive features of pastoral society in comparison with agricultural society, specific context of Northern Kenya, characteristics of different ethnic groups in Northern Kenya, and abovementioned contributing factors. Those characteristics and features should be carefully analysed and approaches should be customized according to the context. Recommendations on dealing with each of these factors are described in the Guidelines.

(2) Stepwise Approach: Due to the culture of relying on others for decades, it is not feasible to change people's attitudes in a few years of the Project. It was found that interventions to bring a radical change of the community can even cause negative impacts. For example, the introduction of a complicated financial management system to communal savings to prepare for drought in a place where people are not ready to manage distorts the traditional community and causes exploitation

among the community. If the gap between the current situation and the intended one is significant, a stepwise approach should be taken. The stepwise approach is recommended to be applied to develop a self resilient society particularly for a community with low capacity.

(3) Modification of CMDRR Approach: Although CMDRR approach is a well-developed and widely used approach, it emerged that its elaboration and modification is still inevitable especially when it is applied in a different context from the one in which it was developed.

- DMC: The DMC, which is supposed to be formed in a "community", should be an umbrella committee to oversee development issues and act as a practical secretariat to chiefs and elders. A coverage "community" for DMC is recommended to be a small government unit, i.e., sub-location under the central government system at the moment, in consideration of the importance of being accommodated within government system for sustainability. The important considerations here are that the functions of the DMCs and how these functions can be harmonised and positioned with the traditional social structures and government structure.

- CAP institutionalisation: Recognising that CAPs are still useful for planning activities for governmental or external agencies reflecting community needs and avoiding duplication, the CAP preparation process is recommended to be a regular process, preferably integrated into the county government planning process. As was agreed in the seminar on enhancing drought resilience in Northern Kenya with a large number of stakeholders, actions for integration of the Community Action Plan (CAP) into the County Integrated Development Plan (CIDP) should be taken. The CAPs can be used as an input for formulating and updating the County Integrated Development Plan. The CMDRR approach should be officially adopted in the county development planning, especially the process after CAPs are formulated.

5.3 Natural Resource Management

Results:

(1) Establishment of Boreholes (permanent water source): As a physical impact, the total beneficiaries of the 20 boreholes established in Turkana range from 1,000 to 1,500 households and from 89,000 to 137,000 livestock, even though the estimates of the households and livestock were drawn from oral interviews in the community and not quite accurate due to varying understanding on counting. Boreholes are expected to more useful during drought periods, as most of them were established strategically in the dry season grazing areas.

Regarding the Operetion &Maintenance of these boreholes, 16 out of 19 that require maintenance of pumps have been registered under the O&M scheme of the Diocese of Lodwar by contributing the registration fee for two years. Some boreholes have received maintenance and repair from the scheme after minor problems were observed. The approach of registering to the available O&M scheme seems to be a feasible and practical way of maintenance.

(2) Water pans and sand dam for rangeland management: All the water pans constructed through the Project, except Sotowesa water pan that had not received enough rainfall, are operational as intended. Each large water pan serves roughly from 7,000~10,000 livestock and about 3,500 for the smaller ones. The water pans constructed in the pasture-rich areas have made the unused pasture available for grazing during dry season. Other pans constructed relatively near the settlement areas have been used at the beginning of the dry season before livestock move to the grazing areas with permanent water sources. This situation is expected to contribute to preserving pasture around permanent water sources for severe dry seasons.

(3) Rock Catchment: It is estimated that once the new rock catchment is filled up with water, it can serve 120 households for about 208 days based on the rule of the WUA of Lokichura that limit the amount of water to be fetched to 30 litres per household per day although there are other factors influencing such as evaporation and seepage into the rocks. It is difficult to judge the actual amount as the rock catchment has not been filled up after completion of the work. The community indicated that if the rock catchment is filled up and holds water, they can have water available near their households

for a longer period. This can, especially for women, reduce distance to search for water, which contribute to save time for women so that they can spend more time for other activities.

(4) Turkana Water Potential Study: Turkana Groundwater Development Potential (TGDP) Map was prepared and shared with the relevant stakeholders under control of the counterpart agency. The TCDP map includes the potential level by colour on SRTM topographic image, major fractures and fault lines, existing boreholes location with water quality, simulated groundwater head contours, and proposed drilling sites. It indicates selection of the site, recommended depth of drilling and water quality. Therefore, TGDP Map can be used for identifying an area to drill for hand pump before the field survey is done.

The following are the major findings of the study on the Turkana ground water potential.

- The current water volume utilised through boreholes is only 12% of the sustainable yield in the whole of Turkana County
- However, the water availability is unevenly distributed in the county. Some water sheds are using more than 30% of sustainable yield.
- Even though ground water potential is still high in Turkana, not all water is suitable for human or livestock. The recommended drilling depth for hand pump is 100m in terms of water quality

Lessons Learnt and Recommendation:

(1) Strategic Provision of Water Points: Establishment of a dry season grazing area is key to drought resilience in terms of natural resource management. If the livestock herds have enough span on the chains of the dry season grazing areas, they would not be prone to much loss in case of droughts.

Issues to be considered in establishment of strategic water points are as follows. Firstly, the migratory routes should be carefully examined in consideration of variation and flexibility of pastoralists' movement as migratory routes vary depending on rainfall distribution for the year and differ between ethnic groups.

Secondly, potential rangeland should be evaluated in terms of type of vegetation, amount of grass, and expectation of stable rainfall in the wet season. The first option can be the rangelands that have not yet been fully utilised due to scarcity of water sources. Another option is a rich rangeland even in dry seasons near a settlement area, which have been utilised as the wet season grazing area.

Furthermore, territorial relations between bordering ethnic groups should be considered. Each ethnic group has a boundary of their migratory routes in relations with other ethnic groups. Invasion into the territorial areas of other ethnic groups can cause conflict.

(2) Improved Structure of Rock Catchment: A new design of rock catchment facility was introduced in the Project. With the new design, an underground excavated reservoir was constructed instead of a tank on ground level, in order to increase the storage capacity of a reservoir tank and to minimise the construction cost. This design has advantages in (1) lower construction cost by more than 30%, (2) larger capacity of reservoir (from 7 to 15 times more than normal design, and effective collection of rain water. Nonetheless, there are possibilities of leakage. It is recommended that, if the budget allows, a concrete side wall be used in order to minimise leakage from the reservoir. An impervious paint-coating on the rock surface is also recommended.

(3) Solar power generation system as alternative power for water pumping: The utilisation of solar power is one of the effective and recommended resources in Northern Kenya, in consideration of (i) economical aspect in overall life span, (ii) ecological aspect, and (iii) operation and maintenance aspect.

A comparison was made between the calculated expenses of a diesel generator power system and that of a solar power system at Shurr borehole pump system in which the Project actually installed a solar power system. According to the comparison, the overall expense of the diesel generator system was 3.8 times more than that of solar power system.

(4) Proposed Borehole Development Sites: Based on the concept of strategic natural resource management with collected data from the Project, the Project designated Natural Resource Development Belts as high prioritised areas to be developed in Turkana. Using the priority areas, the Project identified 50 potential borehole-sites in Turkana through electrical sounding tests. It is strongly recommended that these 50 identified potential borehole sites be developed for adjacent communities use.

(5) O&M System and Customary System: Ability to manage water pans differs among different ethnic groups. Where there have been traditional systems of management, such as *Aba Herega* system in Borana Community, potential of introducing further management system or improvement of the management is easier. However, in the area where herders are merely users of the water source without having a sense of ownership or any idea of management of the common property, introduction of a management system may take much longer. These tendencies are highly related to the characteristics of the target community as well as the prevailing features of the pastoralist society in the context of Northern Kenya. In Borana communities, amalgamation of the newly introduced management system in the traditional system worked relatively well.

(6) Sustainable O&M of the Facilities that Requires External Materials and Skills for Maintenance: Although fee collection is inevitable for sustainable O&M of the facilities that require expenses, feasibility and applicability of appropriate fee collections depends on the situation of the communities. First, it has been found difficult to introduce fee collection where people are used to getting free water, in which the maintenance has been always supported by either donor agencies or government.

Secondly, financial management in the community is extremely difficult especially in a community where majority of the people are illiterate and have no idea of financial management supervision.

5.4 Livestock Value Chain Improvement

Results:

(1) Sub-project of Heifer Exchange Programme (Marsabit): The following assumptions made by the Project prior to the implementation of the sub-project were confirmed.

Assumption-1). If the Project provides pastoralists opportunities to buy young female animal/heifer at the local livestock market, many pastoralists would like to buy them at normal price.

It was confirmed by the fact that the Project brought and sold out 401 shoats, 308 cattle, 47 camels, and 88 donkeys to pastoralists at Dirib Gombo and Jirime livestock markets.

Assumption-2) When pastoralists want to purchase the young female animal/heifer offered by the Project, they sell their old animal to obtain cash at the local market.

This assumption was also confirmed, through interview surveys, by the fact that approximately 50-95 percent of the pastoralists had sold their own animal to obtain cash to buy young female animal/heifer at local livestock market.

Finally, due to the programme, it was confirmed that drought resilience could be improved, because the exchanged young female animals have the following advantages in comparison with old / aged animals in terms of drought resilience:

- High productivity: According to the sample follow-up survey, the reproduction rate of young goats which were sold under the programme was 55% in 1 year. In contrast, old/aged animals have no contribution in reproduction.
- Mortality rate in drought: According to the interview survey, most of pastoralists answered that young female animal were more resistant against droughts in comparison with old/aged animals.

(2) Sub-project of Kalacha Feedlot (Marsabit): The following points were observed through implementation of the sub-project:

- Vegetation in the feedlot farm was significantly recovered with irrigation water, if water supply was sufficient under appropriate operation and maintenance.
- Fattening activity with irrigated fodder was confirmed to be profitable in two trials of fattening practices, as shown in the following table.

Table Results of the Trials

	1st Trial	2nd Trial
Number of goats	20 goats	20 goats
Fattening period	6 weeks	3 weeks
Average Weight Gain in the period	3.1kg	6.1 kg
Average Profit per Stock	Ksh. 725/goat	Ksh 210/goat
Total Profit	**Ksh.14,500 (Ksh. 2,417/week)**	**Ksh 4,200 (Ksh.1,400/week)**

Source: JICA Project Team

(3) Sub-project for pasture Establishment by Reseeding (Turkana):

The following impacts were observed in the reseeding farm activity in the sub-project:

- Due to two (2) exposure tours, community members in Lokichoggio and Loritit were very encouraged. Then construction work of a reseeding farm in each community was conducted with many participants, e.g. more than 100 people participated in Lokichoggio. In case of introduction of reseeding farm activity, it was confirmed that an exposure tour was one of the good methods of encouraging people.
- There was a challenge in protection of the vegetation in the reseeding farm continuously in Lokichoggio and Loritit farms. Most pastoralists had a tendency of bringing and grazing their animals in the reseeding farm. Then, in such a case, a small conflict occurred inevitably between the pastoralists and the reseeding farm group . This was a crucial diverging point which determines whether the reseeding activity was in vain or successful. If a good mediator is able to resolve this issue, the reseeding farm could succeed and be sustained for a long time.

Lessons Learnt and Recommendations:

The following lessons learnt and recommendations emerged.

- The heifer exchange programme is an effective tool for revitalising livestock transactions in local markets among pastoralists. However, sustainability of its operation might have a big challenge. This is because this programme has to deal with a certain amount of fund as a revolving fund, and which may face misappropriation and mismanagement under weak control of a communal committee.
  Under the present condition, it is highly recommended that the heifer exchange programme should be implemented as "an **alternative programme for the long run**" after an emergency restocking programme of livestock in drought. The heifer program can provide a more animals with a relatively smaller investment than what a restocking program needs, and it can restructure the herd composition in Northern Kenya and realise more resilience to drought in the long run.
- Through the experience of Kerio livestock market, it was proved that, if the market itself is operated well, physical improvement of the facility can be a significant assistance for vitalising livestock activities in terms of operation hours of the market, number and type of animal which can be traded in the market, as well as attraction of other new traders/buyers from other areas. On the other hand, a new market establishment can be more difficult to have impact, because it requires more inputs, in terms of financial assistance, time-span of activity, and training. As

mentioned above, the heifer exchange programme can be utilised in such newly established markets as experienced in Dirib Gombo market.

- In Northern Kenya, there are challenges in terms of both human resources and financial capacity that affect the introduction and development of livestock activities on a voluntary basis by the community. Pasture Reseeding can be one of good practices which do not require a big input in monetary and human resources. In an established feedlot young livestock, emaciated livestock, and lactating livestock can survive on the fenced and secured pasture during drought. Establishment and enforcement of strong bylaws by the community for the protection of the reseeding plot is essential for success of the project.
  If strong leadership for enforcement is absent, it is recommended that reseeding activities be introduced on an individual basis. In the Kangakipur reseeding farm case where the reseeding activities were implemented by each individual, there was much willingness and commitment.

5.5 Livelihood Diversification

Results:

(1) Resin and honey business (Marsabit): . Honey business is more active than the resin one. With regard to the honey business, sale of containers, whose procurement was supported by the Project, have almost been completed 99.9% (3,688 bottles), which is a great improvement compared with the previous transaction of coca-cola bottles of about 1,500 bottles per year.

For net profit per member, the previous transaction generated Ksh 4,900 per year on average across all the group members. This more than doubled to Ksh 10,839 annually after the first business cycle.

(2) Salt Business (Marsabit): Since the group started this business in the last dry season (around July/August 2013), almost one and half year had passed and they experienced one business cycle for one year at the end of the monitoring period. During the first cycle, a total of 615 bags were collected while 516 bags were delivered to the identified markets. Of these 405 bags were sold, with gross sales expected to be approximately Ksh.470,000.

The most obvious impact was that the group has seen salt as a source of income. The group is now focusing on exploiting the raw salt as an alternative source of livelihood for its members with the knowledge and skills obtained. The group is also determined to continue with the salt business, even after the sub project is completed, since the members have learnt how to access the market, negotiate the prices and even manage their own funds, indicating that the activity is sustainable.

(3) Dry meat (Turkana): After the training and other activities, the group members have acquired a new technique of preserving dry meat. They had a traditional technique making thick strands of meat which did not last long. The new technique that they learned focuses on long periods of preservation using thin strands of meat leading to faster drying and therefore not getting spoilt quickly. The frequency of drying meat in the past was low because the purpose was mostly for home consumption .The members are ready to adopt the new method as trained, and apply it when drought occurs.

Lessons Learnt and Recommendations:

(1) Socio-economic Condition and Categorisation: Livelihood measures are economic activities that are affected by socioeconomic conditions. It is important to analyse the socioeconomic condition in selecting the livelihood measures. In addition, 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 the socioeconomic conditions and categorisation for better selection of the livelihood measures.

(2) Beneficiary's Capacity and Cultural Role: In designing the contents of livelihood assistance, capacity level and cultural role of beneficiaries are important issues to be analysed. Capable communities can operate more livelihood measures with complicated contents, but less capable ones

can only manage a few measures with simple transactions. The support program should be designed depending on the level of capacity of target communities.

The other point is that peoples culture may affect and determine the livelihood measures to be introduced. For example, chicken has not been considered as an edible animal from conventional pastoralists view. Thus, in remote areas where conventional thinking remains, chicken rearing may not be recommended.

(3) Procedure aiming at capacity development: Capacity building of communities is a must for livelihood diversification because livelihood measures are managed by themselves even after the assistance is over. 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.

The fourth step is particularly important in order to build their capacity through on-the -job training. In this step, mentorship activities are implemented; and some of the effective tools are 1) exchange visits and 2) study (exposure) tours.

(4) Fundraising and livelihood activities in Northern Kenya: A Stage-wise approach is important in terms of fundraising for livelihood measures. At the initial stage, livelihood measures must be planned at a level that the community can handle. At the later stage, gradual increase of the capital can be considered.

As forms of fund raising, "merry-go-round" and VICOBA are good tools for the initial stage. However, it must be noted that VICOBA has disadvantages as listed below:

- This is a loan, therefore low interest rates and short repayment periods are recommended.
- Calculations are complicated and sometimes the community cannot understand.
- VICOBA can be introduced together with some kind of IGA (money alone without an explanation on how it could be used would not work).

5.6 Peace Building

Peace Building Work regarding Dololo Dokatu Water Pan: Peace building programme regarding Dololo Dokatu water pan was taken up due to the conflict raised between Borana and Gabra communities contesting ownership of the rangeland surrounding the water pan. After the completion of the water pan, even though a large number of herders from both communities have used the pan, no conflict has been observed in use of rangeland around the pan. Sharing of resources between these two communities have also been observed in the livestock market in Dirib Gombo, where the same communities brought their livestock for sale.

The lessons learnt are:

- Water source, such as water pans, boreholes, can be a source of conflicts among different ethnic groups, as they influence their use of rangeland. Therefore introduction of water source should be carefully selected upon proper examination of grazing patterns, territorial ownership of surrounding rangeland, and relationship between tribal communities of potential users.
- If necessary, a peace keeping programme should be implemented. Peace building with water source can provide a good opportunity for discussions among hostile ethnic groups in order that they may benefit even where ethnic conflicts have hampered utilisation of such resources for long.
- The relation developed through peace building activities can be established based on their own benefits, especially for water or pasture. It should be noted, however, that changing fundamental perspectives of people takes time. Therefore, peace building approach should be continuously applied.

5.7 Capacity Development

Results in Stage 1- On the Job Basis: In the process of capacity development by on-the-job basis at stage 1, many officers visited the selected pilot communities and worked together with the Project team members. Through this process, it is expected that the officers learned something related to the technical activities, i.e. Community Empowerment, NRM, Livestock Value Chain, and Livelihood Diversification. In addition, those officers had learnt the Project's Motto, i.e. the Project's attitudes for working with community, such as CARP and *Kujitegemea* (self-reliance) spirit. Since these were essential basic matters for workers for community, they are sometimes forgotten due to time and resource constraints in projects. Thus the Project repeatedly emphasised the importance of these values in the course of project implementation.

Results in Stage 2 -Seminars/Workshops: In the capacity development activities in the Project, the following participants attended the seminars and workshops held by the Project.

Table Numbers of Participants in the Seminars/Workshops

Seminars/Workshops	Month / Place	Participants
Stage 2-1) Training Workshop on Community Based Drought Management to County Government Staff	February '15 / Turkana	42 persons
	April '15 / Marsabit	46 persons
Stage 2-2) Dissemination Seminar / Validation Workshop on the Guideline based on ECoRAD's Experiences	July '15 / Marsabit	38 persons
	August '15 / Turkana	78 persons
	August '15 / Nairobi	30 persons

Source: JICA Project Team

Lessons Learnt:

Based on ECoRAD's experiences at the county level, the following four points should be highlighted in terms of sustainable capacity development.

- Necessity to develop capacity of the county government officers
- Necessary fields and subject officers for capacity development
- Importance to build self-reliant capacities of the county officers
- Necessity of Dissemination of Applicable New Technology and Technique

5.8 Resilience Enhancement in Northern Kenya

5.8.1 A Process to Realise the Project Purpose

The project purpose is *"The pastoralists' communities resilience to drought is enhanced in Turkana County and Marsabit County"*. This project purpose was a bit ambitious to realise considering the current Project frame and period; and there are many factors that lead to building resilience of the pastoralist community within the entire two counties, other than the interventions that the Project undertook.

Thus the Project took "a pilot trial method", in which various pilot sub-projects were formulated and implemented to verify their effectiveness as a trial in the Project. Then, verified pilot sub-projects, out of all the implemented sub-projects, are expected to be disseminated to the government offices, other donors and related agencies, of which capacity was built through the Project activities, as recommended projects that can enhance resilience in the counties and when implemented as outlined.

5.8.2 Contribution to Drought Resilience

Contribution to drought resilience through the implementation of the sub projects is expected as the main issue to achieve the project purpose. Especially for the following three technical areas, possible contribution is argued per each element and sub project, referring to the four approaches to enhance drought resilience, as below:

(1) Natural Resource Management

Development of natural resources and their management have been contributing to enhancing drought resilience in the following ways.

Table Contribution of Natural Resource Development to Drought Resilience

Elements	Approach Type*	Contribution to Drought Resilience by the sub-project
Water resource development and Rangeland management	Base-up Mitigation	Development of new water sources has expanded grazing potential of unused rangeland. Since new water sources were located strategically to avail unused pastures during the dry season, potential of the pasture land increased. Improvement of water facilities provided solutions to some difficulties faced before. Improvement of water capacities increases water availability that can result in increasing potential of use of surrounding pasture.
Rangeland management	Mitigation Bounce back/ Quick recovery	
Water resource management	Mitigation	Even though people have not been fully capacitated through the Project, generation of mind of contribution from the community where they had completely depended on external support is a great step towards a resilient community. Improvement of management including rules in water use, fee collection and financial management can also contribute to develop the fundamental capacity of people to manage drought situations.
Improvement of O&M	i) Mitigation ii) Bounce back/ Quick recovery	Improvement in feasibility of maintenance of water facilities either by the community with their own or utilising existing scheme also directly contributes to the drought resilience as it enables the facilities to provide water continuously. Community's maintenance capacity can increase mitigation of drought impact by continuously providing water even during drought.

*: Drought Resilience Improvement Approach described in Section 3.2 of Main Report

Source: JICA Project Team

(2) Livestock Value Chain Improvement

After implementation of the sub-projects, its contribution to drought resilience is expected to be in the following ways.

Table Contribution of Livestock Sub-projects to Drought Resilience

	Approach Type*	Contribution to Drought Resilience by the sub-project
Sub-project of Heifer Exchange Program	i) Base-up ii) & iii) Mitigation	i) Productivity of herd is increased => Number of herd in a family is increased. => If drought hits them, a good number of animals still remain to sustain life. ii) Livestock market is vitalised => Destocking activity prior to drought becomes easier for pastoralists => Destocking is accelerated in advance of drought => Number of dead livestock is reduced during drought. iii) Herd composition of young female animal increased => mortality of livestock in drought is decreased.
Sub-project of Kalacha Feedlot	i) Mitigation ii) Bounce back/ Quick recovery	i) Fodder in feedlot is cultivated => Livestock can consume such fodder during drought spell => Mortality of livestock is decreased in drought spell. ii) Fodder in feedlot is cultivated => Livestock can consume such fodder during dry season => Selling price of livestock after/in dry season increased. => Pastoralists increase cash income and savings => Cash is used for any recovery measures after drought

	Approach Type*	Contribution to Drought Resilience by the sub-project
Sub-project of Livestock Market Linkage and Vitalization	i) Mitigation ii) Bounce back/ Quick recovery	i) Livestock market is vitalised => Destocking activity prior to drought become easier for pastoralists => Destocking is accelerated in advance of drought => Number of dead livestock is reduced during drought. ii) Pastoralists can sell livestock at fair price at market => Pastoralists increase cash income and saving => Cash is used for any recovery measures after drought
Sub-project of Pasture Establishment by Reseeding	i) Mitigation ii) Bounce back/ Quick recovery	i) Fodder in feedlot is cultivated => Livestock can consume such fodder during drought spell => Mortality of livestock is decreased in drought spell. ii) Fodder in feedlot is cultivated => Livestock can consume such fodder during dry season => Selling price of livestock after/in dry season increased. => Pastoralists increase cash income and savings => Cash is used for any recovery measures after drought
Sub-project of New Construction and up-grading of Livestock Markets Facilities and Organization	i) Bounce back/ Quick recovery	i) New livestock market is established near community & the road between main road and community is improved => Transportation expenses decreased => benefits of pastoralists are increased => Pastoralists increase cash income and saving => Cash is used for any recovery measures after drought

*: Drought Resilience Improvement Approach described in Section 3.2 of Main Report

Source: JICA Project Team

(3) Livelihood Diversification

Contribution to resilience enhancement by each livelihood measure assisted by the sub-projects is summarised in the following table based on the discussion above, referring to the approaches of resilience shown in Chapter 3 and 4, though it is different from one group to another even within one sub-project.

Table Summary Contribution of the Sub Projects To Enhance Drought Resilience

	Contents	Contribution to Resilience Enhancement	Appoach of resilience*
Marsabit	Salt Business	Profit from salt sales as a group and distributing profit to individual members, preparedness by increased money and group capacity strengthened, improved access by VICOBA	Base-up, mitigation, bounce back, transformation
	Goat Merry-Go-Round	Women ownership of group goats, resilience by increased goat numbers, ability to restart the same system or do something else which mitigates drought impacts (using Drought Fund), improved access by VICOBA	Base-up, mitigation, bounce back
	Chicken Merry-Go-Round	Individual benefit from eggs and chicken sales of improved breed, preparedness by increased breed and money, ability to restart the same system or do something else which mitigate drought impacts (using Drought Fund) , improved access by VICOBA	Base-up, mitigtion, bounce back
	Resin Honey Business	Individual profit from sales of honey, preparedness by increased money, improved access by VICOBA, group capacity strengthened	Base-up, mitigation, transformation

	Contents	Contribution to Resilience Enhancement	Appoach of resilience*
Turkana	IGA <Livestock Trade & Retail Shop>	Individual business skill development, expectation of business profit and preparedness by increased money	Base-up, mitigation, transformation
	Small scale rain-fed agriculture	Individual farming skill development, expectation of securing food and preparedness by food stock (exchange with goats is also possible)	Base-up, bounce back
	Dry meat	Individual skill development on dry meat processing, expectation of securing food which can be preserved longer, expectation of dry meat business, thereby preparedness by increased money	Mitigation
	Fishery	Expectation of profit of fishery by new fishing area and market improvement, expectation of securing food, preparedness by food stock and increased money	Base-up, mitigation, bounce back

*: Drought Resilience Improvement Approach described in Section 3.2 of Main Report

Source: JICA Project Team

6 Recommendations

6.1 Recommendation through Implementation of the Project

Detailed recommendations are shown in Chapter 5 of Main Report and the Guidelines as a result of the implementation of 24 sub-projects and several studies in Marsabit and Turkana Counties by the Project.

Here, a summary list of the overall recommendations is given below:

- Proper understanding of characteristics of community,
- Importance of stepwise and tailor-made approach,
- Strategic water point development,
- Water resource management by the community for sustainable natural resource,
- Turkana water resource potential study,
- A combination of both engineering and non- engineering assistance in livestock value chain improvement,
- Livelihood diversification,
- Consideration of institutional issues,
- Consideration of progress of the decentralization,
- Gender consideration and generation gap,
- Necessity of Changing Current mindset of the community,
- Different inputs to different needs,
- Consideration on impacts on community, and
- Technical areas which can be focused for further assistance.

For further explanation, articles in Section 6.1 of Main Report should be referred to.

6.2 Other Recommendation

Apart from the above mentioned recommendations, additional advice based on aspects which the ECoRAD project did not cover are mentioned below for further enhancing drought resilience in Northern Kenya. Details of these topics should be referred to in the Main Report.

- Necessity of coordination among stakeholders
- Importance of peace building/conflict resolution
- Formulation of a Master plan
- Capacity development of the county governments
- Necessity of long-tem planning and commitment
- Necessity of infrastructure development
- Necessity of assistance to education and health sectors

FINAL REPORT

THE PROJECT FOR ENHANCING COMMUNITY RESILIENCE AGAINST DROUGHT IN NORTHERN KENYA

MAIN REPORT

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List of Abbreviation

A/C, D/C	:	Alternative Current, Direct Current
ADF	:	African Development Fund
ACTED	:	Agency for Technical Cooperation and Development
ADESO	:	Africa Development Solution
AfDB	:	African Development Bank
ALRMP	:	Arid Lands Resource Management Project
AMCEN	:	African Ministerial Conference on the Environment
Apad	:	Agency for Pastoralists Development
ASAL	:	Arid and Semi-Arid Lands
A.S.L	:	Above Sea Level
BH	:	Borehole
CAP	:	Community Action Plan
CARE	:	Cooperative for Assistance and Relief Everywhere (NGO)
CBPP	:	Contagious Bovine Pleuro-Pneumonia
C&D	:	the Institute for Cooperation and Development
CDC	:	Community Development Committee
CDF	:	Constituency Development Fund
CDW	:	Cold Dressed Weight
CIDP	:	County Integrated Development Plan
CIFA	:	Community Initiative Facilitation & assistance (NGO)
CITES	:	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CMDRR	:	Community Managed Disaster Risk Reduction
COBRA	:	Community Based Resilience Analysis
CP	:	Crude Protein
CSG	:	Community Steering Group
DAO	:	District Agricultural Officer
DC	:	Development Committee
DEO	:	District Education Officer
DEM	:	Digital Elevation Model
DFID	:	Department for International Development
DFRD	:	District Focus for Rural Development
DHMT	:	District Health Management Team
DLCI	:	Dry Land and Capacity Building Initiative
DLPO	:	District Livestock Production Officer
DLMC	:	District Livestock Marketing Council

DMC	:	Drought Management Committee
DRR	:	Disaster Risk Reduction
DRRAP	:	Drought Risk Reduction Action Plan
DSG	:	District Steering Group
DVO	:	District Veterinary Officer
EC	:	Electric Conductivity
ECHO	:	Humanitarian Aid Department of the European Commission
ECoRAD	:	The Project for Enhancing Community Resilience against Drought in Northern Kenya
EDRP	:	Emergency Drought Recovery Project
EIA	:	Environmental Impact Assessment
EMC	:	Environmental Management Committee
EU	:	European Union
EWS	:	Early Warning System
FAO	:	Food and Agriculture Organization of the United Nations
FEWS NET	:	Famine Early Warning System Network
FHI, Fhi	:	Food for the Hungry International (NGO)
GA	:	Grazing Area
GARA	:	Gum and Resins Association
GDP	:	Gross Domestic Product
GIMMS	:	Global Inventory Monitoring and Modeling Studies group
GIS	:	Geographic Information System
GIZ	:	Deutsche Gesellschaft für Internationale Zusammenarbeit
GOK, GoK	:	Government of Kenya
HFA	:	Hyogo Framework for Action
HH	:	Household
IBLI	:	Index Based Livestock Insurance
IBRD	:	International Bank for Reconstruction and Development
ICPAC	:	International Climate Prediction and Appliction Centre
ICT	:	Information Communication Technology
IGA	:	Income Generating Activity
IGAD	:	Inter-Governmental Authority on Development
ILRI	:	International Livestock Research Institute
IOM	:	International Organization for Migration
ISDR	:	International Strategy for Disaster Reduction
ITK	:	Indigenous Technical Knowledge
JICA	:	Japan International Cooperation Agency

KARI	:	Kenya Agricultural Research Institute
KEFRI	:	Kenya Forest Research Center
KES, Ksh	:	Kenya Shilling
KMC	:	Kenyan Meat Council
KNBS	:	Kenya National Bureau of Statistics
KPLC	:	Kenya Power and Lighting Company Ltd.
KRRA	:	Kenya Rural Road Authority
LINKS	:	Livestock Information Network Knowledge System
LMA	:	Livestock Market Association
LMD	:	Livestock Marketing Division
LOWASCO	:	Lodwar Water and Sanitation Company Ltd.
LRA	:	Long Rain Assessment
MDG	:	Millennium Development Goal
MDoNK	:	Ministry of State for the Development of Northern Kenya and other Arid Lands
MIS	:	Management Information System
MMC	:	Market Management Committee
MoLD	:	Ministry of Livestock Development
MoSSP	:	Ministry of State for Special Programmes
MOU	:	Memorandum of Understanding
MWI	:	Ministry of Water and Irrigation
NACONEK	:	National Commission on Nomadic Education in Kenya
NASA	:	National Aeronautical and Space Administration
NEMA	:	National Environment Management Authority
NDCF	:	National Drought Contingency Fund
NDMA	:	National Drought Management Authority
NEP	:	North Eastern Province
NEPAD	:	New Partnership for Africa's Development
NGO	:	Non-Governmental Organization
NIB	:	National Irrigation Board
NOAA	:	National Oceanic and Atmospheric Administration
NRM	:	Natural Resource Management
NSWB	:	Northern Water Service Board
OCHA	:	Office for the Coordination of Humanitarian Affairs
O&M	:	Operation and Maintenance
PAG	:	Pastoralist Assistance Group
PFS	:	Pastoralist Field School
PISP	:	Pastoralist Integrated Support Program (NGO)

PR	:	Progress Report
PRA	:	Participatory Rural Appraisal
PRIDP	:	Rural Pastoralist Integrated Development Project
REGAL-IR	:	Resilience and Economic Growth in Arid Lands – Improving Resilience
REGLAP	:	Regional Learning and Advocacy Programme
RPLRP	:	Regional Pastoral Livelihoods Resilience Project
RVWSB	:	Rift Valley Water Service Board
SIDA	:	Swedish International Development Cooperation Agency
SME	:	Small and Medium-sized Enterprise
SRA	:	Short Rain Assessment
SRTM	:	Shuttle Radar Topography Mission
STUCCO	:	Society of Turkana County Contractors
TDS	:	Total Dissolved Solid
TGDP Map	:	Turkana Groundwater Development Potential Map
TOR	:	Terms of Reference
TWADO	:	Turkana Women Advocacy Development Organization
TWP	:	Turkana Water Project
UN	:	United Nations
UNDP	:	United Nations Development Programme
UNESCO		United Nations Educational, Scientific and Cultural Organisation
UNHCR	:	United Nations High Commissioner for Refugees
UNICEF	:	United Nations Children's Fund
UNISDR	:	United Nations International Strategy for Disaster Reduction
USAID	:	United States Agency for International Development
VICOBA	:	Village Community Banking
WASH	:	Water, Sanitation and Hygiene
WB	:	World Bank
WDMA	:	Water Development Assessment and Mapping
WDF	:	Women Development Fund
WESCOORD	:	Water and Environmental Sanitation Coordination
WFP	:	World Food Program
WRA	:	Water Resource Assessment
WRMA	:	Water Resource Management Authority
WSAM	:	Water Source Assessment and Mapping
WUA	:	Water Users Association
YEDF	:	Youth Enterprise Development Fund
YF	:	Youth Fund

Measurement Units

Length

mm = millimeter(s)
cm = centimeter(s) (cm = 10 mm)
m = meter(s) (m = 100 cm)
km = kilometer(s) (km = 1,000 m)

Extent

cm^2 = square centimeter(s) (1.0 cm × 1.0 cm)
m^2 = square meter(s) (1.0 m × 1.0 m)
km^2 = square-kilometer(s) (1.0 km × 1.0 km)
ha = hectare(s) (10,000 m^2)
Acre = 0.4047 hectare(s) (4,047 m2)

Volume

cm^3 = cubic centimeter(s) (1.0 cm × 1.0 cm × 1.0 cm, or 1.0 ml)
m^3 = cubic meter(s) (1.0 m × 1.0 m × 1.0 m or 1.0 kl)
L = liter (1,000 cm^3)
MCM = million cubic meter(s)

Weight

g = gram(s)
kg = kilogram(s) (1,000 grams)
ton(s) = metric ton(s) (1,000 kg)

Time

sec = second(s)
min = minute(s)
hr = hour(s)

Others

ppm = parts per million
° = degree
°C = degrees Celsius
% = percent
mS = millisiemens

Currency

US$ = United State dollar(s)
JPY = Japanese yen(s)
Ksh. = Kenyan shilling(s)

CHAPTER 1. INTRODUCTION

1.1 General

This is the "Final Report" prepared by the Project team in accordance with the Record of Discussion for "the Project for Enhancing Community Resilience against Drought in Northern Kenya (ECoRAD)", defined as "the Project", agreed upon between the Ministry of State for Development of Northern Kenya and Other Arid Lands and the Japan International Cooperation Agency (JICA) on January 6, 2012.

JICA ECoRAD Project team commenced work on February 2012 to undertake various activities for the Project, and completed the activities by the end of October 2015.

The Project team compiled the following reports to present the results of studies and outcomes of pilot sub-projects it implemented.

Table A1.1.1 Reports Prepared in ECoRAD Project

Reports	Date
1) Inception Report	March, 2012
2) Progress Report -1	October, 2012
3) Interim Report	March, 2013
4) Progress Report – 2	September, 2013
5) Progress Report – 3	March, 2014
6) Progress Report – 4	September, 2014
7) Progress Report – 5	March, 2015
8) Draft Final Report	August, 2015
9) The Guideline	October, 2015

Source: JICA Project Team

Upon completion of the Project, the Project team documented all the project activities, outcomes, and lessons learnt in the Final Report.

1.2 Outline of the Project

1.2.1 Objectives of the Project

The purpose and expected outputs are summarized below:

(1) Project Purpose

The purpose of the project is that pastoralists' communities' resilience to drought is enhanced in Turkana County and Marsabit County.

(2) Expected Outputs

Output-1: Capacity of community based drought management is improved in targeted communities.

Output-2: Sustainable natural resource management is realized in targeted communities.

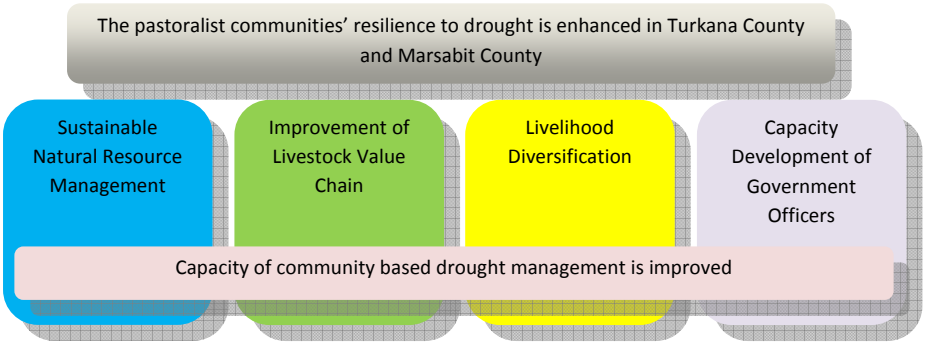
Output-3: Livestock value chain is improved in targeted communities.

Output-4: Diversification of livelihoods is promoted in targeted communities.

Output-5: Capacity of the government officers to enhance the pastoralists' resilience to drought is improved.

Output-6: The guideline for enhancing the communities' resilience to drought is established.

The schematic image of the Project is shown in the following figure:



Source: JICA Project Team

Figure A1.2.1 Schematic Image of the Project

1.2.2 Project Period

(1) Work Schedule (Original)

The Project had three major periods as outlined below:

1) Marsabit implementation period: March 2012 – April 2013,

2) Turkana implementation period: April 2013 – March 2014, and

3) Follow-up and dissemination period: April 2014 – February 2015.

However due to the following reasons, a time extension of the Project period was inevitable.

(2) Reason of Time Extension

- Necessity for close follow-up of 24 pilot projects (77sites) in Marsabit & Turkana
- Delays in progress due to:
  - irregularity of rainy/wet season for construction works
  - poor workmanship of Marsabit & Turkana contractors
  - evacuation during the presidential election (March '13)
  - the bandit attack in Marsabit (May '13)

On January 30, 2015, the project progress and need for time extension were discussed in the Project Steering Committee (PSC) meeting in Nairobi in the presence of the Principal Secretary State Department of Devolution, Ministry of Devolution and Planning (the Ministry in which the Project was domiciled after restructuring of Government which took place during the Project implementation) and the deputy chief Representative of JICA Kenya office.

The time extension was duly accepted by both the Ministry of Devolution and Planning and JICA Kenya office during the meeting and documented in the Minutes. These Minutes of Discussion were later signed by both parties on February 13, 2015 as an amendment to the earlier mentioned initial Record of Discussion.

(3) Work Schedule (Revised)

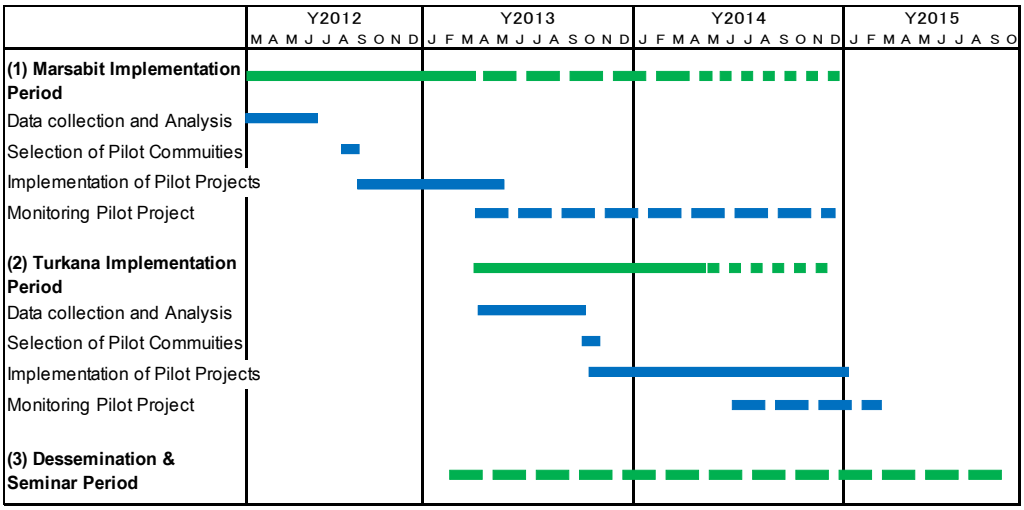
Based on the revised schedule, the Project the three major periods, we adjusted as follows:

1) Marsabit implementation period: March 2012 – April 2013,

2) Turkana implementation period: April 2013 – December 2014, and

3) Follow-up and dissemination period: April 2015 –October 2015.

Major schedule of the works are shown in the following figure:



Source: JICA Project Team

Figure A1.2.2 Work Schedule of the Project (revised)

1.2.3 Project Area

The Project target areas were Marsabit and Turkana Counties as shown in the Project Location Map.

Marsabit County covers an approximate area of 70,961 km^2. It is the largest county in Kenya, bordering Ethiopia in the North, Isiolo County in the South, Wajir County in the East, Turkana County in the west and Samburu County in the South West. Administratively the County is divided into seven (7) Sub-counties, namely; Marsabit Central, Marsabit South, Marsabit North, Sololo, Moyale, Loiyangalani and North Horr Sub-counties. The project area covers Marsabit South, Marsabit North and Marsabit Central Sub-counties. Marsabit County has a population of 291,166 persons comprising 56,941 households (2009 population and housing census).

Turkana County is one of the counties in the Arid and Semi-Arid Lands (ASAL) on Kenya. The County is located in north western Kenya bordering Marsabit County to the east, Samburu County to the south east, and Baringo and West Pokot County to the south. It has a total geographical land area of approximately 68,680 km^2. The County is divided into seven (7) Sub-counties[1], namely; Turkana Central, Loima, Turkana North, Kibish, Turkana West, Turkana South, and Turkana East Sub-county.

Table A1.2.1 County Summary of Two Counties

	Turkana County		Marsabit County	
	Data	Rank[1)]	Data	Rank
Population	855,399	18	291,166	42
Surface area (km²)	68,680	2	70,961	1
Density (people per km²)	12.45	42	4.10	47
Poverty rate, based on KIHBS (%)	94.3	47	83.2	44
Share of urban population (%)	14.2	37	22.0	18
Population of secondary education (%)	9.5	39	8.9	41
Improved water (%)	74.3	15	77.6	8
Improved sanitation (%)	17.8	46	35.4	41

Note 1): Rank among 47 counties.

Source: County Fact Sheet (2011 Dec)

[1] Kibish Sub-county was newly formed, separated from Turkana North Sub-county. Therefore, it is noted that there are some data which do not show Kibish Sub-county in the report depending upon the data source.

1.2.4 Selected Pilot Communities and Pilot Sub-projects

(1) Pilot Communities

The Project team implemented several sub-projects as pilot trials as well as other project activities in 20 selected communities in Marsabit and Turkana Counties.

Table A1.2.2 Selected Pilot Communities

Marsabit	Korr, Arapal, Ngurnit, Turbi, Kalacha, Hurri Hills, Dirib Gombo, Dakabaricha/Jirime, Gar Qarsa
Turkana	Milimatatu, Kangakipur, Loritit, Lokichoggio, Lokiriama, Lorengippi, Eliye, Kerio, Lochawaangikamatak, Lokichar, Lopii

Source: JICA Project Team

(2) Pilot Sub-projects in Marsabit

In Marsabit, the Project team formulated and implemented 13 pilot sub-projects in 26 places in 9 pilot communities. The followings are the pilot sub-projects by the Project. During the implementation of the Project, it was decided that a peace building component be included in the components specified in the Record of Discussion because of the importance of conflict management raised during the Community Managed Disaster Risk Reduction (CMDRR) process.

Table A1.2.3 Sub-projects in Marsabit

Sub-project Name	Places
(1) Sub-project of New Construction and Rehabilitation of Water Pan	1) Yaa Gara Water Pan, Hurri Hills Location in Marsabit North Sub-county
	2) Sotowesa Water Pan , Turbi Location in Marsabit North Sub-county
	3) Dololo Dokatu Water Pan, Dirib Location in Marsabit Central Sub-county
	4) Dadach Manchure Water Pan, Gar Qarsa Location in Marsabit Central Sub-county
	5) Halo Girisa Water Pan, Gar Qarsa Location in Marsabit Central Sub-county
(2) Sub-project of Rehabilitation and up-grading of Arapal Water Pipeline	1) Arapal community, Arapal Location in Loiyangalani Sub-county
(3) Sub-project of New Construction of Lokuchura Water Rock Catchment	1) Ngurnit community, Ngurnit Location in Marsabit South Sub-county
(4) Sub-project of Introduction of Solar Power System in Water Pump Facilities	1) Kubi Qallo community, Qilta Location, Marsabit Central District
	2) Shurr community, Shurr Location, Marsabit North Sub-county
	3) Korr Community, Korr Location, Marsabit South Sub-county
(5) Sub-project of Heifer Exchange Program	1) Dirib Gombo, Dirib Locations, Marsabit Central Sub-county
	2) Jirime community, Jirime Locations, Marsabit Central Sub-county
(6) Sub-project of Kalacha Feedlot	1) Kalacha community, Kalacha Locations, Marsabit North Sub-county
(7) Sub-project of New Construction and up-grading of Livestock Markets Facilities and Organization	1) Dirib Gombo community, Dirib Locations, Marsabit Central Sub-county
	2) Jirime community, Jirime Locations, Marsabit Central Sub-county

Sub-project Name	Places
	3) Korr community, Korr Location, Marsabit South District
(8) Sub-project of Rural Road Improvement for Livestock Value Chain	1) Hurri Hills Access Road Improvement, Marsabit North Sub-county
	2) Ngurnit Access Road Improvement, Marsabit South Sub-county
(9) Sub-project of Chicken Merry-go-round	1) Dakabaricha community, Dakabaricha Location in Marsabit Central Sub-county
	2) Jirime community, Jirime Location in Marsabit Central Sub-county
(10) Sub-project of Goat Merry-go-round	1) Gar Qarsa community, Gar Qarsa Location in Marsabit Central Sub-county
	2) Kalacha community, Kalacha Location in Marsabit North Sub-county
	3) Arapal community, Arapal Location in Loiyangarani Sub-county
(11) Sub-project of Resin and Honey Business	1) Ngurnit community, Ngurnit Location in Marsabit South Sub-county
(12) Sub-project of Salt Business Program	1) Kalacha community, Kalacha Location in Marsabit North Sub-county
(13) Sub-project for Peace Building	1) Dirib Gombo, Shurr, Songa communities, in Marsabit Central Sub-county
	2) Arapal, Gas and other communities, in Loiyangalani and North Horr Sub-county

Source: JICA Project Team

(3) Pilot Sub-projects in Turkana

The Project team started several trials in Turkana in April 2013. In Turkana, the Project team formulated and implemented 11 pilot sub-projects in 50 places in 11 pilot communities. The followings are the sub-projects in Turkana.

Table A1.2.4 Sub-projects in Turkana

Sub-project Name	Places
(1) Sub-project of New Construction and Rehabilitation of Water Pan	1) Kaabilikeret Water Pan, Yapakuno Location in Turkana North Sub-county
	2) Kasuguru Water Pan, Yapakuno Location in Turkana North Sub-county
	3) Edukon Water Pan, Nanam Location in Turkana west Sub-county
	4) Kaalale Water Pan, Lorengkippi Location in Loima Sub-county
	5) Nasikiria water pan, Mogila location in Turkana west Sub-county
	6) Nachuro water pan, Lomeyan Location in Loima Sub-county
(2) Sub-Project for Groundwater Development	1) 20 boreholes in 6 Sub-counties
(3) Sub-project of Rehabilitation of Sand Dam	1) Kangakipur Sand dam, Kaeris Location in Turkana North Sub-county

Sub-project Name	Places
(4) Sub-project of Introduction of Solar Power Pumping System in Lodwar Water and Sanitation Company	1) Borehole No.1A, Lodwar Town, Lodwar Location, Turkana Central Sub-county
	2) Borehole No.3, Lodwar Town, Lodwar Location, Turkana Central Sub-county
	3) Borehole No.6, Lodwar Town, Lodwar Location, Turkana Central Sub-county
(5) Sub-project for Construction, Upgrading and Improvement of Livestock Market Facilities	1) Kerio livestock Market, Kerio Location in Turkana Central Sub-County
	2) Lodwar livestock market pipe culvert, Lodwar Town, Lodwar Location in Turkana Central Sub-county
	3) Milimatatu Drift Slab, Yapakuno Location in Turkana North Sub-county
	4) Keekorsogol Drift Slab, Lochwaangikamatak Location in Turkana South Sub-county
	5) Kabulit 1 Drift Slab, Letea Location in Turkana West Sub-County
	6) Kokopito Drift Slab, Namoruputh Location in Loima Sub-county
	7) Kabulit 2 Drift Slab, Letea Location in Turkana West Sub-county
(6) Sub-project of Livestock Market Linkage and Vitalization	1) Kakuma community, Kakuma Location, Loima Sub-county
	2) Lodwar, Lodwar Location, Turkana Central Sub-county
	3) Lokichar, Lokichar Location in Turkana South Sub-county
	4) Kerio livestock Market, Kerio Location in Turkana Central Sub-County
(7) Sub-project of Pasture Establishment by Reseeding	1) Lokichoggio community, Lokichoggio Locations, Turkana West Sub-county
	2) Loritit community, Lotea Locations, Turkana West Sub-county
(8) Sub-project of Income Generating Activities	1) 1 group in Loritit community, Lotea Locations, Turkana West Sub-county
	2) 2 group in Lokiriama community, Lokiriama Location, Loima Sub-county
	3) 2 group in Lochwaangikamatak community, Lochwaangikamatak Location, Turkana South Sub-county
	4) 2 group in Lopii community, Kochodin Location, Turkana East Sub-county
(9) Sub-project of Small Scale Rain-fed Agriculture	1) Loritit community, Lotea Locations, Turkana West District
(10) Sub-project of Fishery	1) Eliye community, Kangatotha Location, Turkana Central Sub-county
(11) Sub-project of Dry-meat	1) Lokiriama community, Lokiriama Location, Loima Sub-county

Source: JICA Project Team

(4) The Guideline

In addition to the above activities, the Project team prepared a guideline titled "Guideline for Enhancement of Pastoralists communities' Resilience to Drought through Community Based Drought Management" from the experiences of JICA ECoRAD Project" (the Guideline) as Project Output-6.

1.3 International and Regional Policy against Drought

Kenya is a drought prone country with more that 80% of its total areas being arid or semi arid. Droughts directly impact on the household food security of people living in drought-prone areas. Droughts erode the assets of poor communities and undermine their livelihood strategies culminating in a downward spiral of increasing poverty and food insecurity. Although drought affects the country as a whole, its effect is felt most dramatically by the livestock based economies and livelihoods in the Kenyan ASAL. In addition to the socio-economic losses, drought hamper development speed of the countries, because it is forced to divert a substantial amount of financial and other resources for development to relief and rehabilitation assistance to disaster-affected people each year.

1.3.1 International: Hyogo Framework for Action 2005 - 2015

The Hyogo Framework for Action (HFA) is the first plan to explain, describe and detail the work that is required from all different sectors and actors to reduce disaster losses. It was developed and agreed on with the many partners needed to reduce disaster risk - governments, international agencies, disaster experts and many others - bringing them under a common system of coordination. The HFA outlines five priorities for action, and offers guiding principles and practical means for achieving disaster resilience. Its goal is to substantially reduce disaster losses by 2015 by building the resilience of nations and communities to disasters. This means reducing loss of lives and social, economic, and environmental assets when hazards strike.

Priority Action 1: Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation.

Priority Action 2: Identify, assess and monitor disaster risks and enhance early warning.

Priority Action 3: Use knowledge, innovation and education to build a culture of safety and resilience at all levels.

Priority Action 4: Reduce the underlying risk factors.

Priority Action 5: Strengthen disaster preparedness for effective response at all levels.

In this framework, the following points should be underlined in line with implementation of the Project;

- It was noted that participation of community was strongly emphasized, for the development and strengthening of institutions, mechanisms and capacities, which can systematically contribute to building resilience to hazards. It should be promoted through the adoption of specific policies, the promotion of networking, the strategic management of volunteer resources, the attribution of roles and responsibilities, and the delegation and provision of the necessary authority and resources.
- Concept of the effective integration of disaster risk considerations into sustainable development policies, planning and programming, was introduced with a special emphasis on disaster prevention, mitigation, preparedness and vulnerability reduction.
- At times of disaster, impacts and losses can be substantially reduced if authorities, individuals and communities in hazard-prone areas are well "prepared" and ready to act and are equipped with the knowledge and capacities for effective disaster management. Preparedness and improvement of resilience against disaster are required.

1.3.2 Summit on the Horn of Africa Crisis in Kenya: Ending Drought Emergencies

A summit on the Horn of Africa Crisis was held in Nairobi, Kenya in September, 2011. The objective of summit was to expedite collaboration among countries in the Horn of Africa to have synergy effects in domestic, regions and inter-countries for programme implementation against climate change.

In this summit, they coined the phrase "Ending Drought Emergency (EDE)" to capture a new sense of purpose, which noted an important shift in policy, from one that relies on reacting to the effects of droughts as they arise, to one that actively seeks to reduce vulnerability and risk through sustainable development.

As the final product of the summit, a "Nairobi Declaration" was compiled. In the Declaration, the following points were emphasized.

- It is essential, in order to fill the resource gap, for development Partners, the African private sector and civil society to "walk" and "work" together and extend material and monetary support to the country-led long-term programmes and strategies,
- The issues of refugees are global in nature and thus require concerted efforts at local, regional and international level; and call upon the international community to support the host community in environmental conservation and other provisions to avert resource conflict,
- The Nairobi Action Plan shall compliment and support medium and long-term efforts being undertaken by the Inter-Governmental Authority on Development (IGAD) to mitigate the effects of drought in conjunction with the African Development Bank Group.

Undertake to:

- Enhance the provision of timely and actionable Early Warning information to all actors by strengthening the IGAD Climate Prediction and Applications Centre (ICPAC);
- Develop the Horn of Africa Regional Disaster Resilience and Sustainability Strategy Framework to reduce the impact of disasters in the region considering existing frameworks and programmes of action;
- Create and support a Multi-donor Trust Fund for drought and other disasters to be anchored in the IGAD Secretariat;
- Launch regional projects to address the underlying causes of vulnerability in drought-prone areas, in particular emphasis on pastoralists and agro-pastoralists to promote disaster risk reduction, ecosystem rehabilitation and sustainable livelihood practices. Such projects could include construction of cross-border infrastructure joint irrigation projects, and development of drought-tolerant crops and water harvesting technologies. We shall endeavour to allocate significant portion of national revenue to fund these projects;
- Promote ecosystem rehabilitation and management with a purpose of building natural buffers against disasters specifically identifying common targets on increasing land cover and improved water resource management; in Arid and Semi-Arid Lands. The targeted interventions should at least be 10 per cent forest cover and irrigated land in each country by 2017 as well as control over-grazing.

1.3.3 Recent International Policy: Sendai Framework for Disaster Risk Reduction 2015-2030

The Third United Nations World Conference on Disaster Risk Reduction was held from 14 to 18 March 2015 in Sendai, Miyagi, Japan. In this conference, a post 2015 framework for disaster risk reduction (the Hyogo Framework) was discussed and adopted as the Sendai Framework for Disaster Risk Reduction 2015-2030. The goal and priorities for action of the Sendai Framework are summarized as below:

Goal:	Prevent new and reduce existing disaster risk through the implementation of integrated and inclusive economic, structural, legal, social, health, cultural, educational, environmental, technological, political and institutional measures that prevent and reduce hazard exposure and vulnerability to disaster, increase preparedness for response and recovery, and thus strengthen resilience.
Priority 1:	Understanding disaster risk.
Priority 2:	Strengthening disaster risk governance to manage disaster risk.
Priority 3:	Investing in disaster risk reduction for resilience.
Priority 4:	Enhancing disaster preparedness for effective response and to "Build Back Better" in recovery, rehabilitation and reconstruction.

1.4 National Policy against Drought

1.4.1 Kenya National Disaster Management Policy (2009)

In Kenya, it is regretfully pointed out that an adequate level of preparedness required to address its significant risk profile has not been achieved, in spite of several disaster management initiatives undertaken in the past two decades (*"Initiatives have been undertaken in an inconsistent, unharmonious, reactive and uncoordinated manner due to lack of a unified policy framework. National Disaster Management Policy: 2009)"*. Thus the GoK has formulated the Management Policy including several key changes for emphasizing proactive and preventive strategies.

The National Disaster Management Policy includes 7 key changes. The following key changes are especially underlined in the report in line with the Project's approaches:

- Establishing an institutional and legal framework that streamlines processes for effective and efficient disaster management in the country. This includes the establishment of national disaster management directorates under the Ministry of State for Special Programmes (MoSSP) and promoting the National Platform for DRR to be the overarching humanitarian coordination forum for Kenya to integrate qualified actors and initiatives.
- Incorporating and adjusting the conceptual thinking behind disaster management in Kenya to fully embrace the paradigm shift which has taken place over the past decade from thinking about a disaster response-centric approach to a balanced and proactive Disaster Risk Management approach. Prevention, preparedness and recovery are therefore fully embraced and the view of hazards broadened to include violence, disease and conflict among others.
- Promoting an increased national disaster awareness culture and capacity building for disaster preparedness at all levels.
- Promoting linkages between disaster risk management and development processes for reduction of vulnerability to hazards.

1.4.2 Summit on the Horn of Africa Crisis in Kenya (2011)

A summit on the Horn of Africa Crisis was held in Nairobi, Kenya in September, 2011. In this summit, the GoK made a statement in the country programme paper. The components of a comprehensive regional strategy to deal with drought and its consequences in Kenya cover the following priority areas:

1) Security. Governments in the Horn of Africa and their international partners must give top priority to the establishment of peace and security. For Kenya this applies most urgently to its international borders in Upper Eastern and North Rift. Estimate: US$350 million.

2) Humanitarian relief: The Kenya Emergency Humanitarian Response Plan outlines needs in areas of food, health, nutrition, water and sanitation, agriculture and livestock, protection, education, early recovery, and refugees, of which 36% is unfunded. US$264 million.

3) Climate-proof infrastructure: Given the chance, most communities at risk would rather improve their livelihoods by marketing goods and livestock to national and regional markets which they cannot access at the moment due to poor infrastructure. Priority is given to roads, water and irrigation, and energy. Estimate: US$714.2 million.

4) Building human capital: Arid and semi-arid lands lag behind the agricultural and urban areas in education and health which, apart from their intrinsic benefits, are key to improving productivity and enabling livelihood diversification. These services must be provided in a manner suitable to pastoral living, and, in the case of education, will be led and coordinated by the new National Commission on Nomadic Education in Kenya (NACONEK). Estimate: US$305 million.

5) Building sustainable livelihoods in a context of climate change. This involves a range of measures to increase adaptive capacity, in areas such as marketing (including market information), rangeland management, livestock, appropriate crops and fodder production, Small and Medium-sized Enterprises (SMEs), social protection, and water and environmental conservation. Estimate: US$38.6 million.

At the end of the summit, a Nairobi Declaration was adopted which, among other commitments, undertook to enhance the provision of timely and actionable early warning information to all actors by strengthening IGAD Climate Prediction and Applications Centre. In addition, there will be launches of regional projects to address the underlying causes of vulnerability in drought-prone areas, with emphasis on pastoralists and agro-pastoralists to promote disaster risk reduction, ecosystem rehabilitation and sustainable livelihood practices.

1.4.3 Other Important Policies Related to Drought

(1) Recent Policy Documents

There are three current policy documents related to drought and summarised in the table below:

Table A1.2.5 Current Three Major Policies for Drought

	National Policy for the Sustainable Development of Northern Kenya and other Arid Lands	Vision 2030 Strategy for Northern Kenya & other Arid Lands	Ending Drought Emergencies in Kenya: Country Programme Paper
Status	Approved by Cabinet on 13th October 2012.	Endorsed by the Ministry of State for Planning, National Development & Vision 2030 on 16 August 2011.	Approved by Cabinet on 13th October 2012.
Purpose	To re-frame, in light of the region's history, the way in which Northern Kenya and the arid and semi-arid lands are considered by Government: As a region of opportunity and potential, not just challenge. As a region where Government will think and act differently, taking its unique characteristics into account (including mobility, low population density, and pastoralism's distinct institutional arrangements). As a region which is fully part of Kenya, and therefore whose citizens are entitled to the same basic rights in development as other areas of the country.	To complement and deepen Vision 2030 by showing how its goals will be realised in the specific context of Northern Kenya and other Arid Lands, and to integrate ASAL priorities fully into the national framework for development policy and planning.	To demonstrate how Kenya will end drought emergencies within the next ten years.

	National Policy for the Sustainable Development of Northern Kenya and other Arid Lands	Vision 2030 Strategy for Northern Kenya & other Arid Lands	Ending Drought Emergencies in Kenya: Country Programme Paper
What it does	1. Reinforces Constitutional provisions on inequality and marginalisation. 2. Recognises the value of pastoralism and domesticates the African Union Policy Framework for Pastoralism in Africa. 3. Emphasises the region's contribution to national development, which will be achieved by accelerating investment in the foundations for poverty reduction and economic growth (such as roads, security, and human capital). 4. Opens the way to new approaches to service delivery and governance. 5. Establishes a stronger institutional framework for multi-sectoral and multi-stakeholder ASAL development.	1. Interprets the foundations and the three pillars of Vision 2030 in light of the realities prevailing in Northern Kenya and other Arid Lands. 2. Identifies priority investments appropriate to the region across all the foundations and pillars.	1. Re-frames drought management in terms of the debate on vulnerability and resilience, arguing that drought resilience will only be built by investing in the basic foundations for development (as articulated in the Vision 2030 strategy). 2. Strengthens the institutional and financing framework for drought management in Kenya, and calls for more effective international financing mechanisms. 3. Fulfils Kenya's responsibilities under the IGAD initiative to End Drought Emergencies in the Horn of Africa
Lead agency	Ministry of State for Development of Northern Kenya & other Arid Lands	Ministry of State for Development of Northern Kenya & other Arid Lands	National Drought Management Authority

Source:http://reliefweb.int/sites/reliefweb.int/files/resources/1_Policy%20documents%20of%20Northern%20Kenya%20and%20other%20ASALs.pdf, prepared by the Ministry of State for the Development of Northern Kenya and Other Arid Lands, October 2012

In relation to Vision 2030 mentioned above, there is a policy document on "Sector Plan for Drought Risk Management and Ending Drought Emergencies, Second Medium Term Plan 2013-2027", as part of the Kenya Vision 2030 MTP2 organised by the Drought and Ending Drought Emergencies Thematic Group chaired by the N DMA.

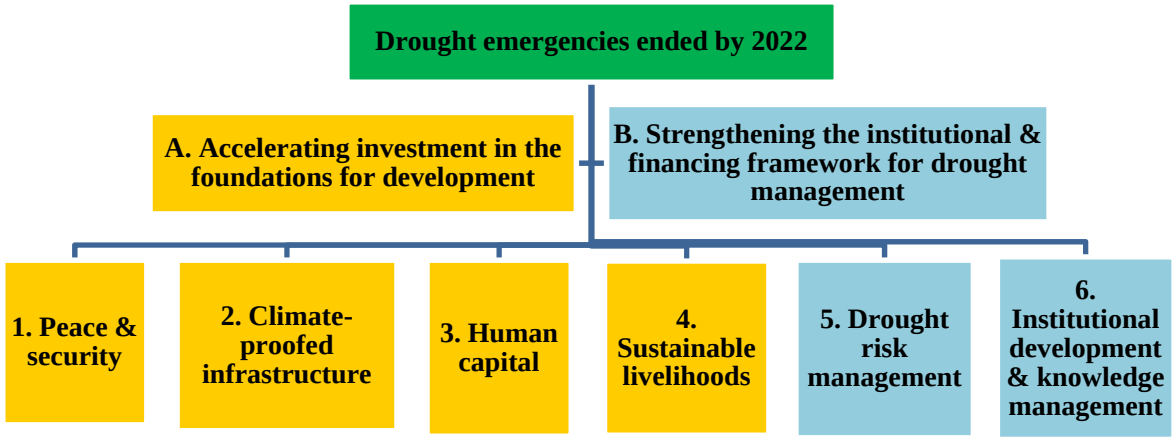
In this plan, programmes and projects for 2013/14-2017/18 are shown with budget, in the following areas; peace and human security, infrastructure, education, health, livelihoods, and drought risk management and coordination.

(2) Ending Drought Emergencies in Kenya: Country Programme Paper and Programme Framework

Current practical policy paper which is referred to the most by the county level drought coordinators is Ending Drought Emergencies (EDE) in Kenya: Country Programme Paper. As summarised above, this policy stipulates how drought emergency can be ended by 2022.

To operationalise the EDE strategy, the Common Programme Framework to End Drought Emergencies was developed through a series of discussions between the Government of Kenya and its development partners which took place between October 2013 and August 2014. It represents the first phase of a ten-year programme to EDE by 2022. This framework was finally launched in November 2015.

The EDE framework to achieve this is depicted in the figure below:



Source: Presentation material of NDMA for Workshop on Enhancing Drought Resilience in Northern Kenya, December 9-10, 2014, Silver Springs Hotel

Fiaure A1.4.1 EDE Framework

1.5 Other Donors Experiences

1.5.1 Arid Lands Resource Management Project (ALRMP) by World Bank

(1) Project Outline

The Arid Lands Resource Management Project (ALRMP) was a Government led programme established in 1996 with on-going funding from the World Bank and other donors.
In 1996, the ALRMP was initiated after the World Bank-funded Emergency Drought Recovery Project (EDRP), which operated from 1992 to 1995, came to an end. While the EDRP was a quick-fix project to mitigate the effects of severe drought, ALRMP was a longer-term development-oriented project focusing on institutionalization and mainstreaming of drought management activities in the Kenya Government system. The first phase ended on June 30, 2003.
ALRMP II was launched in September 2003, with initial coverage of 22 arid and semi-arid districts, and was to be implemented over six years (2003-2009). The total program budget for phase II (2003-2010) was USS 142.85 million. The project was leading drought management activities in the ASAL areas.
Key activities supported via the ALRMP include:

- Early warning data collection systems and monthly bulletins.
- Staffing of drought management offices in each district (sub-county).
- The completion of twice annual short and long rain assessments (SRA/LRAs) that inform the allocation of humanitarian funding by government and other actors.
- Support to District Steering Groups (DSGs) to co-ordinate drought response, develop and implement drought management and contingency plans.

Unfortunately the ALRMP was closed down at the end of 2010 due to misappropriation of funds identified by an audit by the Bank.

(2) Observations

At first, ALRMP made good impacts in Northern Kenya, in particular, at institutional development which is still effective after the project closed:

- ALRMP has had major influence on national policy and development agendas in the arid and semiarid lands. The experiences and lessons from ALRMP have informed national

drought management policy and response through the creation of a National Drought Management Authority (NDMA) and Drought Contingency Fund.

- The project initiated to formulate District Steering Groups (DSGs) which have been central in enhancing drought management actions, including improving drought coordination, reducing duplications, and improving response at the district (sub-county) level. After ALRAMP closed, DSG meeting continue to be held regularly in initiative of NDMA in Turkana and Marsabit.

Secondly, the project focused on development of drought preparedness and contingency plans at the district (sub-county) level, which includes assembling information on climate and vulnerability to food insecurity, training staff to create, use, and apply this information, and fostering capacity for policy-making and implementation. And the project has coordinated with other agencies, such as FEWSNET, in developing and disseminating drought management and early warning information. NDMA operate the early warning system periodically to provide effective information for preparedness of drought.

Against these institutional successes, an audit by the World Bank found evidence of serious shortcomings suggestive of misappropriation of fund. It was told the audit found that 29 percent of sampled transactions were ineligible. It is noted the extent of such human-error issues remains a major challenge to addressing persistent implementation of activities in Northern Kenya.

1.5.2 The Drought Risk Reduction Action Plan (DRRAP) by ECHO

(1) Project Outline

The Drought Risk Reduction Action Plan (DRRAP) was funded by the European Community Humanitarian Aid and Civil Protection Department (ECHO) in Djibouti, Ethiopia, Kenya, Somaliland and Uganda from June 2006 to December 2013 for focusing on increasing resilience and reducing vulnerability to drought in local communities. DRRAP is piloting projects that mitigate and respond to drought in order to identify successful models that can be replicated, scaled up and used to influence the policy environment.

DRRAP supports practical solutions generated by communities. This promotes strong local ownership while promoting local skills. The DRRAP coordination structure was made up of UN agencies and NGOs representative, and provides support to national and regional coordination on disaster management.

(2) Observations

The following observations were made on DRRAP in terms of 3 aspects.

(a) Participatory community planning and action

At the community level, DRRAP used the Community Managed Disaster Risk Reduction (CMDRR) to stimulate grassroots solutions to common problems. This supported to empower communities to make their own decisions on the ground. Communities had developed a community action plan (CAP) and a contingency plan that are presented to the local and national government authorities for consideration in prioritizing investments. However shortcomings were observed in terms of application of CMDRR approach, such as:

- Duplication of functions between a community drought management committee (DMC) and a community development committee (CDC) in a same community,
- Sustainability of DMC after the project team left, and
- Some CAP seemed to be “wish lists”, which did not be formulated based on their capacity and current gaps

(b) Knowledge sharing

The Regional Learning and Advocacy Programme (REGLAP) was a consortium of NGOs that was coordinating advocacy and documenting good practices. REGLAP advocated for improved policy and practice among governments, NGOs and other stakeholders through the use of lessons learnt. It was a quite effective tool for sharing knowledge and experiences on various projects by various donors. This function was succeeded to Drylands Learning and Capacity Building Initiative (DLCI) after DRRAP terminated. ECoRAD Project greatly owned it to REGLAP and DLCI that we have collected useful various past experiences, outcomes, and lessons learnt for drought resilience in Northern Kenya.

(c) Natural Resource Management (NRM)

DRRAP supported natural resource management in not only ensuring preparedness to drought but also in securing peace status and harmonious utilization of resources. DRRAP partners worked with traditional institutions to ensure good management and security through regulating the use of water and grazing resources. It was considered that the methodology of using traditional entities is very effective in Northern Kenya, then this methodology could be applied to other purpose of project activities, such as sustainable water facility management by community (using traditional system “aba elega”), etc.

1.5.3 Other On-going Projects

There are two major resilience related developmental projects in Marsabit and Turkana Counties.

(1) Resilience and Economic growth in Arid Lands – Improving Resilience in Kenya (REGAL-IR) by USAID

This USAID funded project covered five counties of arid and semi-arid land, namely Garissa, Isiolo, Marsabit, Turkana and Wajir. The project duration is from August 2012 to August 2017, and there are six activity goals as follows:

- Improve business capacity of individual an community based enterprises:
- Support access to livestock sector inclusiveness through market linkage:
- Support community structures that improve management of their natural resources:
- Strengthen community capacity to resolve conflicts:
- Strengthen community capacity to cope with drought and other ecological shocks: and
- Improve consumption of nutritious foods.

(2) Regional Pastoral Livelihoods Resilience Project (RPLRP) by World Bank

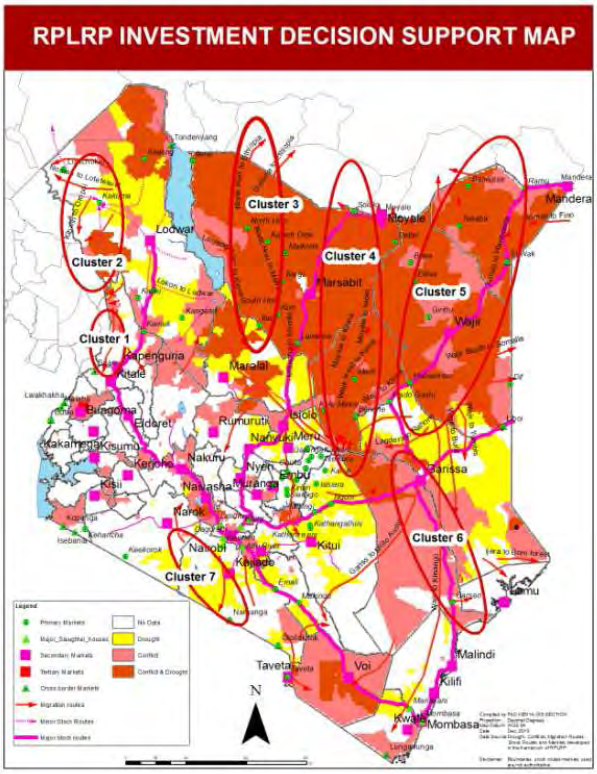
The project objective is to enhance livelihood resilience of pastoral and agro-pastoral communities in cross-border drought prone areas of selected countries and improve the capacity of the selected countries’ governments to respond promptly and effectively to an eligible crisis or emergency. The selected countries are Kenya and Uganda in the first phase, and Ethiopia may be included in the second phase. The project utilises the cluster approach to concentrate the project’s investments and activities along livestock routes/corridors with regional significance -across border or within country boundaries. A cluster is defined here as a geographic space e.g. narrow corridor of sustainable landscape that might cut across multiple counties/districts and international borders where a range of resources is shared by pastoral communities. Overall project implementation started in 2014 and will end in 2019.

In Kenya, there are seven clusters selected including Turkana and Marsabit as shown in Figure A1.5.1.

The project has five components, 1) NRM – Natural Resources Management, 2) MAT-Market Access and Trade, 3) LS-Livelihood Support, 4) PRM-Pastoral Risk Management, and 5) PM&IS-Project Management and Institutional Support.

(3) Kenya Rural Development Programme (KRDP) by EU

KRDP is a sector-wide programme funded by the European Union. The programme focuses on securing long-term food security in Kenya through improved agricultural productivity and better responses to drought and improved livelihoods in arid and semi-arid lands (ASALs). The following two KRDP projects are implemented under the National Drought Management Authority (NDMA):



Source: Presentation material of the RPLRP project unit in Turkana

Figure A1.5.1 RPLRP Investment Decision Support Map

- Kenya Rural Development programme-ASAL Drought Management (KRDP/ASAL DM)

  This is a five-and-a-half year project runs from July 2011 to December 2016. The objective is to help the NDMA strengthen the drought management structures in Kenya and increase the capacity of communities in arid and semi-arid lands (ASAL) to manage drought and improve resilience.

- Kenya Rural Development programme-ASAL Drought Contingency Fund (KRDP-DCFP)

  ASAL- Drought Contingency Fund is a 3-year project to facilitate timely response to drought. The total project budget is Euro 11,355,364 with EU contribution of €10,000,000 (88.4 %) and Government of Kenya contribution € 1,307,428(11.6 %). The government plans to establish a National Drought Contingency Fund (NDCF) as a way of institutionalising the use of drought contingency funds. The proposed NDCF is a multi-donor basket fund that allows contributions from both the Government and its development partners and has the capacity to disburse funds to drought-affected areas in a flexible, effective and efficient way. The DCF allocation under KRDP has been provided directly to the NDMA with the implementation of ASAL-DCFP, ahead of the formal establishment of the NDCF.

CHAPTER 2. NATURAL AND SOCIOECONOMIC CONDITIONS IN THE NORHERN KENYA

2.1 Conditions in Marsabit County

2.1.1 Socio Economy

It is a vast county covering approximately 12% of Kenya, with variable landscape and climate and the population estimated at 291,166 persons (Kenya Population Census, 2009). It occupies an area of about 70,961 km^2. The Marsabit County constitutes seven sub-counties of Marsabit Central, Moyale, North Horr, Sololo, Loiyangalani, Marsabit South and Marsabit North.

The county is home to a number of ethnic groups the major ones being Gabra, Rendille, Borana, Samburu, Turkana, Burji, Dasanetch, etc in the ascending order of numerical intensity. Historically nearly all the ethnic groups depend on pastoralism to some extent. The Gabra and Rendille communities herd camels cattle, goats and sheep while the Borana and Samburu were largely herded cattle.

The only natural resource found in Marsabit County includes the highland forest found in Marsabit Sub-county, and extensive pasture spread across all sub-counties. Limited precipitation severely curtails vegetation cover for most of the driest parts of the county. Aridity therefore limits land use pattern for most of the County leading to extensive pastoralism. Critical natural resources such as water remain the most scarce basics in the county.

Based on Kenya Population and Housing Census of 2009, the total population for the county was 260,107 persons in 2009. Moyale sub-county had the highest population of 80,550 persons while Sololo sub-county had the lowest with 13,495 persons. Following table profiles the population data for each sub-county.

Table A2.1.1 Population Distribution of Each Sub-county

Marsabit Central	Marsabit North	North Horr	Marsabit South	Loiyangalani	Moyale	Sololo	Total
46,502	29,561	45,635	18,253	26,111	80,550	13,495	260,107

Source: Kenya Population and Housing Census 2009

In May 2012, the Project conducted a survey in each district in Turkana and Marsabit Counties to seize the district profile on a sublet basis. Summary tables of seven district profiles for Marsabit are shown in Table BA3.1.1 in Annex A. Since a district profile survey was conducted before the decentralization process, those tables show the condition based the district administration system as of May 2012.

2.1.2 Climate

Marsabit is classified as an ASAL region with hot and dry weather conditions.

Typical of climatic conditions characteristics are limited to true desert in most of the vast county, it experiences low rainfall amounts, high temperatures combined with high potential evapo-transpiration exceeding actual annual precipitation that leads to marked moisture deficiency for most of the year. Due to variations in the terrain, rainfall also varies with elevations. For instance, lowest part receives less than 200 mm of rainfall per annum; while Mt. Marsabit gets much higher rainfall (1,700 mm) and means annual rainfall of 800 mm. The rainfall displays both temporal and spatial variation and is bimodal in distribution. Drought as phenomenon is common in many parts, putting severe stress on the fragile and arid ecosystem. With exception of few relatively wetter areas on the top of mountains like Mt. Marsabit and Kulal most of the area is classified as within the semi-desert or desert eco-climate zone.

Monsoon winds from the east and south east direction influence the altitudinal limits of vegetation on Mt Marsabit; high-altitude part of Mt Marsabit is in the path of the monsoon winds from the southeast.

As a result, the mountain area is normally swept by a strong hot wind from the north east throughout the dry season. The importance of this wind direction spreads risk of a grass fire from the northeast and eastern sides that the Mt Marsabit forest.

Table A2.1.2 Average Climate Data of Marsabit

Marsabit Station				
Month	Mean Temperature °c		Mean Total Rainfall (mm)	Mean Number of Rain Days
	Daily min	Daily max		
Jan	15.7	25	92	6
Feb	15.9	25.7	60	3
Mar	16.2	25.7	91	7
Apr	16.7	24.9	149	9
May	16.1	24.8	54	5
Jun	14.6	24.4	14	4
Jul	13.8	23.8	17	3
Aug	13.5	24.1	8	4
Sep	14	25.1	9	2
Oct	15.4	25.2	62	6
Nov	16	23.8	91	9
Dec	15.9	24.2	46	6
			693	64

Source: World Meteorological Organization (http://worldweather.wmo.int)

2.1.3 Water Resources

(1) Natural Water Sources

Marsabit has limited water resources. The Turkana Lake is saline and is of limited use for human consumption. Permanent rivers are non-existent. There are three crater lakes that are located within the Marsabit Mountain in Marsabit Sub-county that supports abundant wildlife in the Marsabit National Reserve. The major water sources are therefore crater lakes on Mt. Marsabit, springs on Mt Marsabit, at foot slopes of Ndoto Ranges, and margin of Chalbi Desert.

(2) Developed Water Points

Shallow wells and boreholes are the major water source for domestic and livestock consumption in seven sub-counties. The numbers of the developed water points in the county are summarized in the table below.

Table A2.1.3 Number of Developed Water Points

Sub-county	Shallow wells	Boreholes	Pans	Rock-catchments	Buried tanks	Springs
Marsabit Central	30	5	20	1	60	1
Moyale	250	16	38	1	33	0
North Horr	10	3	3	0	3	0
Marsabit North	40	12	6	3	30	0
Sololo	0	10	10	2	2	0
Marsabit South	300	22	30	7	3	0
Loyangalani	20	5	6	0	5	0

Source: District Water Offices, Marsabit County (June 2012)

2.1.4 Road Network

The road network in Marsabit County was poor when the ECoRAD Project started. From Nairobi, the main road stretched through Nanyuki, and Isiolo via Marsabit and reaches Moyale covering a distance of over 500 km in bad condition. Roads connecting the various sub-counties in Marsabit County were also very bad and were only passable during dry seasons. The main A2 highway connecting Nairobi and Moyale via Marsabit has been improved to asphalt pavement up to Merrille, a distance of over 100 kilometers from Isiolo Town.

Later on road between Marsabit town to Turbi was paved with asphalt and, consequently road access between those towns greatly improved. The road between Merrille to Marsabit town has been under construction to bitumen standards

Since several roads are under up-grading works, current road status is not clear. The table below shows the condition of the roads in the whole county before starting the rehabilitation works.

Table A2.1.4 Types of Roads Infrastructure in Marsabit Sub-county

District/Sub-county	Asphalt paved roads	All weather gravel roads	Dry season earth roads
Marsabit Central	0 km* (but under upgrading works)	407.4 km	1629.9 km*
Moyale	0 km* (but under upgrading works)	406.2 km	406.2 km*
North Horr	0 km	278.0 km	1,104.0 km
Sololo	0 km* (but under upgrading works)	200.0 km	150.0 km*
Marsabit North	0 km* (but under upgrading works)	202.0 km	808.8 km*
Loyangalani	0 km	291.0 km	300.0 km

*: Length should be changed after upgrading works.

Source: Key Informant Interviews of JICA Project Team (June 2012)

2.2 Condition in Turkana County

2.2.1 Socio Economy

Turkana County is one of the counties in the ASAL in Kenya. The county is located in north western Kenya bordering Marsabit County to the east, Samburu County to the south east, and Baringo and West Pokot Counties to the south. It has a total geographical land area of approximately 68,680 km^2.

According to the Kenya Population Census 2009, population in 2009 was 855,399, but Turkana County has an estimated population of about 954,133 as at 2012. About 99% of the populations are Turkana while Somali are about 1%. Distributions of the population within the county are shown on sub-county basis the table below. The county is sparsely populated with a rural area population density ranging from two to nine square kilometres and a general average county population density of 12.45 persons/km^2.

Table A2.2.1 Population Distribution of Each Sub-county

Turkana Central	Loima	Turkana North & Kibish	Turkana West	Turkana South	Turkana East	Total
163,200	119,662	100,691	234,945	189,864	145,771	954,133

Source: Turkana Sub-county Development Plans 2008 – 2012

In May 2012, the Project conducted a survey in each district in Turkana and Marsabit Counties to seize the district profile.

Summary tables of six district profiles for Turkana are shown in Table BA3.2.1 in Annex A. Since a district profile survey was conducted before the decentralization process, those table shows the condition based on the district administration system as of May 2012.

2.2.2 Climate

Turkana County lies within ASAL which are characterized by harsh climatic conditions. Rainfall is generally low and occurs during April / May and October / November. The total annual precipitation, which ranges normally 100 - 300 mm is unreliable and shows considerable temporal and spatial variability. Temperatures are usually high and range from a minimum of 22.1 °C to a maximum of 36.4 °C.

Table A2.2.2 Average Climate Data of Turkana

Lodwar Station				
Month	Mean Temperature °c		Mean Total Rainfall (mm)	Mean Number of Rain Days
	Daily min	Daily max		
Jan	22.1	35.6	8	1
Feb	23.2	36.2	8	2
Mar	24.2	36.4	21	2
Apr	24.5	35.1	48	4
May	24.6	34.7	24	1
Jun	24.2	34.1	9	1
Jul	23.7	33.1	19	1
Aug	23.8	33.6	10	1
Sep	24.3	35.0	5	2
Oct	24.8	35.4	9	1
Nov	23.8	34.7	17	2
Dec	22.5	35.0	12	1
			190	19

Source: World Meteorological Organization (http://worldweather.wmo.int)

2.2.3 Water Resources

(1) Natural Water Sources

There are two permanent rivers, Turkwel River and Kerio River that traverse the central and south-eastern parts of the County. In addition, there are numerous seasonal rivers and *laggas*. During the rainy season these rivers and *laggas* experience flood flows which are marked by heavy sediment loads and rock boulders. Flood water and rich alluvial soils extend onto the river plain that is occasionally cultivated after heavy rainstorms. When the rivers dry up, open-pit wells are dug along the riverbeds in order to get water for watering livestock and for domestic use.

(2) Developed Water Points

The types of water facilities developed in the sub-counties of Turkana are shown in table below.

Table A2.2.3 Number of Developed Water Points

Sub-county	Boreholes	pans	Rock catchments	Shallow wells	Springs
Turkana Central	42	6	2	45	4
Loima	36	4	-	32	3
Turkana North	82	18	-	15	5
Turkana West	13	35	3	87	3
Turkana South	36	3	-	24	3
Turkana East	25	10	-	18	2
Total	234	76	5	221	20

Source: Data from Sub-county Water Offices, Turkana County (June 2012)

2.2.4 Road Network

Turkana County has a total road network of 489.2 km of bituminous asphalt surface, 590.6 km of gravel surface and 2,310.5 km of earth surface (District Development Plans 2008 - 2012). A summary of road network is as shown in table below.

Table A2.2.4 Types of Roads Infrastructure in Turkana Sub-county

Sub-county	Tarmac roads	All weather gravel roads	Dry season earth roads
Turkana central	102 km	156.0 km	168.0 km
Loima	68 km	104.0 km	112.0 km
Turkana North	0 km	63.9 km	659.5 km
Turkana West	163 km	33.7 km	650.0 km
Turkana South	0 km	103.0 km	290.0 km
Turkana East	156 km	130.0 km	431.0 km

Source: District Roads Offices & Turkana District Development Plans 2008-2012

Bitumen surface roads include Kitale - Lodwar - Lokichoggio (A1) Road and Lodwar - Kalokol (D348) Road. Gravel roads link the sub-county headquarters and major trading centres.

The two main roads constructed to bitumen standards have sections of the carriage with worn out surface and in dire need of repairs, overhaul and reconstructions. Such weak spots act as constrictions to smooth traffic flows. Gravel and earth roads are dusty during the dry weather, a condition that inhibits better visibility and therefore reducing the effective speed and flow of traffic. During the rainy season, many sections of the roads (bitumen, gravel and earth surfaces) are washed away by flush floods (*laggas*), encroaching rivers leaving behind gulley and collapsed pavement structures. Other sections become slippery and vehicles get stuck. On the other hand, flush floods deposit rock boulders, mudslides and debris on sections of the road network. These phenomenon impacts negatively on traffic flow resulting in cut off road communication, during severe cases.

2.3 Government Organization and Policy in the Northern Kenya

2.3.1 Progress of Devolution

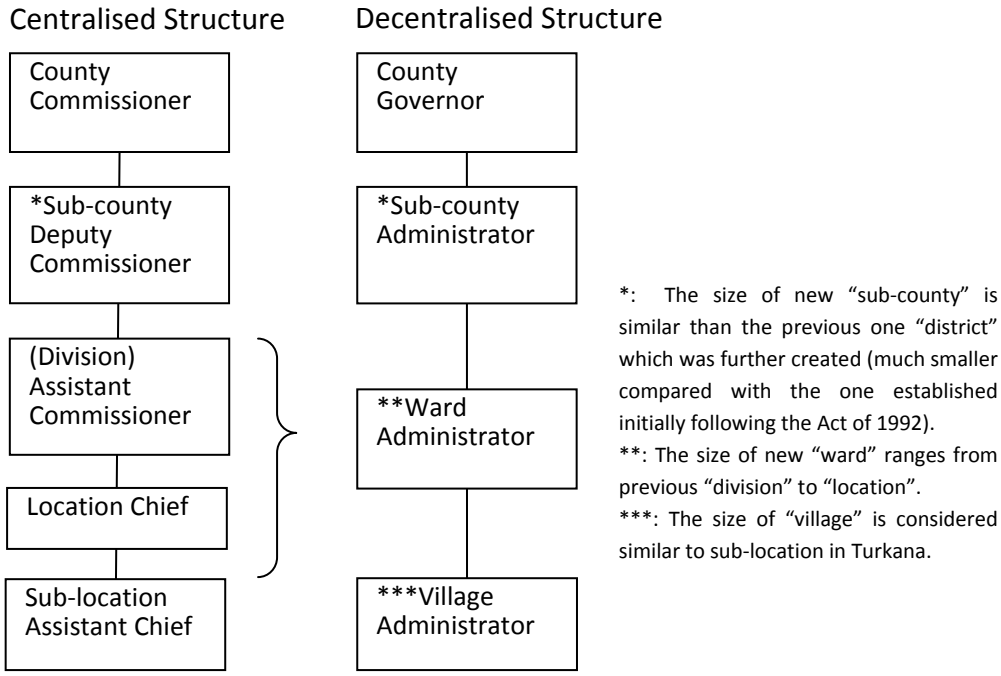
The new constitution of Kenya was promulgated on August 2010. Under the previous constitution, public sectors were defined as centralized ones while under the new constitution, they are defined as comprising two levels of government: a national government and 47 county governments, which are equivalent to the districts established under the Districts and Provinces Act of 1992. By this, some government functions have been devolved to county governments from the national government. According to the new constitution, the national government has the mandate for security, foreign affairs, policy and some national infrastructures. On the other hand, county governments are responsible for public service delivery of major development activities in their areas.

When the ECoRAD Project started in 2012, the governance system of Kenya was still under the centralized system. After the general election in 2013, the county governments system has gradually been set up taking one to two years. In 2015, though some of the positions were not yet fully filled, the county governments system began its operation.

2.3.2 Administrative Unit

The new constitution defines Sub-counties, Wards and Villages as administrative units under each county. The decentralized administration structure is as shown in Figure B2.3.1. Sub-counties are almost equivalent to former Districts, while boundaries of Wards are newly created, each of which generally covers a smaller area than former Division but larger than Location. The village as the administrative unit of a county is different from the Sub-location in the former central government. Boundaries of Villages in county governments have not been fixed yet in most counties. At each unit level, administrators are supposed to be appointed through competitive process. Transition to the new

system in these administrative units, however, have been still in process, and the administrative structure of the central government as shown in Figure B2.3.2 has remained although sub-county and ward administrators have already been appointed in some counties. At community level, chief and assistant chief who were appointed in the centralized period still function in order to implement activities and resolve conflicts in their areas since Village administrators have not been appointed yet. A comparison between centralized and decentralized administration is shown in Figure A2.3.1.



Source: JICA Project Team based on hearing from the county governments

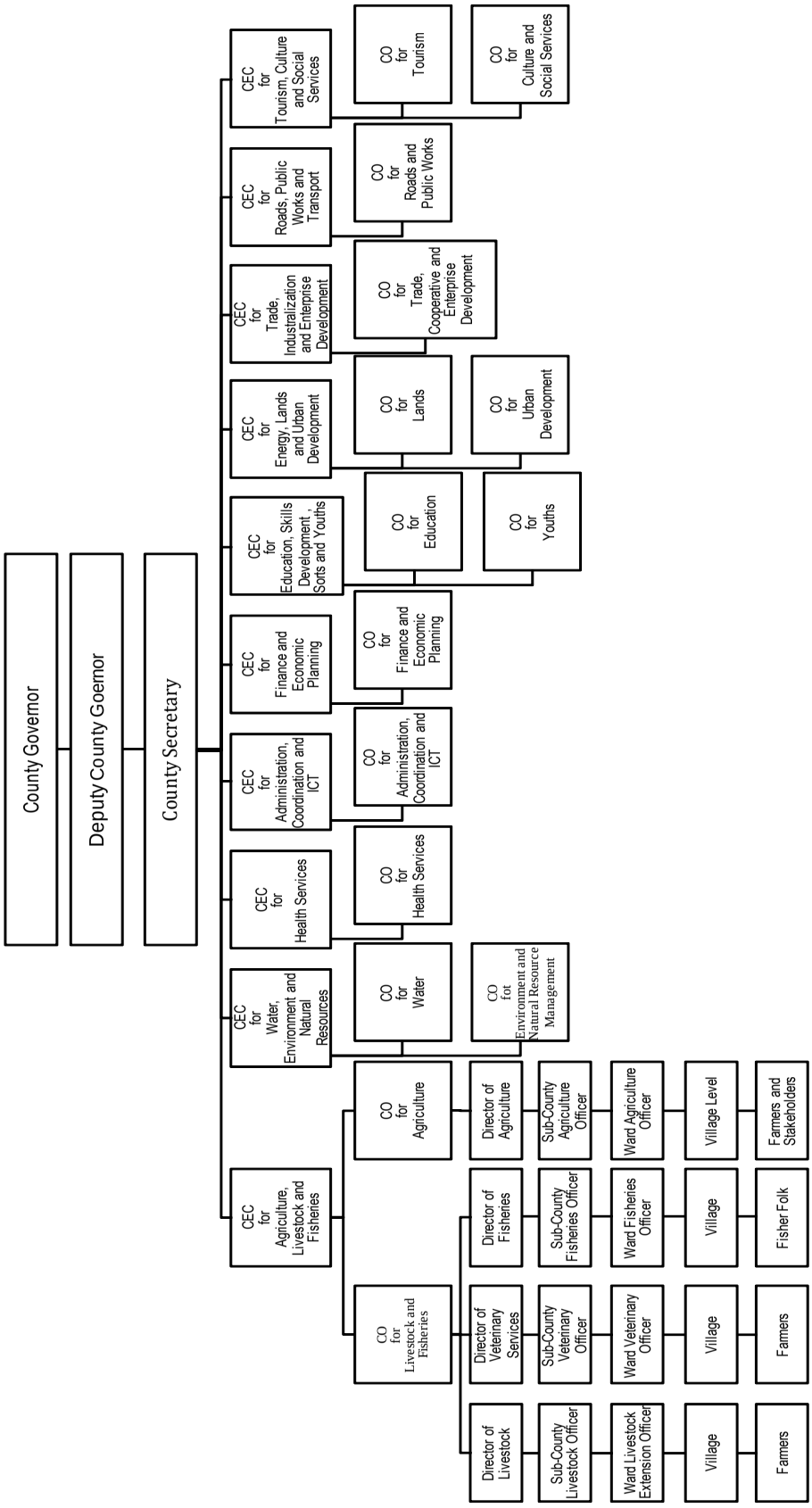
Figure A2.3.1 Comparison: Centralized and De-centralized Administration

There are seven Sub-counties and 20 Wards in Marsabit County as shown in Table B2.3.1. All Sub-county and Ward administrators have been already appointed in Marsabit County. In Turkana County, there are seven Sub-counties and 30 wards as shown in Table B2.3.2. Out of these, all Sub-county and 27 Ward administrators have been appointed in Turkana County. Village councils will be formed under charge of village administrator, which shall be decision making bodies consisting of village elders.

2.3.3 Public Service Office in Marsabit and Turkana County Government

According to the constitution, each county government is comprised of a county assembly and a county executive committee. Members of a county executive committee are the county governor, the deputy county governor and the members who are equivalent to ministers appointed by the county governor. Functions of the county executive committee are to implement the county legislation, manage and coordinate the function of the county administration and so on. A county governor can decide which ministers he/she puts in within the county executive committee and how he/she forms organization structures according to the situation of his/her county.

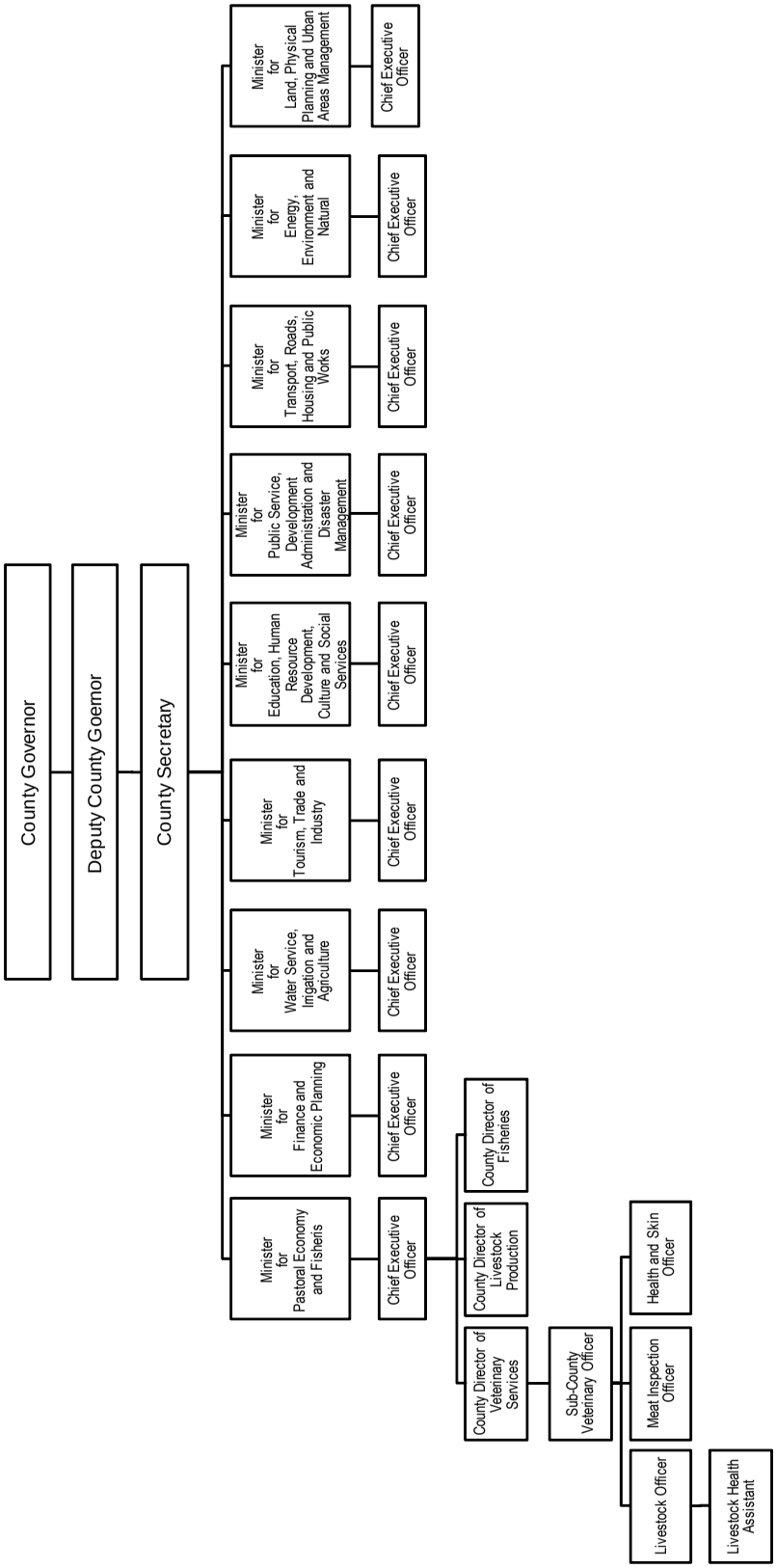
In Marsabit County, there are 10 technical ministers and 15 chief officers under the county governor as shown in Figure A2.3.2. On the other hand, in Turkana County, there are 9 technical ministers and 9 chief executive officers under the county governor as shown in Figure A2.3.3. These two county governments have different technical ministers following the functions of county governments defined under the constitution. For example, in Marsabit County, the Ministry of Agriculture, Livestock and Fisheries is in charge of agricultural fields, while in Turkana County, the ministry which is in charge of agriculture sector is the Ministry of Water Service, Irrigation and Agriculture.



Note: the organization of the Ministry for Agriculture, Livestock and Fisheries is shown as an example of the structure inside a ministry. Similar structure is followed for the other ministries.

Prepared by JICA Project Team based on website and hearing from Marsabit county government

Figure A2.3.2 Organization Structure in Marsabit County Government



Note: the organization of the Ministry for Pastoral Economy and Fisheries is shown as an example of the structure inside a ministry. Similar structure is followed for the other ministries.

Prepared by JICA Project Team based on hearing from Turkana county government

Figure A2.3.3 Organization Structure in Turkana County Government

2.3.4 Other Related Organization in the Context of Drought Management

The National Drought Management Authority (NDMA) is one of the semi-autonomous government agencies under the Ministry of Devolution and Planning established by the State Cooperation Act (Cap 446) of the Laws of Kenya by Legal Notice Number 171 of November 2011, which provides coordination and leadership of Kenya's efforts in the management of drought risks and enhancing adaption to climate change. The NDMA has 23 county offices including Marsabit and Turkana Counties, and they produce reports on drought monitoring and early warning for their counties every month.

In Marsabit and Turkana Counties, there is a coordinating mechanism for drought management, called 'County Steering Group Meeting', coordinated by the NDMA with participants of the county government ministries and development partners working in the counties on drought related activities.

2.3.5 County Integrated Development Plan

As a result of the devolution process, county governments have now become important stakeholders of development. Currently, each county government prepares the County Integrated Development Plan (CIDP), which is a core development plan in each county to be followed by all stakeholders. The plans were prepared in both Marsabit and Turkana Counties and are briefly summarised as follows:

(1) Marsabit County

The vision is to be a cohesive and prosperous county of choice; and the mission is to spearhead transformative and sustainable development towards quality life. The plan targets five years from 2013 to 2017.

For the development priority program and projects, nine sectors are used, namely: Agriculture and Rural Development; Energy, Infrastructure and ICT; General Economic, Commercial and Labour Affairs; Health; Education; Public Administration and International Relations; Social Protection Culture and Recreation; Governance, Justice, Law and Order; and Environmental Protection, Water and Housing, which are related to the organization of the county government.

In terms of community based drought management, the emphasis is scattered under the above technical sectors, and not well presented as a specific focus area like the CMDRR approach.

(2) Turkana County

The vision is to be a prosperous, peaceful and just county with an empowered community enjoying equal opportunities; and the mission is to facilitate socio-economic transformation of Turkana through sustainable use of resources to ensure a high quality of life for the people of Turkana County. The plan targets five years from 2013/14 to 2017/18.

The county development priority programmes and projects are shown based on the following sectors; namely Agriculture, Water Services and Irrigation sector; Health and Sanitation Services Sector; Energy, Environment and Natural Resources Sector; Public Service, Decentralized Services and Disaster Management Sector; Tourism, Trade and Industry Sector; Pastoral Economy and Fisheries Sector; Human Resource and Development, Gender, Children and Social Services Sector; Transport, Roads, Housing and Public Works; and Education Sector, which are also related to the organization of the county government, slightly different from Marsabit indicating a different perception on development.

Unlike the Marsabit CIDP, the description related to community based drought management is found in the plan. Especially in Chapter 7, "County Development Priority Programmes and Projects", the CMDRR approach is planned to be adopted for two planned projects, namely "Turkana Multi Hazard Preparedness and Response Contingency Plan and DRR strategy", and "Disaster Management and Disaster Risk Reduction Capacity Building" under Public Service, Decentralized Services and Disaster Management Sector.

2.4 Present Conditions and Constraints Related to the Components of the Project

2.4.1 Community and DMC

(1) Situation and Concept of "Community"

In the current Northern Kenya society, the word 'community' has been widely used. However, what they actually imply may be different from the other people who mention the 'community'. "Community" can mean an administrative zone such as Sub-location for administrator, a kraal for those that graze around, a clan for elders, or all the users of a water pan for herders. This means people are forming and living in a different unit of society depending on the purpose and activities they serve. For example, an administrative unit are mostly used when government interventions are provided, and traditional decision makings are done within clans.

(2) Situation of Existing Committees Related to Community Resilience

Drought management committees or similar others have been formed in particular projects. Moreover, there have been several committees formed through different government schemes, such as Development Committees (DCs) under the policy of District Focus for Rural Development (DFRD) that have mostly disappeared, Community Development Committee (CDC) under Arid Lands Resource Management Project (ALRMP), and Disaster Management Committees under Disaster Management Policy of the government. Existence of several different committees brought confusion in the community. The situation regarding the committees of the above mentioned CMDRR related government structure varies on the ground. A major activity of the existing drought management related committees seems to be implementation of particular economic or income generation activities, which could be intended to enhance self sustainability. However, some of the activities do not serve to enhance resilience against drought for a good number of the community members, but to benefit only the committee members. Judging by the perception of the community in 11 selected sites, most of these committees were formed to implement activities of the projects with some funds provided, thus they got dormant after running out of the provided funds.

There are many committees and groups in communities with different mandates and activities. In most cases, these local institutions were established to handle particular technical issues or activities such as water management committees, livestock marketing management committees, and some the Income Generating Activity (IGA) groups to conduct some business activities. Some were formed though their own initiatives, while many were introduced from outsides. There were also committees established in a government schemes to handle issues of each line ministers, such as Environment Management Committee, School Management Committee, and Committee for health centre. In addition, external projects are establishing management committees for them.

2.4.2 Natural Resource Management

(1) General

In ASAL areas, water facilities to be used for livestock and domestic water supply in pastoralist communities are classified as shown in the below table.

Table A2.4.1 Type of Water Points for Pastoralists

Type of water points	Water source	Water source facility
Water pan	Surface water and rainwater	Reservoir pond for harvesting rain water and surface water from relatively small catchment, generally excavated below ground level.
Rock catchment	Rain water	Rainwater harvesting facility with water tank, constructed on lower reaches of bare rock without fractures or cracks, where runoff losses to the soil, vegetation and structures is minimized.
Sand dam	Surface water	Storage dam build on and into the seasonal riverbed, effectively increasing volume of groundwater available for abstraction. Water is captured through a scope hole, hand-dug well or tube well.

Type of water points	Water source	Water source facility
Sub-surface dam	Riverbed water	Storage dam consists of a vertical, impermeable barrier through a cross section of a sand-filled seasonal river bed.
Shallow well	Groundwater and riverbed water	Wells drilled along seasonal rivers by machine or manpower. Water is abstracted by pump and manpower.
Borehole	Groundwater	Wells drilled by machine, from which water is abstracted with pump and flowed into trough for livestock though pipe.
Spring	Spring	Small inlet structure provided with concrete wall Water is generally abstracted through pipeline, or directly flowed into trough for livestock

Source: JICA Project Team

(2) Marsabit

Water Resources Assessment (WRA) that was executed by GoK and the Government of Netherlands from 1993 to 1996 suggested Forole, Turbi, Golole and Ngurnit-Illaut-Korr triangle as potential rock catchment areas, while water pan development is limited. Shallow groundwater is expected in the north-western and southern parts of the Marsabit County and near Moyale Town. The report revealed that about 40% of the study areas have no potential for deep groundwater potential.

Water Source Assessment and Mapping (WDAM) conducted by Oxfam Quebec in 2003 assessed the proposed development options that distribution of permanent water sources for livestock within the county is sufficient, and overgrazing is evident around the permanent water sources, taking into consideration the pasture condition and accessibility to water sources.

1) Rainwater harvest in Marsabit

Water pan / dam and rock catchment can be developed in certain areas in the Project area, even though there is not ideal potential site due to limited rainfall and high evaporation. There are certain numbers of bare rock outcrops probably usable for rock catchment from a technical viewpoint, except desert areas.

2) Surface water in Marsabit

Apart from the Badasa dam with water supply pipeline system toward Marsabit City, there is no identified plan for a relatively large scale surface water resource development.

3) Subsurface water and groundwater in Marsabit

Potential of the groundwater is low in Marsabit. In addition, the operation and maintenance (O&M) activities for pumps and the diesel generators in the existing boreholes are not properly achieved in many cases.

(3) Turkana

Water resources for the pastoralist communities in Turkana are limited to i) groundwater utilized from shallow wells and boreholes, ii) riverbed water pools in the seasonal rivers, and iii) small scale harvesting of surface water and rainwater, such as water pans, sand dams and rock catchment. During the drought period, water resources are not sufficiently reserved nor recharged and dry up, resulting in severe water shortages. Deep wells water levels recede discharges decrease and some of the wells even dry up. This forces the pastoralists to move for long distance to water points causing deterioration of the grazing area due to concentration of their livestock around the limited available water points .

1) Rainwater harvest in Turkana

Water pan / dam and rock catchment can be developed in certain areas in the Project area, even though there are no ideal potential sites due to limited rainfall and high evaporation.

2) Surface water in Turkana

As for surface water, there is no other permanent river except the Turkwel River in the county. Seasonal Rivers were considered as water sources in the Project by development of small storage dams and water pans. Lake Turkana water is alkaline and lies at low altitude, and is not considered as a potential source at present. Other lakes and swamps including craters have water which is mostly seasonal and mainly used by wildlife.

3) Subsurface water and groundwater in Turkana

Investigation and potential study were conducted in ECoRAD in collaboration with UNESCO, and results evaluation on groundwater potential are shown in Annex E.

(4) Other Constraints in Water Resource Development

Other constraints observed regarding NRM are as follows:

- Sedimentation in water pans resulting in reduction of effective storage of water:

  Even though maintenance work, especially sediment removal is inevitable, it is difficult for herders to desilt when there is water in the pans. On the other hand, after a pan dries up at the end of the dry season, the herders need to move in search of water. Community participation in desilting has been a problem because the communities have mainly relied on external support;

- Problems in structures and functions of water pans:

  It was observed that embankments of most water pan and dam are insufficiently compacted. Some dams / pans have no spillway that is important to protect the embankment from over flow;

- Shortage of drinking water supply due to increasing water demand:

  It was widely observed that the villagers are facing serious shortage of their drinking water due to lack of adequate water facilities or deterioration of existing ones caused by lack of maintenance, while water demand is increasing; and

- O&M problem for pumping water system:

  It is noted that the O&M activities for diesel pump system at the existing boreholes are not properly done in many cases, relying on external financial support for the maintenance.

(5) Grazing Pattern

In ASAL area, the conditions of pasture in rangeland are affected by rainfall. And generally speaking, such rainfall pattern varies so drastically year by year. Thus spatial rainfall condition should be deeply considered to identify reliable grazing areas. There are specific grazing patterns and migratory routes for each ethnic group within the pastoralists. However, each tribe has their own territory and own grazing areas which they respect and accept mutually based on their tribal histories.

Migratory routes of the major ethnic groups of the Project target areas in Marsabit are as follows;.

- Rendille people have three major routes; from Korr going south towards Merille up to Isioro during drought, from Kargi going west towards Arapal up to Lake Turkana during drought, and from Loglogo moving towards southeast of Marsabit.
- Gabra people, with their main livestock of cattle and sheep, normally graze around Hurri hills, Tull Galla and Tull Dimuto areas, and move to northwards up to the Ethiopian border.
- Gabra herds with camel and goat move to south during drought towards the northern foot of Mt. Kulal.

- Boran people normally graze around Galgal plain as it is pasture rich, and move to Ethiopia during drought. Those in Dirib Gombo and Jaldesa move eastwards and migrate south towards Yamicha during drought.

The grazing areas in the Turkana County can be broadly classified into rainy season, dry season and rainy/dry season grazing areas. The plains stretching from the relatively low altitude interior toward Lake Turkana are utilized as rainy season grazing area, while the northern mountainous region (Kadingetom range, Lorienetom range, Lokwanamoru range, Lapurr range, Mogila range, Songot Hills), western mountainous region (Moru-Angithiger Loima Hills, Puch Prasir Plateau, Uganda escarpment), southern mountainous region (Loriu Plateau) and the Turkana lakeside region make up the dry season grazing area. Cattle mainly graze in these high altitude dry season grazing areas. During drought, they cross over the Uganda escarpment into Uganda. The areas along the banks of the Turkwel, Kerio, and Tarach Rivers and other river basins are utilized as rainy/dry season grazing areas. Experience dictates when and where to move, a decision based on the conditions of the year's precipitation, vegetation and security situation. The migratory routes in the county are shown in AnnexD.

2.4.3 Livestock Value Chain Improvement

(1) Marsabit

Based on the study results and observations, following constraints were identified in livestock value chain in Marsabit County:

- Since improvement of livestock market value chain and revitalization of livestock market are focal issues in Northern Kenya, there were so many interventions which were implemented by the Government, and donors. However, such attempts did not provide good success in Northern Kenya. Even when new livestock market facilities were constructed in many communities, they did not sell their livestock unless they needed cash immediately for specific reasons, such as buying food, education fee, etc. This is because possession of livestock is prestigious in a pastoralist society.
  It is indeed necessary to invent new approaches in which would encourage pastoralists to sell their own livestock voluntary in their local market. Otherwise all the efforts invested in, such as construction of new market facilities and market training for pastoralists, will be in vain.
- Since migration is a suitable coping mechanism for pastoralists in Northern Kenya, it seems they tend to rely on such activity and overlook significant effect of cultivation of fodder in their livestock activities. In particular, in consideration that nowadays pastoralists' families have started to settle in one place permanently and only herders migrate seasonally with animals, fodder cultivation near village can support them a lot, in particular for dairy shoats and young animals which remain in villages throughout the years.
  There are not many places where fodder can be cultivated in the field, cultivation in such areas should be recognised as a strong tool for combating drought; and
- High and constantly increasing transport cost significantly affect market performance and efficiency. For example the only good road in Marsabit is the one between Marsabit town and Turbi. Other roads in the sub-counties are generally poor and often impassable when it rains. Poor roads have the impact of increasing costs when transporting livestock throughout the county.

(2) Turkana

In Turkana, there are almost same constraints which were observed in Marsabit livestock. In addition to the above, the following constraints were observed:

- Since there are much more transactions of livestock than in Marsabit, some of the market facilities are not equipped well for further development of trades. In particular, some local markets did not

have essential facilities for large scale trade with external dealers, e.g Nairobi traders, such as loading lump, holding pen in which large animals can be kept during market day, shade house which can facilitate prolong operation hours of market; and

- In livestock markets in Turkana County, generally there are no specific market days in each market, except Kerio and Nakerio, and the traders and producers have their activities everyday in the markets. Such arrangements of operation were a big advantage for producers who want to sell their animals in their convenient time. This however was not good for traders, especially those who come from remote places, such as Nairobi traders.

It is highly recommended that a specific market day is fixed for each market, taking into consideration scheduled days for adjacent markets to avoid overlaps where the numbers of traders from Nairobi are split into markets within the same region.

Details should be referred to Chapter F1 in Annex F.

2.4.4 Livelihood Diversification

(1) General

In general, compared to the central and lower parts of Kenya, both Marsabit and Turkana Counties have a harsh arid climate, low infrastructure development (poor road and low mobile phone coverage), minimal access to services such as banking and government support except relief food. Also, as a whole, it is said that pastoralists may be willing to try new ideas but adoption takes slightly longer, and their dependant attitude has been fostered due to exposure to relief support. All these are factors hindering economic growth.

(2) Marsabit

Considered with the resource available in Marsabit County, eight potential measures were identified, and their constraints were examined.

Table A2.4.2 Constraints and Lessons for Identified Livelihood Measures in Marsabit

Measures	Constraints and Lessons
Chicken	1) Large Scale Production with improved Breed a) Lack of Self-Reproduction b) Expensive Price of Feed c) Diseases 2) Small Scale Production with Indigenous Breed a) Low productivity b) Predators 3) Potential Poultry Keepers a) Lack of access to indigenous chicks b) Lack of capital for starting poultry keeping c) Inadequate knowledge
Gum and resin	Gum Arabic is produed and dealt with by comunity but the production volume is very minimal, leading to less attactive commodity to buyers.. Unlike Gum production, training for resins production has never been conducted. In addition, economic value and market potential of resins are still not yet known for the producers in production area.
Aloe production	Although the demand for products containing aloe is increasing globally, there is not yet an established aloe market in Kenya. In Marsabit, the commercial value of aloe is not at all known and wild aloe is slightly used in traditional way. Although well established market channels for aloe trade will have significant beneficial impact to the livelihood of the dry-land communities, it is too early to take into consideration commercial value of aloe for the moment.
Small scale agriculture	Although many people proclaim that vegetable production increases by introducing greenhouse or nets, it is not easy for other farmers to introduce them on their own effort. Such facilities generally come from Nairobi and the price is very high. In addition, even if the introduction of locally made facilities succeeds, the problem of lack of water source is not yet solved. Development of new irrigation system or rehabilitation of existing irrigation systems is very expensive and it is not easy to get enough funds.

Measures	Constraints and Lessons
Milk	There are several difficulties for milk production and marketing in Marsabit as follows; - Unsustainable milk supply - Low productivity of milk - Poor infrastructure - Milk processing - Traditional culture
Natural salt	Salt trade has been done by various people before. There is evidence that there was an established group that carried out this trade but the activities fizzled out after the group leader passed on. There are also issues of concern as far as marketing is concerned.
Honey production	Small scale honey production is observed in areas where there are relatively high trees concentrations such as the hillside of Mt. Marsabit or forested areas in Marsabit South. Among all, Ngurnit is well known of its honey production potential. In Ngurnit town.
Merry go round	Merry Go Round is one of the systems that have been used by many communities to cushion members against certain calamities, and is widely implemneted. There is a new thinking that apart from money, new concepts can be introduced that will bring about group cohesion and new ways of thinking in approaching issues of concern especially drought impacts in these areas, because this system is well known in the areas.

Source: JICA Project Team, refer to ANNEX G2 for more detail.

The information on the advantage and disadvantage of the current livelihood measures can be useful and was referred to in the selection and implementation of sub-projects.

(2) Turkana

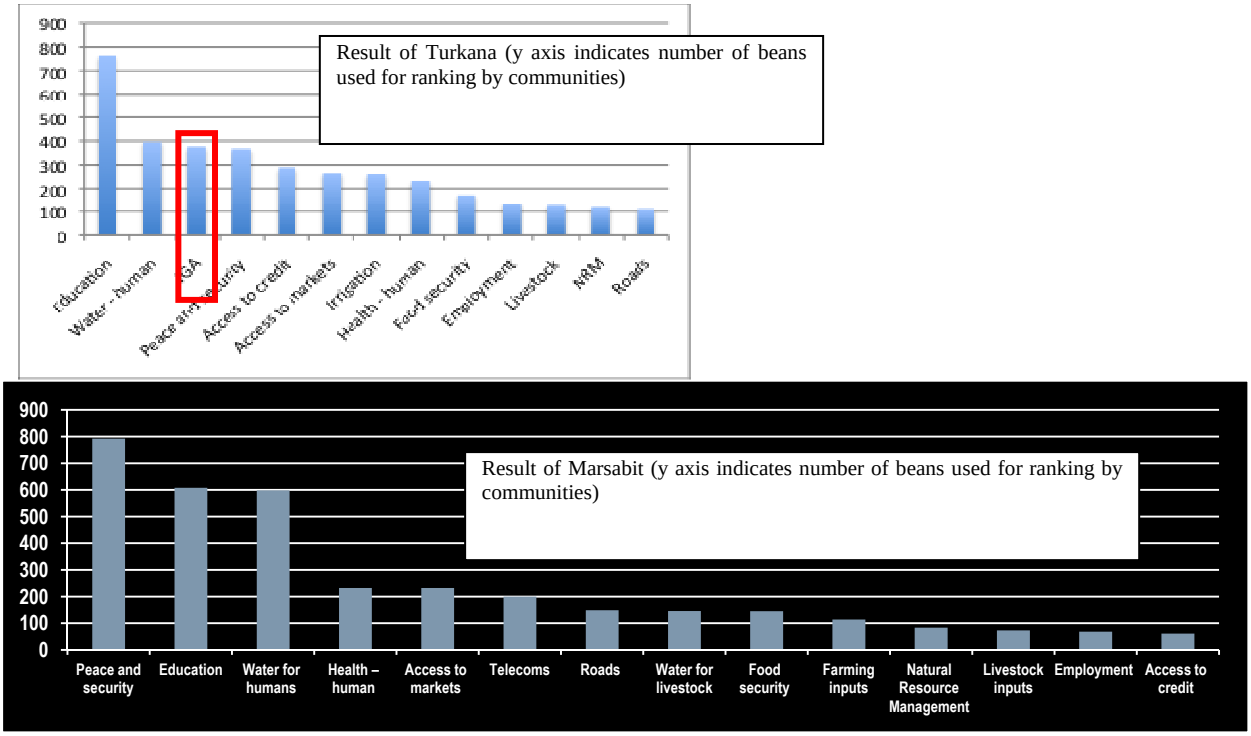
The following livelihood measures were found in general, but not limited, in Turkana County (ILRI Research Report 5, 2008):

- Agriculture;
- Fishery;
- Weaving of mats and baskets;
- Collection and sale of aloe, gum arabic, honey, wild fruits, firewood;
- Production and sale of charcoal, and alcohol;
- Processing and sale of skins and hides;
- Chicken production;
- Gold mining;
- Petty itinerant; and
- Kiosk-based trade.

They are generally exercised based on spatial characteristics, such as available resources (proximity to water/river for agriculture, Turkana lake for fishery, other available resources like aloe, gum arabic, honey, etc.), and urban or settlement areas for some trades.

According to the analysis on the above measures shown in this report (ILRI Research Report 5, 2008), marketing and value-addition are pointed out the most as weakness. Similarly, the two great constraints identified were, lack of know-how and business skills and, lack of capital and access to credit. These important points should be noted.

The Community Based Resilience Analysis (CoBRA) study supported by UNDP found that IGA and business are the most important livelihoods to prepare for the drought in Turkana as shown below.



Source: materials for CoBRA Workshop held in Lodwar in Oct 2013

Figure A2.4.1 Communities' Rates on Important Issue for Preparedness for Drought in Marsabit and Turkana Counties

The above result shows clear differences in desired preparedness for drought by the communities in Marsabit and Turkana. This provides clues on the needs of the communities, and in Turkana, the community desires IGAs

2.4.5 Capacity Development of Government Officers

The government system was dramatically changed from centralization to decentralization with the promulgation of the new constitution, and some public sectors were devolved to the county government within the Project period. Down to Ward level, transition to the new administrative units has already proceeded while at community level, Location Chief and Assistant Chief in the centralized system are still functioning.

The counterpart to the Project was the Ministry of State for Development of Northern Kenya according to the record of discussion. This however was replaced by the Ministry of Devolution and Planning upon the reorganistion of Government during the implementation. The Counterpart at the county level has changed from the former Ministry to the NDMA in Marsabit and Turkana Counties. The Project implemented its activities in collaboration with the national and county governments after the restructuring.

Under these circumstance, in terms of the capacity development component, on-the-job training was the main form of training targeting the national government officers at the county level, who were the actors in implementing development interventions during the implementation of the sub-projects (especially in the earlier stage). When the county governments came in place, the off-the-job trainings (seminar and workshop) were the major tools for this component especially to the county government officers who were deployed and were new to public development and drought management.

CHAPTER 3. UNDERSTANDING OF DROUGHT AND RESILIENCE

In this chapter, the basic understanding on drought and resilience is reviewed in the context of Northern Kenya, before the Project activities are discussed.

3.1 About Drought

3.1.1 Target People Who Suffer from Drought in Northern Kenya

In principle, drought and its impacts in the context of this report is that which is experienced by the pastoralists, the predominant people living in Northern Kenya and ex-pastoralists. Although drought impacts may include drought to agriculture farmers, who are impacted differently by drought from the pastoralists, they are not included in this report context. Ex-pastoralists are another major group to be discussed in the Northern Kenya context due to the following situation. The number of people known as semi settled and settled people living in settlements/towns has been increasing. One of the reasons is that ex-pastoralists who lost their livestock due to past severe droughts have come to the town centres to find other means of livelihood. They expect some income sources especially in towns where there are more economic activities. Again, due to several other reasons such as recent droughts and conflicts among ethnic groups, access to water and pasture near their settlement areas becomes difficult, males have to go farther to be able to access water and pasture and as a result, women, children, and the elderly have to be left in their settlement with small numbers of livestock.

This report intends to address the impacts of drought on this group of people as well.

3.1.2 Characteristics of Drought for Pastoralist

(1) Climate in Northern Kenya

In Northern Kenya, a year is generally divided into four seasons: long rainy season from March to May, followed by the long dry season from June to November, then short rainy season between mid-November and early January, and lastly, the short dry season from January to March. In a normal year, the long dry season which lasts for about six months is regarded as the most difficult period especially for the farmers who depend on rain-fed agriculture. The pastoralists do not recognise a normal dry season as drought for as long as it rains at the end of the dry season.

(2) Recognition of drought by pastoralists

Drought is identified by the lack of rainfall in a rainy season. For example, the long dry season lasts for six months, if it fails to rain in the following short rainy season, and falls in the following long rainy season, the dry period may extend up to 11 months. This is recognised as a single-year drought. If rain fails and the dry spell continues into the long rain season and only falls in the next short rainy season, the period of the dry season extends to 18 months. If the short rainy season fails again, then the dry period will be 21 months. A dry period lasting for more than two rainy seasons is recognised as multi-year drought, and the situation becomes severe. Since rainfall is unpredictable, pastoralists cannot forecast whether a drought may last for a single year or multi-year. In other words, no one can predict a drought, as it comes gradually, but ends abruptly as soon as it rains.

Based on this understanding, the pastoralists always expect the rain but tend not to start preparatory activities for drought, because they do not have to do anything when rain comes. Then, by the time they realise that a severe drought has come, it is already too late because the situation has reached a point of no return. This is the pastoralists' perception of preparedness, making resilience building difficult.

Further, under the influence of global warming and climate change, the frequency of drought has been increasing. Rainfall patterns have also changed. Pastoralists have pointed out that abnormal rainfall is being observed even during the dry season. These changes are further negatively impacting the local communities who have continually suffered the impacts of recurrent droughts.

(3) Major Difficulties for Pastoralists

1) Natural resource

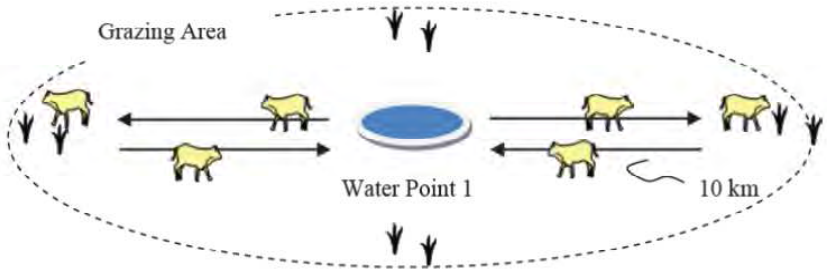
Once the pastoralists recognise a longer period of drought and consume pasture nearby, they start moving to places where water and pasture are available. They can survive for as long as they can find water and pasture to feed their herds. This is the pastoralists' coping strategy which has been adopted for a long time. However, there are issues that may hinder their coping strategy such as population pressure and other social factors that restrict their moving such as insecurity caused by conflicts with other ethnic groups. Due to these issues, less pasture and water are expected in their areas when drought comes. There is therefore need for natural resource development and management focusing on water and pasture.

2) Migratory patterns

In order to accelerate the basic understanding, the migratory patterns by the pastoralists are explained further here.

Migration in normal year

Livestock herds basically migrate between a home village and grazing areas in a year. In a "dry season grazing area", the herds move daily between a water source and pasture rich areas within watering days' intervals. The illustration of movement in dry season grazing area and acceptable days' interval of watering livestock are shown below:



Source: JICA Project Team

Figure A3.1.1 Image of Movement in Dry Season Grazing Area

Table A3.1.1 Interval of Watering and grazing distance of Livestock in Northern Kenya

	Wet Season	Dry Season	Distance[3)]
Cattle	3-4 days	2-3 days	10 km/day
Camel	No drink[1)]	12-14 days[2)]	20 km/day
Sheep & Goat	No drink[1)]	3-4 days	7 km/day

Note 1): Since grasses in wet season contains moisture, animals do not need to drink water.
Note 2): This is for Rendille Camel. In case of Somalia Camel, it is only 5-6 days under the Northern Kenya climate.
Note 3): Under normal conditions (with grazing) of stress level in dry season.
Source: JICA Project Team based on the results of interviews with pastoralists

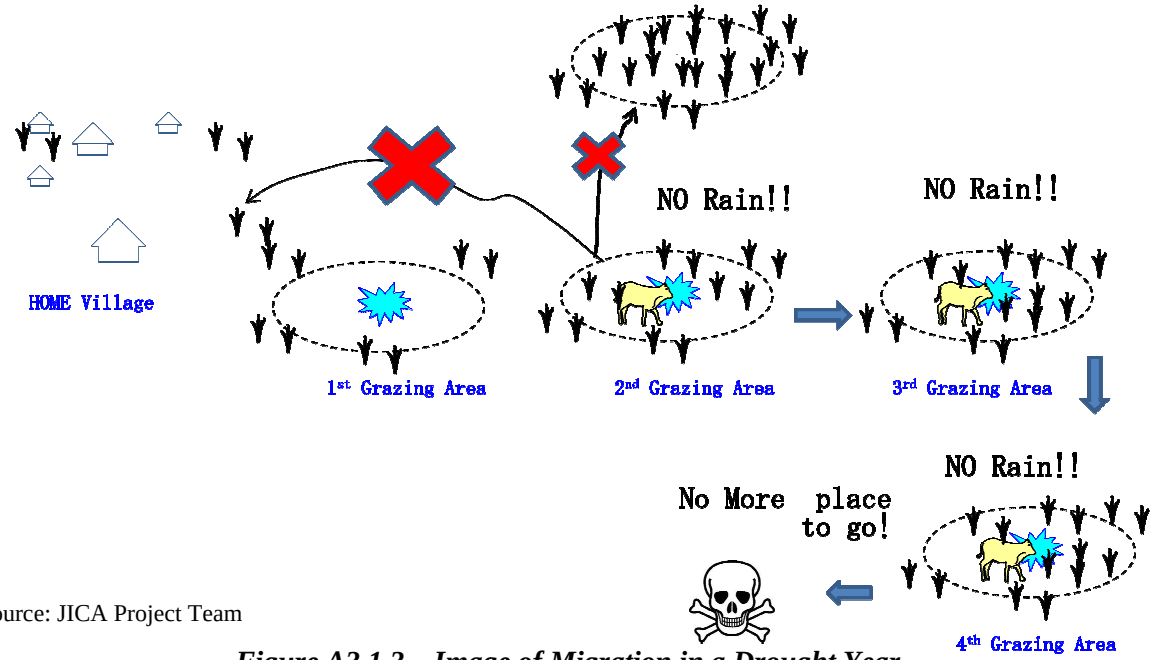
Herds usually stay near their village during the rainy season. When the rainy season is over, and dry season comes, herds start to move to the dry season grazing area (hereinafter referred to as 'dry season GA') where pastures and water are available even in dry season. If the pasture or water is exhausted in a first dry season GA, they move to a next dry season GA. More specifically, if herds cannot find pasture within the range of ten to 20 km radius from the water source, they will start migrating to another dry season grazing area. When rainfall comes, and dry season is over, herds go back to their home village, and stay there for the whole rainy season. In a normal year, herds go back to the home village before their dry season grazing areas are exhausted in a dry season. This process is depicted in the figure below:

Source: JICA Project Team

Figure A3.1.2 Image of Migration in Normal Year

Migration in drought year

Herds have the same migrating pattern in a normal dry season as described in the illustration above, just before drought comes. If herders do not experience the rain, it means that it is the start of the drought. The herders then have to move to next dry season GA. Herds move to another dry season GA as long as they have their next place to go. However, if they do not have their next place to go due to physical or territorial limitations which may cause conflicts with adjacent ethnic groups, the livestock starts to die. This is livestock's death in a typical drought case. This is explained in the following figure:



Source: JICA Project Team

Figure A3.1.3 Image of Migration in a Drought Year

In this sense, strategic water resource development is necessary.

3) Livestock trade

There are many factors influencing livestock trade in Northern Kenya. Pastoralists in general are not willing to sell their animals because of the prestige attached to owning a large number of livestock in their culture. Besides the "prestige" however, there are several other factors resulting in inactive livestock trade especially during a drought spell (see the box below). These factors make spontaneous livestock trade in drought occasions difficult. There is therefore a rationale to improve the livestock value chain in Northern Kenya.

Box. Drought makes the decision making on restocking and destocking difficult.

After suffering the whole dry season, livestock becomes weak and the market price becomes low. Then, if the government declares the drought, the market price drops down severely.

It is a difficult decision whether herders should sell animals at a low price to avoid potential damage from drought, or they should wait for the unpredictable rain in the coming rainy season.

Furthermore, after the drought, restocking is also difficult. When the rain comes at the beginning of the rainy season, people who have lost their livestock in the drought want to buy animals for recovery. But few people want to sell the animals in the rainy season. When more people wanted to buy but few of them wanted to sell, the price of the livestock increases no matter how good or not the health condition is. This ground level mechanism is also needed to be understood.

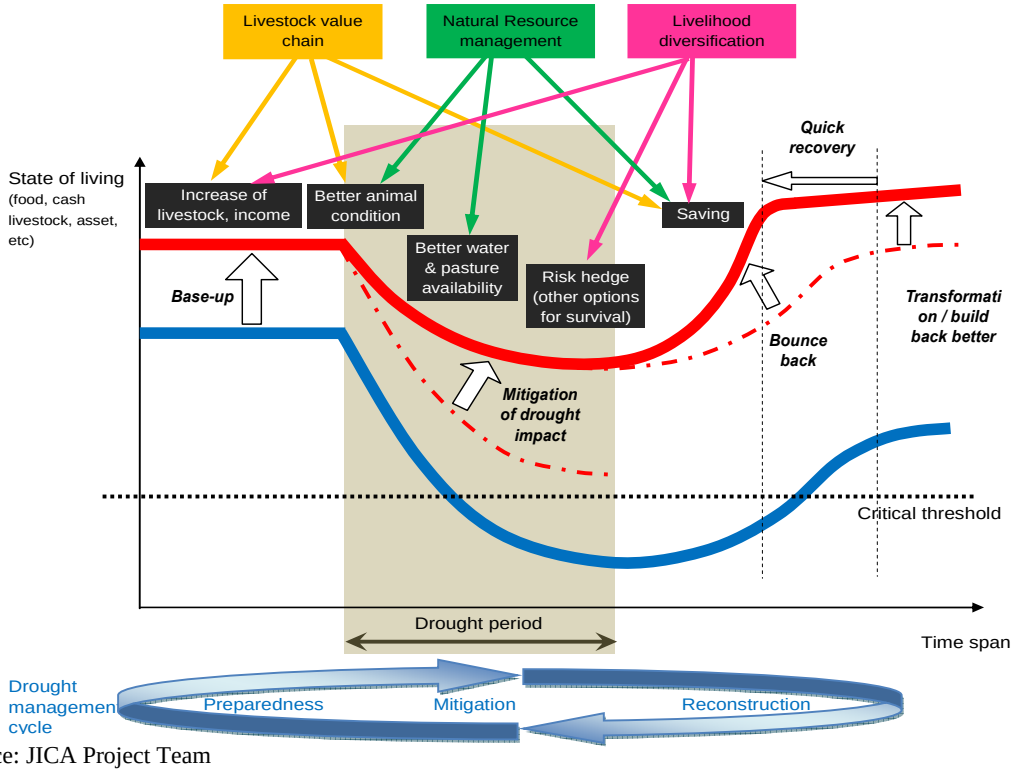
(4) Major Difficulties for Semi-settled and Settled People – Livelihood Measures

For people who have lost majority of their livestock, have only a small number of them, and live in a certain area, the magnitude of suffering from drought is severe. When drought hits, they are unable to move to find water and grass because they are already settled and somehow attached to the land. As water and pasture become scarce in the area, their livestock is lost. Due to the small numbers of livestock, they easily lose most of their assets on which they live, and hence become more vulnerable than before leading to a vicious cycle of poverty. For this type of people (but not limited to them), diversification of livelihood is desirable in order to avoid risks

3.2 About Drought Resilience

3.2.1 Approach and Intervention to Enhance Drought Resilience

The approaches and interventions to improve drought resilience proposed in the Project were four; namely 1) improving the situation of normal time (base-up); 2) minimising the impact of drought (mitigation); 3) increasing the capacity of recovering (bounce back/ quick recovery) and; 4) further development to self-sustainable society (transformation) as shown in the figure below:



Source: JICA Project Team

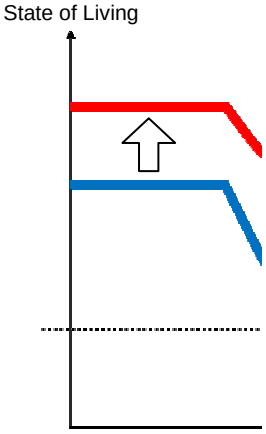
Figure A3.2.1 Conceptual Framework of Drought Resilience

In this framework, the conceptual idea proposed is on how drought affects the state of living, and how people recover from its negative impacts. As the blue line shows, if the state of living of people becomes lower than the critical level due to drought, people definitely fall into the critical situation. In order not to do so, this blue line is expected to be raised upward to the red line by taking these approaches. This is the concept of resilience building.

Individual activities contribute to these resilient components in different ways. It is important to think how each intervention works to improve drought resilience based on its conceptual framework. Further details of these approaches are described as below.

(1) Base-up

The base-up approach means improving living conditions during normal period so that the situation would not deteriorate to a critical level during drought. Through base-up activities, increased stock of wealth and property are used during drought. Examples of interventions are as follows:



Source: JICA Project Team

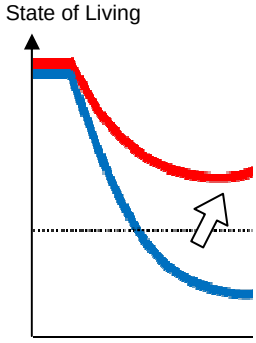
Figure A3.2.2 Image of Base-up

- Sound and effective breeding of livestock that can contribute to increase of livestock and enhance the strength of animals;
- Increase of livestock as their property through improvement of livestock market value chain;
- Improvement of livestock market that can increase savings, which can be used to restock after the drought for recovery;
- Development of water resources that can make unused pasture usable for livestock during the dry season, and expanding the dry season grazing area, which can result in the relieved degradation of the pasture in the current dry season grazing area; and
- Increase of income source and income through livelihood diversification that enables people to purchase and stock their daily needs.

(2) Mitigation of Drought Impact

Even if the state of living is the same during normal period, taking certain measures can minimise the impact of drought not to reach the critical level of damage. Though the mitigation measure will take effect when the drought starts, the measure should already be taken during the normal period. It would be too late to take action once drought starts. Example of interventions is as below:

- Adequate and timely livestock offtake can minimise the loss of animals during the drought through sensitisation and available livestock market;
- Improvement and maintenance of livestock health conditions through adequate animal health care, which can make the livestock stronger and increase the resilience of the livestock to survive during the drought;
- Increase of water sources that can be used during drought to increase the available pasture to feed livestock;
- Management of rangeland and pasture to reserve for drought period, which are fundamental sources for herds to survive during drought;
- Dispersing risks of drought damage by increasing their options for survival apart from livestock as their livelihood, which is especially vulnerable to drought;



Source: JICA Project Team

Figure A3.2.3 Image of Mitigation

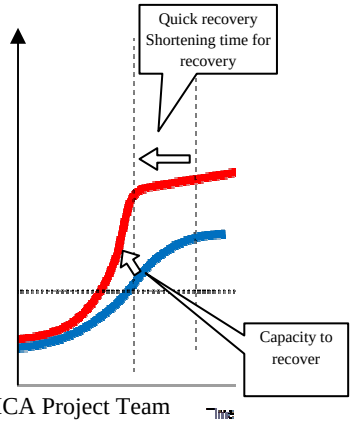
- Equipping with alternative livelihood means that can either directly help their survival during drought or indirectly contribute by increasing their savings instead of selling emaciated animals during the drought period;
- Stocking of resources such as hay, food, cereal banking, and saving of cash to be consumed during drought; and
- Establishing collective management and support system (e.g., fee collection for maintenance so that repair can be done timely with the saved money).

(3) Bounce Back / Quick Recovery

Bounce back is the capacity of people to recover from the drought's damage to the pre-drought state. Some measures can help recover faster after the drought. Example of interventions is shown below:

- Increase of savings through:
  - As individuals: other income sources than livestock, and early off-take of livestock,
  - As a community/group: fee collection and saving of water, Village Community Banking (VICOBA), livestock trade fee, etc.

  which can be used in recovering from drought damage;



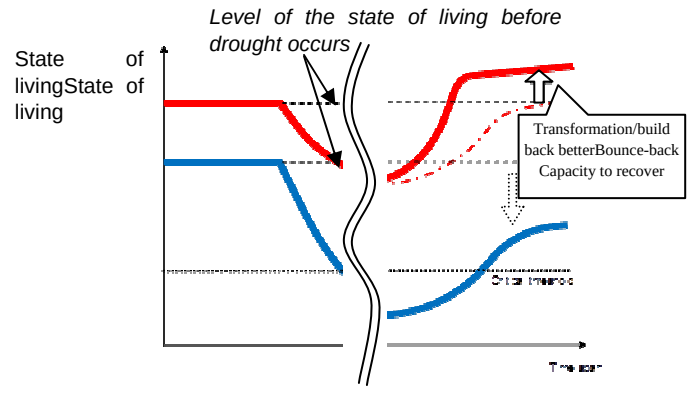
Source: JICA Project Team

Figure A3.2.4 Image of Bounce Back/ Quick Recovery

- Restocking and rebuilding lives with savings (however, if this activity is totally carried out by the external support, it does not enhance the resilience of people but is merely a relief aid); and
- A certain approach of natural resource management can improve in the savings and preparedness to avail resources during drought through fee contribution.

(4) Transformation / Build Back Better

The rebuilding of their living is not just to recover from the pre-drought level, but also for them to develop further. To do so, a possible intervention is to build capacity of community people for them to think how they can develop their community better than before in all aspects including natural resource management, livestock value chain, and livelihood diversification. This may include social structural change, not only individual change.



Source: JICA Project Team

Figure A3.2.5 Image of Transformation/Build Back Better

CHAPTER 4. PROJECT ACTIVITIES

4.1 General

4.1.1 Selection of Communities

In the Project, 20 pilot communities were selected based on the following rules and allocation procedures shown in the table.

Table A4.1.1 Selection Rules and Allocation of 20 Pilot Communities

	Marsabit County	Turkana County
(1) Unit of community*	Location basis	Sub-location Basis
(2) Based on Security condition and reachable distance	7 districts --> 4 districts (Marsabit Central, Marsabit North, Laisamis, Loyangarani)	6 sub-counties --> 6 sub-counties
(3) Based on a policy of Equal Distribution to ethnic groups or sub-counties	Rendille area = 3 communities Gabra area = 3 communities Borana area = 3 communities	Turkana North = 2 communities Turkana West = 2 communities Turkana Central = 2 communities Loima = 2 communities Turkana South = 2 communities Turkana East = 1 communities
(4) Based on road access and on three sectoral areas, such as natural resource management, livestock value chain and livelihood diversification**	Candidates in 3 sectoral areas, (1) Natural Resource Management Turbi, Hurri Hills, Arapal, Dirib Gombo, Gar Qarsa, Ngurnit, Loglogo, etc. (2) Livestock Value Chain Korr, Jirime/Dakabaricha, Dirib Gombo, Turbi, Kalacha, Moyale, etc. (3) Livelihood Diversification Ngurnit, Kalacha, Mikona, Jirime/Dakabaricha, Gar Qarsa, etc.	Candidates in 3 sectoral areas, (1) Natural Resource Management Lorengippi, Lokiriama, Lokichoggio, Milimatatu, Loritit, Lokichar, Kangakupur, Lopii, Kakuma, etc. (2) Livestock Value Chain Lokichar, Kerio, Kakuma, Lodwar, Lokichoggio, Lorengippi, etc. (3) Livelihood Diversification Lokiriama, Eliye, Loritit, Kakuma, Lodwar, Lochwaangikamatak, etc.

* Details should be referred to Section 4.2 in this report and ANNEX B

**: Details should be referred to ANNEX A4

Source: JICA Project Team

After the above mentioned screening process, the following 20 communities were selected as the pilot communities in the Project. The population of the selected communities is shown in Table B4.1.1.

Marsabit County		
Rendille area (Marsabit South)	Gabra area (Marsabit North)	Borana (Marsabit Central)
1. Ngurnit, at Ngurnit Location	4. Turbi, at Turbi Location	7. Dirib Gombo, Dirib Location
2. Korr, at Korr Location	5. Kalacha, at Kalacha Location	8. Dakabaricha/Jirime Jirime Locations
3.Arapal, at Arapal Location	6. Hurri Hills, Hurri Hills Location	9. Gar Qarsa, Gar Qarsa Location
Turkana County		
Turkana North	Loima	Turkana South 9. Lochwaangikamatak at Lochwa'tak sub-location
1. Milimatatu at Milimatatu sub-location	5. Lokiriama, at Lokiriama sub-location	10. Lokichar at Lokichar sub-location
2. Kangakipur at Kangakipur sub-location	6. Lorengippi at Lorengippi sub-location	
Turkana West	Turkana Central	Turkana East
3. Loritit at Loritit sub-location	7. Eliye at Eliye sub-location	11. Lopii at Lopii sub-location
4.Lokichoggio at Lokichoggio sub-location	8. Kerio at Kerio sub-location	

Since characteristics of those twenty communities cannot be easily described, the Project tried to define them roughly into the following four attributes; road access, topography of area, preferred large animal, and ethnic group.

Table A4.1.2 Rough Profiles of 20 Pilot Communities

	Road Access	Topography of area	Camel / Cattle	Ethnic Group
Marsabit				
Korr	Fair	Lowland	Camel	Rendille
Arapal	Poor	Mountain	Camel /cattle	Rendille/Samburu
Ngurnit	Fair	Near mountain	Camel	Rendille
Turbi	Very good	Lowland	Camel	Gabra
Kalacha	Poor	Lowland	Camel	Gabra/Borana
Hurri Hills	Poor	Mountain	Camel /cattle	Gabra
Dirib Gombo	Good	Near mountain	Cattle	Borana
Dakabaricha / Jirime	Very good	Mountain	Cattle	Borana
Gar-Qarsa	Good	Near mountain	Cattle	Borana
Turkana				
Milimatatu	Poor	Lowland	Camel	Turkana
Kangakipur	Poor	Lowland	Camel	Turkana
Loritit	Poor	Lowland	Cattle	Turkana
Lokichoggio	Good	Near Mountain	Cattle/ camel	Turkana
Lokiriama	Poor	Mountain	Cattle/ camel	Turkana
Lorengippi	Poor	Mountain	Cattle / camel	Turkana
Eliye	Fair	Near the lake	Camel	Turkana
Kerio	Good	Lowland	Camel	Turkana
Lochwaangikamatak	Very Good	Lowland	Camel	Turkana
Lokichar	Very good	Lowland	Camel	Turkana
Lopii	Poor	Lowland	Camel	Turkana

Source: JICA Project Team

When the four topics are seized, communities' characteristics in the following points could be imaged roughly.

- Road access:
  If road access is good, generally speaking accesses to several social services, such as access to water facility, health care service, veterinary service, food relief service, and so on, could be in better conditions,

- Topography of area:
  In mountainous area, there is a high possibility of higher quantity of rainfall received. And it is also expected to have good access to water facilities, such as boreholes, shallow wells in laggas, water pans etc. Here semi-agriculture could be possible. Agricultural activity implies there is less mobility or migratory activity. In the lowlands the opposite conditions could be anticipated.

- Preferred large animals (camel or cattle):
  Camel keepers can have high mobility of herds in the dry season. On the other hand cattle keepers have less mobility and tend to be in a semi-settlement condition. If semi-settlement is developed, relation and cohesion among community is enhanced at a geographical basis.

  Details should be referred to No.9 of Part-II in the Guideline.

- Ethnic group:
  There are several significant characteristics in each ethnic group in terms of communal collective action, leadership and decision making. Refer to ANNEX C and Part-II in the Guideline.

  Detailed information and data on selection of the pilot communities contained in Chapter A5 of ANNEX A.

4.1.2 Selection of Sub-project

Sub-projects were selected based on the Community Action Plans (CAPs) which were formulated by community people in CMDRR workshops held at the community level. Formulation of CAPs is described in the Section 4.2.

The following table shows the selected 24 sub-projects.

Table A4.1.3 Selected 24 sub-projects in the Project

Sub-project Name	
Marsabit	**Turkana**
Natural Resource Management (1) Sub-project of New Construction and Rehabilitation of Water Pan	**Natural Resource Management** (1) Sub-project of New Construction and Rehabilitation of Water Pan
(2) Sub-project of Rehabilitation and up-grading of Arapal Water Pipeline	(2) Sub-Project for Groundwater Development
(3) Sub-project of New Construction of Lokchura Water Rock Catchment	(3) Sub-project of Rehabilitation of Sand Dam
(4) Sub-project of Introduction of Solar Power System in Water Pump Facilities	(4) Sub-project of Introduction of Solar Power Pumping System in Lodwar Water and Sanitation Company
Livestock Value Chain Improvement (5) Sub-project of Heifer Exchange Program	**Livestock Value Chain Improvement** (5) Sub-project for Construction, Upgrading and Improvement of Livestock Market Facilities
(6) Sub-project of Kalacha Feedlot	(6) Sub-project of Livestock Market Linkage and Vitalization
(7) Sub-project of New Construction and up-grading of Livestock Markets Facilities and Organization	(7) Sub-project of Pasture Establishment by Reseeding
(8) Sub-project of Rural Road Improvement for Livestock Value Chain	
Livelihood Diversification (9) Sub-project of Chicken Merry-go-round	**Livelihood Diversification** (8) Sub-project of Income Generating Activities
(10) Sub-project of Goat Merry-go-round	(9) Sub-project of Small Scale Rain-fed Agriculture
(11) Sub-project of Resin and Honey Business	(10) Sub-project of Fishery
(12) Sub-project of Salt Business Program	(11) Sub-project of Dry-meat
Peace Building (13) Sub-project for Peace Building	

Note: Selected-pilot-community-wise presentation of sub-project is shown in Table B4.1.2.

Source: JICA Project Team

The details of each sub-project are given in the following sections.

4.2 Outline of CMDRR Approach

CMDRR refers to a process in which a community is actively engaged in identifying, analysing, and evaluating disaster risks, with the aim of reducing people's vulnerability and enhancing their capacities. In a CMDRR process, communities are facilitated and assisted to carry out disaster risk assessment, draw a disaster risk reduction strategy, and prepare a Disaster Risk Reduction (DRR) Community Action Plan (CAP), followed by implementation of the plan by a Drought Management Committee (DMC) to be established in a community.

In the context of disaster management, the CMDRR framework is regarded as offering new thinking (paradigm) since it aims at building resilient communities not only in terms of physical assets or secured livelihoods but also in terms of the capacity and mentality of the communities.

4.2.1 Objectives in application of CMDRR Approach in the ECoRAD Project

The following impacts are expected by introducing CMDRR approach in the Project:

- Empowerment of the communities to take own initiatives to reduce the risks associated with hazards and disasters by extension, rather than relying on relief aids;
- Involving the communities as partners by shifting from emergency response to a more proactive systematic approach of preventing, mitigating and preparing for drought; and
- The process to be embedded in the community being merged with the traditional customs.

4.2.2 Disaster Risk Reduction Assessment and Community Action Plans

CMDRR workshops have been implemented in the selected nine communities in Marsabit and 11 communities in Turkana by local NGOs selected in the tender. DRR assessments were executed and CAPs were prepared in each community through the workshops by the participants comprising of community elders, administrative chiefs / assistant chiefs, women group leaders, youth group leaders and so on.

In Turkana, based on the experience at Marsabit, CAPs were prepared for two different purposes, i.e. (i) a plan with external financial support, and (ii) a plan without external financial support (with their own resources). The following are the key issues raised from the DRR assessment of the two counties.

Details of CAPs are attached in ANNEX B, and an example is shown in Table B4.2.1.

Table A4.2.1 Summary of the Results of DRR Assessment in Marsabit and Turkana

Marsabit County	Turkana County
- All the nine communities selected "drought" as 1st priority hazard. And all the communities selected "tribal conflict" as the 2nd priority. - Most of the communities raised the necessity of water source development. - Significance of conservation of environment was pointed out.	- 10 communities, except Lopii, selected "drought" as 1st priority hazard to be considered and most affect on village life. The Lopii community selected "insecurity" as their 1st prioritized hazard. - "Human diseases", "livestock diseases", and "conflict/insecurity" were selected as 2nd priorities.

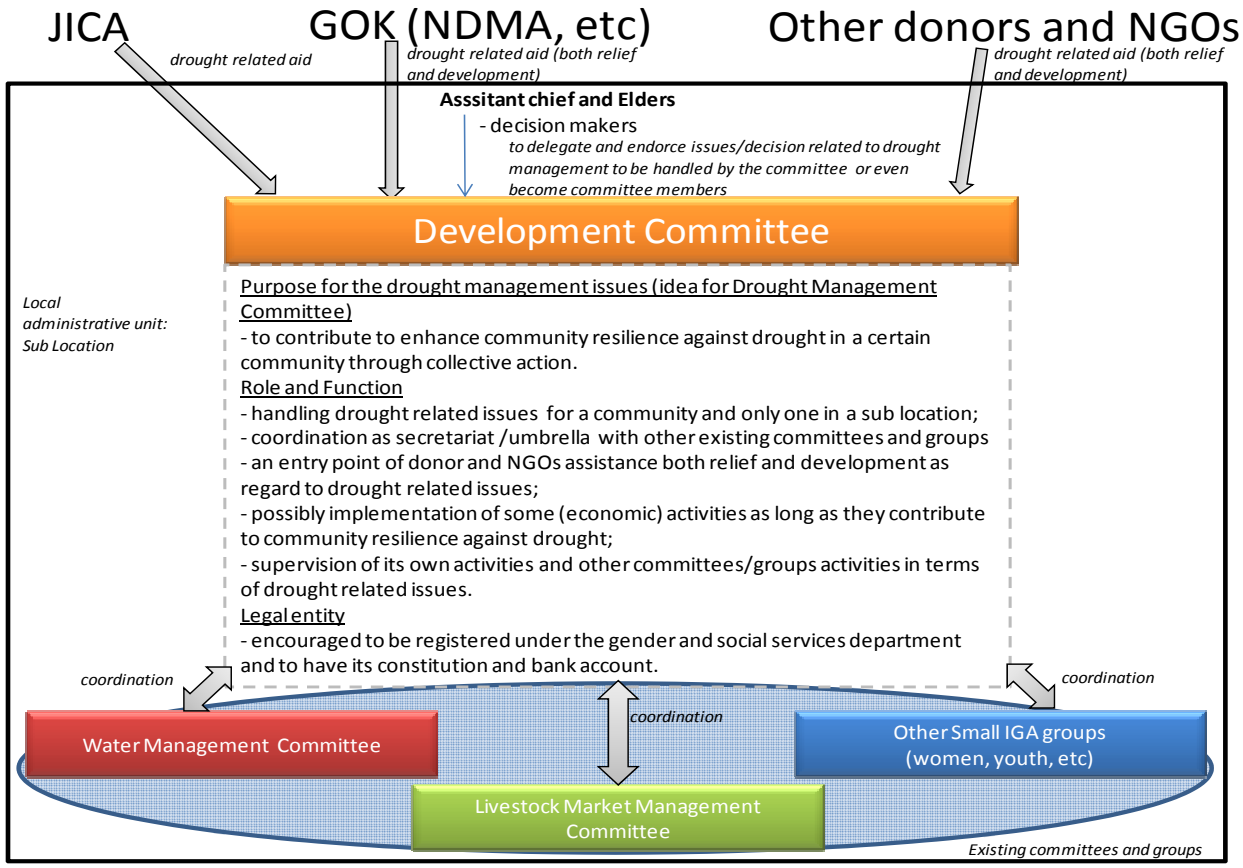
Source: JICA Project Team

4.2.3 Establishment of DMC for CMDRR

(1) Proposed Roles and Functions of the Drought Management Committee (DMC) in the Project

In consideration of the above mentioned objective, the committee is expected to primarily serve as a kind of secretariat / umbrella committee in a community to deal with all drought related issues. It shall collaborate with other existing committees and groups in implementation of specific activities such as water management committee for water resource development.

The roles and functions are illustrated in the figure below:



Source: JICA Project Team

Figure A4.2.1 Concept and Functions of Committees for CMDRR

(2) Formation of DMC and Basic Approach to Strengthen DMC

1) Formation of DMC

Formation of DMC was done by the sub-contracted NGOs both in Marsabit and Turkana. They firstly approached the chiefs, then requested to hold public barazas, and appointed the members of DMC in the public barazas with the consent of those in attendance. The unit for a community for Marsabit is Location, and that for Turkana is Sub-location, reflecting lessons learnt from the activities in Marsabit as a Location seems larger than the size of an appropriate community.

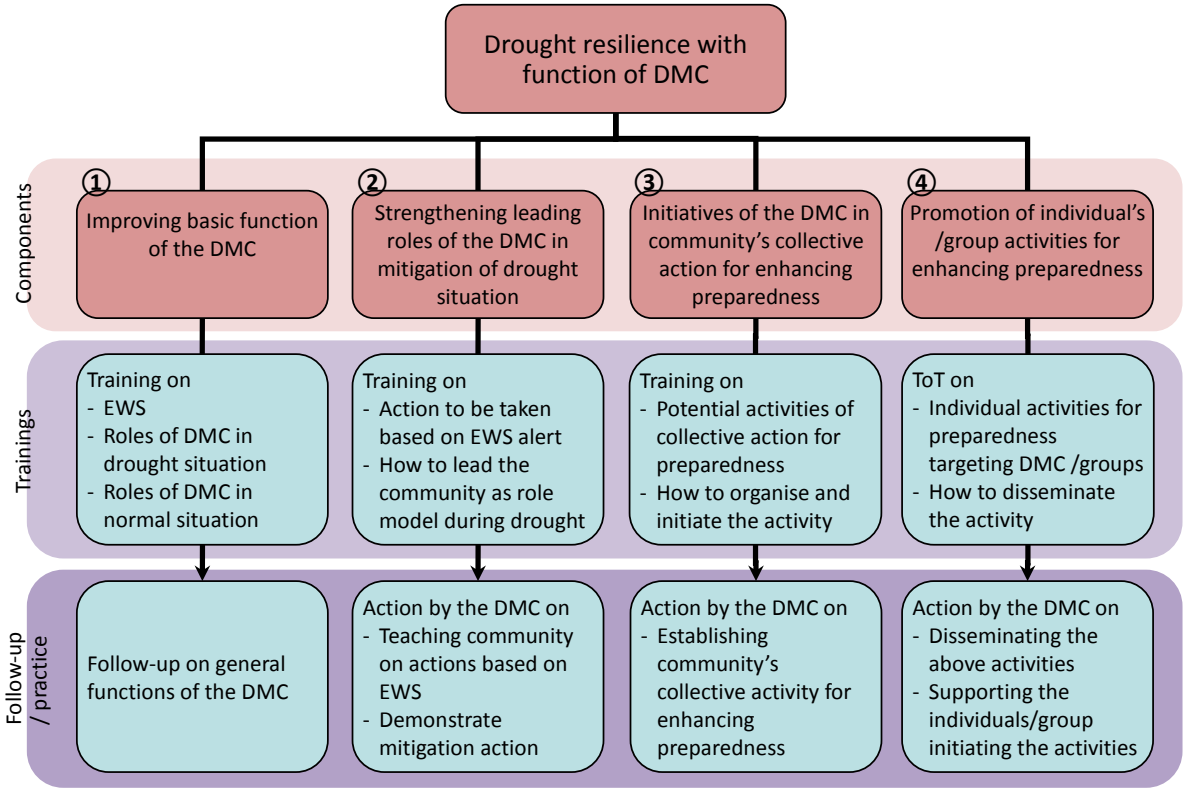
Considering that the actual existence and functionality of the existing committees differ in different areas, new committees were formed in areas without one while existing committees were revived.

2) Basic Approach to Strengthen DMC

After formation of DMCs, training programmes were conducted by the sub-contracted NGOs on basic organizational development followed by a few follow-up visits.

Moreover, several programmes were planned and organised to encourage implementation of activities by the DMCs. Taking into consideration that the communities have been experiencing one-off training to make plans without implementing actual activities, a series of discussions and interventions were conducted after the training to develop a foundation in the committee to work on their own initiatives.

Outline of the training programmes is as indicated in the below figure.



Source: JICA Project Team

Figure A4.2.2 Conceptual Structure of DMC Development Supports

(3) DMC Training and Post -Training Activities

Trainings to encourage implementation of activities by the DMCs were conducted through the following steps.

Box: Steps of activity development and Training programmes

Step 1. Training on basic functions of DMC & Activities based on Early Warning System (EWS)

Session 1. Early Warning System and roles of DMC (Component 1)

- Early Warning System
- Roles and action to be taken based on the warnings by the EWS
- Roles of the DMC in the normal situation

Session 2. Technical trainings on actions to be taken for

- Mitigation of the drought situation with initiative of the DMC based on the warnings of the EWS (Component 2), and
- Community's collective action to enhance preparedness (Component 3)

Step 2. Awareness raising of the community on the EWS and actions to be taken (Component 2), and Trial of the Community's collective action to enhance preparedness (Component 3)

Step 3. Technical trainings on the actions to be taken by individuals/groups (targeting community groups involving the DMC members) during the normal situation or less severe situation (Component 4)

Step 4. Dissemination and training on individual based activity (Component 4)

Bearing in mind that most of the committee members are used to taking action even holding their regular meetings only when they receive funds, it was stressed during the training that they start with small activities under their own initiative and resources. The committees came up with their activities such as:

- Sensitization of the community with knowledge they have learnt through the training to raise awareness on Early Warning System (EWS) emphasising on the importance of actions to be taken at the early stages of drought;
- Formation of sub-committees for specific activities such as water management and rangeland management, strengthening coordination function of the DMC by sharing information with other existing committees and groups; and
- Educational meetings on rangeland management and early animal off-take.

The above mentioned activities were planned and organised through the initiative of the committee.

Activities related to drought resilience were selected based on the feasibility in the community and considering other factors such as availability of a suitable plot for reseeding, conflict situation for rangeland management, and market availability for animal off take. Further technical assistance was provided to the community that showed their interest on the activities and took some initiative to start on their own, such as demarcating and fencing land for reseeding farm. Further technical training provided included reseeding farm preparation and early animal off-take. It is noted that these activities were implemented especially in Turkana.

4.3 Natural Resource Management

4.3.1 General

Natural resource management (NRM) can contribute to the enhancement of drought resilience in different ways through different aspects of the activities. The following summarise the relationship between NRM activities and drought resilience.

Table A4.3.1 Contribution of the NRM Components to Enhancing Drought Resilience

Approach of drought resilience / Elements	Base-up	Mitigation	Bounce back/ quick recovery	Transformation / build back better
Water resource development	high	high		
Rangeland management		high	high	
Water resource management		high		
Improvement of O&M		high	high	

Source: JICA Project Team

NRM under the project is defined as the effective use and conservation of water and pasture for the pastoralists. To develop sustainable NRM in the target areas, a water potential study was conducted to identify suitable water sources such as rainwater harvesting, surface water, subsurface water, shallow groundwater and deep groundwater. Water resource potentials were assessed based on the revision of existing studies[1] in Marsabit and through own study in Turkana mentioned in Section 4.3.3. Since needs of water sources are highly dependent on the use of the rangeland, migration routes and grazing patterns of pastoralists were studied as well.

Sub-projects for strategic water source development and their details were designed and implemented in consideration of these factors;

(1) Potentials of water sources,

[1] "Marsabit & Moyale Districts Water Resource Assessment Study Report (June, 1997)" and "Marsabit District Water Source Assessment and Mapping (January, 2003)"

(2) Migration routes and grazing pattern of pastoralists,

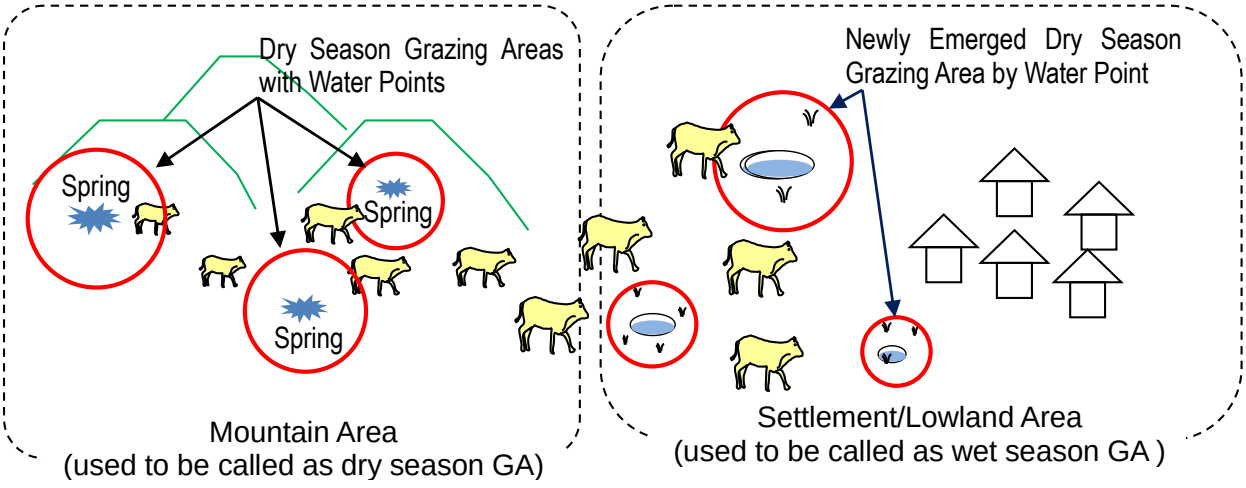
(3) Impacts on other natural resources,

(4) Sustainability of the facility in consideration of O&M, and

(5) Difficulties and constraints faced by the existing water sources (e.g. over grazing at permanent water source, sedimentation of water pans, shortage of maintenance fund, and water capacities against increasing demand).

The sub-projects were formulated based on the following strategic concepts for drought resilience:

- Strategic distribution of water points: Expansion of availability of dry season grazing area by establishment of new water sources in the form of construction of new water pans and boreholes as described in the Figure A4.3.1;
- Structural improvement of facilities to increase water capacity: Structures of water pans that make desilting easier and that protect from water contamination, structures of rock catchment and sand dam that have larger water holding capacity, and improvement of pumping capacity of water pipeline system; and
- Improvement of O&M activities: Labour sharing system for sediment removal of water pans, conservation of grazing area through rangeland management around water source, regular maintenance through adequate O&M system with financial management, and introduction of solar power generation system to generate maintenance fund.



Source: JICA Project Team

Figure A4.3.1 Newly Emerged Dry Season Grazing Area with Water Pan

NRM activities identified in the CAP and action plan by DMCs, apart from water source developments, are mainly rangeland management, reseeding of pasture, establishment of Water Users Association (WUA) and rangeland management committees. Rangeland management and reseeding activities were implemented through support to DMCs' activities.

4.3.2 Outline of Sub-projects

The sub-projects of strategic water source development implemented in the project are summarised as follows and details are shown in Table B4.3.1 (referred to ANNEX D for more detail):

Table A4.3.2 Summary of the NRM Sub-projects in Marsabit and Turkana

Sub-project	Marsabit	Turkana	Activities implemented	
			Facility improvement	O&M activities
Borehole construction	-	20	Ground water potential survey Drilling and well development Hand pump installation with animal trough construction	Support in registering under the existing O&M scheme of Diocese of Lodwar with community contribution Training on maintenance of hand pump and mitigation of negative impacts
Water pan construction	3	2	Construction of new water pan and related facilities, such as intake, inlet channel, silt trap, spillway etc.	Formation of WUA Training for desilting and maintenance of the facility Training of O&M, organizational development, and rangeland management Monitoring of operation and maintenance work
Water pan rehabilitation	2	4	Desilting and shaping. Construction of additional pan (Cascade system) and other related facilities	
Sand dam rehabilitation	-	1	Rehabilitation of damaged portion and improvement of existing sand dam and related facilities	Improvement of operation and maintenance system through training program to the community
Rock catchment construction	1	-	Construction of a rock catchment with related facilities and underground reservoir with roof, hand pump, spillway and drain	Strengthening WUA through training and actual operation
Water pipeline rehabilitation	1	-	Laying additional pipes, and construction of related facilities such as water storage tank, trough etc to improve water availability	Strengthening WUA through trainings, introduction of maintenance fund and training of local plumbers on minor repairs
Solar power system for borehole	3	3	Installation of solar power generation system Rehabilitation of pump system	Strengthening WUA/LOWASCO through trainings and actual operation to establish adequate fee collection and financial management of maintenance fund

Source: JICA Project Team

4.3.3 Turkana Water Potential Study

A study on potential of water resources were carried out to provide primary suggestions for a strategic water development plan in Turkana. The study included preparation of water potential maps for ground water development and surface water development. The following table summarises the study contents (referred to ANNEX E)

Table A4.3.3 Summary of the Turkana Water Potential Study

Groundwater Potential Study	Hydrological Environment Quality of Ground water Recharge Mechanism and Aquifer System Regional Groundwater Flow and Sustainable Yield Natural Resource Development Belts Proposed 50 Borehole Sites
Surface Water potential study	Water Pan Potential in Priority Grazing Areas Proposed area for Developing Water Pan in Lotikipi Plain

Source: JICA Project Team

The results of the study are described in the following chapter.

4.4 Livestock Value Chain Improvement

4.4.1 General

As explained in Section 3.2, the Project considered four types of approaches, i.e. (i) Base-up approach, (ii) Mitigation approach, (iii) Bounce back/Quick recovery approach, and (iv) Transformation. Based on those four approaches and the constraints described in Section 2.4.2, four Sup-projects in Marsabit and three Sub-projects in Turkana, were formulated aiming to contribute to improved drought resilience in terms of livestock value chain improvement in Northern Kenya.

Relationship between the four approaches and those Sub-projects are summarised in the following table:

Table A4.4.1 Contribution to Drought Resilience by Livestock Sub-projects

Approach of Drought resilience / Elements	Base-up	Mitigation	Bounce back/ quick recovery	Transformation / build back better
Heifer Exchange Program	high	low		
Kalacha Feedlot		high	low	
New Construction and up-grading of Livestock Markets Facilities and Organization (Marsabit & Turkana)		high	low	
Rural Road Improvement for Livestock Value Chain		high		
Livestock Market Linkage and Vitalization		high	low	
Pasture Establishment by Reseeding		high	low	

Source: JICA Project Team

4.4.2 Outline of Sub-projects

The following sub-projects were selected and implemented:.

Table A4.4.2 Summary of the Sub-projects for Livestock Value Chain

Sub-projects	Facility / physical input	Training / Capacity Development
(a) Marsabit County		
Heifer Exchange Program	Initial investment of purchasing heifer	- Trainings for traders, LMA, and DMC
Kalacha Feedlot	New construction of feedlot, and irrigation pipeline	- Trainings for committee members, and technical training of plumber for O&M works
New Construction and up-grading of Livestock Markets Facilities and Organization	- Dirib Gombo livestock market (new) - Jirime and Korr livestock market (up-grade)	-
Rural Road Improvement for Livestock Value Chain	Road pavement improvement with gravels and concrete surface lining	-
(b) Turkana County)		
Construction, Upgrading and Improvement of Livestock Market Facilities	- Improvement of Keiro livestock market. - Improvement of road access with drifts at *laggas*	-
Livestock Market Linkage and Vitalization	-	- Trainings on LMA officials for livestock information system. - Training on Kerio market members

Sub-projects	Facility / physical input	Training / Capacity Development
Pasture Establishment by Reseeding	-	- Technical training for establishment of reseeding farm Exposure tours to an existing farm - Arrangement of seed provision between the ministry of livestock and community

Source: JICA Project Team

The outlines of sub-projects for livestock value chain improvement are summarised in Table B4.4.1 (referred to ANNEX F for more detail).

4.5 Livelihood Diversification

4.5.1 General

To enhance resilience against drought in Northern Kenya, livelihood diversification is important. It contributes to the enhancement of resilience by hedging risks and cushioning negative drought impacts as well as recovering early through another livelihood measure added on top of their livestock keeping activity, or even through several measures (ultimately by money or food). Individual livelihood measures could be many even in harsh condition like Northern Kenya. Depending on the socioeconomic conditions, livelihood measures must differ from one place to another. Examples are shown as below, but not limited to:

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

Referring to the approaches about drought resilience described in Chapter 2, the following elements of livelihood diversification are expected to contribute to the enhancement of resilience as shown in the table below.

Table A4.5.1 Expected Contribution of the Elements of Livelihood Diversification To Enhance Drought Resilience

Approach of Drought resilience / Elements	Base-up	Mitigation	Bounce back/ quick recovery	Transformation / build back better
Additional Asset provision (livestock, etc)	high	high		
Business (IGA) skills	high	high	low	
Technical skills (fishery, agriculture, dry meat, other skill based livelihood measures)	high	high	high	low
Saving		high	high	low
Capacity Development (group strengthening, individual capacity development)	high	high	high	high

Source: JICA Project Team

The livelihood measures assisted through the sub-projects by the Project also include all of the above elements. Therefore implementation of the sub-projects was expected to build resilience.

4.5.2 Outline of Sub-projects

(1) Outline

The following sub-projects in this program were selected and implemented. These are summarized in the table below and the detailed information is shown in Table B4.5.1 and ANNEX G:

Table A4.5.2 Summary of Sub-projects Under Livelihood Diversification Program

Sub-project Sites		Contents of Sub-project	No. of Groups	Components and Activities
Marsabit	North: Kalacha	Salt Business	1	Components Collect salt and sell for livestock Activities Entrepreneurship/VICOBA training and mentoring activities
		Goat Merry-Go-Round	4	System Provide goats to groups and multiply them, passing to subsequent members, Ask groups to save money called Drought Fund. Activities Provision of goat, goat technical/VICOBA training and mentoring activities
	Central: Dakabaricha/ Jirime	Chicken Merry-Go-Round	8	Component Provide chicken to groups and multiply them, passing to subsequent members. Ask groups to save money called Drought Fund. Activities Provision of chicken and poultry houses (only representative), chicken technical /VICOBA training, and mentoring activities
	Central: Gar Qarsa	Goat Merry-Go-Round	9	same as above
	South: Arapal	Goat Merry-Go-Round	2	same as above
	South: Ngurnit	Resin Honey Business	3	Component Procure/collect honey comb, sieve to pure honey, pack and sell Activities Entrepreneurship/VICOBA training and mentoring activities (improved containers, exposure tour)
Turkana	West: Loritit	IGA <Livestock trade>	1	Component Improve livestock trade such as buying a small number of livestock and selling them Activities Entrepreneurship training, and mentoring activities
		Small scale rain-fed agriculture	1	Component Improve their rainfed agriculture practices (training on line planting) Activities Agriculture technical training, experimental plot, and mentoring activities
	Loima: Lokiriama	IGA <Livestock Trade&Retail Shop>	2	Component *Livestock trade*: the same as above *Retail shop*: improve retail shops business to buy commodies and sell in their settled areas Activities *Livestock trade*: the same as above *Retail shop*: entrepreneurship training and mentoring activities

Sub-project Sites		Contents of Sub-project	No. of Groups	Components and Activities
		Dry meat	1	Component Improve their dry meat techniques Activities Dry meat technical training
	Central: Eliye	Fishery	2	Component Improve fishing techniques and marketing activities Activities Fishery technical training, entrepreneurship training and mentoring activities including exposure tour
	South: Lochwaangikamatak	IGA <Livestock Trade&Rtail Shop>	2	The same as above
	East: Lopii (Lopii center& Kaaruko)	IGA <Retail Shop>	2	The same as above

Note: mentoring activities include ad hoc additional training, exchange visit and study (exposure) tour.

Source: JICA Project Team

(2) Concept for Categorization of Livelihood Diversification

Concept for the livelihood diversification program is summarized as below:

Table A4.5.3 Categorization of JICA's Approach in Livelihood Diversification

Type	Livelihood Measures (sub-projects)
Livestock utilization	Chicken merry go round
	Goat merry go round
	Processing of livestock product (dry meat)
	IGA- livestock trading
Local resource utilization	Resin Honey Business
	Salt Business
	Small scale rainfed agriculture
	Fishery
Provision of necessary goods and services	IGA- Retail business

Source: JICA Project Team

Livelihood measures can be categorised depending on its contents. Based on the livelihood measures that the sub projects assisted, the categories of livelihood measures in Northern Kenya are proposed as above.

In Marsabit, considered with the general socio economic conditions in the target locations, two types of livelihood diversification are being implemented with four sub-projects; chicken and goat merry-go-round sub-projects under livestock utilisation type, and salt business and resin and honey business sub-projects under local resources utilisation type.

In Turkana, the major sub-project implemented focused on IGA. Depending on the contents of the IGA, types differ.

For the case of livestock trading, IGA can be under livestock utilisation type (dry meat as well) while provision of necessary goods and services includes retail business. Agriculture and fishery sub-projects are categorised under local resource utilisation type.

4.6 Peace Building

4.6.1 General

Sustainable natural resource management and drought resilience in Northern Kenya is associated with peace building, where conflicts between different ethnic groups occur when resources are scare especially during drought. Peace building programmes were conducted to mitigate conflict that can contribute to enhancing drought resilience through amicable use of resources. Marsabit county is a cosmopolitan area where 13 ethnic communities with different cultural backgrounds reside. Conflict between different ethnic communities has occurred in the past. Turkana is relatively homogeneous within the county. However the County is bordered by Uganda to the west, South Sudan and Ethiopia, including the disputed Elemi Triangle, to the north and northeast. Furthermore, the neighbouring counties to the south and east are occupied by other ethnic groups such as the Pokot, and the Samburu.

Tribal conflict between the Turkana community and the neighbouring communities in Kenya and along the international border areas, presents one of the most significant contributors to threats against drought resilience. Peace building programmes targeted those vulnerable areas involving people from different ethnic groups.

4.6.2 Outline of Sub-projects

The programmes conducted through the project are shown in Table B4.6.1 and summarised below (referred to ANNEX H for more detail).

Table A4.6.1 Summary of Peace Building Programmes in Marsabit and Turkana

Area	Programme/activities
Marsabit	
Dirib/Jaldesa, Shurr and Songa communities	1) Joint public Barazas, 2) Training of Kenya Police Reservists (KPR), Training of Peace committee, natural leaders, chiefs and women opinion leaders 3) Intercommunity meeting 4) Intra community dialogue 5) Peace Marathon 6) Monitoring
Arapal and Gas area (Gabra, Rendille and Samburu communities)	1) Baseline survey 2) Inter community Children Peace Camps and Friendship for Peace twinning of Children (2 times) 3) Inter-Community Holiday Exchange Peace Program (2 times) 4) Formation of Peace Club 5) Inter-community Children and Parents twinning (3 times) 6) Training of Trainers for Peace Educators (1 time) 7) Post Project Survey

Source: JICA Project Team

In Turkana County, the Project supported Lokiriama Peace Accord Commemoration in Karamoja Cluster (participants from Kenya, Uganda, Ethiopia and South Sudan) as a part of the International Day in partnership with NDMA, USAID, Danish Refugee Council, APaD (Agency for Pastoralists Development), ADESO (Africa Development Solution), IOM (International Organization for Migration), and TWADO (Turkana Women's Advocacy Development Organization)

4.7 Capacity Development of Government Officers to Enhance Pastoralists Resilience to Drought

4.7.1 General

Capacity development on government officers to enhance pastoralists' resilience is one of the major pillars in the ECoRAD Project.

Capacity development was realized at the following two stages.

- Stage-1 (February 2012 – February 2015)
  In Stage-1, capacity development were mainly performed through an on-the job basis in the course of pilot sub-projects implementation. In addition to such trainings several development trainings were made on an ad-hoc basis in seminars and workshops.
- Stage-2 (February 2015 – October 2015)
  In order to improve government officers' capacity for drought response and management, in particular, in terms of community based drought risk management, a specific capacity development training plan was formulated and implemented in the ECoRAD Project.

Table A4.7.1 Capacity Development Schedule & Plan for Government Officers

Seminars /Workshops	Feb'12 – Feb '15	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
Stage-1: On-the-Job Basis	■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■							
Stage-2: Seminar / Workshops basis									
Stage 2-1: Training Workshop on Community Based Drought Management to County Government Staff		■ ■ ■ ■ ■ ■ ■ ■ ■ ■							
Stage 2-2: Dissemination Seminar / Validation Workshop on the Guideline based on ECoRAD's Experiences						■ ■ ■ ■ ■			

Source: JICA Project Team

The details of the contents for the above mentioned activities are contained in the following sections.

4.7.2 Capacity Development: Stage-1 (On-the Job Basis)

Capacity development of government officers on the-Job basis was performed in the following activities in the period of Stage-1:

- Implementation of CMDRR workshops at the selected pilot communities, and CMDRR follow-up seminar which were held after 2 months of CMDRR workshop (NDMA officers and chiefs were involved);
- Activities for selection, designing, constructing water facilities, such as water pans, boreholes, and so on (Sub-county water officers were involved);
- Construction supervision at boreholes and test pumping activities for 20 boreholes (Turkana WRMA officers were involved);
- Study of pastoralists' migratory routes and evaluation of rangeland conditions (Sub-county livestock officers were involved);
- Establishment of new livestock market facility and upgrading of existing facilities (Sub-county livestock officers were involved);
- Pilot sub-project implementation for livelihood diversification (chiefs, NDMA officers, livestock officers in the counties, gender and social services officers, were involved);

- Procurement process of contractors for civil works (Sub-county water officers were involved); and
- Enhancement of water fee collection system at the solar power pumping system (Marsabit WRMA officers were involved).

In addition to the capacity development activities on-the-job basis, the following seminar and workshops were held or presented by the Project in several occasions.

- JICA/ECHO NDMA Enhancing Drought Resilience in Northern Kenya Workshop；
- Seminar on Turkana Water Resource Potential Study Results; and
- National Water Summit in Turkana (the Project staff presented the experiences in the summit).

Detail programmes and contents of each seminar should be referred to ANNEX I.

4.7.3 Capacity Development: Stage-2 (Seminars/workshops Basis)

(1) General

From March 2015, the Project provided seminars and workshops for some specific topics. For this, the most critical issues and topics which government officers were facing in the course of improving community drought resilience were to be identified. To do this, the Project conducted interview surveys on several county government officials in Marsabit and Turkana, and analysed the present conditions.

Based on analysis of the above activity, a capacity development plan was formulated in February 2015 based on several considerations as mentioned below.

(2) Analysis of Present Conditions for Capacity Development through Needs Assessment

To formulate specific training seminars/workshops for Stage 2, the following present conditions were analysed based on the current challenges, constraints, and needs of the county government officers and the Project team's observations:

- As a result of devolution, the county government is responsible for development in the county, and quite a large sum of funds for drought resilience activities will be allocated soon to public works by the county government. Thus knowledge and skills that could be applied immediately and practically was required urgently.
- Since the county government was recruiting several officers after devolution, the county government offices received new employees day by day. However some of such newly recruited county government officers do not have enough experience and knowledge for their duty in some areas. In particular, ward administrator was one of the new posts which were created after the devolution to the county government.

  However, since they would take significant roles in community development and resilience building in their communities, many of them needed to have basic knowledge and technique in order to be good facilitators for communities.
  On the other hand, there are several officers who have been working as government officers for a long time. Those officers have received a lot of training and obtained practical experiences. Thus a wide capacity gap between the newly recruited officers and the experienced officers existed, which may hamper smooth implementation of project activities in the near future. This gap should be filled as soon as possible.
- Linkage between County Integrated Development Plan (CIDP) and community action plan (CAP) is essential factor to implement community activities effectively and efficiently. Such linkage would be one of the major roles of county government officers. In JICA/ ECHO NDMA

Enhancing Drought Resilience in Northern Kenya Workshop held in December 2014, this point was strongly emphasised by many county government officers.

- There was a strong need for new technologies and specific skills which could contribute to improvement of drought resilience on the ground. According to the interviewees in Turkana and Marsabit county government offices in the "need assessment survey'' by the Project, the following technical and specific topics were listed.

(In Turkana)

- Environmentally friendly technology, such as solar power system, wind power system.
- Latest livestock treatment technique,
- Sustainable new technology, if any
- Conflict management technique
- Drilling technique which realises high success rate at boreholes,
- Participatory community planning technique for community resilience, such as CMDRR
- Monitoring and evaluation technique for community resilience, such as COBRA
- Advocating and mobilisation technique for community action,

(In Marsabit)

- Fund raising management system, such as VICOBA and community merry-go- round
- Index-based livestock insurance system
- Environmentally friendly technology, such as solar power system, wind power system.
- Sustainable new technology
- Community based sustainable activities
- Latest livestock treatment technique,
- Conflict management technique
- Participatory community planning technique for resilience, such as CMDRR
- Sustainable and applicable livelihood interventions for pastoralists

(3) Capacity Development Plan

In consideration of the above mentioned observations and findings, the Project set up the following capacity development plan for government officers:

The plan is divided into two stages, i.e. Stage2-1 and Stage-2-2.

For stage 2-1, the Project conducted three-day seminars in Turkana and Marsabit counties, specifically for newly recruited officers to reduce the skills- gap between the new officers and the experienced ones. In the seminar, basic knowledge on CMDRR as a community facilitator was mainly delivered in addition to some specific topic of new technology, i.e. solar power system, which could be highly applicable and useful in Northern Kenya.

Then in Stage 2-2, the experiences of the Project compiled as the Guideline, which could be widely referred to by anyone for community resilience activities in Northern Kenya, were disseminated and validated in a one-day seminar.

(a) Stage 2-1

Title: Training Workshop on Community Based Drought Management to County Government Staff

Objectives: To provide basic knowledge of CMDRR or other participatory community planning methods to county government officers, in particular newly recruited ones, for their future work with the community. And to provide applicable and useful new technology in Northern Kenya, such as solar power system.

Target groups:
County government officers. In particular, newly recruited county government officers, such as ward administrators, chief officers in county ministries, etc.

Target areas / contents:

(i) CMDRR or equivalent community participatory planning and monitoring method (basic knowledge for new community workers)

(ii) Solar power system (Environmentally friendly technology and Sustainable new technology)

Schedule:

Turkana in February 2015, and Marsabit in April 2015

(b) Stage 2-2

Title: Dissemination Seminar / Validation Workshop on the Guidelines based on ECoRAD's Experiences

Objectives: The objectives of the Workshop were to:

- Disseminate accumulated lessons learnt in the Project to all the stakeholders of drought resilience workers in Northern Kenya
- Verify contents of the Guidelines of ECoRAD in light of participants' understanding and experiences

Target group:

(i) County government officers, (ii) Community leaders, and (iii) National government officers, international donors, NGOs and other stakeholders

Target area / contents:

Dissemination and verification of the Guideline based on the ECoRAD Project experiences included the following topics:

(i) Basic understanding on drought, resilience, and community in Northern Kenya

(ii) Lessons for better community-based drought management including modified CMDRR approach to consider current community situation, project implementation procedure, and community involvement in Northern Kenya.

(iii) Lessons in each technical area including natural resource management, livestock value chain improvement, livelihood diversification, and capacity development of the government officers.

Schedule:

Marsabit, Turkana, and Nairobi in the late July to the early August 2015

Above descriptions are just summaries of the workshops. Detail programmes and contents of each workshop should be referred to ANNEX I.

CHAPTER 5. RESULTS AND LESSON LEARNT

5.1 About Community

The first important lesson that has to be shared is proper understanding of 'Community' in Northern Kenya. Although the detailed findings are shown in the Guidelines, the key issues are summarised in this report.

5.1.1 Community Resilience

Community resilience can be used in comparison to an individual's resilience, in which the community members handle the issue as a whole, or in comparison to a public-driven resilience.

Some of the activities to mitigate drought can be practised individually, such as running a small business for an alternative income source, saving, and breeding and selling of livestock.

"the whole is more than the sum of its parts," which means that a collection of resilient individuals does not guarantee a resilient community (Norris H. Fran, et. al, 2007)

On the other hand, community resilience can be understood from a different point of view. It could be as a set of capacity for effective organisational behaviour, or as a strategy for promoting effective disaster readiness and response. However, what is complicated is the variation in the meaning of 'community'. It may not be always, but typically, a community is an entity that has geographic boundaries and a shared fate. However, the situation is different in Northern Kenya. The communities are composed of built, natural, social, and economic environments that influence one another in complex ways (Norris H. Fran, et. al, 2007).

Community resilience is important for sustainable resilience in the area. Although it is an important concept, the social status of the specific area should be considered in order to apply the idea of community resilience.

Community Resilience is defined as the existence, development and engagement of community resources by community members to thrive in an environment characterized by change, uncertainty, unpredictability and surprise. Members of resilient communities intentionally develop personal and collective capacity that they engage to respond to and influence change, to sustain and renew the community, and to develop new trajectories for the communities' future (Magis, 2010).

5.1.2 Community in Northern Kenya

One of the major findings of the Project throughout the activities is the importance to understand 'community' in the specific context of Northern Kenya. Detailed findings are shown in the Guideline and summarized as below.

(1) Different Concept of 'Community' in Pastoral Society from Agriculture-based Society

In general, the pastoralists in Northern Kenya are not bound by the geographical area, but tied by traditional bonds such as clans. Even though the relationship and sense of belonging is strong within clans, their daily living is rather independent. In agriculture-based societies, people are strongly attached to their land that is the fundamental means of their living. Therefore, people are bound by the geographical area. Residing in a particular place, cooperation grows and people share public goods and common properties. Since standardized approaches for community management have, in most cases, been developed in agriculture-based society, it is important to recognise this difference.

In addition and related to the above discussion, the unit of 'community' can be a clan, kraal, administrative unit, neighbouring settlers, etc., depending on the context. If 'community' is not specified in community actions, nobody will take them up as their own activity. Thus, it is necessary to define 'community' when an approach is used for community resilience activities in Northern Kenya.

(2) Distinctive Ideas and Attitudes of Pastoral Communities in Northern Kenya

The specific context of Northern Kenya has been influencing their culture and society. It is important to recognise the following five points:

- What is important for the pastoralist is what actually happens rather than "unpredictable inconceivable issues";
- They have a strong identity with clans while they live independently;
- Traditional leadership is not always the same as expected leaders for development activities depending upon what kind of role and functions are given;
- The perspective and understanding of the pastoralist people in Northern Kenya are different from what other people expect; and
- During the drought that affects Northern Kenya, people have been utilising external supports, and those supports became a part of their normal life in Northern Kenya.

Considering the foregoing it is therefore necessary to understand the characteristics of the target community correctly prior to making a plan for community resilience.

(3) Different Features and Customs of Different Tribal Communities

In addition, the tribal customs and social structures also affect how a community adopts functions of resilience. Where there is a traditionally recognised social and governing system, the newly introduced system can work and be easily accepted when it is not in conflict with the traditional system. Thus, it is also important to understand their existing system. For reference, characteristics of major four tribal communities in Marsabit and Turkana and tendency of rough characteristics by Large Animals are shown to understand.

Table A5.1.1 Characteristics of Major Four Tribal Communities in Marsabit and Turkana

Borana Community	**Turkana Community**
● Strong 'Gadha system' = identity of Borana people. ● Aba herega functions as a part of their governing system. ● Gadha system is relatively well merged/incorporated with the modern administrative system. ● Cattle holding community = semi-settled in highland	● Council of elders as a decision making body. ● No strong governing system and people are more autonomous. ● Administrative system has been relatively merged with traditional system. Administrative system often prevails over the traditional.
Gabra Community	**Rendille Community**
● A strong traditional governing system called 'Yaa' in each clan where elders of households form a council of elders known as 'Dabela'. ● A cohesion system of loaning camel called 'Maal system'	● Camel holding = highly mobile. ● Strong clan identity (Yaa system) but no authority existing in larger community ● Things are decided through discussion of elders. ● The traditional prevail over the government administrative system.

Source: JICA Project Team

Table A5.1.2 Tendency of Rough Characteristics by Large Animals

	Cattle rearing	Camel rearing
Characteristics of animal	Shorter interval of watering, Grazing (fed with grasses).	Longer interval of watering Browsing (fed with leaves on bushes).
Dwelling environment	Due to the characteristics and low mobility of cattle, they stay in (a) wet & cool climate, (b) rangeland with rich grasses, (c) near water points.	Due to the characteristics and high mobility of camels, they can, stay in (a) relatively dry & hot climate, (b) near the bush fields, (c) relatively far places from water points.
Livelihood	semi- pastoralism/semi- agriculture.	mainly pure pastoralism. (agricultural activities are not suitable)
Mobility of families	Mobility is relatively low. Semi-settlement style may be dominant.	Mobility is high.
Cohesiveness of a community	People may develop some relations based on geographical connection.	Pastoralism lifestyle hampers them in developing relations based on geographical connection.

Source: JICA Project Team

5.2 Drought Management Committee and CMDRR Approach

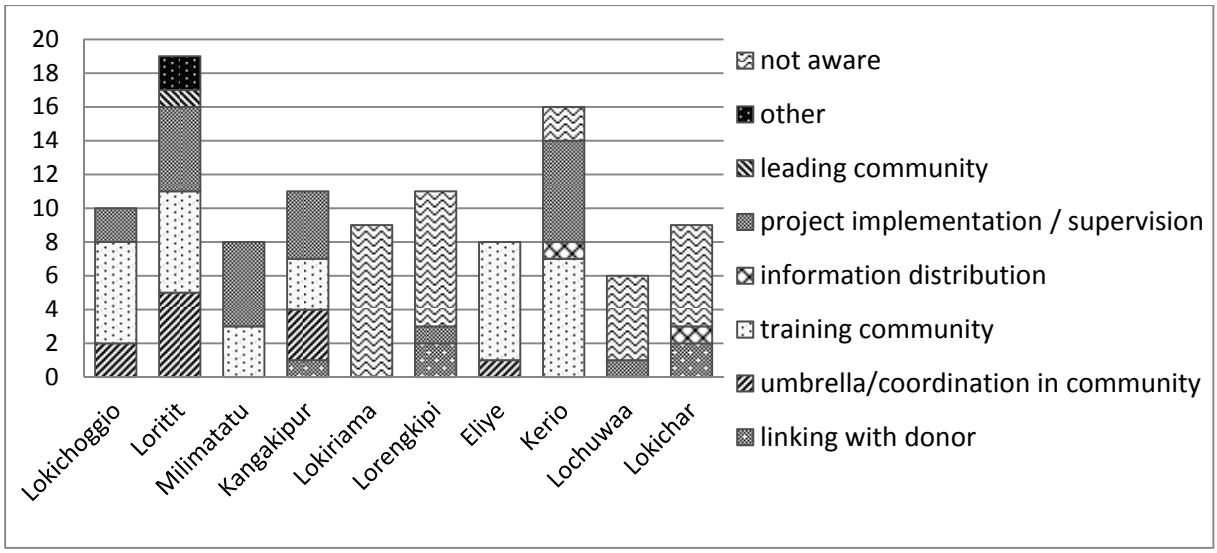
5.2.1 General

The crucial issue learnt from the former projects on CMDRR and DMC was sustainability of the committees. In order to overcome this difficulty, the Project has taken approaches to develop self reliance of the committee. The fundamental approach taken through the Project was encouraging the committees to start their own activities without major materials and financial support. Technical support was provided to the communities that have taken the initiative to start activities. Initiatives taken by the committees were raising EWS awareness in the communities, establishment of reseeding farms, training of the communities on early animal off-take, and formation of sub-committees that will be in charge of management of particular activities such as water management under DMCs as umbrella committee. Some DMCs took the initiative to implement activities of their own involving the communities, even though the activeness of the DMC and the communities differ among the target communities.

An evaluation study was conducted in Turkana at the end of the Project intervention to assess contribution of DMC functions in enhancing community resilience, as well as analyzing critical factors that influence the level of success of the DMC in community resilience. Lessons were drawn from the analysis of the study. Study results are attached in ANNEX B.

5.2.2 Result of Strengthening Drought Management Committee

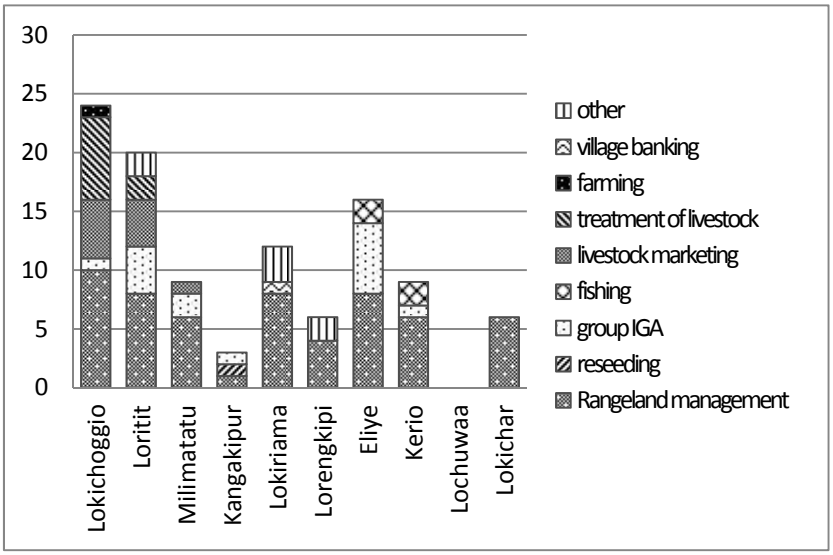
The quantitative results of the endline study indicate that DMCs have been well recognized by the community with a certain level of understanding on their roles. The following graph shows the activities led by DMCs recognized by each target community.



Source: JICA Project Team

Figure A5.2.1 Recognised activities led by the DMC/CDC

Disparities were observed mainly due to existence of physical activities or projects in the area. Where there are visible projects such as water resource development or other infrastructure improvement, people have recognised the role of the DMC/CDC supervising project implementation. Trainings of the community are also recognised as the activities of the DMC/CDCs. Execution of the role of an entry point for external agencies highly depends on the existence of other external support. In some communities, DMC/CDCs have played their role as an umbrella organization in the community, the degree of which is highly influenced by existing social structure and social relations. On the other hand, every DMC/CDC faces several difficulties in sustaining its functions, expecting further support from external agencies and from community leaders. With regard to activities on drought resilience practiced individually, activities with traditional knowledge prevail over the activities introduced by external agencies. Communal activities for drought resilience are not yet well established except rangeland management. Considering their habit of communal activities limited within the clan, such activities outside the clan boundary takes time to be adopted.



Source: JICA Project Team

Figure A5.2.2 Communal Activities for Drought Preparedness

Through the analysis of the DMC functions, it was found that four factors; (1) leadership in the community, (2)structure of the community, (3) influence of external support and (4) level of development of the area have a significant influence on the activeness of the DMCs as well as communal activities in the community. The following shows the result of the analysis of the contributing factors on DMC functions.

Table A5.2.1 Analysis of Contributing Factors on DMC Functions in Turkana

	Lokichoggio	Loritit	Milimatatu	Kangakipur	Lokiriama	Lorengippi	Eliye	Kerio	Lochwaa	Lokichar
leadership	High	Mid	Low	High	Mid	Low	Low	High	Low	Low
Community structure	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Low	Low
External influence	Large / Neutral	Middle / Neutral	Middle / Negative	Small / Neutral	Small / Neutral	Small / Negative	Small	Small	Large / Negative	Large / Neutral
Level of development	High	Low	Low	Low	Low	Low	Mid	Mid	Mid	high
Judgement from the above factors	Mid	Mid	Low	High	Mid	Low	Mid	High	Low	Low
Observed activeness	Mid	Mid	Low	High	Mid	Low	Mid	High	Low	Low

Source: JICA Project Team

Even though activeness of DMC determines possibility of communal activities for drought resilience, the correlation between activeness of the DMC and the level of communal activities, which is critical for community resilience, are still weak. This could be because it will take time to bring significant change to their customs. However, it can be concluded that activeness and function of DMC is one of the critical factors in promoting communal work that is essential for community resilience.

5.2.3 Achievement of the Project Output-1

As mentioned before, drought resilience with communal action has not been familiar to most people in the target area. Although pastoralists have their traditional ways of coping with drought situations, management of public facilities is new to them. Since most of the facilities were developed by external agencies that have also been taking care of maintenance, people have not had an opportunity to manage them by themselves. This confirms that before developing the capacity of the people on drought resilience, it is important to first develop a mindset of the people to learn to manage on their own effort instead of depending on others.

Capacity of community based drought management consists of different aspects. The following summarise the necessary capacity of people for community resilience.

Table A5.2.2 Capacities Required for Community Resilience and Their Indicators

Capacity for community resilience	Indicators to assess the capacity
Human resources	Existence of leaders
Capacity to identify risks and solution	Experience / episode on identification of any community issue / problem (as drought risk is limited during the project period)
Capacity in mobilisation of resources,	Resources utilised for community development and drought mitigation
Capacity to address the identified issue with their own resources and with external resources	Experience / episode on handling of any community issue / problem (as drought risk is limited during project period)
Capacity to utilise and apply knowledge and skills	Application of the knowledge and skills learnt through trainings (not limiting to ECoRAD trainings)

Source: JICA Project Team

To judge improvement of capacity of community-based drought management, some cases have been observed that signify improvement in those indicators. Firstly, some people started some activities that were leant through trainings provided. Even though activities were mostly at individual level, it can be said that their capacity of applying knowledge and skills had improved.

Some of the DMC members have taken strong initiative to take community action in their area, leading other people. In such areas, communal works have been undertaken well. Through the trainings and actual implementation of the activities, leadership was identified and strengthened.

Some DMCs have managed to mobilise resources from other sources, even though it was introduced from the Project at the beginning. It is expected that they can continue mobilisation of resources once the Project linked them with other organisations. Through these observations, the capacities of mobilisation of resources are, even to a small extent, enhanced. Regarding the capacity of handling community issues, people now have different levels of management. Most of the tribal communities have their traditional ways of handling issues within their clans.

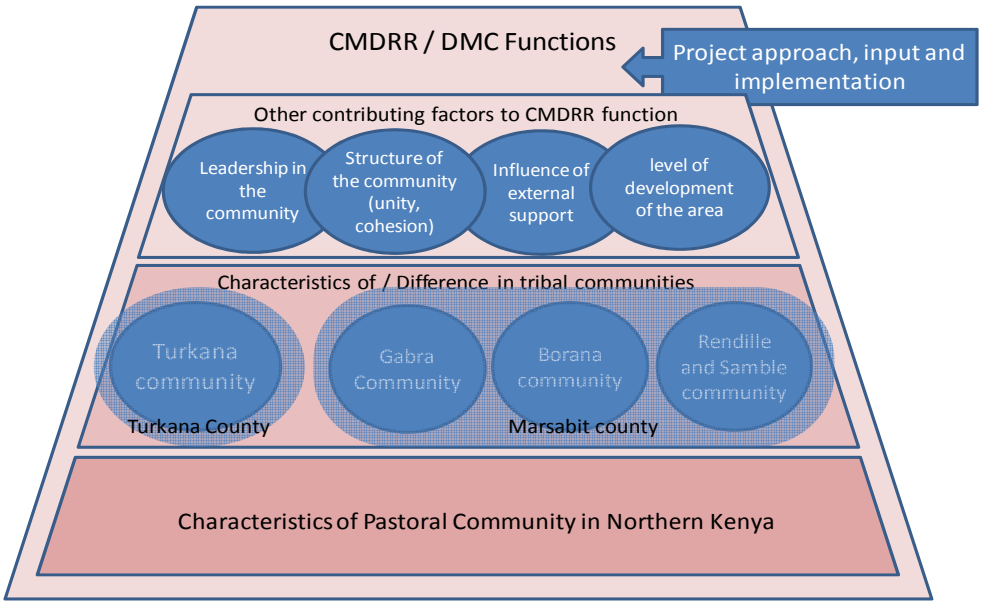
Through the introduction of communal management in larger areas or a different unit of the community such as a sub-location of the local administration unit, different systems have been adopted. In addition to the management by clan leaders, representatives of administrative units have been recognised as part of the leadership in some areas and are mobilising people when required. People are solving problems that influence a larger community such as security related matters, management of water resources, and allocation of external resources, under the leadership of the DMCs and other representative committees.

Although it is difficult to judge change and improvement purely drought from the Project, it can be concluded that capacities related to community-based drought management have improved while there are some disparities among target areas. Even though their capacities are not yet fully developed to manage everything by themselves, signs of improvement or change towards improvement have been observed, which will contribute to ultimately greater community resilience.

5.2.4 Lessons Learnt and Recommendation

CMDRR approach has been developed and mostly implemented in foreign countries. It was found that application of an externally developed approach should be carefully customised when it is introduced in the context of northern Kenya.

The Project identified significant characteristics in different levels of the society; distinctive features of pastoral society in comparison with agricultural society, specific context of Northern Kenya, characteristics of different ethnic groups in Northern Kenya, and the above mentioned contributing factors. The relations of these factors are illustrated in figure A5.2.3. Those characteristics and features should be carefully analysed and approaches should be customized according to the context. Recommendations on dealing with each factor are described in the Guideline.



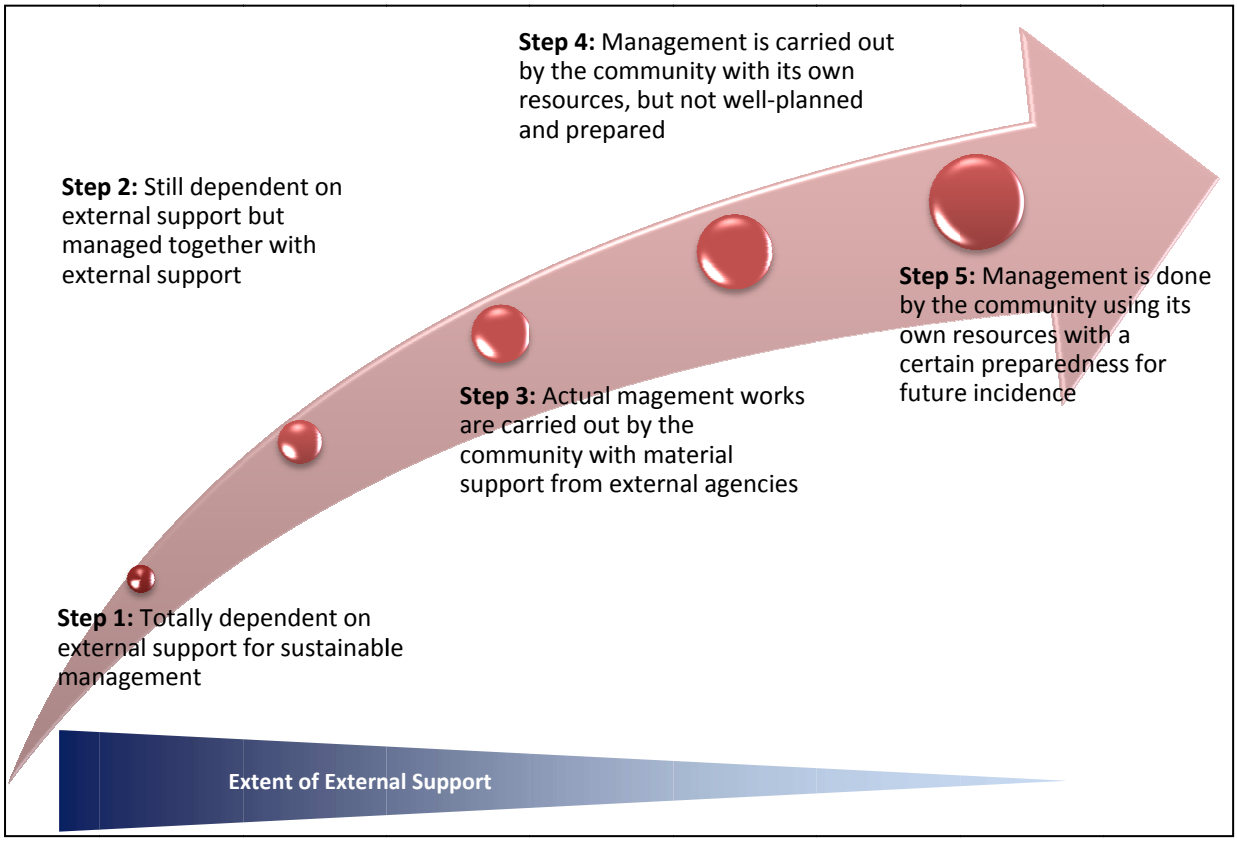
Source: JICA Project Team

Figure A5.2.3 Framework of Major Factors Influencing Community Resilience

(1) Lessons on General Approach with Regard to Community Development

Societies in Northern Kenya have been developed in cooperation with external support including relief aids for several decades. Therefore, external aids take substantial part of their development and dependencies have been embedded. Since the community resilience intends to encourage communities' self reliance, capacity development is a critical part of the intervention.

Due to the culture of relying on others for decades, it is not feasible to change people's tendencies in a few years of the Project. It was found that interventions intended to bring a radical change of the community can even cause negative impacts. For example, introduction of a complicated financial management of communal savings to prepare for drought in an area where there is no capacity to manage it distorts the traditional way and leads to exploitation of the community. If the gap between the current situation and the intended situation is significant, a stepwise approach should be taken. The stepwise approach is recommended to be applied to develop a self-resilient society especially for the community with lower capacity. The details of the step by step approach are explained in the Guideline.



Source: JICA Project Team

Figure A5.2.4 Stepwise Approach of Community Development

Due to the deeply embedded dependency on relief aid, it requires tremendous time and effort to change people's mind to develop self reliance. Since the society is now experiencing a mix of relief aid and development projects, different approaches between these two bring divergent influences on the people's minds.

Even though relief aid and development are based on different policies and objectives, collaboration is inevitable if a self-reliant society is to be developed. Provision of relief donations and the encouragement of self-reliance for the community can contradict each other. The approaches to be used should be agreed upon among the different external agencies and through coordination by the county government

(2) Lessons on Application of CMDRR Approach

Although CMDRR approach is a well-developed and widely used approach, it was noted that elaboration and modification is still necessary when it is applied in a different context from the one in which it was developed.

The followings are modifications and recommendations in the application of CMDRR approach in the context of Northern Kenya.

1) Drought Management Committee

The DMC, which is supposed to be formed in a "community", should be an umbrella committee to oversee development issues and act as a practical secretariat to chiefs and elders as shown in Figure A4.2.1. A size of "community" which a DMC can manage is recommended to be a small administrative unit, i.e., sub-location currently under the national government system, in consideration of the importance of being accommodated within government system for sustainability.

However, for tribal groups, such as the Rendille community, which have not yet fully adapted the government system, traditional social units, which have strong cohesion such as clan, must be considered as the coverage "community" for the DMC. The important considerations here are that the functions of the DMCs and how they can be harmonised and merged with the traditional social structures and government structures.

Further, all stakeholders including the county governments, national government, the NDMA, and all donor agencies should share the community level structure and use it as a common community structure for their respective activities. In addition, selection of DMC members should be done based on the full understanding of all the above parties. It should be done jointly by facilitators and the community members, but not just holding a public baraza.

2) Community Action Plan Preparation

CAP preparation should be done with a proper understanding of its meaning. In most cases, CAPs are prepared for donor agencies to decide which activities to support. Instead a CAP should be prepared as an absolute plan of the community that can be used by the community for their own action with support by the external agencies as supplementary help. The process of planning in consideration of their own capacities and what can be done by the community is crucial to promote endogenous development and self reliance.

Two CAPs were prepared in the ECoRAD Project, one with external support and the other without. By doing so, the communities were offered an opportunity to think on what kind of measures they can take to prepare for drought by themselves. Not all of the projects listed in the CAPs without external assistance seem well examined though. Through such a process, a proper understanding of CAPs can be expected.

3) CAP institutionalisation

Recognising that CAPs are still useful for planning activities for governmental or external agencies reflecting community needs and avoiding duplication, the CAP preparation process is recommended to be a regular process, preferably integrated into the county government planning process. As was agreed in the seminar on enhancing drought resilience in Northern Kenya with a large number of stakeholders, actions for integration of the Community Action Plan (CAP) into the County Integrated Development Plan (CIDP) should be taken.

The CAPs can be used as an input for formulating and updating the County Integrated Development Plan. The CMDRR approach should be officially adopted in the county development planning, especially the process after CAPs are formulated. At the moment of preparation of this report, a new structure under county government was still being established, and decision making

and governance systems have been delegated from the central government system to the county one. This change should be taken into consideration when developing drought resilience mechanisms.

Many CAPs have been prepared and left unattended after the particular project that prepared the CAP left. Implementation of CAP has not been emphasised enough as one donor can handle a limited issue and another donor again prepare a different CAP for their assistance. In order to make the CAP an absolute plan of the community, in the short run, the government staff should act as a central body to facilitate and connect the community with the higher government and donors to access funds for investment, while the government and donors should continue building the community's capacity for it to be able to manage the activities by themselves in the long run.

One of the main reasons for dormant DMCs is one-off funds to execute only a particular activity. This easy injection of funds may send the wrong message to the community that CAP implementation cannot be done without donor funding, indicating dependence or reluctance.

Without a proper understanding of the role and functions of the DMC, its activities will not continue once they use up all the availed funds. To avoid this situation, one strategy is to institutionalise the CAP process into the government process so that a regular process of funding for CAPs is secured. While implementing donor funded activities, it is important to foster activities that can be implemented with their own effort and through fund raising and management of the funds in the long run.

5.3 Natural Resource Management

The details of impacts, observation and relation to the Project Outputs by the sub projects are shown in Table B5.1.

5.3.1 Results and Impacts of Sub-projects

(1) Establishment of Boreholes (Permanent Water Source)

As a physical impact, the total beneficiaries of the 20 boreholes established in Turkana range from 1,000 to 1,500 households and from 89,000 to 137,000 livestock, even though these estimates are based on community interviews and may not be quite accurate. They are expected to serve more especially during drought period, as most of the boreholes were established as strategic boreholes located in the dry season grazing areas. Since the boreholes are permanent water sources, rangeland around borehole can be used throughout the year. The boreholes established in unused rangeland can contribute to expanding potential grazing area for sever dry season.

Regarding the Operation & Maintenance of the boreholes, 16 out of 19 that require maintenance of pumps have been registered under the O&M scheme of Diocese of Lodwar by contributing the registration fee for two years. Some boreholes have already received maintenance and repair from the scheme after minor problems were observed. The approach of registering to the available O&M scheme seems to be a feasible and practical way of maintenance. Even though it still relies on external support, it is a workable option to be considered in the current situation where neither the "young" community can cater for maintenance work by themselves, nor the government. With the small amount of community contribution as a form of registration fee for the O&M scheme, it can nurture a culture of contribution among the dependent community with minimum mismanagement that could occur when "young" community try to manage common fund.

(2) Water Pans and Sand Dam for Rangeland Management

All the water pans constructed through the Project, except Sotowesa water pan that has not received enough rainfall, are functioning as per intended purpose. Each water pan is serving approximately 7,000~10,000 livestock for larger water pans and about 3,500 for the small pans. Those constructed in pasture-rich areas have made the unused pasture available for grazing during the dry season. Other pans constructed relatively near the settlement areas are being used at the start of the dry season before livestock are moved to the grazing areas with permanent water sources.

This situation is expected to contribute to preserving pasture around permanent water sources for severe dry season. Even though it is difficult to analyse change of migration route of herds as it highly depends on the rainfall of each season, preservation of pasture around permanent water sources will contribute to survival of livestock during drought. Since the new water pans expanded grazing areas with water, herders spread into different and larger grazing areas and the density of livestock population has reduced, and thus reducing overgrazing.

Rehabilitated water pans and sand dam through the expansion of the water pan capacity contributed to prolonging use of the surrounding pasture, depending on the livestock using the pans. Another impact reported by the community was that the newly constructed water pans also strengthened planning of the grazing pattern. Although tribal conflicts sometimes affect their grazing patterns, pastoralists can now split and use different water sources to reduce pressure on the rangeland.

It was found that desilting of water pans is, in general, difficult to be undertaken fully by the community. Management of the water pans including control of their use, watering orders, desilting, and cleaning of the pans, have worked better in an area where there has been strong traditional water management system such as *Aba Herega* system in Boran community.

Adequate integration of the traditional *Aba Herega* system into the newly-introduced management system made WUA recognised as an authorised management body in the community. This resulted in a relatively good understanding on and acceptance of the new management system and strengthening traditional management such as utilisation of '*meer*' that contribute to desilting.

Even though major desilting has not been done in the concerned water pan, initiatives and efforts were taken by the WUA to desilt the pan where needs of the water was high and people benefitted from it. This can imply actual benefits, when their needs were met, therefore change their mindset from dependency to self reliance.

It can be expected that the benefit of the water pan together with the facilitation and encouragement of the O&M through several discussion enhanced the motivation of people on managing common water resources by themselves. Since major desilting works are not possible manually, people can take action to seek for support at adequate timing instead of waiting for the assistance to come.

(3) Water Pipeline

A major impact of the improvement of pipeline water distribution system is improvement of water availability. After the sub-project implementation, discharge of piped water increased from 0.5 L/sec to 1.2 L/sec. Increase of water volume made it possible to serve water efficiently in a shorter time. Before the rehabilitation, it had taken longer time to water animals due to smaller water volume from the pipe. This implies possibility of serving more livestock efficiently during drought period. Efficiency of watering can enable livestock to travel to further grazing area that can expand grazing potential and reduce congestion in a surrounding area. Furthermore, they do not need walking long distances in search of water, which happened before especially during breakage of pipeline. As water is always available nearby, women now have more time to attend to other chores such as weaving, fetching poles and making traditional items for sale, which can result in increase of family resources.

Improvement of maintenance skills and their practice of minor repair enabled continuous supply of water without delay in repair. Even though collection of maintenance fee has been slow and less than expected, they have used the collected money to procure spare parts for repairs. This made some of the community members to realize importance of saving in advance for quick repair in case of problems. Although radical change was difficult, introduction of the new idea has influenced people's behaviour, which will contribute to improvement of skills to cope with difficulties through community's own effort.

(4) Rock Catchment

Pastoralist's communities are facing serious shortage of their drinking water supply, and improvement of water supply systems was one of the major interventions. The proposed rock catchment was a pilot

facility with a new design that is; construction of an excavated reservoir under the original ground level at the foot of the rock slope to maximize the storage capacity at minimized construction cost.

Once the new rock catchment is filled with water, it can serve for about 208 days for 120 households based on the rule of the WUA of Lokuchura that limit the amount of water to be fetched to 30 litres per household per day technically, although there are actually other factors influencing such as evaporation and absorption into the rocks. It is difficult to judge actual amount as the rock catchment has not been filled up after the additional rehabilitation work. The community mentioned that if the rock catchment is filled up and water can stay, they can have water available nearby their household for a longer period. This can, especially for women, reduce distance to search for water, which contribute to save time for women so that they can spend more time for other activities.

(5) Solar Power System in Water Pump Facilities

The solar power generation system enabled the community to acquire water without any disturbance of scarcity of fuel or breakage of generators. This also implies that the solar power generation system can continue pumping water even during drought when people cannot afford to pay for fuel facing difficulty in acquiring cash due to emaciation of livestock. This is the significant contribution of the solar power generation system to drought resilience. Furthermore, uninterrupted water supply saves time for the live stock watering and brought more immigrants since there is no fear of lack of water especially during severe dry period. Furthermore, due to decrease of the cost of the solar power systems, it is more cost effective than engine generator in total, saving fuel cost for operation.

Management of communal fund through saving from water fee showed different impact among the three target areas in Marsabit. While Korr and Kubi Qallo have faced difficulties in managing communal fund for O&M and community development, Shurr has experienced some remarkable achievement in use of communal fund. In Shurr, community fund saved from the water fee have been spent for community development activities of a primary school classroom construction as well as employment of parents teacher, which have contributed to better education environment of children. Improvement of learning environment can enhance health status of the children and improve their learning. Although enhancement of education is not direct resilience against drought, it is one of the fundamental elements to improve community resilience in the area where people lack basic education to manage necessary resources such as financial resources. Furthermore, accomplishment of the community project introduced an idea of community project with their own resource.

Installation of solar power system in a local water supply company, LOWASCO, in Turkana enabled the company to save fuel cost. Saved cost from fuel is used for maintenance of hand-pump boreholes in the county. An agreement was signed between the county government and the water company to handover 60% of the saved fund to the County government for maintenance of hand-pumps, which is currently subcontracted to the Diocese of Lodwar. This contributed to solving problem of unattended repairs of the boreholes in the county. Reviving of abandoned boreholes can contribute to increase options of water sources.

5.3.2 Achievement of the Project Output-2

It can be concluded that several tendencies and progress towards sustainable of the NRM have been observed during the Project period, meaning that sustainable NRM is to some extent realised in target communities. Due to the situation of the community at the beginning of the Project that had been fully dependent on external support, it will require longer intervention to realise self-sustainable NRM. The Project has introduced different methods of management that can be sustainable to some extent with their capacity. Innovative designs of the water facilities that prolong the lifespan of the facilities is one of the examples. Introduction of existing O&M scheme is another example, which is not fully sustainable as it still depends on external support, but a realistic way that is more sustainable than before and better than complicated management system beyond their capacities are introduced. Judging from some cases where people have started contributing for management of water facilities, it can be assumed that the Project approaches have contributed to the shift of people's mind towards management of resources with their own effort.

5.3.3 Contribution to Drought Resilience

Development of natural resources and their management have been contributing to enhancing drought resilience in the following ways.

Table A5.3.1 Contribution of Natural Resource Development to Drought Resilience

Elements	Approach Type*	Contribution to Drought Resilience by the sub-project
Water resource development And Rangeland management	Base-up Mitigation	Development of new water sources has expanded grazing potential of unused rangeland. Since new water sources were located strategically to avail unused pastures during dry season, potential of the pasture land increased. Improvement of water facilities provided solutions for some difficulties faced before. Improvement of water capacities increase water availability that can result in increasing potential of use of surrounding pasture. Developments of water sources, together with management of rangeland, can physically contribute to drought resilience by increasing water and pasture that are fundamental needs for livestock survival. Increase of available water and pasture work as base-up of the situation against drought impacts.
Rangeland management	Mitigation Bounce back/ Quick recovery	
Water resource management	Mitigation	Improvement of management with development of capacity of people is crucial part of enhancing drought resilience. Capable people can manage on mitigation of drought impact and rebuild their life from drought damage. Even though people have not been fully capacitated through the Project, generation of mind of contribution from the community where they had completely depended on external support is a great step towards resilient community. Improvement of management including rules in water use, fee collection and financial management can also contribute to develop fundamental capacity of people to manage drought situation.
Improvement of O&M	i) Mitigation ii) Bounce back/ Quick recovery	Improvement in feasibility of maintenance of water facilities either by the community with their own or utilising existing scheme also directly contribute to the drought resilience as it enable the facilities to provide water continuously. Capacity of maintenance can increase mitigation of drought impact by continuously providing water even during drought.

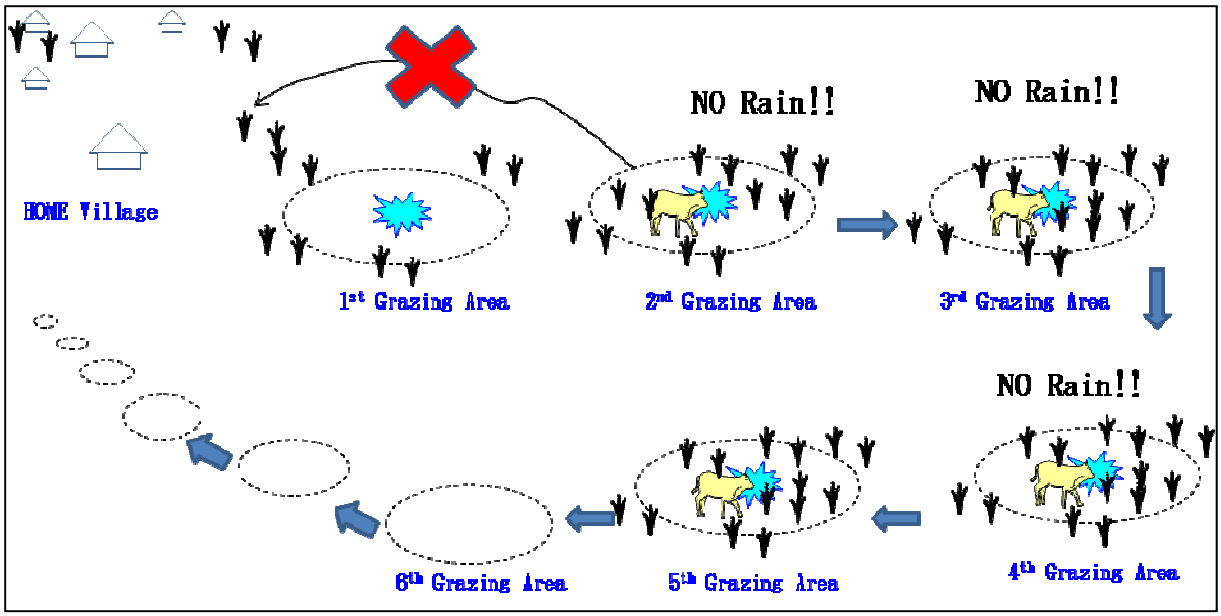
*: Drought Resilience Improvement Approach described in Section 3.2

Source: JICA Project Team

5.3.4 Lessons Learnt and Recommendation

(1) Strategic Provision of Water Points

Establishment of dry season grazing area is key to drought resilience in terms of natural resource management. As shown in the figure below, if the herds had enough span on the chains of the dry season grazing areas, they would not be affected adversely in case of droughts.



Source: JICA Project Team

Figure A5.3.1 Image of Ideal Migrating Condition in Drought Year

Issues to be considered in establishment of strategic water point are as follows.

- Firstly, the migratory routes should be carefully examined in consideration of variation and flexibility of pastoralists' movement as migratory routes vary depending on the rainfall distribution of the year and differ between ethnic groups.
- Secondly, potential rangeland should be evaluated in terms of type of vegetation, amount of grass, and expectation of stable rainfall in the wet season. The first option can be the rangeland that are under-utilised due to scarcity of water sources. Another option is a rich rangeland even in dry seasons near a settlement area, which has previously been utilised as the wet season grazing area.

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

Table A5.3.2 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

According to the table above, areas No. 2 and No. 4 have high potential for the pans. This means that one of the most effective ways of supporting the pastoralists' mobility is to construct pans in the wet season grazing area while the pastures are available in those areas.

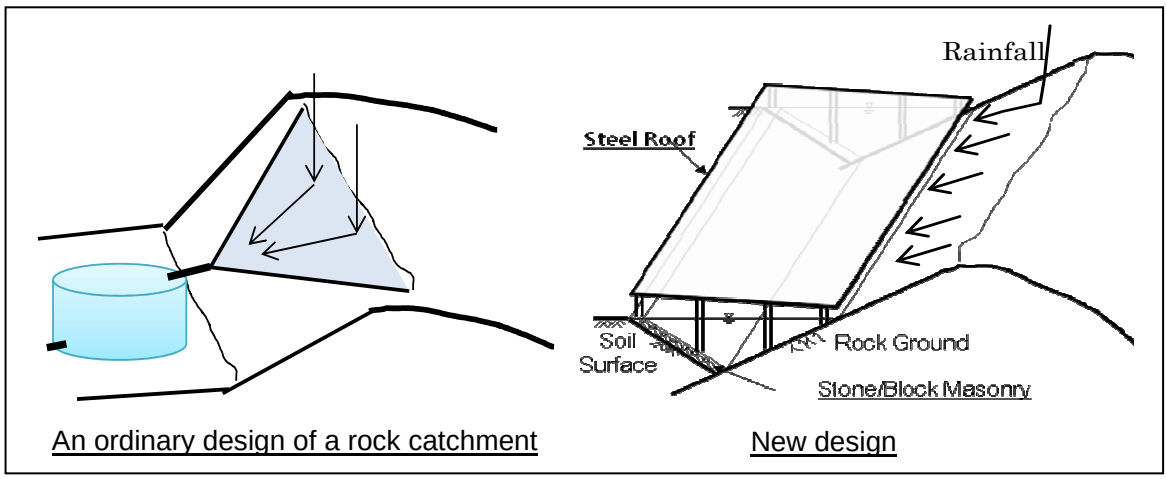
Furthermore, territorial relation between bordering ethnic groups should be considered. Each ethnic group has a boundary of their migratory routes in relation to other ethnic groups. Intrusion into the territorial areas of other ethnic groups can cause conflict and development of water sources can possibly lead to disputes over ownership.

In other words, strategic water points can contribute to easing ethnic conflict. This is because if the newly established water point can expand potential grazing land within a group's territory, herders need not move over their boundary, thus avoiding potential conflicts with other ethnic groups.

While considering all the above factors, community consultation is still mandatory for selection of water points.

(2) Improved Structure of Rock Catchment

A new design of rock catchment facility was introduced in the Project. With the new design, an underground excavated reservoir was constructed instead of a tank constructed on ground, in order to increase the storage capacity of a reservoir tank and to minimise the construction cost as shown in the figure below.



Source: JICA Project Team

Figure A5.3.2 Schematic Images of New Rock Catchment

This design has advantage in (1) lower construction cost by more than 30%, (2) larger capacity of reservoir (from 7 to 15 times more than normal design, and effective collection of rain water. Nonetheless, there is possibility of leakage. It is recommended, if the budget allows, to use a concrete wall as side wall in order to minimise the leakage from a reservoir. It is also recommended to apply impervious paint-coating on the rock surface.

(3) Solar Power Generation System as Alternative Power for Water Pumping

The utilisation of solar power is one of the effective and recommendable resources in Northern Kenya, in consideration of: (i) economical aspect in overall life period, (ii) ecological aspect, and (iii) operation and maintenance aspect.

The following table shows the comparison between the calculated expenses of a diesel generator power system and that of a solar power system at Shurr borehole pump system in which the Project actually installed a solar power system. As mentioned in the table, the overall expense of the diesel generator system was 3.8 times more than that of solar power system.

Table A5.3.3 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	Maintenance 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./10years	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 submergible pump.

Source: JICA Project Team

A suitable condition for solar power pump system is conversion from diesel generator system in the remote area where cost of diesel is high and repair and maintenance activities of a diesel generator are the difficult. Technical recommendation in solar power installation is explained in the Guideline.

(4) O&M System and Customary System

Possibility of management of water pans differs among different ethnic groups. Where there have been traditional systems of management, such as *Aba Herega* system in Boran Community, potential of introducing further management system or improvement of the management is easier. However, in the area where herders are merely users of the water source without having sense of ownership and idea of management of the common property, introduction of the management system should takes much longer time. These tendencies are highly related with the characteristics of the target community as well as prevailing features of the pastoralist society in the context of Northern Kenya.

In Boran communities, amalgamation of the newly introduced management system in the traditional system worked relatively well. The strong traditional system of *Aba Herega* in Boran society has leadership has been respected by the community. Thus the system that can be accepted by the *Aba Herega* can be most likely to be accepted by the community. Even though desilting by the community seems to take time to be adopted even in the Boran Community as the communities have not been experienced it under the condition where relief aids have worked for them, other relatively minor works such as fencing of water pan, arrangement of watering order, and cleaning of pan including collection of animal dung have been implemented.

On the other hand, in the community where there has not been custom of management of common facilities, it is challenging to introduce management system in a short run. As the users of water pans are neither specified nor belonging to particular communities, ownership and responsibility are unclear. This can be understood from the point of the characteristics of the pastoralists' lifestyle in which they move around seeking for other available sources when one is exhausted or vanished.

(5) Possibility of O&M by the Community Depending on the Type of Facilities, Their Location and Their Purpose.

Management of the water facilities is inevitable for sustainability. Even though desilting is necessary, feasibility of desilting work depends on the purpose of the water pan. In consideration of strategic allocation of water sources, if the water source is developed in the middle of wet season grazing area where there is no settlement, it is less likely to be managed by unspecified community. However, those water pans established where there is no settlement are important to enhance resilience of pastoralists against drought by making currently unused pasture land accessible during dry season. Therefore, if the water pan has the purpose of serving for dry season grazing area locating far from settlements, alternative way of management, such as controlling under government or private schemes, should be proposed, as it is unfeasible to expect the unspecified communities to manage.

(6) Sustainable O&M of the Facilities that Requires External Materials and Skills for Maintenance

Although fee collection is inevitable for sustainable O&M of the facilities that require expenses, feasibility and applicability of appropriate fee collections depends on the situation of the communities.

Firstly, it has been found difficult to introduce fee collection where people are used to getting water free. Even though the facilities require expenses for maintenance, the maintenance has been always supported by either donor agencies or government. In such cases, people know that they are suffered from scarcity of water when problems occur as they need to wait for someone to help. However, the concept of preparing for unpredictable problem is hard to be accepted. This is mainly due to the fact that there are helps available if they wait, and that pastoralists have a custom of seeking for available resources instead of controlling them.

Secondly, financial management in the community is extremely difficult especially in the community where majority of people are illiterate and people do not have idea of supervision of financial management. Ideally maintenance cost should be covered with communal fund prepared in advance. However, holding a certain amount of money in hands of limited people without proper supervision by others easily cause mismanagement. Different ways of covering O&M costs should be introduced with sensible judgment of the capacity of the community. The different ways can include (1) no fee collection but contributing when problem occurs, (2) collecting fee only for daily operation, and (3) periodical fee collection to prepare for emergency. Details of the options are discussed in the Guideline.

An alternative option is collaboration with existing O&M scheme. When the community does not have enough capacity and idea of maintaining the facility with communal efforts, it is an option and could be a helpful step forward to self sustainable management. Considering the difficulty and immaturity of the community, it shall be more sensible at this stage not to promote community contribution in terms of money to avoid exploitation by a certain local influential persons. In cases where people are not capable and there is risk of mismanagement, it is realistic to utilize available external support with necessary capacity building until the community equips with enough competence to handle their own contribution. Meanwhile, application of the existing O&M scheme should have aspect of introduction to community contribution, while the rest of the cost can be supported by the scheme.

What is important to be mentioned here in establishing sustainable O&M system is that it will take time and cost more to develop mentality of the community on self reliance and to equip them with adequate skills on management of O&M. The project intervention should view longer term plan and impact instead of trying to achieve the ideal situation in a few years of time with limited intervention on capacity development of people. A stepwise approach with different intervention at different stage of the community is proposed. The details of the stepwise approach are described in the Guideline.

5.3.5 Result and Recommendation of Turkana Water Potential Study

(1) Groundwater Potential

Turkana Groundwater Development Potential (TGDP) Map was prepared and shared with the relevant stakeholders under control of the counterpart agency. The TCDP map includes the potential level by colour on SRTM topographic image, major fractures and fault lines, existing boreholes locations with water quality, simulated groundwater head contours, and proposed drilling sites. It indicates selection of the site, recommended depth of drilling and water quality. Therefore, TGDP Map can be used for preliminary selection of the area to drill for hand pump before field survey is done.

The followings are the major findings of the study on the Turkana ground water potential. The details of the study are in ANNEX E

- The current water volume utilised through boreholes is only 12% of the sustainable yield in the whole of Turkana County
- Water availability is unevenly distributed in the county with some water sheds using more than 30% of the sustainable yield.

- Even though ground water potential is still high in Turkana, not all water is suitable for human or livestock consumption. The recommended drilling depth for a borehole for hand pump is 100m, to ensure good water quality is got.

1) Available ground water quantity and its distribution in Turkana County

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

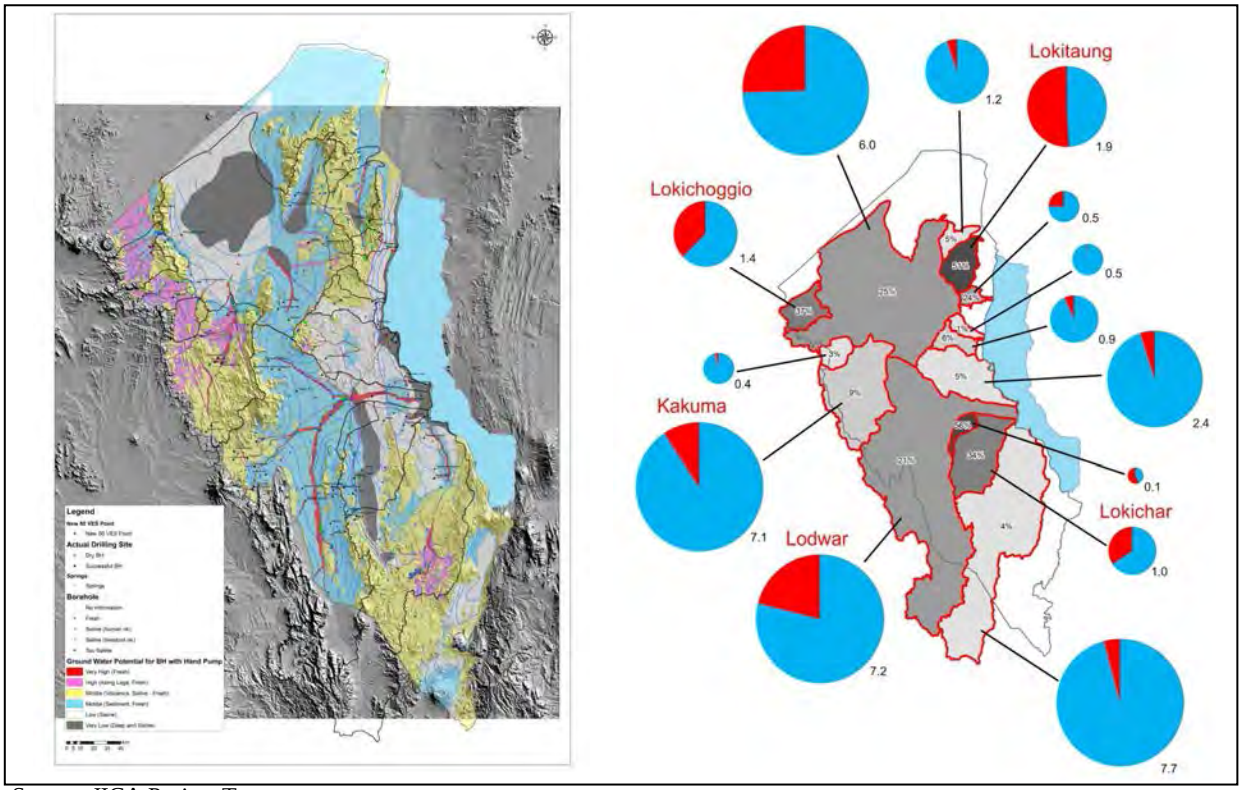
Table A5.3.4 Groundwater Potential in Turkana

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

2) Distribution of ground water sources.

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-coloured zones indicating the groundwater's development potential level from a high potential (Level 5) to low potential (Level 1).



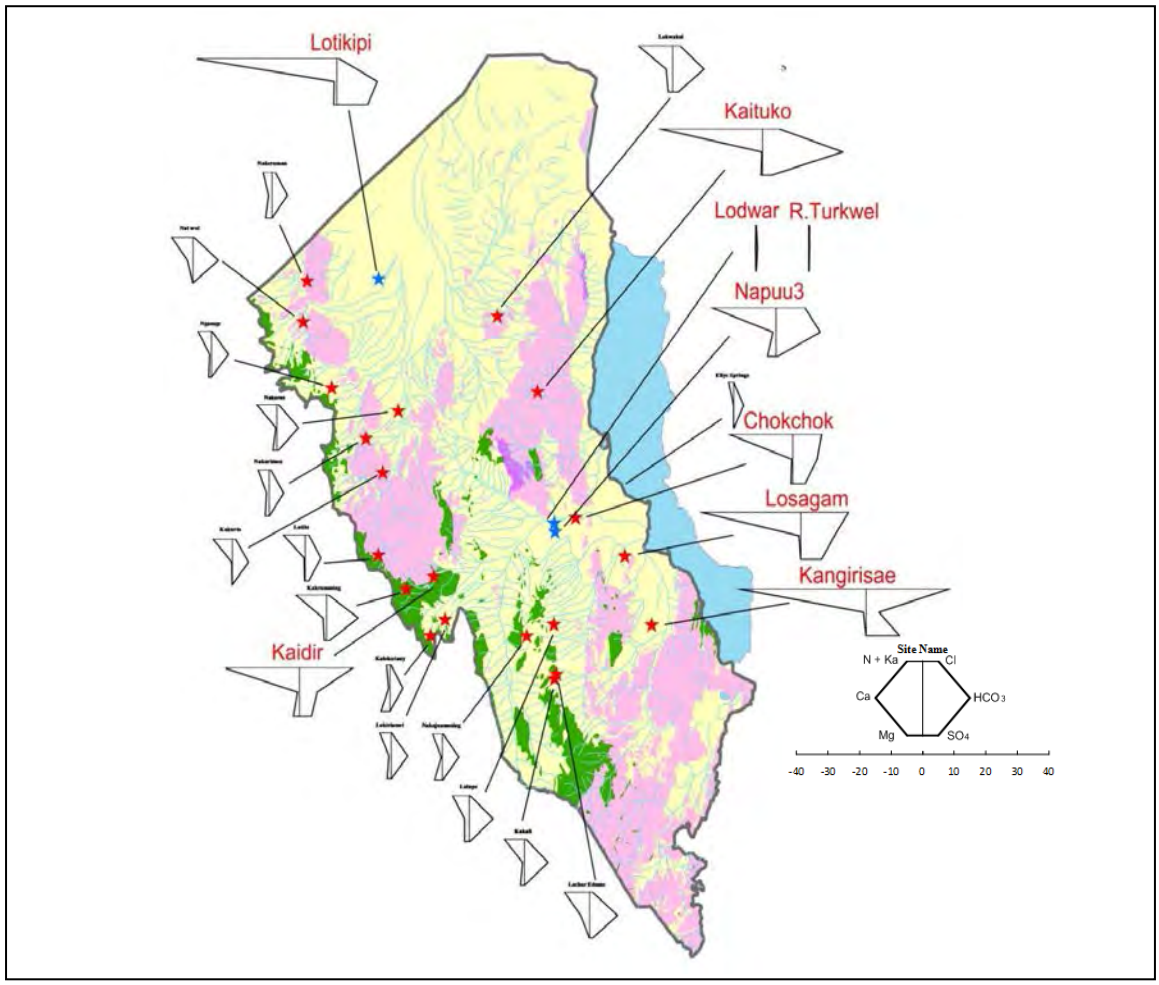
Source: JICA Project Team

Figure A5.3.3 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 cu.m (MCM) of a sustainable yield and only around 10% is used currently.

3) Water quality

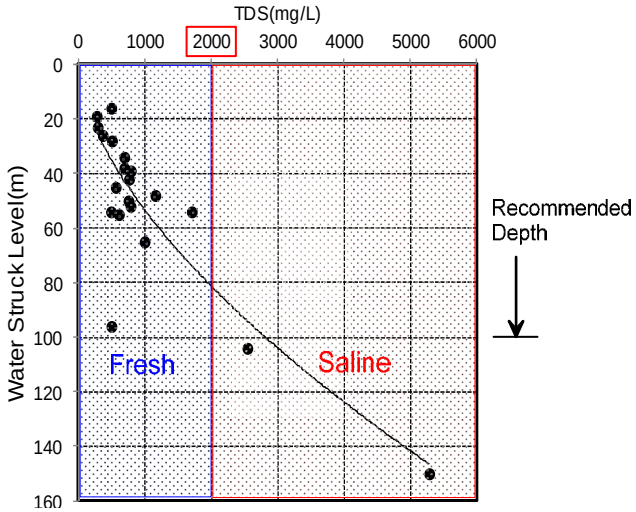
The figure below shows the distribution status of water qualities, which were obtained at the boreholes. The shapes of hexagons represent the water qualities. If the size of the hexagon is big in width, it means that water is contaminated with undesirable substances. According to the water quality survey and groundwater flow analysis, it was found that there are two significant areas, which are marked in gray colour 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 regrettably having water quality that is not preferable for consumption.



Source: JICA Project Team

Figure A5.3.4 Groundwater Quality Map 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.

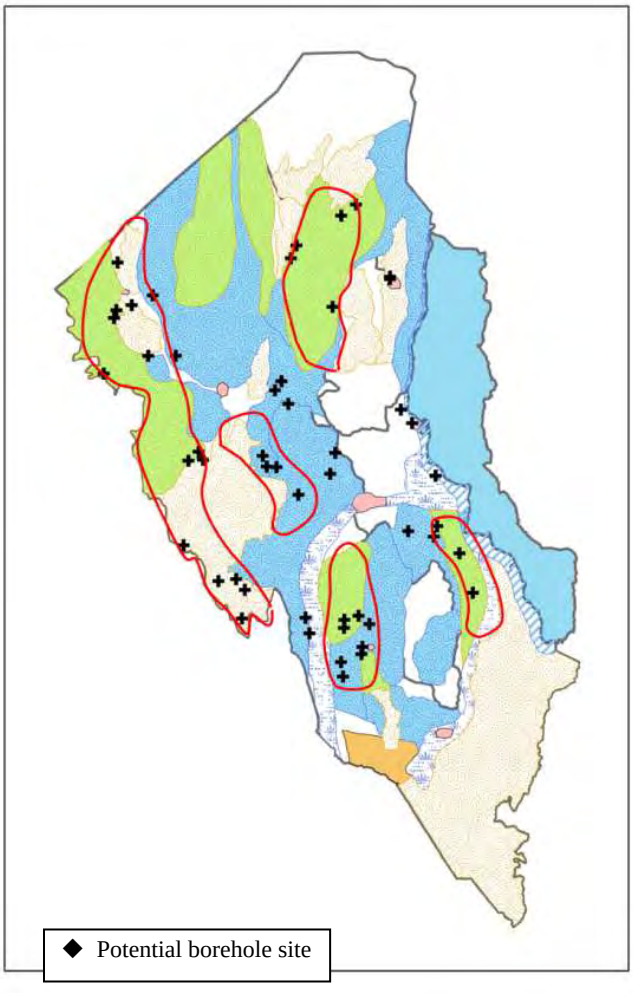


Source: JICA Project Team

Figure A5.3.5 Water Quality and Water Struck Depth

4) Proposed borehole development sites

Based on the designated Natural Resource Development Belts shown below, the Project identified 50 potential borehole-sites in Turkana. The 50 identified potential borehole sites are indicated in the following map.



Source: JICA Project Team

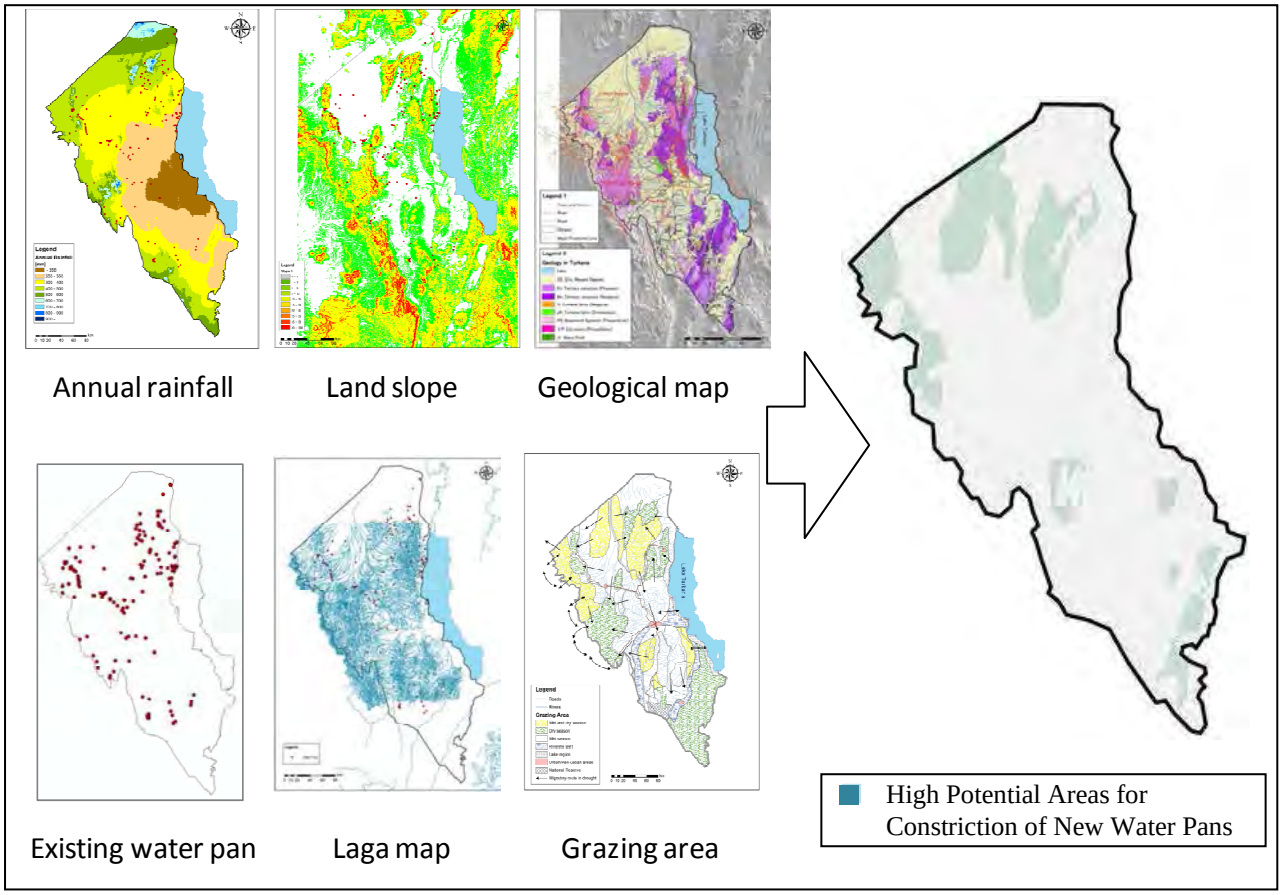
Figure A5.3.6 Identified Natural Resource Development Belts in Turkana County

(2) Surface water potential

Potential of surface water development was studied based on detailed investigation of the local conditions with focus on the water pan development. Conditions of suitable area for water pan construction were identified and proposed based on annual rainfall, land slope, geology, existence of laggas, locations of the existing water pans, and availability of pasture-rich grazing areas. The suitable areas for the water pan construction are to be in and around good grazing areas during the dry season.

It is recommended that if both potentials are high for borehole with hand pump and water pan, the priority will be given to the groundwater development, because of perennial stable water source and less construction cost.

The following figure shows the potential map for construction of new water pans that was prepared by analysing the relevant resource maps as shown in the figure.



Source: JICA Project Team

Figure A5.3.7 Potential Map of Water Pan Construction in Consideration of Other Factors

5.4 Livestock Value Chain Improvement

The details of impacts, observation and relation to the Project Outputs by the sub projects are shown in Table B5.1.

5.4.1 Results and Impacts of Sub-projects

After implementation of sub-projects, the following activities had significant and tangible impacts during the Project period.

(1) Sub-project of Heifer Exchange Programme (Marsabit)

Through the sub-project, the following assumptions made by the Project prior to the implementation of the sub-project were confirmed.

Assumption)

1) If the Project provides pastoralists opportunities to buy young female animal/heifer at local livestock market, many pastoralists would want to buy them at normal price.

2) When pastoralists want to purchase the young female animal/heifer offered by the Project, they sell their old animal to obtain cash at the local market.

Assumption No.1 was confirmed by the fact that all the young female animal/heifer were sold out at the local livestock market. Total number of sold young female animal/heifer and its price were summarized in the following table.

Table A5.4.1 Total Young Animals (heifers) Offered under the Programme

	Species and place	No. Offered	No. Sold	Lowest Price	Highest Price
1	Shoats in Dirib Gombo market	401	401	3,786	6,029
2	Cattle in Dirib Gombo market	141	141	22,007	29,302
3	Camel in Dirib Gombo market	50	47*	51,250	55,000
4	Donkey in Dirib Gombo market	88	88	15,600	17,600
5	Cattle in Jirime market	167	167	23,061	26,410

*) 50-47 = 3; 3 camels were attacked and killed by lions

Source: JICA Project Team

Assumption No.2 was also confirmed by the fact that the following percentage of pastoralists had sold their own animal to obtain cash to buy young female animal/heifer at local livestock market.

Table A5.4.2 Way of Making Cash for Heifer under the Programme (Dirib Gombo)

	Persons who sold their animal at local market	Persons who obtained cash from other means
For shoats young females	79.38%	20.62 %
For cattle heifers	53.80%,	46.20 %
For camel young females	95.00%	5.00%

Source: JICA Project Team

Based on the above mentioned facts, it was estimated that around 1,212 animals, possibly old or aged animals, were sold and converted to young female animals/ heifers under this sub-project, through Dirib Gombo livestock market (see table below for calculation).

Table A5.4.3 Total Number of Heifers and Aged Shoats Exchanged(at Dirib Gombo Market)

	Total number of heifers sold	% of exchanged heifers	Number of exchanged heifers	Average sold unit price of heifer [Ksh]	Conversion rate to aged shoats*	equivalent to shoats
Camel	50	95.00	47.50	51,477	10.57	502
Cattle	141	53.80	75.86	25,688	5.28	400
Shoats	401	79.38	318.31	4,728	0.97	309
						1,212

*: Conversion rate = "heifer's price" / "Selling price of a aged shoat"

"Selling price of a finished shoat" is assumed at Ksh 4,868 based on survey data.

Source: JICA Project Team

Finally, due to the programme, it was confirmed that drought resilience could be improved, because exchanged young female animals have following advantage in comparison to aged animals in terms of drought resilience.

- High productivity: According to the sample follow-up survey, reproduction rate of young goats which were sold under the programme was 55% in 1 year. In contrast, aged animal have no any contribution to reproduction; and
- Mortality rate in drought: According to the interview survey, most of pastoralists answered that young female animal had more resistant against droughts in comparison with aged animals.

More specific and detailed information should be referred to ANNEX F2.

(2) Sub-project of Kalacha Feedlot (Marsabit)

The following points were observed through implementation of the sub-project:

- Vegetation in the feedlot farm was significantly recovered with irrigated water, if water supply was sufficient under appropriate operation and maintenance; and
- Fattening activity with irrigated fodder was confirmed to be profitable in 2 times of trial fattening practices, as shown in the following table.

Table A5.4.4 Results of the Trials

	1st Trial	2nd Trial
Number of goats	20 goats	20 goats
Fattening period	6 weeks	3 weeks
Average Weight Gain in the period	3.1kg	6.1 kg
Average Buying Price	Ksh. 2,345	Ksh 2,565
Average Selling Price	Ksh.3,070 (31% up)	Ksh 2,775 (8%)
Average Profit per Stock	Ksh. 725/goat	Ksh 210/goat
Total Profit	**Ksh.14,500 (Ksh. 2,417/week)**	**Ksh 4,200 (Ksh.1,400/week)**

Source: JICA Project Team

More specific and detail information should be referred to ANNEX F3.

(3) Sub-project for Livestock Market Linkage and Vitalization (Turkana)

a) Core management training for LMAs officials

The core management training for LMAs officials was carried out at Kerio, Lokichar, Lodwar and Kakuma LMAs and the participants mentioned in the following table attended for each LMA.

Table A5.4.5 Details for the LMAs Officials Training

LMA	Details
Kerio	**Dates**: 31st March 2014 to 1st April 2014, **Venue**: Kerio LMA Sale yard old office **Participants:** 5 Kerio LMA officials, **1** chief and 2 Community Development Committee officials
Lodwar	**Dates**: 12th May 2014 to 13th May 2014, **Venue**: Conference Hall, CLMO **Participants**: **5** Lodwar LMA officials and **1** chief (Lodwar Township Location).
Kakuma	**Dates:** 24th March 2014 to 25th March 2014, **Venue:** Kakuma Guest House **Participants: 5** Kakuma LMA officials and **1** chief
Lokichar	**Dates**: 3rd April 2014 to 4th April 2014, **Venue**: Naperobei Guest House, Lokichar. **Participants: 5** Lokichar LMA officials, **1** Assistant chief and **2** Community Development Committee officials

Source: JICA Project Team

b) Livestock marketing trading workshop for Kerio Livestock Market Association officials, traders and producers

Thirty five Participants attended the workshop, such as (i) 10 Kerio livestock market officials, (ii) 10 traders, (iii) 12 producers, and (iv) three officials from Community Development Committee (CDC). The main workshop training contents were as follows:

- Livestock Information Needs and Requirements,
- General Livestock Health,
- Livestock Record Keeping and Training Needs,
- Book Keeping & Group Dynamics,
- Livestock Value Chain Players and their roles, and
- Marketing and M-pesa Services.

c) Project impacts in Kerio Livestock Market

The following impacts were observed in Kerio Livestock Market by the sub-project:

- Extension of Market Operation Hours: Before the Project, most of the trading activities were closed by around 11:00am in order to avoid sunshine. However, after the Project constructed shades, people extended the business time up to 2:00-3:00pm. This time extension could affect trading price significantly, in particular for the pastoralists who want to sell livestock at a higher price than that at previous negotiation in the morning.
- Cattle and Camel Trading in the Market: It was reported that, after the Project implementation, trading of big animals, i.e. cattle and camels, increased. It was because of the existence of a new holding pen constructed by the Project. Without a solid holding pen, it was hard to keep big animal at one place.
- Emergence of New Traders from Other Places: It was reported that new traders came from the eastern side of Lake Turkana (North Horr in Marsabit County) to buy young Camels which are traded at lower prices than in Marsabit. They ordered local traders in Kerio to collect 10-20 young camels. It is expected such business opportunities to Marsabit area could be scaled up in number, if more big animals are gathered at the Kerio market.
- Establishment of Producers Association: Since the Livestock Market Association should be an organization for both traders and producers, the traders had previously been dominant in the Kerio LMA, and producers were not involved in its activities. In the light of this situation, they established an association just for producers in order to strengthen their bargaining power and compete with livestock traders in Kerio market. This was quite a preferable development as it would give them some autonomy and they could improve the situation through their own initiative.

More specific and detail information should be referred to in ANNEX F7.

(4) Sub-project for Pasture Establishment by Reseeding (Turkana)

The following impacts were observed in the reseeding farm activity in the sub-project:

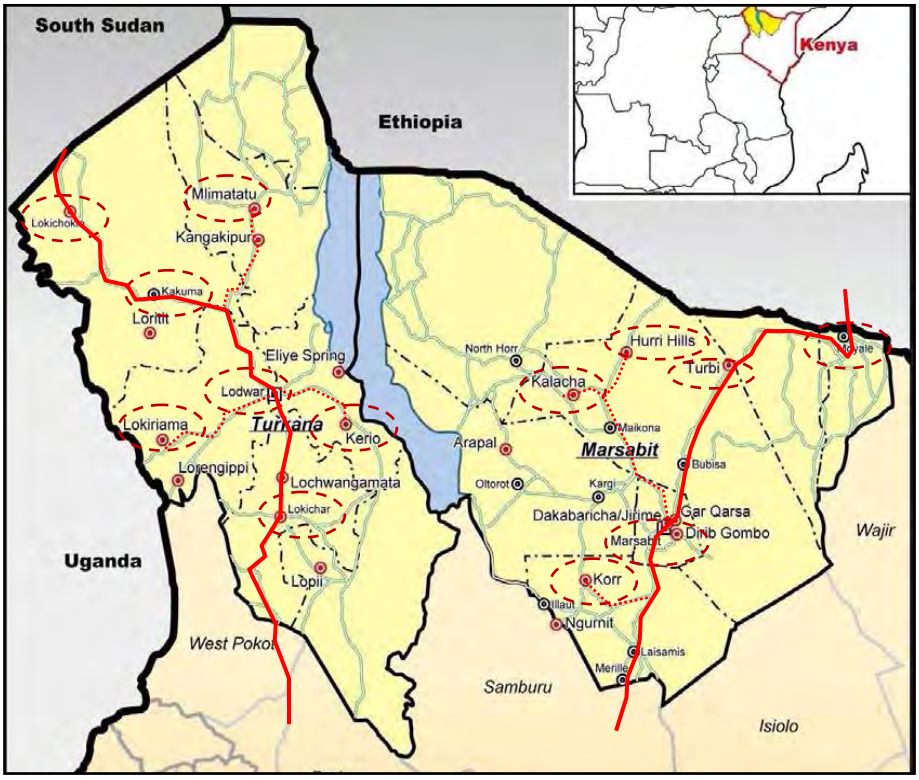
- Community members in Lokichoggio and Loritit were encouraged so much by two exposure tours organised for them by the project. Then development work of the reseeding farm in each community was conducted with a lot of participants, e.g. more than 100 people in Lokichoggio case. For introduction of reseeding farm activity, it was confirmed that an exposure tour is one of the good methods to encourage people; and

- There was a challenge in protection of vegetation in the reseeding farm continuously in Lokichoggio and Loritit farms. Most pastoralists had a tendency of bringing the animals to the reseeding farm leading to a minor conflict between the pastoralists and the reseeding farm group. This was a crucial diverging point which determines whether the reseeding activity was in vain or successful. If a good mediator would solve this issue, the reseeding farm could be sustained for a long time. This is only a major challenge in this activity.

More specific and detail information should be referred to in ANNEX F8.

(5) Livestock Market Potentials Identified

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, then roughly identified livestock market potentials in Turkana and Marsabit counties. The following figure indicates the relationship between major high/middle potential towns in terms of livestock market and major road access. More specific and detailed information should be referred to in ANNEX F1.



Source: JICA Project Team

Figure A5.4.1 Livestock Market Potentials in Marsabit and Turkana Counties

5.4.2 Achievement of the Project Output-3

The Project Output-3 was *"Livestock value chain is improved in target communities"*. Since the Project implemented pilot sub-projects for livestock value chain improvement in several communities, such as Dirib Gombo, Korr, Kalacha, Gar Qarsa, Kerio, Lokichar, Lokichoggio, and Loritit, out of the 20 selected pilot communities, activities in these communities have not yet generated tangible impacts directly connected to improvement of livestock value chain as a whole.

This is because those sub-projects need a certain time span to develop livestock market and generate benefits for improving livestock value chain. However, among those communities, some had significant improvement in market value chain. For example, due to the LMA training / workshop and improvement of livestock market facility in Kerio, this community organised the Kerio Livestock

Producers Association, and increased the volume of trade and types of animals on offer. Thus pastoralists noted that they realised higher trading prices at their market after the Project implementation.

Another example is that though it might not be a direct impact, it seems that transportation expenses from the pilot community to major livestock market would be decreased due to improvements of road pavement and drift at *laggas*. In the long run, such a decrease of transportation cost will be reflected in market trading prices at local markets.

In Dirib Gombo, the community people had established new Dirib Gombo livestock market successfully by means of the introduction of heifer programme and new construction of Dirib Gombo livestock market. Thus if this market can continuously be developed, to a certain extent, market access around Dirib Gombo community will be improved. And it can significantly reflect a decrease of transaction costs in this market, and accelerate improvement of livestock value chain in the community in various aspects.

5.4.3 Contribution to Drought Resilience

After implementation of the sub-projects, its contribution to drought resilience is expected to be in the following ways.

Table A5.4.6 Contribution to Drought Resilience by Livestock Sub-projects

	Approach Type*	Contribution to Drought Resilience by the sub-project
Sub-project of Heifer Exchange Program	i) Base-up ii) & iii) Mitigation	i) Productivity of herd is increased => Number of herd in a family is increased. => If drought hits them, a good number of animals still remain to sustain life. ii) Livestock market is vitalised => Destocking activity prior to drought becomes easier for pastoralists => Destocking is accelerated in advance of drought => Number of dead livestock is reduced during drought. iii) Herd composition of young female animal increased => mortality of livestock in drought is decreased.
Sub-project of Kalacha Feedlot	i) Mitigation ii) Bounce back/ Quick recovery	i) Fodder in feedlot is cultivated => Livestock can consume such fodder during drought spell => Mortality of livestock is decreased in drought spell. ii) Fodder in feedlot is cultivated => Livestock can consume such fodder during dry season => Selling price of livestock after/in dry season increased. => Pastoralists increase cash income and savings => Cash is used for any recovery measures after drought
Sub-project of Livestock Market Linkage and Vitalization	i) Mitigation ii) Bounce back/ Quick recovery	i) Livestock market is vitalised => Destocking activity prior to drought become easier for pastoralists => Destocking is accelerated in advance of drought => Number of dead livestock is reduced during drought. ii) Pastoralists can sell livestock at fair price at market => Pastoralists increase cash income and saving => Cash is used for any recovery measures after drought
Sub-project of Pasture Establishment by Reseeding	i) Mitigation ii) Bounce back/ Quick recovery	i) Fodder in feedlot is cultivated => Livestock can consume such fodder during drought spell => Mortality of livestock is decreased in drought spell. ii) Fodder in feedlot is cultivated => Livestock can consume such fodder during dry season => Selling price of livestock after/in dry season increased. => Pastoralists increase cash income and savings => Cash is used for any recovery measures after drought

	Approach Type*	Contribution to Drought Resilience by the sub-project
Sub-project of New Construction and up-grading of Livestock Markets Facilities and Organization	i) Bounce back/ Quick recovery	i) New livestock market is established near community & the road between main road and community is improved => Transportation expenses decreased => benefits of pastoralists are increased => Pastoralists increase cash income and saving => Cash is used for any recovery measures after drought

*: Drought Resilience Improvement Approach described in Section 3.2

Source: JICA Project Team

5.4.4 Lessons Learnt and Recommendation

The following lessons learnt and recommendations were realised:

- The heifer exchange programme is an effective tool for revitalising livestock transaction in a local market among pastoralists. However sustainability of this programme may face challenges because it needs to deal with a certain amount of revolving funds. Some misappropriation and mismanagement can occur due to weak controls of a communal committee managing the exercise.
  Under present conditions, it is highly recommended that the heifer exchange programme should be implemented as "an alternative programme for the long term" after an emergency livestock restocking programme during drought. This is because a heifer program can provide much more numbers of animals using a relatively smaller investment than a restocking program requires, and it can restructure herd composition in Northern Kenya and realise more resilient condition to drought for the long run;
- In the feedlot sub-project, the two trials conducted for fattening goats and sheep, proved its viability. The feedlot offered an opportunity to pastoralists to save weak goats during dry season and bridged the gap, however small, in all seasons, for production of good quality small stock, which was not possible under the traditional production system where the use of natural pasture was the norm.
  In the Project, technical effectiveness was confirmed, but organizational and institutional challenges emerged and remained to be solved.
  Since the Project was closing down, it was recommended that the Ministry of Agriculture and Livestock should take a leading role to ensure a sustained process is maintained for greater potential in up-scaling good fodder production management practices;
- Through the experience of Kerio livestock market, it was proved, if the market functions well, physical improvement of facility could be a significant assistance for revitalising livestock activities in terms of operating hours of the market, number and kind of animals traded, and attraction of new traders/buyers from other areas,.
- In contrast, an establishment of market facility alone would be more difficult to generate the impact, because it requires more inputs in terms of financial assistance, time-span of activities, and training. As mentioned above, the heifer exchange programme could be utilised in such a newly established market as it had already succeeded in Dirib Gombo market; and
- In Northern Kenya, there are few livestock activities which can be introduced and capably developed, on a voluntary basis by the community. . A reseeding pasture farm could be one of the good practices which do not require a substantial input of funds and human resource. In an established feedlot young, emaciated, and lactating livestock can survive by using the fenced and secured pasture during drought.
  The only challenge is how to establish strong local controls by the community for protection of the reseeding plot by themselves. In the absence of a strong leadership to enforce control, it is

recommended to introduce reseeding activities on an individual basis. In the Kangakipur reseeding farm case that was implemented by each individual, there was much greater willingness and commitment.

5.5 Livelihood Diversification

The details of impacts, observation and relation to the Project Outputs by the sub projects are shown in Table B5.1. Detailed discussion is shown in ANNEX G and a summary is outlined as below.

5.5.1 Results and Impacts of Sub-projects

(1) Results

Chicken merry go round (Marsabit)

The following table shows comparisons between the initial plan and the actual progress.

Table A5.5.1 Comparison of Progress between Initial Plan and Current Progress

Group Name	Initial plan	Current Progress
Members who get/have initial set of chicken from the Project	16	23
Subsequent members who receive/have multiplied chicks	144 (Indigenous chicken by May 2014, Sasso by June 2014)	9
Total	160	32

Source: JICA Project Team

The progress at the end of the monitoring period (December 2014) is static at 20% of the initial plan in terms of number of members who have chicken. There are key issues hindering the success of chick production and distribution namely; low number of laid eggs due to under-nutrition, old age of the hens, high chick mortality rates (though improved a bit). Sasso is a heavy breed and needs much feeds to lay many eggs.

For those not experienced in keeping improved breeds, it may not be easy to give enough feed to produce the expected number of eggs. Although chicks are hatched, techniques to rear them to maturity seem not easy by majority of the people. The latter issue is considered more important because the high mortality rate directly affects transfer of chicks to subsequent members or even the survival rate of chicks which have already been transferred to subsequent members.

Goat merry go round (Marsabit)

The initial idea was that by September 2014, all the target members would have received one female goat. The final progress at the end of the monitoring period shows a 31% success rate. The most significant reason can be attributed to physiological performance of the introduced Galla goat. If Galla goat's performance from the time of delivery could have been better or local goats used, the success rate could have been greater than the current one.

Table A5.5.2 Overall Progress of the System Introduced

Group Name	Initial plan	Current Progress
Initial members who got/have initial female goat	116	86
Subsequent members who receive/have multiplied female goat	174	5
Total	290	91

Source: JICA Project Team

Resin and honey business (Marsabit)

All the groups have been continuing their business. Honey business is more active than resin one. With regards to honey business, sales of the containers of which procurement was assisted by the

Project have almost been completed 99.9% (3,688 bottles), this is a great improvement compared with the previous transaction of coca-cola bottles of around 1,500 bottles per year.

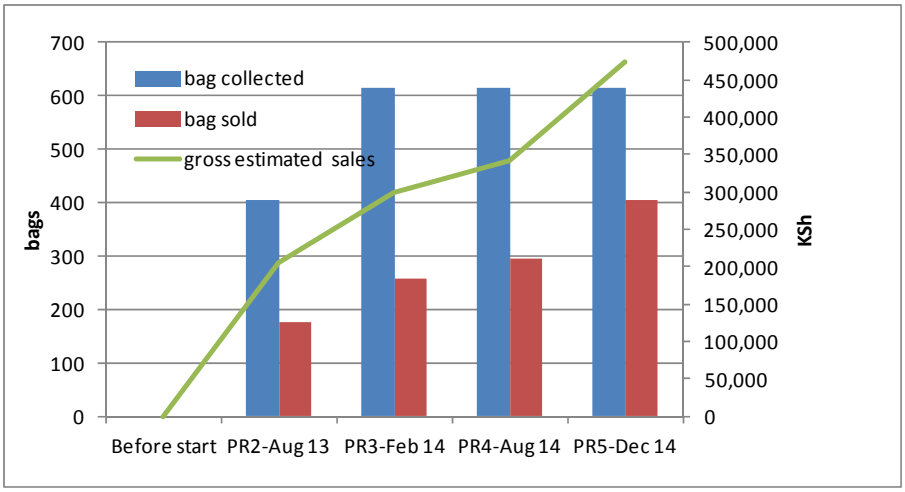
When it comes to net profit per member, the previous transaction showed Ksh 4,900 per year on average for all the group members. This increased to Ksh 10,839 annually after the first business cycle, which is more than double the previous transaction.

Salt business (Marsabit)

Since the group started this business in the last dry season (around July/August 2013), almost one and half year had passed and they experienced one business cycle for a year at the end of the monitoring period. During the first cycle, a total of 615 bags was collected while 516 bags were delivered to the identified markets.

Those sold were 405 bags, and the gross expected sales are approximately Ksh.470,000.

The growth of the business is summarized in the figure below.



Source: JICA Project Team

Figure A5.5.1 Salt Business Record So Far

IGA for retail shop and livestock trade (Turkana)

For all groups of both IGA components, they are continuing their business as before. Slight improvement especially in transaction volume of livestock trade groups has been observed, and others are at the previous level.

Small scale rainfed agriculture (Turkana)

The result of this sub-project is that the members equipped with knowledge were waiting for the next main farming season which starts in January onwards (out of the monitoring period). Some of the members tried line planting in their farms during the short rain season.

Fishery (Turkana)

After all the activities of the sub-project were done, the members learned, were inspired by the knowledge and exposure tour to see advanced examples. Still, transaction level is almost the same, albeit with some minor improvements. One notable change is that some members have started going to Kalokol, which is the main fishery centre and do commission fishing, learnt from the exposure tour. Their practical actions are expected after this.

Dry meat (Turkana)

After the training and other activities, the group members have acquired new techniques of processing dry meat. They had traditional methods making thick strands of meat which did not last long. The new technique that they learned focuses on longer period of preservation with thin strands of meat (improvement of cutting) leading to faster dry and therefore not getting rotten quickly.

The Frequency of drying meat was not high earlier because the purpose was for home consumption only and it was done when livestock died; and this still prevails. The members are ready to process as trained, and thus it is expected they will apply this when drought occurs. In addition, the group members have ambition to use this technique for IGA purpose. It could be beneficial if they started IGA with this new dry meat technique.

(2) Major Impacts

Chicken merry go round (Marsabit)

- Several efforts have been made to adjust the rule given to modify it and make it easier for themselves. The most effective invention what the groups did is to pass eggs not chicks, showing their positive and flexible attitude to the system;
- Although the levels of acquisition of skills on chicken rearing entirely vary from group to group and among individuals, some people have acquired substantial skills in poultry rearing and are seriously taking the activity as a source of livelihood. This shows some members recognized positive impact of the benefit, internalized all techniques and knowledge provided, and are willing to utilize them for their own development. This is the desired self-reliant attitude that was initially envisaged;
- There are positive gender impacts. Women have been empowered in ownership of chicken and decision making by themselves for chicken handling. This is made because skills and knowledge were obtained through training and mentorship. Men have also started to aggressively involve themselves in rearing too;
- VICOBA was also positively evaluated by the members. Easy financial access by individual is very useful to do some livelihood related activities individually; and
- There are individuals of our subsequent members who have not yet received, but are adopting the design of the chicken house provided by the Project.

Goat merry go round (Marsabit)

- Acquisition of skills. Members have learned skills on goat rearing through continuous mentoring and monitoring;
- From the Drought Fund concept, majority of members agreed to have realized the need of saving of which they promised to have a saving culture. They said that they apply this idea to their individual life and business although hard economic times may not have allowed them to do so during the project period;
- By this system, group cohesion is enhanced to work as a group. This in turn will be expected to enable members to help each other when severe drought hits them;
- VICOBA was appreciated by most of the members. This could satisfy individual fund demand for their family matters as well as their individual IGA activities in situations where formal banks are not available in their proximity; and
- Through this sub-project, women were empowered through both goat ownership and improvement of their financial status.

Resin and honey business (Marsabit)

- Unlike before when they were unable to procure the containers by themselves, the women can contribute money and procure them from the manufacturers. And since the new containers have increased their portion of the market (due to customers trust in the new containers with a safety seal), the women have sworn not to go back into using used coca-cola bottles to sell their honey;

- Skills and knowledge obtained from the training and mentorship activities have been instilled in them through their on-the-job application. These can be applied even in other products and a positive improvement is expected;
- Women have been empowered by economic success. Since honey sells faster due to the new containers and this brings fast cash that has supported the women in their daily lives without entirely depending on their husbands. Women have also been able to interact more with different people outside Ngurnit town (including relationship with a taxi driver in Nairobi in procurement of containers) through their business activities than before. Men have accepted the role played by women in the honey business and therefore do not interfere their activities; and
- Individuals somehow understand the benefit of working as a group. Individuals who participated as a status of individual formed a group and develop VICOBA. Of course business itself is done individually, but at least they understand some benefit of a group e.g. VICOBA, collective action to buy containers, and access to the governmental assistance.

Salt business (Marsabit)

- The most obvious impact is that the group has seen salt as source of income. The group is now focusing on exploiting the raw salt as an alternative source of livelihood for its members with knowledge and skills obtained. Also, the group is determined to continue with the salt business even after the sub-project was completed since they have learnt on how to access the market, negotiate the prices and even manage their own funds, indicating sustainability of this activity is high;
- The group has created VICOBA out of the funds obtained from the sale of salt and thus providing easy microfinance base for women who are involved in their individual business. One of the members was able to start their own business using the business skills;
- Similar to VICOBA, the group also thinks to use part of the group money as a social fund, which can be accessed by the members when they suffer from some social events and need money; and
- Women have been empowered through the success of the salt business. Even other community members see this is successful and some of them copied the salt activities.

IGA for retail shop and livestock trade (Turkana)

Livestock trade

- The groups have learned business knowledge and have been increasing their net profit using the knowledge obtained through the training. Following is the knowledge and skills that they said they learned:

Table A5.5.3 Skills Knowledge that They Learned (Livestock Trade Groups)

Category	Skills
Financial	· Financial management: clear demarcation between business and home consumption · How to maximize profit · Expenses: need to know cost involved, and such cost should be the part of selling price · Keeping record · Profit should be used for both next business expansion and home consumption
Marketing	· Understanding of market (price low -> less transaction, price high -> more transaction) · Networking with traders · Use of mobile phone · Livestock should be fed before selling so that they can prevent selling price from falling
Other business skill	· Business negotiation

Source: JICA Project Team

- The active members across the groups have increased their business operational capital using part of the net profit to expand the business. Also, most of these active members have embraced saving part of their net profit for future use;
- Most of the members across the groups engage in retail trade also which has increased their resilience even when the livestock business is not doing well. Many members use the returns from the livestock business to purchase food commodities and other household durable goods for sale in their villages; and
- Through the activities, group cohesion is enhanced.

Retail shop

- Similar to the livestock trade groups, the groups have learned business knowledge and were ready for increasing their net profit using the knowledge obtained through the training in general. The major knowledge and skills that they said they learned are financial, marketing, and other business skills such as importance of preparing a business plan and diversifying business. Especially, Most of the group members have embraced good customer relationship, debts management and use of net profit for business expansion as learnt from the trainings; and
- Retail business is normally handled by women. Thus, women empowerment is achieved by actively doing this business.

Small scale rainfed agriculture (Turkana)

- Acquisition of line planting and other farm management techniques. This group has got knowledge and skills, of which benefits are not only increment of production (though not yet realized in individual farms), but easy farming practices (easy movement inside the field, flood that can pass easily in the field not affecting plants down etc.), though the degree of acquisition still varies from individual to individual; and
- Their attitude towards farming as a source of livelihood has changed positively. This is reflected primarily from their mind set to recognize agriculture itself is beneficial, but also their commercialized mind set of the farm produce. They now think of selling most of their harvest leaving just enough for domestic use and using the returns to do other businesses such as retail or livestock trade during times of drought. This was not the case initially when farming was done mainly for exchange of livestock.

Fishery (Turkana)

- Knowledge of fishery technique and business skills is both positively evaluated by the members. The following is the items of leaning from the trainings that they raised:

Table A5.5.4 Skills Knowledge that They learned

Category	Skills
Technical	· Dry fish technique: previously fish was dried on the ground, but they learned it is important to hang fish in the air for sanitary issue. · Dry fish technique: previously they directly put salt onto opend fish but this method did not make salt put uniformally. Now, they learned to dip fish in salted water so that salt uniformally spreads to fish; · Size of net: they used 4cm size-net but smaller fish is caught with this. Thus, 5cm is recommended in order not to catch smaller one from the viewpoint of resource management; and · Life jacket: Jacket will be needed for future when permit is issued.
Business	· Communication and marketing: they learned importance of using moble phone to get price and demand information with buyers.

Source: JICA Project Team

- Through the exposure tour to Kalokol, some of the group members have started commission fishing where they are hired by the owner of the boat. This is a major resilience for the Nawoyatira group whose group's boat broke down paralyzing the group fishing.

Dry meat (Turkana)

- One positive impact is for them to gain new dry meat techniques. Members of this group have embraced the dry meat knowledge and skills as most of them have already adopted the technique for family resilience against food insecurity; and
- Beyond the initial design of the sub-project as aiming at self consumption, the group members express needs and even tried to test this dry meat for commercial purposes, e.g. some selling to the travellers and sometimes taking a small quantity to the Ugandan side (Moroto), though there is still less viable current markets identified.

5.5.2 Achievement of the Project Output-4

According to the Project framework, "diversification of livelihoods is promoted in targeted communities" is expected through this program as the Project output. Based on the discussion made above, the following can be inferred;

In general, the sub-projects improve the current livelihood measures which the target groups had been practising, though the salt business sub-project gave a new measure to the group. The chicken sub-project provided them with the improved breed which enables them to enjoy new benefits. The goat sub-project introduced the system itself and gave goats to women's members as an additional measure for livelihood. In other sub-projects of business like honey, and IGA in Turkana, the target members improved their profit to some extent. The sub-projects of agriculture, fishery and dry meat gave technical skills that are expected to improve their current exercise. Further, through the capacity development built by several trainings and mentoring activities, it is an evident that the members use their capacity, and knowledge/skills obtained for other livelihood measures. As such in conclusion, it can be stated that the output set before the Project started has been achieved though not perfectly.

5.5.3 Contribution to Drought Resilience

Contribution to resilience enhancement by each livelihood measure assisted by the sub-projects is summarised in the following table based on the discussion above, referring to the approaches of resilience shown in Chapter 3 and 4, though it is different from one group to another even in one sub-project.

Table A5.5.5 Summary Contribution of the Sub Projects To Enhance Drought Resilience

	Contents	Contribution to Resilience Enhancement	Appoach of resilience
Marsabit	Salt Business	Profit from salt sales as a group and distributing profit to individual members, preparedness by increased money and group capacity strengthened, improved access by VICOBA	Base-up, mitigation, bounce back, transformation
	Goat Merry-Go-Round	Women ownership of group goats, resilience by increased goat numbers, ability to restart the same system or do something else which mitigates drought impacts (using Drought Fund), improved access by VICOBA	Base-up, mitigation, bounce back
	Chicken Merry-Go-Round	Individual benefit from eggs and chicken sales of improved breed, preparedness by increased breed and money, ability to restart the same system or do something else which mitigate drought impacts (using Drought Fund) , improved access by VICOBA	Base-up, mitigtion, bounce back
	Resin Honey Business	Individual profit from sales of honey, preparedness by increased money, improved access by VICOBA, group capacity strengthened	Base-up, mitigation, transformation

	Contents	Contribution to Resilience Enhancement	Appoach of resilience
Turkana	IGA <Livestock Trade & Retail Shop>	Individual business skill development, expectation of business profit and preparedness by increased money	Base-up, mitigation, transformation
	Small scale rain-fed agriculture	Individual farming skill development, expectation of securing food and preparedness by food stock (exchange with goats is also possible)	Base-up, bounce back
	Dry meat	Individual skill development on dry meat processing, expectation of securing food which can be preserved longer, expectation of dry meat business, thereby preparedness by increased money	Mitigation
	Fishery	Expectation of profit of fishery by new fishing area and market improvement, expectation of securing food, preparedness by food stock and increased money	Base-up, mitigation, bounce back

Source: JICA Project Team

Pastoralists who depend on livestock in a nomadic way can hedge risk by moving to areas where water and pasture are available when drought occurs. On the other hand, semi-settled and settled people are considered vulnerable against drought because they may not have much livestock and are bound by "land". Therefore livelihood diversification including saving must be promoted for such people (but not limited to).

The target members of the sub-projects were such people, and the contents of the sub-projects were one of the livelihood measures. If persistent assistance to livelihood measures as the sub-projects did continues; individual capacity of community members is strengthened; and eventually resilience in Northern Kenya is greatly enhanced by increasing number of such empowered people, that would be desirable.

5.5.4 Lessons Learnt and Recommendations

(1) General

Lessons obtained through the implementation of the sub-projects are described in the Guideline and summarized here as shown in the table below:

Table A5.5.6 Lesson Learnt as Key Messages

Aspect of Activities	Key Messages
Planning aspect	Selection of livelihood measures: need to consider socioeconomic conditions and categorisation of measures
	Inputs of assistance: need to reflect beneficiaries' capacity and cultural role
Procedural aspect	A must aim: capacity development of beneficiaries ~ procedural aspect
Technical aspect	Contents of assistance: need of customisation based on kinds of livelihood measures
	Technical considerations of ECoRAD experiences
	Business-related lessons: aspects of identification, production, market, and cost and benefits
	Other issues: handout provision and other aspecs
	Fundraising of community people: start within current capacity

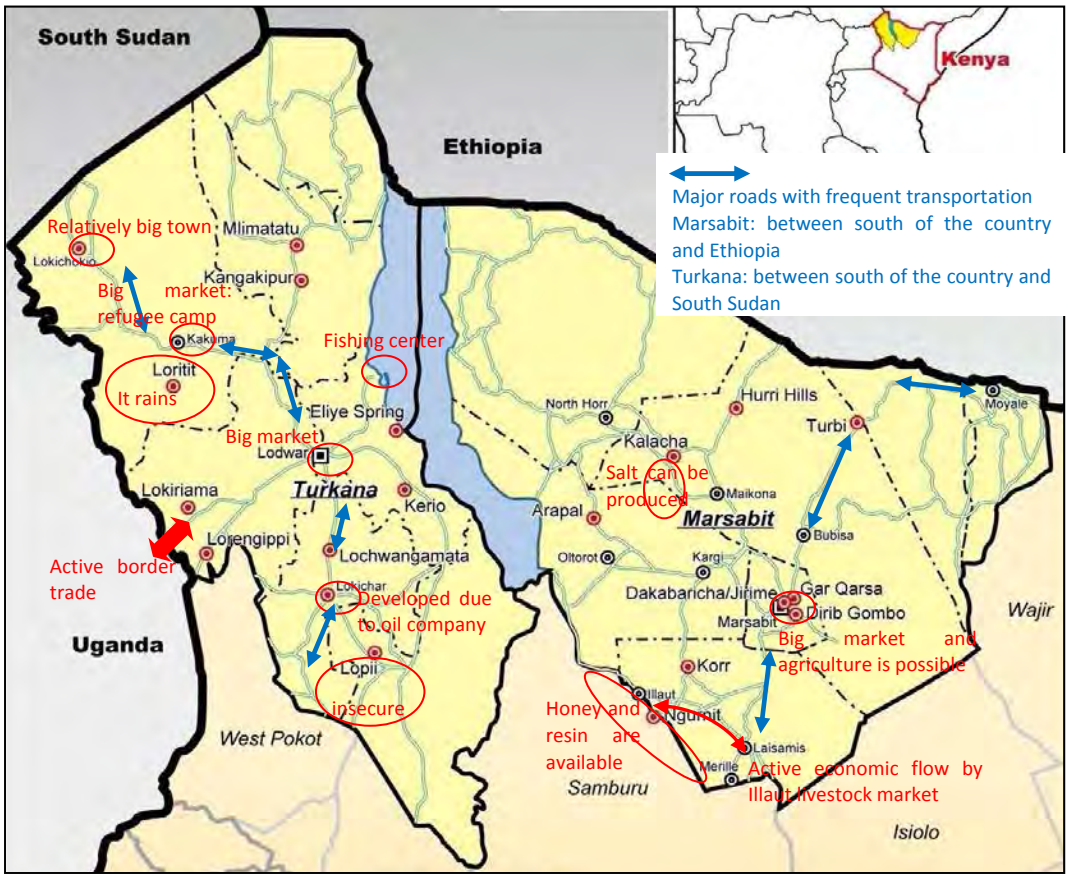
Source: JICA Project Team

(2) Major Lessons

Out of the above key messages, major lessons are shown hereinafter.

1) Socio-economic condition and categorisation

Livelihood measures are economic activities that are affected by socio-economic conditions. It is important to analyse the socioeconomic condition in selecting the livelihood measures. In addition as shown in Chapter 4, 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 assess most suitable category for specific socioeconomic conditions for better selection of the livelihood measures.



Source: JICA Project Team

Fiaure A5.5.2 Socioeconomic Conditions Related to ECoRAD in Turkana and Marsabit

2) Beneficiary's capacity and cultural role

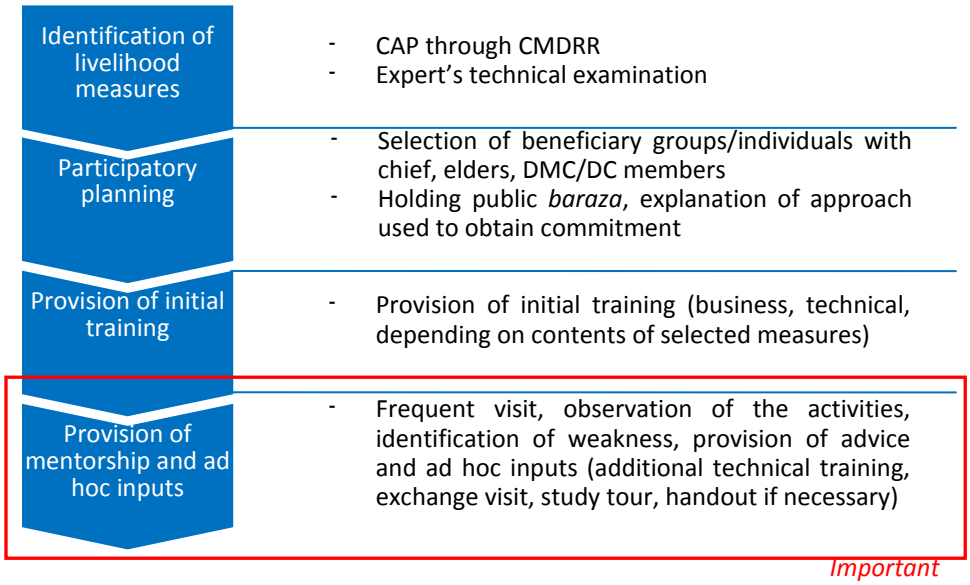
In designing the contents of livelihood assistance, level of capacity and cultural role of beneficiary are important issues to be analysed. Capable community people can operate more livelihood measures with complicated contents, but less capable people can do few measures with simple transaction. Assistant program should be designed depending on level of capacity of target communities.

The other point is that cultural role may affect the livelihood measures. For example, chicken has not been considered as an eatable animal from a conventional pastoralist view. Thus, in remote areas where conventional thinking remains, chicken rearing may not be recommended. In addition, small business activities are basically considered as roles of women, hence empowerment of women also needs to be considered.

3) Procedure aiming at capacity development

Capacity building of the community is a must for livelihood diversification because livelihood measures are managed by them even after the assistance is over. 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. The fourth step is particularly important to build their capacity through on-the -job trainings. In this step, mentorship activities are implemented; and some effective tools are 1) exchange visit and 2) study (exposure) tour.



Source: JICA Project Team

Figure A5.5.3 Recommended Procedure of Livelihood Projects

4) Content of assistance

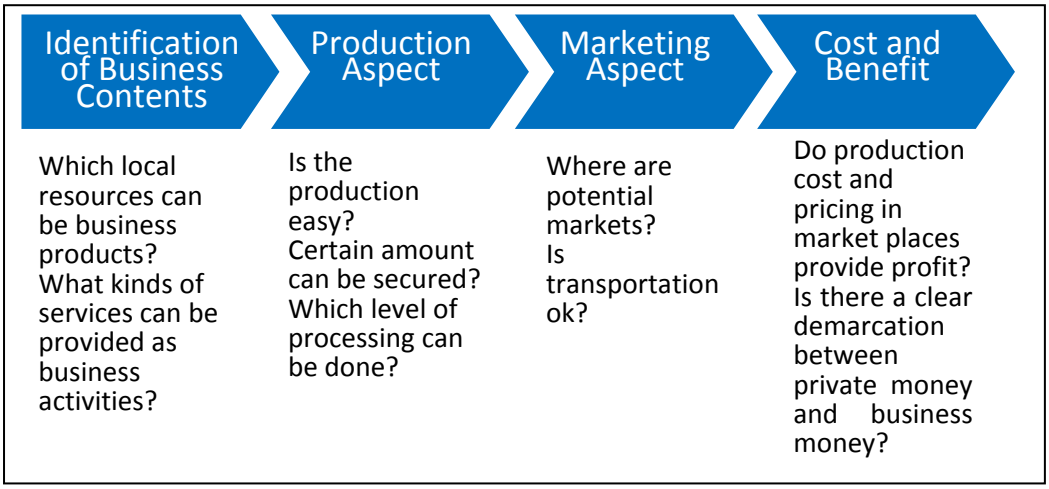
Depending on the type of the livelihood measures, the required knowledge varies. Therefore, it is important to customise and provide the required trainings and mentorship activities based on the livelihood measures to be supported. The following table shows the required training depending on the kind of livelihood measures.

Table A5.5.7 Required Training Depending upon the Type 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

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



Source: JICA Project Team

Figure A5.5.4 Framework of Business Activities

5) Other issues: Handout provision and social impacts

Provision of handouts, which have been common in Northern Kenya because of past relief aid, 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 upwards.

In terms of social impact, through this assistance, the enhancement of group cohesion and gender/youth consideration is realised. This depends on the nature of type of livelihood measures assisted. Success of livelihood measures directly leads to enhancement.

6) Fundraising and livelihood activities in Northern Kenya

A stage-wise approach is important in terms of fundraising for livelihood measures. At the initial stage, livelihood measures must be planned at a level that the community can handle. At a later stage, consideration to increase the capital can be gradually done.

As forms of fund raising, “merry-go-round” and VICOBA are good tools for the initial stage. It must however be noted that VICOBA has disadvantages as listed below:

- This being a loan, a low interest rate and a short repayment period are recommended.
- Calculations are complicated, and the community members sometimes cannot understand this well.
- VICOBA can be introduced together with some kind of IGA (i.e. money alone without an explanation on how it could be used will not work).

Applications to existing fund institutions (Constituency Development Fund (CDF), Women Development Fund (WDF), Youth Fund (YF), or even formal banking if they can manage) is one way for the advanced stage of the process. A Drought Fund Kitty can be one of the ideas at the group level for cushioning negative impact by future drought.

5.6 Peace Building Programme

The details of impacts, observation and relation to the Project Outputs by the sub projects are shown in Table B5.1.

5.6.1 Impact and Contribution to Drought Resilience

(1) Peace Building Work regarding Dololo Dokatu Water Pan

Peace building programme regarding Dololo Dokatu water pan was supported due to the conflict raised between Borana and Gabra communities claiming ownership of the rangeland surrounding the water pan.

A series of peace building programmes targeting both communities created opportunities for discussion of an amicable solution against disputes. After the completion of the water pan, even though a large number of herders from both communities have used the pan while grazing around it, no conflict has been observed in use of the rangeland.

This indicates that the peace building dialogues have contributed to the peaceful use of rangeland between the two tribal communities that have had a history of conflicts. Sharing of resources between these two communities has also been observed in the livestock market in Dirib Gombo, where the same communities, that had disputes about the ownership of Dololo Dokatu water pan, brought their livestock for transaction. Currently herders from Shurr area of Gabra community come to sell their livestock at Dirib Market interacting with Borana people. It can be said that the peace built between those two communities encouraged sharing of resources that is crucial in drought management in which the particularly limited resources during drought should be shared.

(2) Children Peace Building around Gabra Community and Rendille/Samburu Community

Peace building focusing on building amicable relations among children from different tribal communities has made a significant impact. The most important is change of the mindset of the entire community through the peace activities with children. Relations among children strongly influenced on the perception of their parents. As shown in the result of the post evaluation survey, perception towards people from other tribes has improved remarkably. This implies improvement of relations between the tribal communities.

In fact that there have been some close cultural interactions beside the programme took place between different tribal communities. The participants of the cultural occasion took the opportunity to learn about the culture of the others and to enhance friendship with them. Improvement of perception towards others, having positive impression of them, can contribute to reduction of conflict that would otherwise escalate the situation especially during the resource limited period of drought.

5.6.2 Lessons learnt and Recommendation

(1) Peace Building Work Regarding Natural Resource Management

Water sources, such as water pans and boreholes, could be a source of conflicts among different ethnic groups, as they divert their use of rangeland that is a critical issue for pastoral community. Therefore the introduction of a water source should be carefully assessed by examining grazing patterns, territorial ownership of surrounding rangeland, and relationship between tribal communities of potential users. Peace keeping programme is inevitable when there is possibility of conflict regarding the development of new water resources. Even if the water source to be developed is located in an ideal area to expand their potential rangeland, conflicts can lead to abandonment of the facility. It can be said that the peace building with water source can provide a good opportunity for discussions between hostile ethnic groups in order to obtain their own benefits which had been hampered for so long due to ethnic conflicts.

Learning from the case of Peace building activities regarding Dololo Dokatu water pan, the relations developed through peace building activities can be established based on their own benefits, especially for water or pasture. It should be noted, however, that change of fundamental perspectives of people would take time. Therefore, peace building approach should be continuously applied.

(2) Peace Building with Children

Children's peace building activities which were implemented by the Project are kind of educational events with a long term operational span. These activities are essential for changing notions of an ethnic group against the others. However, it requires perseverance and continuous effort by the implementers until tangible benefits and good outcomes are observed.

A peace camp is a very effective way for developing good relations among children from different ethnic groups, despite some difficulties. Sustainability of the relationship after the peace camp is one of the issues. Exchange correspondence in peace club of schools is one of the good strategies for maintaining relations that were generated in peace camp activities. However one of the major challenges in this strategy is how to establish correspondence delivery routes between schools. Once a delivery route is established, members of the peace clubs can share communication with other schools in different ethnic groups.

For school club activities, it was understood that the level of activeness mostly depends on the vitality or strong will of the teachers in charge of them. Thus it is strongly recommended to conduct some revitalising activities, for examples a refresher training of peace club teachers.

5.7 Capacity Development of Government Officers to Enhance Pastoralists' Resilience to Drought

5.7.1 Results and Impacts of Activities

(1) Participants of the Seminars / Workshops

In the capacity development activities in the Project, the following participants attended the seminars and workshops held by the Project.

Table A5.7.1 Numbers of Participants in the Seminars/Workshops

Seminars/Workshops	Month / Place	Participants
Stage 2-1)		
Training Workshop on Community Based Drought Management to County Government Staff	February '15 / Turkana	42 persons
	April '15 / Marsabit	46 persons
Stage 2-1)		
Dissemination Seminar / Validation Workshop on the Guideline based on ECoRAD's Experiences	July '15 / Marsabit	38 persons
	August '15 / Turkana	78 persons
	August '15 / Nairobi	30 persons

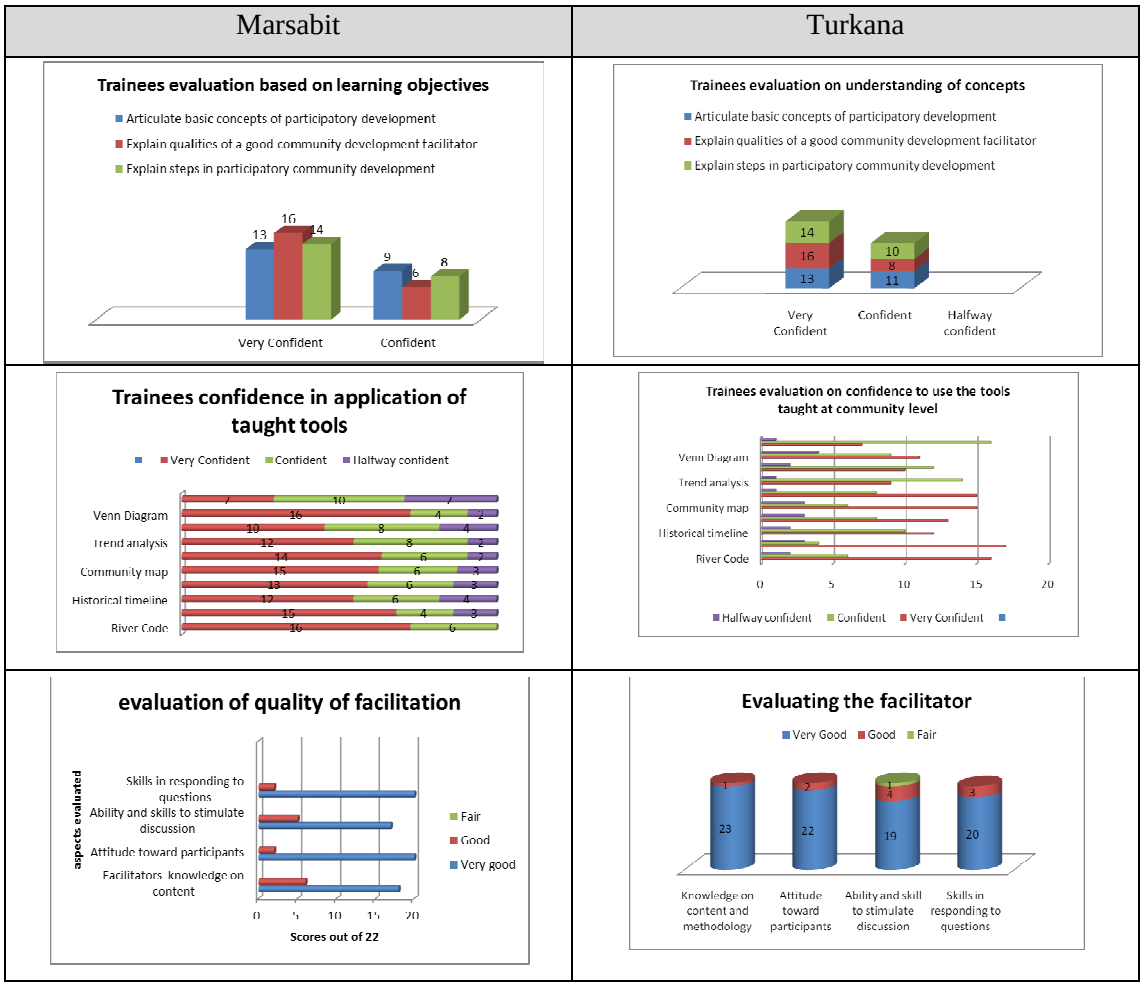
Source: JICA Project Team

(2) Evaluation Results of Workshops in Stage 2

a) Stage2-1

At the end of CMDRR workshops at Marsabit and Turkana Counties in Stage 2-1, evaluations of workshops were made by the participants.

The results of their evaluation were as shown in the following Figures.



Source) JICA Project Team

Figure A5.7.1 Results of Evaluation by participants

It seemed that contents and level of participants were matched; consequently the participants were satisfied with the workshops provided by the Project.

b) Stage2-2

In the three seminars, active discussions occurred and the following comments, clarifications, and suggestions were raised:

- Clarifications and corrections about their culture, such as characteristics of clans and tribes, were made in the seminars;
- There were also comments about CAPs, in particular, problems in the present CAP formulating procedure, such as selection of representatives and roles of drought management committee (DMC);
- The county government officers pointed out its significant roles of linkage between County Integrated Development Plan (CIDP) and CAPs, and its methodology and challenges;
- By some chiefs, result of remarkable success by the Project, such as water pans, heifer exchange programme, were explained by themselves and shared with others;
- Relatively technical comments and questions were made in Turkana, for example necessity of fence at water pan site, necessity of handout (sodas), necessity of more big volume of water pans, and inquiry about Kerio markets practices, etc.; and

- Social comments and inquiries were also discussed, such as a relation between drought resilience project and vulnerable people which tend to be left out of development, possibility to predict drought, and conflict management in line with selection of water facility site.

The Project team answered all those clarifications and comments as long as time allowed. Those comments and suggestions were reflected in the Guideline during its finalisation process.

The details of comments and suggestions should be referred to ANNEX I.

5.7.2 Achievement of the Project Output-5

The Project Output-5 was *"Capacity of the government officers to enhance the pastoralists' resilience to drought is improved"*.

The Project implemented several activities through on-the- job basis and on seminar/workshop basis.

In the process of capacity development by on-the-job basis at the stage 1, a lot of officers went to the selected pilot communities and worked together with the Project team members. Through this process, it is expected that the officers learned something related to the technical activities, i.e. Community Empowerment, NRM, Livestock Value Chain, and Livelihood Diversification. In addition, those officers had learnt the Project's Motto, i.e. the Project's attitudes for working with community, such as CARP and *Kujitegemea* (self-reliance) spirit.

Box: ECoRAD Motto
- **CARP**
  Consideration
  Aftercare
  Repeat
  Perseverance
- ***Kujitegemea*** (self-reliance) spirit
  To be built in target people

Although the motto and spirit were essential basic ingredients for workers and the community, they were sometimes forgotten due to time and resource constraints in projects. The Project however repeatedly emphasised on their importance in the course of the Project implementation.

Through the training in stage 2-1 (*"Training Workshop on Community Based Drought Management to County Government Staff"*), the county government staff's capacity was enhanced in particular for the methodology of community involvement, namely the CMDRR approach. At their communities, it is expected they will use the knowledge and technique given in the workshop for facilitating and mobilising community people to formulate community action plans (CAPs) and drought contingency plans.

Regarding to stage 2-2 (the Dissemination Seminar / Validation Workshop on the Guideline based on ECoRAD's Experiences),

The Project disseminated the various lessons learnt in the Project to the county government officers and national government officers, including i) basic understanding of each ethnic group tendencies, ii) constraints and way forwards in terms of community based drought management e.g. step by step approach etc., iii) new, innovative and recommended new technology and methodology to be effective in drought resilience improvement in Northern Kenya, e.g. solar power pumping system and the heifer exchange programme, and so on. Those lessons learnt were compiled in the Guideline and will be distributed to government officers and other related entities upon completion of the Project.

5.7.3 Lessons Learnt and Recommendation

Based on the ECoRAD's experiences at county level, the following four points should be highlighted in terms of sustainable capacity development.

(1) 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 a result of 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 the Guideline and the Draft Final Reports at the end of the Project period, the county structure has not yet been fully established. Furthermore,

since some of the newly recruited county government officers do not have enough experiences and knowledge for working with community, they need basic training in order to be good facilitators for communities. Therefore, there is a strong need that the county government officers shall be trained further to enhance community resilience against drought in Northern Kenya.

(2) Necessary Fields and Subject Officers for Capacity Development

Necessary fields of training are 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. Target 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 on a day-to-day basis, especially from the viewpoint of community resilience.

Training of the technical officers from line ministries is also necessary because a basic understanding of the typical pastoralist's "world" and how to deal with it are a must when providing technical assistance to the communities.

(3) Importance to Build Self-reliant Capacities of the County Officers

Unlike the other parts of Kenya, there is a lot of relief and development assistance in this area, which have different characteristics by nature. And this assistance often uses 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 suitable to local conditions rather than just apply standardised approaches.

(4) Need for Dissemination of Applicable New Technology and Techniques

It was found that county officers were always keen to learn new technology and innovative techniques. In some cases, the new technology might provide a break-through for improving pastoralists' drought resilience in future.

It was noted, however, that basic conditions in Northern Kenya are very different from those in other developed areas. Thus if somebody simply applies some new technique in Northern Kenya, without deep deliberation, it could not necessarily achieve the objectives successfully as in other developed areas, e.g. purification treatment of saline water or water with fluoride. Since dissemination of new technology is preferable way for capacity development, each technology should be confirmed to be applicable in Northern Kenya through actual examinations and pilot trials under the conditions of Northern Kenya before dissemination.

In the Project, a solar power system was introduced and it was fortunately found to be much applicable in Northern Kenya. Such kind of trials should be conducted by other donors or national government carefully.

5.8 Resilience Enhancement in Northern Kenya

5.8.1 A Process to Realise the Project Purpose

In this section, it is examined how the six Project outputs described in Section 1.2.1 contributed to the Project purpose *"The pastoralists' communities resilience to drought is enhanced in Turkana County and Marsabit County"* in the Project.

This Project purpose was a bit ambitious to realise considering the current Project frame and period; and there are many factors that lead to build resilience of the pastoralist community within the entire two counties, other than the interventions that the Project undertook.

Thus the Project took "a pilot trial method", in which various pilot sub-projects were formulated and implemented to verify their effectiveness as trial in the Project. Then, verified pilot sub-projects, out of all the implemented sub-projects, are expected to be disseminated to the government offices, other donors and related agencies as recommended projects. By so doing, it is then expected that similar

interventions mold all stakeholders to implement their interventions in the whole two counties based on the ECoRAD's pilot sub-project experiences as a diffusion effect of the ECoRAD Project, consequently the Project purpose would be achieved afterwards.

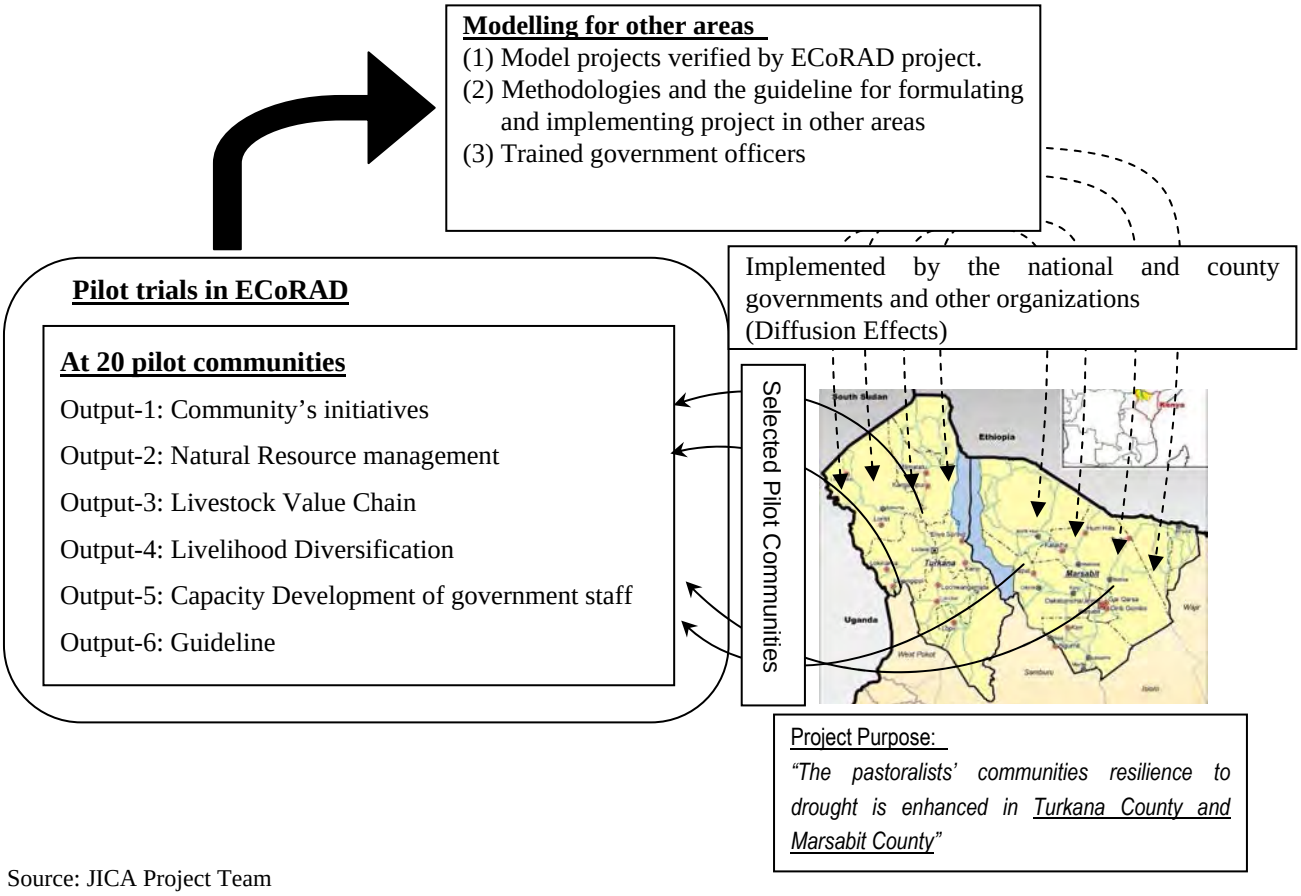
Thus the Project aimed to achieve the following results after implementation of pilot sub-projects.

(a) A number of verified pilot sub-project models which can be applied to other sites directly in Marsabit and Turkana Counties,

(b) Formulation/establishment of methodology and lessons learnt in the Guideline for formulating and implementing good effective interventions in the two counties

(c) Capacity development of government officers for implementing further interventions based on the ECoRAD model and experiences

The following figure shows an image of the process from the six Project outputs to the Project purpose.



Source: JICA Project Team

Figure A5.8.1 Image of Realisation of the Project Purpose

5.8.2 Achievement of the Project Purpose

(1) A Number of Verified Pilot Sub-project Model Which Can Be Applied to Other Sites Directly in Marsabit and Turkana Counties

The Project formulated and implemented 24 pilot sub-projects, consisting of 13 in Marsabit and 11 in Turkana. Since there were difficulties which the Project faced in the course of the sub-project implementation, not all of the trials were verified by the Project as effective and applicable interventions in Northern Kenya area. However, a certain number of the sub-projects were confirmed as verified effective interventions by the Project and are shown in the following table:

Table A5.8.1 Major Verified Pilot Sub-projects in ECoRAD

Sub-project	Pilot Community	Achievement
Sub-project of Introduction of Solar Power System in Water Pump Facilities	3 in Marsabit and 3 in Turkana	Solar pumping systems were verified to be technically applicable and acceptable for pastoralist community as a fund raising method.
Sub-project of Salt Business Program	Kalacha	This is verified effective intervention with low investment and low technique activities which can be acceptable for pastoralist communities.
Sub-project of honey and resin	Ngurnit	Especially for honey business, the business analysis fitted to the capacity of the local people was successful to expand their market.
Sub-project of Heifer Exchange Program	Dirib Gombo and Jirime	This programme could be one of effective options for vitalising livestock market at early stage of new establishment of market.
Sub-project of New Construction of Lokuchura Water Rock Catchment	Ngurunit	This is new design facility invented by the Project. Advantages of this facility are low cost, easy design, easy construction, and large capacity of storage.

Note: Details of each sub-projects should be referred to each ANNEX.

Source: JICA Project Team

(2) Formulation/establishment of Methodology and Lessons Learnt in the Guideline for Formulating and Implementing Good Effective Interventions in the Two Counties

Table A5.8.2 Methodology and Lessons Learnt

Elements	Achievement
Revised CMDRR approach	The Project modified and implemented CMDRR approach based on experiences especially for DMC functions/continued training and CAP institutionalisation.
Sub-project of Pasture Establishment by Reseeding	Due to some difficulties, its effectiveness could not be verified. However significant lessons learnt were derived from the experiences for further implementation, such as a crucial factor of success of reseeding farm is a good leader.
Basic understanding of “community” and ethnic groups in Northern Kenya	Understanding of community people is one of essential issues. The Project summarised what is “community” in this area, and characteristics of each ethnic group and its tendency and way of thinking, and attitudes in the Guideline.
Recommended several methodologies	Based on the Project experiences, the Guideline provides several useful methodologies or ways of approach for project implementation. For example, the step by step approach, four contributing factors for active committee, and so on.
Turkana Water Potential Study	The Project studied the water potential in Turkana, then identified sustainable water yield in ground water at each region. And the Project provided the 50 recommended borehole sites to be drilled. In addition, an effective drilling method was also recommended.
Method of strategic selection of water points in terms of sustainable natural resource management	The Project selected water points based on water potential, rangeland condition, and annual migration patterns. It was verified such methodology functioned well. In particular, it was confirmed the effectiveness of selection of location of water pans at wet season grazing areas.

Elements	Achievement
Lessons on Water Management	Different approaches of water resource management depending on types of water sources, purpose of the sources, and capacity of target communities were demonstrated and proposed based on the experiences of the Project
Lessons for better Livelihood Assistance	Based on the sub-project implementation, general lessons that can be applied in Northern Kenya were compiled from planning to implementation stage including categorisation of measures, procedural steps of assistance, and tips for assistance on business related measures.

Note: Details of each subject should be referred to the Guideline.

Source: JICA Project Team

(3) Capacity Development of Government Officers for Implementing Further Interventions Based on the ECoRAD Model and Experiences

As described in Section 5.7, the capacity development of the government officers was successfully done. In particular, county government officers training was undertaken to uplift the level of recently recruited officers by the county government, who have little experiences in working with community.

5.8.3 Other Considerations

(1) Community Resilience

The following indicate necessary factors to improve community resilience and relevant project interventions. Even though the Project interventions have not made full impact on all factors, it can be concluded that subsistent impact of each intervention, even partially or limited, contributes to improvement of community resilience, and more importantly they will constitute necessary elements of community resilience.

Table A5.8.3 Necessary Elements of Community Resilience

Index		**Elements**	**Project intervention**			
			DMC*	NRM**	LS***	LH****
1. Resources: Improvement in resource availability						
1-1. Economic resources / development (capital, infrastructure, etc)						
	Vulnerability to hazards	Increase in means and opportunity to deal with difficulties		√	√	
	Level and diversity of economic resources / income resources	Increase of assets / financial capital			√	√
		Diversification of income sources				√
	Equity of resource distribution	Information flow and social structure of resource distribution	√			
	Access to economic resources	Availability of economic infrastructure			√	
		Improvement in access to economic transaction				√
1-2. Social infrastructure		Improvement of educational opportunity (including non-formal and informal education)	√			
		Improvement of health situation				
		Improvement of formal education				
1-3. Natural resources		Improvement of access to natural resources,		√		
		Increase of amount of available natural resources,		√		
		Better management of natural resources		√		

Index		Elements	Project intervention			
			DMC*	NRM**	LS***	LH****
2. Capacity of people						
	2-1. Human resources	Existence of leaders	√			
	2-2. Capacity to identify risks and solution	Experience / episode on identification of any community issue / problem	√			
	2-3. Capacity in mobilisation of resources,	Resources utilised for community development and drought mitigation	√	√	√	√
	2-4. Capacity to address the identified issues with their own resources and with external resources	Experience / episode on handling of any community issue / problem (as drought risk is limited during the project period)	√	√		
	2-5. Capacity to utilise and apply knowledge and skills	Application of the knowledge and skills learnt through trainings	√	√	√	√
3. Network / social relationship						
	3-1. Community action	Collective activities taken as a community	√	√	√	
	3-2. Organisational linkage and cooperation	Organisation and function of the DMC/DC and other stakeholders	√			

*DMC: DMC committee strengthening activities (related to Project Output 1)
** NRM: Natural Resource Management activities (related to Project Output 2)
***LS: Livestock Value Chain related activities (related to Project Output 3)
**** LH: Livelihood Improvement Activities, (related to Project Output 4)
Source: JICA Project Team

(2) Harmonization of the Approach

Life of people in Northern Kenya has been nurtured through different interventions in a sense from external agencies, some of which brought adverse effects in terms of discouraging self-sufficient drought resilience possibly by emphasising too much on relief aid. Since it has been embedded through decades of interaction, it is not easy to change this attitude in a few years. However, it requires a consistent and coherent approach to remove negative attitudes. This process must be shared by all stakeholders, aiming at building self-reliant resilience of the community members. Since external support has to some extent been accustomed in their survival methods, alternative mechanisms should be considered, for instance by diversifying sustainable livelihood measures.

(3) Linkage among the Three Technical Areas and Another Way to Implement the Project

Among the three technical areas, theoretically and generally speaking, NRM which involves development and management of water and pasture, and Livestock Value Chain which focused mainly on market improvements, are closely related to one another. For example, the water resource developed by the Project can support livestock for several months utilizing pasture available in the surrounding areas during dry seasons. When pastoralists want to sell livestock fed by the water resources and pasture, they are able to do so through the markets improved by the Project. Activities on Livelihood Diversification are different by nature in terms of its technical characteristics from the other two because most of the activities are economic- related business done by a small number of people. However, it can be said that livestock trade, for instance, undertaken as one of the activities in this program, can be affected positively by the implementation of NRM and Livestock Value Chain activities. As such, there is logic that can explain the linkage among the three.

In the Project, the team focused on the individual sub-projects. Therefore, a pilot community site for a particular sub-project was selected mainly based on its technical assessment, and not all of the selected pilot communities had all activities in the three technical components by the Project undertaken. This is one way to implement a project, which enables the implementer to draw deeper lessons for technical areas.

Another way to look at it is to focus on a particular community. It is also possible to implement all activities including capacity building of the selected community through the DMC, implement all of the three technical areas such as NRM, Livestock Value Chain, and Livelihood Diversification in the same community. This could provide comprehensive lessons focusing on a community. Both ways are equally important.

From a wider (broader) viewpoint, each technical area has its own technical consideration. For example, water resource can be developed basically in locations where water resources are available. Livestock markets cannot be established everywhere in a functional way as discussed in the Guideline. As such, potential preferable locations for respective technical areas are different and location-specific. If locations can be identified, which satisfy the technical considerations for two or more technical areas, they can be good potential communities in terms of geography to implement two or more technical areas at the same places.

From a narrower (localised) viewpoint, if one community at the same geographical area is focused for all the three technical areas, regardless of the above technical considerations from a broader viewpoint, there are possibly some places that have less technical interventions for a particular area(s). For example, a community may be selected in a place where water resources are limited. Even though water pans cannot be constructed there, one way of assistance is to organise community people to identify or to go to the nearest water points. If interior places are selected where livestock markets seem not to function, communities there can also be assisted in a way of livestock trade. Likewise, still something can be done.

(4) Other Factors

Enhancement of the community resilience in Northern Kenya must involve many other factors; e.g. animal health, human health, food security and nutrient improvement, education, infrastructure development, good governance, fair and good government service delivery, development of financial sector, and so forth. To achieve this Project purpose, comprehensive and long term intervention is essential.

(5) Time Limitation of the Project to Prove Resilience Building

The Project produced lots of insightful results, and the sub projects contributed to resilience building examined theoretically in this chapter. However, the concept has not yet been proved as such particularly for mitigation, bounce-back/quick recovery, and transformation/build back better approaches, which was outside the project scope. It is expected that the concept will function as effectively as analysed when severe drought actually occurs and result in increased resilience."

CHAPTER 6. RECOMMENDATION

6.1 Recommendation through Implementation of the Project

Detailed recommendations are shown in Chapter 5 and the Guideline as a result of the implementation of 24 sub-projects and several studies in Marsabit and Turkana Counties by the Project.

Here, a summary of the overall recommendations is given below:

- Proper understanding of characteristics of community:
  Project implementing agencies should understand well about characteristics of "community" in Northern Kenya and the target ethnic group. There are distinct characteristics of each ethnic group, which differ among ethnic groups in Northern Kenya, which could strongly affect project activities. This is importantly applicable to any community-based activities such as drought management and water management.

- Importance of stepwise and tailor-made approach:
  Given the fact that the communities in Northern Kenya are different from agriculture-based society, where community management is relatively easy, and are less experienced in collective actions in a general sense, stepwise and tailor-made approach is critically important in terms of community-managed activities. Approaches that are beyond the capacity of the target communities will cause distortion of the society. Therefore, the approach should be realistic and achievable in consideration of the prevailing situation and capacity even if this means it will neither bring drastic change nor attain ultimate ideal situation.

- Strategic water point development:
  Establishment of dry season grazing areas is a key to drought resilience in terms of natural resource management. As such, particularly in Northern Kenya, water points must be strategically developed considering the water potential (technical), seasonal pasture availability, migration route, and community opinions.

- Sustainable natural resource management:
  Water resource management by the community requires the people's strong commitment, understanding, skills, organisation, and mind of collective works. In the area where those factors are not suitably developed, enough time, budget and input should be allocated to improve those aspects in all the process of the components of natural resource development.

- Turkana water resource potential study:
  The result of the study, namely surface water potential and groundwater potential represented by Turkana Groundwater Development Potential Map, is a remarkable output of the Project. The result is recommended to be referred to by the county government and related stakeholders.

- Livestock value chain:
  To vitalise livestock markets within the Project framework, a combination of both engineering and non engineering assistance is effective, e.g. establishment of market facilities and strengthening market associations. Needless to say, construction of physical livestock markets alone cannot be adequate. Also, markets may not work anywhere in Northern Kenya as a "silver bullet" or a "magical cane". Upon selection of locations, necessary conditions should be studied including road access and securing livestock volume to be transacted. It would also be good to start to set a fixed day per week or two weeks to foster markets.

- Livelihood diversification:
  Selection of measures and content of assistance to fit local conditions as well as capacity of target community people is indispensable considered with socioeconomic condition. To do so, categorisation would help. Also, approaches must aim at capacity building with special attention

given to mentoring activities through frequent and persistent visits with ad hoc trainings and study tour and exchange visits.

- Institutional issues:
  The Community Action Plan (CAP) is one of the expected outputs of the CMDRR approach. As argued in the previous chapters and the Guideline, merger of this CAP process including implementation to the county planning/implementation process is important. To do so, policies/regulations of the county governments which specify concrete procedures of the above are necessary.
  In terms of resilience building, activities are interdisciplinary involving water, livestock, business, community development and other sectors. Each technical area has its own ministry in charge, but there are no government ministries which integrate all these development activities and oversee across them. In this sense, local administrative officers, such as chiefs and administrators, should be the responsible together with DMC for overseeing resilience-enhancement activities at the community level.

- Decentralization:
  Before formulating new activities, a careful monitoring and observation of the progress of decentralised structure, and its practical accommodation at the community level is required currently. Because at the community level, new structure under county government is gradually being established, and decision making and governance systems are being changed from the national government system. This change should be accommodated in developing drought resilience.

- Gender consideration and generation gap:
  Gender consideration and generation gap should be taken into consideration carefully in project planning. Generally speaking, pastoral community in Northern Kenya is a patriarchal society and husband possesses all the family properties. And women tend to have less power and less education.

  However women take significant roles in households, such as education/take-care of children, actors in small income generating activity, etc. If women are educated, trained and empowered in their community for instance in coping with drought, the community will become resilient as a whole. Consideration of gender should therefore be included in project planning and implementation.
  In terms of generation gap, there is possibility that such a gap might be widened and lead to collisions between old generation and new generation through project implementation. In some cases external agencies tend to contact young men who can speak English than old men. And also in their community, educated young men tend to be selected as committee members. Thus the project's decision making could be biased towards young people. Since empowerment of the young generation is one of the important factors for community development, project implementers should carefully examine and balance between the older and younger generation.

- Mindset of the community:
  Society of the drought affected Northern Kenya have been developed with the external intervention and inputs for several decades. A majority of people who take leadership in development have grown in the situation where external support and humanitarian aid is taken as something that must be always available whenever necessary. Since this situation and mindset had been gradually developed and embedded in the society, change of the situation requires gradual long-term movement. Even though it is easier to follow the current situation for smooth implementation of the project, community resilience cannot be developed without change of the

current mindset of the community. Even though the approach to change the current situation may work as hindering factor to achieve short term objectives of the project, it should not be ignored.

- Different inputs to different needs:
  People are not homogeneous in Northern Kenya not only due to different ethnic group and different cultures but also due to variation of lifestyle. The major differences in terms of vulnerability to drought are observed in the needs between pastoralists and settled community. Target and purpose should be clarified when interventions are planned.

- Impacts on community:
  Though the necessary consideration on community-based drought resilience is recommended as above, some impacts on the community were observed to build community resilience as discussed in Table A5.8.3. In this regard, the elements which constitute community resilience should be taken into consideration when projects are formulated and implemented, particularly the "capacity of people" and "network/social relationship".

- Technical areas which can be focused for further assistance:
  There must be several technical areas which can be focused on for further assistance. One option is to focus on two technical areas, namely Natural Resource Management and Livelihood Diversification in Turkana as an immediate assistance. As mentioned, there is a result of Turkana water resource potential study, and potential sites for borehole have already been identified. Since water is the most important resource in the ASAL areas, Natural Resource Management (NRM) focusing on groundwater could be an area for immediate action.

  In Turkana, as argued in section 2.4.4 of Chapter 2, the CoBRA study clearly shows that IGA (income generating activities) is the third most important item for preparedness against drought followed by education, and water. Therefore, assistance to Livelihood Diversification could also be considered as a priority together with the assistance to NRM.

6.2 Other Recommendation

Apart from the above mentioned recommendations, additional advice based on the aspects which the ECoRAD Project did not cover are shown for further enhancing drought resilience in Northern Kenya.

- Coordination:
  More coordination among the county government offices, donors, and other organizations which support pastoralists is strongly required for further progress. Currently there is a County Steering Group meeting (CSG meeting) as a coordination meeting for all county-wide stakeholders. However a function of the CSG is limited at this moment, such as distribution/sharing information, dissemination of good practices, and confirmation of current situation etc. However, for effective coordination of several actors, stronger initiative of CSG is necessary in future for well-organised, harmonised interventions by stakeholders.

- Peace building/conflict resolution:
  Drought resilience and peace building are closely related, in particular water sources and rangeland in drought spell. Thus peace building/conflict resolution activities[1] across the national borders and tribal borders are inevitable and become important for establishing sustainable and stable drought resilience in Northern Kenya.

[1] In case of peace building with rangeland management, "a reciprocal rangeland management approach" is one of good tools for establishment of good relation among neighbouring communities. This approach aims to establish mutual agreement and understanding, and resource-sharing action plan with a clearly described operational rules and regulations in drought spell. Under this agreement, a community which does not have reliable water source during drought is allowed to intrude into the land of the other community for stable water in drought spell. On the other hand, this community should allow the other community's livestock to come and graze at their rich rangeland in normal wet seasons. This is barter trade between water in drought spell and rich fodders in normal wet seasons.

- Master plan:
  A County master plan needs to be formulated. Since there is a county integrated development plan (CIDP) for five years, it seems that the CIDP was in form of just simply binding each sector's development plan in which technical feasibility were not properly evaluated in some cases. Thus more detailed and prioritised plan, in a region or in single/multi sector, should be formulated with a certain level of technical feasibility evaluation for development in the coming 10-20 years. In the process of formulating the master plan, the direction of the county for the next few decades, including prioritised region and sector(s), should be discussed deliberately with capacity building of officers.

- Capacity development of the county governments:
  The county governments were established during the implementation of the Project. Still, the system, the organization, and capacity of the newly deployed staff are weak and need to be strengthened. In addition to the several institutional recommendations made through the implementation of the Project, general development planning capacity from community to county level, and technical capability of line ministries officers are important capacities to be strengthened from the viewpoint of resilience building against drought, which is one of the major issues in the two counties.

- Long-tem planning and commitment:
  Drought resilience cannot be enhanced quickly and drastically in a few years by a single intervention, in particular in communities of Northern Kenya. As shown in EDE, intervention[2] to end emergency (relief) is important (development) and this importance should be shared by all stakeholders with a harmonised approach. Thus the county governments and related project implementing agencies should formulate a long term and continuous development support plan with commitment of persistent implementation of development as well as a short span and specific development plan/project for drought resilience. Needless to say, such long term plans should be aligned with the communities' needs and the county government plans (CIDP).

- Infrastructure development:
  Infrastructure is important for all economic activities. The most important infrastructure is roads. Improvement of the main roads which connect between the down country and the two counties will reduce commodity prices and accelerate economic activities. Rural road network inside the county is also important for smooth commodity flows. For electricity, it would be advisable if off-grid development is promoted using solar power in the short-term. Expansion of mobile phone coverage surely helps people to communicate for various activities. All these development measures are expected to enhance resilience.

- Education and health sectors:
  Assistance in other technical areas outside the three areas covered by the Project, such as education and health sectors, should also be provided for sustainable development of pastoral communities. This is because establishment of schools and dispensaries was raised in the CAPs as the communities' priority needs. Although, unlike infrastructure support, education and health sectors do not earn immediate benefits, they are necessary because sustainable growth and human-capital development in pastoral communities cannot be achieved in the long-term without such basic services.

[2] It would be said that Northern Kenya has been regarded as peripheral areas and the subject for relief, and has been left behind from a notion of development. It could also be said that several decades of relief aid might influence the society negatively. Therefore, by taking this opportunity of devolution which is able to make people think the areas more seriously, all stakeholders must share this importance of development and commit for longer development.

For instance, literacy and simple mathematics are necessary for most of the resilient activities with newly established schools. Also, education on relatively new concepts for pastoralists, such as preparedness for drought and community management of public goods, is important particularly for the younger generation in, for instance, early off take of livestock, saving, and collective actions. Securing enough food, improving nutrition, providing medicine/treatment in newly established health centres are very important elements to keep people healthy and resilient physically.

Tables

Table B2.3.1 List of Wards in Marsabit County

No.	Constituency	Ward
1	Laisamis	Kargi / South Horr
2		Korr / Ngurnit
3		Laisamis
4		Loglogo
5		Loiyangalani
6	Moyale	Butiye
7		Golbo
8		Heilu
9		Moyale Township
10		Obbu
11		Sololo
12		Uran
13	North Horr	Dakana
14		Ileret
15		Maikona
16		North Horr
17		Turbi
18	Saku	Karare
19		Marsabit Central
20		Sagante / Jeldesa

Source: Website of Marsabit County Government (http://marsabit.go.ke/)

Table B2.3.2 List of Wards in Turkana County

No.	Constituency	Ward			
1	Loima	Kotaruk / Lobei	19	Turkana South	Kalapata
2		Loima	20		Kaputir
3		Lokiriama / Lorengikippi	21		Katilu
4		Turkwel	22		Lobokat
5	Turkana Cental	Kalokol	23		Lokichar
6		Kanamkemer	24	Turkana West	Kakuma
7		Kangatotha	25		Kalobeyei
8		Kerio Delta	26		Letea
9		Lodwar Township	27		Lokichoggio
10	Turkana East	Kapedo / Napeitom	28		Lopur
11		Katilia	29		Nanan
12		Lokori / Kochodin	30		Songot
13	Turkana North	Kaaleng / Kaikor			
14		Kaeris			
15		Kibish			
16		Lake Zone			
17		Lapur			
18		Nakalale			

Source: Turkana County Government

Table B4.1.1(A) Population and Population Density for Selected Pilot Communities in Marsabit County

Location	Sub-location	Male	Female	Total	Households	Area in Sq. Km	Density
Dakabaricha		2,102	2,138	4,240	856	14.0	302
	Mataarba	605	582	1,187	272	6.4	186
	Dakabaricha	1,497	1,556	3,053	584	7.6	400
Jirime		930	864	1,794	342	79.5	23
	Milima Tatu	834	772	1,606	306	14.4	112
	Jirime	96	92	188	36	65.2	3
Qilta		1,980	2,005	3,985	774	282.5	14
	Gar Qarsa	556	590	1,156	233	214.0	5
	Qilta	1,414	1415	2,829	541	68.5	41
Dirib Gombo		2,354	2383	4,737	980	97.0	49
	Qachacha	1,251	1,250	2,501	528	51.3	49
	Drib Gombo	1,103	1,133	2,236	452	45.7	49
Hurri Hills		2,132	1,876	4,008	832	2,219.6	2
	Elle-Borr	54	7	61	7	436.5	0
	Forolle	849	677	1526	291	440.4	3
	Hurri Hills	1,229	1,192	2,421	534	1,342.7	2
Kalacha		4,181	3,783	7,964	1,751	2,607.8	3
	El-Gade	1,021	951	1,972	433	1,789.1	1
	Kalacha	3,160	2,832	5,992	1,318	818.7	2
Turbi		2,362	1,959	4,321	958	3,024.9	1
	Burgabo	1,256	1,031	2,287	477	2,568.4	1
	Turbi	1,106	928	2,034	481	456.5	4
Korr		6,391	6,621	13,012	2,456	1,569.9	8
	Korr	1,837	2,073	3,910	837	183.6	21
	Halisurwa	896	1,113	2,009	421	600.8	3
	Hafare	3,658	3,435	7,093	1,198	785.5	9
Ngurnit		3,946	4,347	8,293	1,918	1,211.1	7
	Illaut	1,224	1,421	2,645	638	413.0	6
	Ngurnit	1,467	1,569	3,036	682	449.5	7
	Lonyori Pichau	1,255	1,357	2,612	598	348.6	7
Mt. Kulal		2,411	2,378	4,789	1087	1,554.2	3
	Olturot	4,85	3,74	8,59	181	139.0	6
	Arapal	5,38	437	975	248	428.1	2
	Larachi	172	188	360	79	272.2	1
	Mt. Kulal	1,216	1,379	2,595	579	714.9	4

Source: Population Census 2009

Table B4.1.1(B) Population and Population Density for Selected Pilot Communities in Turkana County

District		Sub-locations:	Location	Division	Population male	Population female	Population total	House-hold	Area km2	Pop density no./km2
North	1	MILIMATATU	YAPAKUNO	KALENG	2,496	2,126	4,622	491	860	5
	2	KANGAKIPUR	KAERIS	KALENG	1,318	1,089	2,407	274	344	7
West	3	LORITIT	LETEA	OROPOI	4,337	4,190	8,527	1,185	577	15
	4	LOKICOGGIO	LOKICHO-GGIO	LOKICHO-GGIO	5,652	5,328	10,980	1,868	504	22
Loima	5	LOKIRIAMA	LOKIRIAMA	LOIMA	1,951	1,664	3,615	482	164	22
	6	LORENGIPPI	LORENGIPPI	LOIMA	1,393	1,066	2,459	299	209	12
Central	7	ELIYE	KANGATO-THA	KALOKOL	2,277	2,515	4,792	804	494	10
	8	KERIO	KERIO	KERIO	2,169	2,085	4,254	692	266	16
South	9	LOCHWAAN-GIKAMATAK	LOCHWAAN-GIKAMATAK	LOKICHAR	7,915	6,646	14,561	1,636	1,072	14
	10	LOKICHAR	LOKICHAR	LOKICHAR	5,630	5,190	10,820	1,644	188	58
East	11	LOPII	KOCHODIN	LOKORI	1,458	1,352	2,810	347	324	9

Source: Population Census 2009

Table B4.1.2 Pilot Sub-projects of Major Three Technical Components at Selected 20 Pilot Communities in Marsabit and Turkana

Pilot Communities (Location/ Sub-Location)	Natural Resource management	Livestock Value Chain	Livelihood diversification
Marsabit County (Location)			
Turbi	Water pan (new)		Salt production Goat programme
Kalacha		Feedlot	
Hurri Hills	Water pan (new)	Rural road	
Dirib Gombo	Water pan (new)	Heifer exchange Market facility improvement	
Dakabaricha /Jirime		Heifer exchange Market facility improvement	Poultry programme
Gar-Qarsa	Water pan (new)		Goat programme
Korr	Solar power system	Market facility improvement	
Arapal	Pipeline system (rehab)		Goat programme
Ngurnit	Rock catchment (new)	Rural road	Resin & honey programme
Turkana County (Sub-location)			
Milimatatu	Borehole, Water pan (rehab)	Rural road	
Kangakipur	Sand dam (rehab)		
Loritit	Borehole	Pasture reseeding	IGA (Livestock trade), Rain-fed agriculture
Lokichoggio	Borehole	Pasture reseeding	
Lokiriama	Borehole		IGA (Livestock trade, retail shop), Dry meat
Lorengippi	Borehole Water pan (new)		
Eliye			Fishery
Kerio	Borehole	Market facility improvement Market linkage	
Lochwaangika matak	Borehole	Rural road	IGA (Livestock trade, retail shop)
Lokichar	Borehole	Market linkage	
Lopii			IGA (retail shop)

Note: In both Marsabit and Turkana, there are more sub-projects including water pans, solar power systems, boreholes, livestock related activities, and peace building interventions outside the selected 20 pilot communities.

Source: JICA Project Team

Table B4.2.1 Community Action Plan in Lokiriama Sub-location, Turkana County

COMMUNITY ACTION PLAN FOR LOKIRIAMA (Donor funded)

Activities	Objectives	Resources needed (KES)	Provider/ responsible	when	Expected changes/outputs
1.Rehabilitation of borehole and construction of piping system at LOKIRIAMA	To provide clean water to the community and reduce the risk of insecurity by making the water available within the village.	-1.5millions	JICA	To be defined by the donor	-Sufficient and clean water supplied to the community. -Mortality rate due to insecurity and water bone diseases reduced. -This will be an IGA for water user association for sustainability and will strengthen the committee. -More trees planted in homesteads.
2. Construction of new water pans at NAKALUWAT, NASOGOLO, KOPOTAKINE and MORUITA.	The pans will provide water for human and animal uses in dry season grazing areas. It will also support vegetable farming and mining activities within the area.	-8millions	JICA	To be defined by the donor	-Dry season grazing area utilized because water will be available. -Establishment of permanent settlement and crops farming encouraged in the area. -Livelihood improved -Wildlife will also benefit
3. Business start up (eg: buying and selling livestock, goods, small shops…)	To increase household income, support payment of school fees and medical bills,	-2millions	JICA	To be defined by the donor	-Business operators/facilities increased -Poverty reduced, more children taken to school. - Warriors reformed
4. Organizing cross border peace events or meetings (3 times/ year; 1 with each of the neighboring community: Karamajon, Tepeth, Pokot).	To promote and maintain peace with the neighboring community and ensure sustainable communication between the neighboring communities through peace committees.	-3millions	JICA	To be defined by the donor	-Insecurity reduced and sustainable peace achieved. -Communities living in harmony, free movement of humans, goods and services. -Creation of job opportunities for youth, women and community as a whole. -Poverty level reduced. -Livestock diseases reduced
5. Construction of facilities for a primary school in Urum	To provide access to primary education to over 2000 children in the area by reducing the distance between the kraals and the school, hence increasing literacy level in the community. This will also reduce the number of potential warriors.	-500,000	JICA	To be defined by the donor	-Literacy level increase due to high enrolment of children in school. -Number of potential warriors decreased. -Permanent settlement encouraged -Business opportunity created for community.
6. Development of a small scale irrigation scheme for crops farming.	To improve farming practices so that the community can achieve food and nutritional security. Provide alternative livelihoods strategy, to reduce hunger and promote self employment.	-10millions	JICA	To be defined by the donor	-Food availability, household income and self reliance increased. -Probability of raids and conflict reduced because the community members will be busy. -Community will be able to pay school fees, hospital bills and livelihood improved

Source: CMDRR Workshop by the sub-contracted NGO

COMMUNITY ACTION PLAN FOR LOKIRIAMA (Community funded)

Activities	**Objectives**	**Resources needed**	**Provider/ responsible**	**Time frame (by when)**	**Expected changes/outputs**
1.Afforestation	To increase vegetation cover and environmental services.	-Seedlings -watering cans (100,000 KES)	Community	March 2014	-Vegetation cover increased -Erosion reduced -Fodder available -Construction material available
2. Stacking of hardcore and ballast	To improve efficiency of the IGAs by reorganizing it.	Man power (20,000KES)	Group members	October 2013	-More resources accruing from the activity. -Self employment
3. Establishment of Aloe vera farm	To provide row material for detergent processing	Land Man power Seedlings (50,000KES)	Group members	November 2013	-Improve household income -Improve health
4. Initiating mobile schools at Lochoralomala and Atalokamusio	To provide basic education for children of pastoralists	Local building materials (40, 000KES)	Community	January 2014	-Literacy level improved in pastoral communities

Source: CMDRR Workshop by the sub-contracted NGO

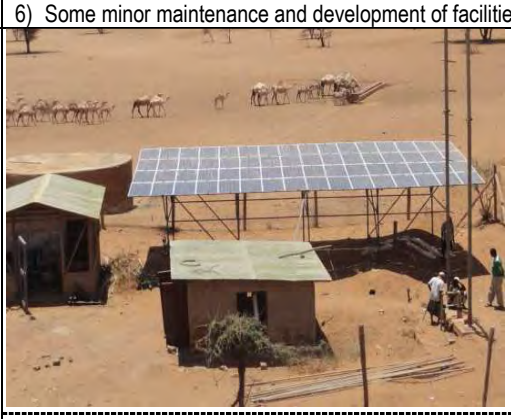
Table B4.3.1 Sub-project Summary Sheets: Natural Resource Management

1. Subproject Name	Sub-project of New Construction and Rehabilitation of Water Pan (Marsabit)
2. Places (Marsabit County)	1) Yaa Gara Water Pan (Rehabilitation), Hurri Hills Location in Marsabit North sub-county 2) Sotowesa Water Pan (New) , Turbi Location in Marsabit North sub-county 3) Dololo Dokatu Water Pan (New), Dirib Location in Marsabit Central sub-county 4) Dadach Manchure Water Pan (New), Gar Qarsa Location in Marsabit Central sub-county 5) Halo Girisa Water Pan (Rehab.), Gar Qarsa Location in Marsabit Central sub-county
3. Objectives	This sub-project aimed to improve sustainable natural resources management both of water and pasture in the grazing area through new construction and improvement of an existing water pan in the rainy season grazing area. Further, to improve operation and maintenance activities, especially strengthening of water users' association was targeted.
4. Beneficiaries	Pastoralists and livestock around pans. Approximately, Human 2,500persons at Yaa Gara water pan, livestock 41,500 heads at 5 pans
5. Project Contents	1) Construction of 3 new water pan and related facilities, such as intake, inlet channel, silt trap, spillway, etc. 2) Improvement of 1 existing water pan with new construction of additional pan (Cascade system) and other related facilities 3) Rehabilitation of 1 existing water pan such as desilting and shaping, etc. 4) Formation and strengthening of 5 water users' organizations 5) Improvement of operation and maintenance system and regulations through training programs and practice during actual use.
6. Project Impacts/ Results	1) Provision of new dry season grazing areas around community residential areas. (For example, about 12,700 heads of livestock stayed around Dololo Dokatu water pan for 2 months additionally in dry season of October – December 2013,) 2) Water pan management skills were improved, such as introduction of merged management system between a “Aba Elega” traditional system and a modern management system by water users committee. 3) Concept of rangeland management around new water pans were understood and implemented actually at seasonal migratory activities by community peoples.
7. Photos	 Dololo Dukatu water pan
	 Yaa Gara water pan (cascade system)

1. Subproject Name	Sub-project of Rehabilitation and up-grading of Arapal Water Pipeline (Marsabit)
2. Place (Marsabit County)	Arapal community, Arapal Location in Loiyangalani Sub-county
3. Objectives	This project aimed to improve sustainable water supply system both for drinking water and their livestock through improvement of existing pipeline system. Further, to improve operation and maintenance activities. Especially repairing of pipe connection and strengthening of water users' association were targeted.
4. Beneficiaries	Pastoralists and livestock around the pan. Approximately, Human 1,800persons, livestock 3,500 heads
5. Project Contents	1) Increasing capacity and expansion of existing water supply pipeline system through laying additional pipes, and construction of related facilities such as water storage tank, trough and so on. 2) Establishment and strengthening of water users' organization 3) Improvement of operation and maintenance system and regulations through training program as well as monitoring and intervention during operation.

6. Project Impacts/ Results	1) Water volume delivered by the pipeline system has been improved from 0.5L/s to 1.2L/s (140% increase), Due to stable water supply, time for watering livestock was shortened that enable herds to graze at further rangeland. 2) Due to increase of available water at village, water access of dairy cows and shoats, which are kept within village during dry season for milk, is improved. 3) Water users association was trained and communal operation and management skills were strengthened, such as repairing skills of broken pipes, collection of repairing fee from users, etc. 4) The community became capable to conduct minor repairs with the obtained skills and saving from the water fee
7. Photos	 New water tank  O & M training to water users committee members

1. Subproject Name	Sub-project of New Construction of Water Rock Catchment (Marsabit)
2. Places (Marsabit County)	Lokuchura community, Ngurnit Location in Marsabit South Sub-county
3. Objectives	This project aimed to improve sustainable water supply system mainly for drinking water through new construction of rock catchment. Further, to improve operation and maintenance activities, especially targeting strengthening of water users' association.
4. Beneficiaries	Approximately, Human 720 persons
5. Project Contents	1) Construction of new rock catchment with related facilities (Rock catchment (catchment area; 10,000 m2, approx.) Underground reservoir (750 m3, approx.) with roof, hand pump, spillway and drain) 2) Establishment and strengthening of water users' organization 3) Improvement of operation and maintenance system and regulations through training program and actual operation
6. Project Impacts/ Results	1) The community have access to water available nearby their household for a longer period. This can, especially for women, reduce distance to search for water. 2) Increase of water use can contribute to improvement of health status of people, through improvement in personal hygiene and clean water intake.
7. Photos	 Inside of the new rock catchment  The community cleaning the water reservoir

1. Subprojject Name	Sub-project of Introduction of Solar Power System (Marsabit)
2. Places (Marsabit County)	Kubi Qallo Borehole at Kubi Qallo community, Qilta Location, Marsabit Central Sub-County Shurr Borehole at Shurr community, Shurr Location, Marsabit North Sub-county Gobore Borehole at Korr Community, Korr Location, Marsabit South Sub-county
3. Objectives	1. Sustainable supply of water from existing borehole 2. To improve financial condition of the water users committee by reduction of consumption of fuel 3. To provide financial support to the community from a part of project benefit
4. Beneficiaries	Approximately, Kubi Qallo: Human 1,800 persons, Livestock 9,000 heads Shurr: Human 828 persons, Livestock 25,500 heads Korr: Human 4,500 person, Livestock n.a
5. Project Contents	1) Installation of solar power generation system 2) Improvement of operation and maintenance system and regulations through training program and through hands-on trainings during actual operation 3) Establishment of fee collection system for O&M and further community development
6. Project Impacts/ Results	1) Fuel consumption for operation of the boreholes are remarkably reduced (Monthly reduction of 2,500~3,000L in Kubi Qallo, 3,000~4,000L in Shurr, and 600~800L in Korr) 2) Water is accessible continuously even during drought period when some herders face difficulty in paying water fee 3) Record keeping for financial management of collected fee was improved 4) People can access water with lower fee 5) Primary school classroom was constructed with the saving from water fee in Shurr 6) Some minor maintenance and development of facilities were conducted with the savings from the water fee
7. Photos	 Solor power generation system installed at Shurr  Water fee collection (counting money)

1. Subprojject Name	Sub-project for Groundwater Development (Turkana)
2. Places (Turkana County)	20 boreholes in Turkana County
3. Objectives	Development of water resource has been critical issue for enhancing resilience of the pastoral community in Northern Kenya. In Turkana, ground water has high potential for use by pastoralists with optimal intervention. This sub-project aimed to improve utility of ground water resources through establishment of 20 new boreholes with introduction of an optimal operation and maintenance scheme. In order to enhance management by the community, communities are involved from the early stage of the project.
4. Beneficiaries	Approximately, Human) 6,500 persons Livestock） 90,000 heads
5. Project Contents	1) Ground water potential survey 2) Drilling and well development 3) Hand pump installation with animal trough construction 4) Support for sustainable operation and maintenance (linking with an existing O&M scheme, training of the WUA on O&M

6. Project Impacts/ Results	1) Permanent water sources were developed and people can access water continuously 2) Availability of rangeland was improved as some unused rangeland that was inaccessible due to lack of water is accessible 3) The boreholes are more sustainable with registration to O&M scheme 4) People in some community improve their ownership towards borehole operation through their contribution
7. Photos	 A established borehole with handpump  Watering animals at a borehole

1. Subproject Name	Sub-project of New Construction and Rehabilitation of Water pan (Turkana)
2. Places (Turkana County)	1) Kaabilikeret Water Pan (Improvement), Yapakuno Location in Turkana North Sub-county 2) Kasuguru Water Pan (Improvement), Yapakuno Location in Turkana North Sub-county 3) Edukon Water Pan (Improvement), Nanam Location in Turkana west Sub-county 4) Kaalale Water Pan (New construction), Lorengippi Location in Loima Sub-county 5) Nasikiria Water Pan (Improvement), Mogila location in Turkana west Sub-county 6) Nachuro Water Pan (New construction), Lomeyan Location in Loima Sub-county
3. Objectives	This sub-project aimed to improve sustainable natural resources management both of water and pasture in the grazing area through new construction and improvement of an existing water pan in the grazing area. Further, to improve operation and maintenance activities, especially strengthening of water users' association was targeted.
4. Beneficiaries	Approximately Livestock: 57,500 heads
5. Project Contents	1) Construction of new water pan and related facilities, such as intake, inlet channel, silt trap, spillway, etc. 2) Improvement of existing water pan with new construction of additional pan (Cascade system) and other related facilities 3) Rehabilitation of damaged portion and improvement of existing water pan such as desilting and shaping, etc. 4) Improvement of operation and maintenance system through training program to the community with support of maintenance tools
6. Project Impacts/ Results	1) Water availability at rehabilitated water pans was improved through increased water capacity 2) Sustainability of the facilities were improved with new system (cascade system) enable desilting easier
7. Photos	 Nasikiria water pan after rehabilitation  Kasuguru water pan

1. Subproject Name	Sub-project of Rehabilitation of Sand Dam (Turkana)	
2. Places (Turkana County)	1) Kangakipur Sand dam, Kaeris Location in Turkana North Sub-county	
3. Objectives	The sub-project aims to improve the water supply conditions in Kangakipur area both for livestock and domestic water through rehabilitation of existing Nakipi Sand Dam.	
4. Beneficiaries	Approximately, Livestock） 5,000 heads	
5. Project Contents	1) Rehabilitation of damaged portion and improvement of existing sand dam and related facilities 2) Improvement of operation and maintenance system through training program to the community	
6. Project Impacts/ Results	1) Water holding capacity improved. Thus people as well as livestock can access water for longer period2)	
7. Photos		
	During rehabilitation work	Improved sand dam

1. Subproject Name	Sub-project of Introduction of Solar Power System in Water Pump Facilities in Lodwar Water and Sanitation Company (LOWASCO) (Turkana)	
2. Places (Turkana County)	1) Borehole No.1A, Lodwar Town, Lodwar Location, Turkana Central Sub-county 2) Borehole No.3, Lodwar Town, Lodwar Location, Turkana Central Sub-county 3) Borehole No.6, Lodwar Town, Lodwar Location, Turkana Central Sub-county	
3. Objectives	1) To raise special fund that is to be exclusively utilised for repair and maintenance of hand pumps in pastoralist communities as preparedness, accumulated from present water fee collection system with reduced O/M cost of pumps 2) To improve financial condition of the water service providers with introduction solar power pumping system, by reduction of consumption of fuel	
4. Beneficiaries	100,000 persons in 5,400 connections (in total LOWASCO system)	
5. Project Contents	1) Installation of solar power pumping system 2) Improvement of management system of LOWASCO for operation and maintenance of water facilities 3) Establishment of new management system for repair and maintenance of hand pump	
6. Project Impacts/ Results	1) Fuel cost of approximately Ksh.900,000 is expected to be saved annually with use of solar power genetation system 2) Ksh.45,000 for 6month of saving was handed over to the County for maintenance of boreholes in the county that was subcontracted to Diocese of Lodwar of its O&M scheme	
7. Photos		
	Solor panel installed at LOWASCO	Saved fund handed over to the County government and then to Diocese of Lodwar

Source: JICA Project Team

Table B4.4.1 Sub-project Summary Sheets: Livestock Value Chain Improvement

1. Subproject Name	Sub-project of Heifer Exchange Program (Marsabit)
2. Places (Marsabit County)	1) Dirib Gombo community, Dirib Locations, Marsabit Central Sub-county 2) Jirime community, Jirime Locations, Marsabit Central Sub-county
3. Objectives	This sub-project aimed to: - Stimulate sales by pastoralists to sale the large number of marketable animals held by them. - Improve herd composition by (1) reduction of aged animals, and (2) increase percentage of female, the heifer and the lactated, so as to increase productivities in a herd and resistance against drought in terms of survivability. - Avail good quality breeding stock heifers / young females, and male animals as per the demand of the local communities, in the market place as a product which is difficult to get
4. Beneficiaries	Approximately, Human 750 persons (Direct beneficiaries only: Pastoralists who bought the heifers & young female animals at the markets)
5. Project Contents	1) Providing young livestock, such as heifer, male young shoats, etc. 2) Strengthening of livestock market committees 3) Strengthening of local livestock traders 4) Establishment of operation and maintenance system and regulations for market activities through training program
6. Project Impacts/ Results	1) Effectiveness of the programme's function was confirmed. It means, if somebody offers to sell heifers or young female animals in local market, pastoralists tend to sell their old animals in order to buy the young animals. 2) Actually all the young animals brought by the Project from January to August 2013 were sold out in Dirib Gombo and Jirime livestock market at normal prices. Thus actual transaction of animal in livestock markets in this period was supposed to be increased drastically.
7. Photos	 Jirime Livestock Market (Marsabit Central)
	 Girib Gombo Livestock Market (Marsabit Central)

1. Subproject Name	Sub-project of Kalacha Feedlot (Marsabit)
2. Place (Marsabit County)	Kalacha community, Kalacha Locations, Marsabit North Sub-county
3. Objectives	This sub-project aimed to: - Provide example and guidance on proper use of fodder and maintenance not only in the proposed feedlot but also in the existing agro-forest. - Provide opportunities to the larger population of pastoralists who do not have plots in the existing agro-forest of saving or fattening their animals during times of stress. - Add value to marketable animals during dry seasons and drought. - Provide opportunity for breed improvement from the purchase of off-springs of the Galla goats multiplication herd in the feedlot.
4. Beneficiaries	Approximately, Human 720 persons (Direct benefit: Pastoralists who lives in the community.)
5. Project Contents	1) Construction of feedlot facility 2) Strengthening of the environmental management committee for operating feedlot 3) Establishment of operation and maintenance system and regulations through training program
6. Project Impacts/ Results	1) People who did not have plot in irrigation farm could have irrigated plot in the feedlot farm. 2) The feedlot offered an opportunity to such pastoralists to have a survival method in droughts by means of feedlot fattening activities and hey cultivation in the farm. 3) The mindset of the members was changed to start another activity by themselves, such as hey stock business, by their own will and sources.

7. Photos		
	Feedlot facility (Marsabit North)	Hey in feedlot farm (Marsabit North)

1. Subproject Name	Sub-project of New Construction and up-grading of Livestock Markets Facilities (Marsabit)
2. Places (Marsabit County)	1) Dirib Gombo community, Dirib Locations, Marsabit Central Sub-county 2) Jirime community, Jirime Locations, Marsabit Central Sub-county 3) Korr community, Korr Location, Marsabit South District
3. Objectives	This sub-project aimed to construct new livestock market facility, and to improve existing, but not fully utilized, livestock market facilities in order to support livestock transaction in Marsabit County.
4. Beneficiaries	Approximately, Human 26,000 persons/year, (persons who related to 13,000 heads/annual)
5. Project Contents	1) New construction of 1 livestock market facility in Dirib Gombo 2) Improvement of 2 existing livestock markets in Jirime and Korr livestock markets 3) Training of association members for good operation and maintenance of the markets
6. Project Impacts/ Results	1) New livestock market facility was constructed in Dirib Gombo, and is being operated by community people properly. 2) Shade house and water tanks were installed in Korr and Jirime existing markets. After improvement works of 2 existing market facilities, user can have trading activities comfortably, consequently numbers of market users increased.
7. Photos	
	Newly constructed livestock market (Dirib Gombo)

New shade house in livestock market (Korr)

1. Subproject Name	Sub-project of Rural Road Improvement for Livestock Value Chain (Marsabit)
2. Places (Marsabit County)	1) Hurri Hills Access Road Improvement, Marsabit North Sub-county 2) Ngurnit Access Road Improvement, Marsabit South Sub-county
3. Objectives	This project aimed to: 1) Energize local market activity by means of facilitating easy access to the pastoralists in primary or secondary livestock market 2) Reduce transportation time and cost of livestock and its products as well as living necessities to pastoralists' communities
4. Beneficiaries	Approximately, 36,500 person/year (All users who pass those facilities)
5. Project Contents	1) Improvement of rural road conditions to Hurri Hill area 2) Improvement of rural road conditions to Ngurnit area 3) Improvement of access to Dirib Gombo Livestock Market
6. Project Impacts/ Results	1) Parts of road which were not passable during rainy season were improved with concrete permanent structures, such as drifts and concrete pavement. 2) Due to new facilities, road access to Hurri Hills, Ngurnit, and Digib Gombo area were improved, in particular during rainy season.

7. Photos		
	Concrete paved road to Hurri Hills (Marsabit North)	Drift on a road to Ngurnit (Marsabit South)

1. Subproject Name	Sub-project for Construction, Upgrading and Improvement of Livestock Market Facilities (Turkana)
2. Places (Turkana County)	1) Kerio livestock Market, Kerio Location in Turkana Central Sub-County 2) Lodwar livestock market pipe culvert, Lodwar Town, Lodwar Location in Turkana Central Sub-county 3) Milimatatu Drift Slab, Yapakuno Location in Turkana North Sub-county 4) Keekorsogol Drift Slab, Lochwaangikamatak Location in Turkana South Sub-county 5) Kabulit 1 Drift Slab, Letea Location in Turkana West Sub-County 6) Kokopito Drift Slab, Namoruputh Location in Loima Sub-county 7) Kabulit 2 Drift Slab, Letea Location in Turkana West Sub-county
3. Objectives	This sub-project aimed to: 1) Provide new additional livestock market infrastructure thereby enhancing livestock marketing activities 2) Stimulation of livestock market by construction and upgrading of road access
4. Beneficiaries	Approximately, 127,750 person/year (All users who use/pass those facilities)
5. Project Contents	1) Construction of additional livestock market infrastructure 2) Strengthening of LMA through capacity building of operation and maintenance of livestock market infrastructure and management of revenue collected and quality reporting. 3) construction and upgrading of access road to markets
6. Project Impacts/ Results	1) Kerio livestock market was improved and market activities were vitalized, such as extension of operation hours up to afternoon, emergence of new traders/producers, etc. 2) Parts of road which were not passable during rainy season were improved with concrete drifts. Consequently road access during rainy season has been improved.
7. Photos	 
	Kerio livestock market (Turkana Central) / Kabulit and Kakopit Drifts (Loima &Turkana West)

1. Subproject Name	Sub-project of Livestock Market Linkage and Vitalization (Turkana)
2. Places (Turkana County)	1) Kakuma community, Kakuma Location, Loima Sub-county 2) Lodwar, Lodwar Location, Turkana Central Sub-county 3) Lokichar, Lokichar Location in Turkana South Sub-county 4) Kerio livestock Market, Kerio Location in Turkana Central Sub-County
3. Objectives	1) Improvement of access to livestock market information 2) Capacity development of LMA officials who are responsible for managing livestock markets data. 3) Capacity development of LMA officials on collection and documentation of correct information and revenue collection as a monitoring indicator.
4. Beneficiaries	28 officers (Direct benefits)

5. Project Contents	1) Formulation of the training plan on collection and documentation of correct information and revenue collection. 2) Executing the training plan. 3) Record keeping of the number of livestock offered and sold and also their prices in terms of different categories of grades. 4) Transmitting Market information 5) Promotion of Livestock trade
6. Project Impacts/ Results	1) Capacity of livestock market officers were improved through training programme by the Project 2) In particular, Kerio livestock market activities have been improved in associated with physical improvement of market facilities. Pastoralists in Kerio livestock market organized Kerio Livestock Producers' Association for seeking their own benefits against a traders association.
7. Photos	 Training on Kakuma LMA officers (Loima)  Training on Lokichar LMA officers (Turkana South)

1. Subproject Name	Sub-project of Pasture Establishment by Reseeding (Turkana)
2. Places (Turkana County)	1) Lokichoggio community, Lokichoggio Locations, Turkana West District 2) Loritit community, Lotea Locations, Turkana West District
3. Objectives	This project aimed to: 1) Pasture establishment in reseeding farms to provide pasture to livestock near community 2) To provide livestock in good condition, in particular after/during dry season, in line with the revitalization of the livestock market. 3) To produce seed for sale as income generation to the community and for expansion of area under pasture 4) To provide a learning site (demonstration plot) to pastoralists on pasture production, conservation and utilization.
4. Beneficiaries	185 members in 2 reseeding farm groups in Lokichoggio, and Loritit, 42 individuals in Kangakipur, and Lopii communities.
5. Project Contents	1) Selection and establishment of sites and fencing of pasture reseeding plots. 2) Technical assistance-exposure visit/educational tour to existing functional pasture reseeding plot. 3) Technical assistance- on water harvesting structures, planting of seeds and hay, seed harvesting, seeds procurement, seed testing and distribution
6. Project Impacts/ Results	1) 2 reseeding farms were established in initiatives of communities, without any financial support by the Project. 2) As a pilot trial scheme, it was confirmed that reseeding activities were acceptable for community people in terms of required technique and financial aspects.
7. Photos	  Loritit Reseeding farm construction (Turkana West)

Source: JICA Project Team

Table B4.5.1 Sub-project Summary Sheets: Livelihood Diversification

1. Subproject Name	Sub-project of Chicken Merry-go-round (Marsabit)
2. Places (Marsabit County)	1) Dakabaricha community, Dakabaricha Location in Marsabit Central Sub-county 2) Jirime community, Jirime Location in Marsabit Central Sub-county
3. Objectives	This sub-project aims to diversify the livelihood of the target communities especially closer to the town using chicken and giving technical training, VICOBA training, and mentoring including PFS to enhance community resilience against drought.
4. Beneficiaries	8 groups in both locations, around 160 group members in Jirime and Dakabaricha.
5. Project Contents	1) Construction of improved poultry houses 2) Distribution of improved/indigenous chicken breed 3) Technical training for chicken rearing 4) Mentoring activities including group strengthening and PFS 5) VICOBA Training
6. Project Impacts/ Results	1) The progress at the end of the monitoring period (December 2014) is static at 20% of the initial plan in terms of number of members who have chicken, because of less chick production and distribution; low number of laid eggs due to under-nutrition, old age of the hens, and high chick mortality rates 2) Drought Fund was created, and VICOBA became activities 3) Some individuals, have acquired substantial skills in poultry rearing and are seriously taking the activity as a source of livelihood. This shows some members recognized positive impact of the benefit, internalized all technique and knowledge given, and has willingness to utilize them for their own development. 4) Women have been empowered in ownership of chicken and decision making by themselves for chicken handling.
7. Photos	 A member holding chicks with a given poultry house  A chicken to a subsequent member

1. Subproject Name	Sub-project of Goat Merry-go-round (Marsabit)
2. Place (Marsabit County)	1) Gar Qarsa community, Quilta Location (Gar Qarsa Sub location) in Marsabit Central Sub-county 2) Kalacha community, Kalacha Location in Marsabit North Sub-county 3) Arapal community, Arapal Location in Loiyangalani Sub-county
3. Objectives	This sub-project aims to diversify the livelihood of the target communities using goat and giving technical training, VICOBA training, and mentoring activities.
4. Beneficiaries	15 groups in all locations, around 290 group members in Kalacha, Gar Qarsa, and Arapal
5. Project Contents	1) Distribution of goats (improved breed) 2) Technical training 3) Mentoring activities including group strengthening 4) VICOBA Training
6. Project Impacts/ Results	1) All the target members would have received one female goat. The final progress at the end of the monitoring period shows 31% of achievement rate due to physiological performance of introduced Galla goat 2) By this system, group cohesion is enhanced to work as a group. 3) Majority of members agreed to have realized the need of saving of which they promised to have saving culture through Drought Fund introduction. VICBA has also been active. 4) Women are empowered both by goat ownership.

7. Photos		
	Delivery of Goat in Gar Qarsa	Second Subsequent Member Who Received Female Kids in Arapal

1. Subproject Name	Sub-project of Resin and Honey Business (Marsabit)
2. Places (Marsabit County)	Ngurnit community, Ngurnit Location in Marsabit South Sub-county
3. Objectives	This sub-project aims to diversify the livelihood of the target communities by assisting their micro scale business activities (IGA: income generating activities targeted resin, and honey) and giving entrepreneur/business training, VICOBA training, and mentoring activities to enhance community resilience against drought.
4. Beneficiaries	2 groups and individual, around 22 group members/individuals
5. Project Contents	1) Business training 2) VICOBA Training 3) Mentoring activities including market linkage
6. Project Impacts/ Results	1) Honey business is more active than resin one. With regards to honey business, sales of the containers of which procurement was assisted by the Project have almost been completed 99.9% (3,688 bottles), this is great improvement compared with the previous transaction of coca-cola bottles of around 1,500 bottles per year. 2) When it comes to net profit per members, the previous transaction showed Ksh 4,900 per year on average across all the group members. This increased to Ksh 10,839 (this figure is considered per year) after the first business cycle, more than twice as big as the previous transaction. 3) VICOBA has become active. 4) Skills and knowledge obtained from the training and mentorship activities have been instilled by them through their on-the-job application 5) Women have been empowered by economic success.
7. Photos	 Frankincense sold in Ngurnit	 Honey of Ngurnit Sold in Ngrunit

1. Subproject Name	Sub-project of Salt Business Program (Marsabit)
2. Places (Marsabit County)	Kalacha community, Kalacha Location in Marsabit North Sub-county
3. Objectives	This sub-project aims to diversify the livelihood of the target communities by assisting their micro scale business activities (IGA: income generating activities targeted salt) and giving entrepreneur/business training, VICOBA training, and mentoring activities to enhance community resilience against drought.
4. Beneficiaries	1 group, around 17 group members
5. Project Contents	1) Business training 2) VICOBA Training 3) Mentoring activities including market linkage

6. Project Impacts/ Results	1) As the result of the first cycle, they collected in total 615 bags, and 516 bags were delivered to the identified markets. Number of bags sold was 405, and gross expected sales are calculated as around Ksh.470,000. 2) The group has created VICOBA out of the funds obtained from the sale of salt and thus providing easy microfinance base for women who are involved in their individual business; and also thinks to use part of the group money as Social Fund. 3) Women have been empowered through the success of the salt business.
7. Photos	 
	Group members and Salt bags Collected / Market Penetration at Balessa

1. Subproject Name	Sub-project of Income Generating Activities (Turkana)
2. Places (Marsabit County)	1) 1 group in Loritit community, Lotea Locations, Turkana West Sub-county 2) 2 group in Lokiriama community, Lokiriama Location, Loima Sub-county 3) 2 group in Lochwaangikamatak community, Lochwaangikamatak Location, Turkana South Sub-county 4) 2 group in Lopii community, Kochodin Location, Turkana East Sub-county
3. Objectives	This sub-project aims to diversify the livelihood of the target communities by assisting their micro scale business activities (IGA: income generating activities of livestock trading and retail shops) and giving entrepreneur/business training, and mentoring activities to enhance community resilience against drought.
4. Beneficiaries	7 groups, and 125 group members
5. Project Contents	1) Implementation of training 2) Business consulting and market linkage 3) Monitoring
6. Project Impacts/ Results	1) For all groups of both IGA components, they are continuing their business as before. Slight improvement especially in transaction volume of livestock trade groups has been observed, and others are at the previous level. 2) The groups have learned business knowledge and continued their business using the knowledge obtained through the training. 3) Through the activities, group cohesion is enhanced.
7. Photos	 
	Livestock Trade in Loritit / Retail Shop in Lokiriama

1. Subproject Name	Sub-project of Small Scale Rain-fed Agriculture (Turkana)
2. Places (Turkana County)	Loritit community, Lotea Locations, Turkana West Sub-county
3. Objectives	This sub-project aims to diversify the livelihood of the target communities by assisting small scale rain fed agriculture activities giving technical training, and mentoring activities to enhance community resilience against drought.
4. Beneficiaries	1 group, and 11 group members

5. Project Contents	1) Implementation of training 2) Provision of technical advice together with operation of Experimental Plot and monitoring
6. Project Impacts/ Results	1) The result of this sub-project is that the members equipped with knowledge were waiting for the next main farming season 2) Acquisition of line planting and other farm management techniques. This group has got knowledge and skills, of which benefits are not only increment of production (though not yet realized in individual farms), but easy farming practices (easy movement inside the field, flood that can pass easily in the field not affecting plants down etc.) 3) Their attitude towards farming as a source of livelihood has changed positively. This is reflected primarily from their mind set to recognize agriculture itself is beneficial, but also their commercialized mind set of the farm produce.
7. Photos	 Activities of Experimental Plot (Weeding)  Individual Member Who Tested Line Planting

1. Subproject Name	Sub-project of Fishery (Turkana)
2. Places (Turkana County)	Eliye community, Kangatotha Location, Turkana Central Sub-county
3. Objectives	This sub-project aims to diversify the livelihood of the target communities by assisting their fishery activities including business elements giving fishery technical and entrepreneur/business trainings, and mentoring activities to enhance community resilience against drought.
4. Beneficiaries	2 groups, and 30 group members
5. Project Contents	1) Fishery technical training and entrepreneurship training 2) Provision of technical advice and business consulting including identifying new buyers etc. 3) Monitoring
6. Project Impacts/ Results	1) After all the activities of the sub project were done, they learned, were inspired by knowledge and exposure tour to see advancing examples. Still, transaction is almost the same, though there are some minor improvements. 2) One change is that some members have started going to Kalokol, which is the main fishery centre and do commission fishing, learnt from the exposure tour. 3) Knowledge of fishery technique and business skills is both positively evaluated by the members.
7. Photos	 Members of the Groups  Entrepreneurship Training (group discussions on startup and working capital)

1. Subproject Name	Sub-project of Dry-meat (Turkana)	
2. Places (Turkana County)	Lokiriama community, Lokiriama Location, Loima Sub-county	
3. Objectives	This sub-project aims to diversify the livelihood of the target communities by providing conventionally technical skills to preserve meat in a dry expected to use it during the drought period to enhance resilience against drought.	
4. Beneficiaries	1 group, 20 group members	
5. Project Contents	1) technical training of processing dry meat 2) Provision of technical advice and monitoring	
6. Project Impacts/ Results	1) The group members have acquired new technique of dry meat. They had traditional technique making thick strands of meat which did not last long. Now, new technique that they learned focuses on long period of preservation with thin strands of meat (improvement of cutting) leading to faster dry and therefore not getting rotten soon. 2) Beyond the initial design of the sub-project as aiming at self consumption, the group members express needs and even tried to test this dry meat for commercial purposes.	
7. Photos		
	A meeting of Participatory Planning	Dry Meat (left: traditional method as a control, right: new technique given through the training)

Source: JICA Project Team

Table B4.6.1 Sub-project Summary Sheets: Peace Building

1. Subproject Name	Sub-project of Peace Building Work Regarding Dololo Dokatu Water Pan (Marsabit)	
2. Places (Marsabit County)	Dirib/Jaldesa, Shurr and Songa communities in Marsabit Central Sub-county	
3. Objectives	To improve relationship between feuding communities of Gabra, Borana, and Rendille, especially in order to establish an effective and peaceful utilization in terms of utilization of Dololo Dokatu water pan	
4. Beneficiaries	265 participants in 5 communities	
5. Project Contents	1) Establish peaceful relation among stakeholders with peace building training and meeting 2) Develop friendship through sports event	
6. Project Impacts/ Results	Dololo Dukatu water pan has been shared by the people from different area without any conflict. Sharing of communal property was observed in other sites such as Dirib livestock market where people from different community bring their livestock and operate amicably.	
7. Photos		
	Peace Marathon (Dirib Gombo)	Inter-community Peace Meeting (Dirib Gombo)

1. Subproject Name	Sub-project of Children Peace Building around Rendille/Samburu and Gabra Areas (Marsabit)	
2. Places (Marsabit County)	- Gabra, Rendille and Samburu communities in Arapal, Gas, Kargi, Korr and other communities, in Loyangarani and North Horr Sub-county	
3. Objectives	To create an atmosphere of peaceful relations, through their children, between feuding communities of Gabra, and Rendille/Samburu.	
4. Beneficiaries	856 pupils in 11 schools	
5. Project Contents	1) Establish peaceful relation and friendship among students in different ethnic groups 2) Establish peace club in school to maintain relations of participants 3) Establish and operate corresponding system for exchange letters among students in different ethnic groups	
6. Project Impacts/ Results	Interactions among different ethnic communities have been observed after the project intervention. The post programme survey revealed that impression towards other ethnic groups have been improved both in children and adults	
7. Photos		
	Children Peace Camps (Kargi) Rendille・Samburu～Gabra)	Family Twinning (Kalacha)

Source: JICA Project Team

Table B5.1 Impacts, Observation, and Relation to the Project Outputs by Sub Projects

	Sub-projects	Facilities		Training & other activities	Beneficiary	Project Impact and other observations	Relation to the Project Outputs					
		Items	Contents	Items			1	2	3	4	5	6
Marsabit	(1) New Construction and Rehabilitation of Water Pan Sub-project	1) Yaa Gara Water Pan, Hurri Hills Location in Marsabit North District	Water pan (cascade type 20,400cu.m), connection channel	- Training for water users association. - Follow-up with project staff for O&M	Pastoralists and livestock around pans. Approximately, Human 2,500persons at Yaa Gara water pan, livestock 41,500 heads at 5 pans	i) Long rainy season (Mar.-May'14): Livestock) 702,000 head-day approx. Human) 252,000man-day approx. Note) This pan was the only one which held enough water in this season. Thereby an extra number of livestock which are not used to come visited the pan. (ii) Short rainy season (Oct-Nov'14) No rainfall	○	◎			△	○
		2) Sotowesa Water Pan , Turbi Location in Marsabit North District	Water pan (15,700cu.m), Settling basin, connection channels & Spillway	- ditto -		i) Long rainy season (Mar.-May'14): No rainfall ii) Short rainy season (rainwater in Mar.-May'14): No rainfall	○	◎			△	○
		3) Dololo Dokatu Water Pan, Dirib Location in Marsabit Central District	Water pan (15,800cu.m), Settling basin, connection channels & Spillway	- ditto -		(i) Short rainy season (rainwater in Oct.-Dec.'13): Livestock) 764,400 head-day approx. Human) No use Note) The pan held water at about 85% of the capacity. (ii) Long rainy season (rainwater in Mar.-May'14): Livestock) 955,500 head-day approx. Human) No use Note) Rain was not enough there, but the pan held water fully due to the remained water in the last rainy season.	○	◎			△	○
		4) Dadacha Man Churre Water Pan, Gar Qarsa Location in Marsabit Central District	Water pan (12,100cu.m), Settling basin, connection channels & Spillway	- ditto -		i) Long rainy season (Mar.-May'14): No rainfall ii) Short rainy season (Oct-Dec '14) Livestock) N.A. head-day Human) No use. Note) This is one of 2 pans which received enough water in this season.	○	◎			△	○
		5) Halo Girisa Water Pan, Gar Qarsa Location in Marsabit Central District	Water pan (6,000cu.m)	- ditto -		i) Long rainy season (Mar.-May'14): No rainfall ii) Short rainy season (Oct-Dec '14) Livestock) N.A. head-day Human) No use. Note) This is one of 2 pans which received enough water in this season.	○	◎			△	○
	(2) Rehabilitation and up-grading of Arapal Water Pipeline Sub-project	1) Arapal community, Arapal Location in Loiyangalani District	Rehabilitated pipeline: 2.3km New trough: 2 nos with 2.5km pipelines	- Training for water users association. - Training for pipeline plumber (6 persons). - Follow-up with project staff for O&M	Pastoralists and livestock around the pan. Approximately, Human 1,800persons, livestock 3,500 heads	(i) Increased volume of water supplied: 1,184,000 L/month (ii) Available increase of castles to be served by this water: 110,634 cattle-day/month	○	◎			△	○
	(3) New Construction of Lokchula Water Rock Catchment Sub-project	1) Ngurnit community, Ngurnit Location in Marsabit South District	Rock catchment reservoir: 750 cu.m Catchment area: 9,500 sq.m	- Training for water users association. - Follow-up with project staff for O&M	Approximately, Human 720 persons	(i) Increased volume of water storage: 750 cu.m/season (ii) This water can serve 25,000 HH-day/season = 120HH for 208days	○	◎			△	○
	(4) Sub-project of Introduction of Solar Power System in Water Pump Facilities	1) Kubi Qallo community, Qilta Location, Marsabit Central District	Solar modules (11.2kW) & accessories	- Training for water users association. - Follow-up with project staff for O&M	Human 1,800 persons, Livestock 9,000 heads	(i) Solar system were operated without any problems since beginning. (ii) 6,600L/year (=Ksh845,000) of fuel was saved. (estimated)	○	◎			△	○
		2) Shurr community, Shurr Location, Marsabit North District	Solar modules (11.2kW) new pump & accessories	- ditto -	Human 828 persons, Livestock 25,500 heads	(i) Solar system were operated without any problems since beginning. (ii) 6,600L/year (=Ksh845,000) of fuel was saved. (estimated)	○	◎			△	○

Table B5.1 Impacts, Observation, and Relation to the Project Outputs by Sub Project

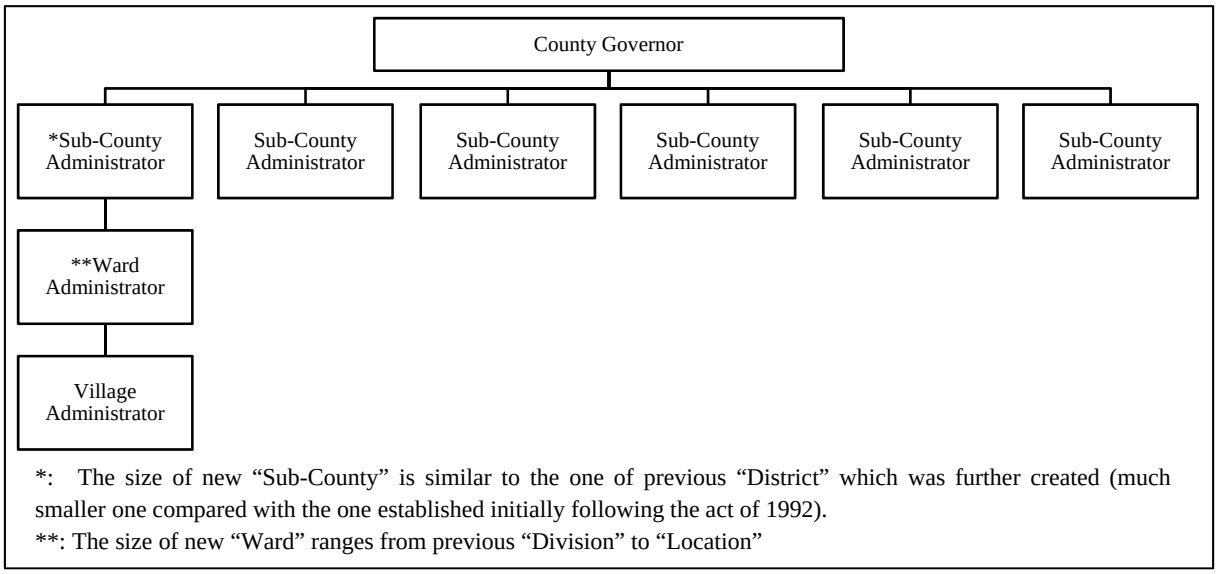
Marsabit	(4) Sub-project of Introduction of Solar Power System in Water Pump Facilities	3) Korr Community, Korr Location, Marsabit South District	Solar modules (4.10kW) & accessories	- ditto -	Human 4,500 person, Livestock n.a	(i) Solar system were operated without any problems since beginning. (ii) 1,320L/year (=Ksh168,960) of fuel was saved. (estimated)	○	◎			△
	(5) Heifer Exchange Program Sub-project	1) Dirib Gombo, Dirib Locations, Marsabit Central District	-	- Training for introduction of heifer system - Training for livestock marketing association. - Follow-up with project staff for O&M	Human 750 persons (Direct beneficiaries only: Pastoralists who bought the heifers & young female animals at the markets)	Refer to impact of "(7) Sub-project of New Construction and up-grading of Livestock Markets Facilities and Organization"	△		◎		△
		2) Jirime community, Jirime Locations, Marsabit Central District	-	- Training for introduction of heifer system - Training for livestock marketing association. - Follow-up with project staff for O&M		Refer to impact of "(7) Sub-project of New Construction and up-grading of Livestock Markets Facilities and Organization"	△		◎		△
	(6) Kalacha Feedlot Sub-project	1) Kalacha community, Kalacha Locations, Marsabit North District	1.3km irrigation pipeline system, plot irrigation system & accessories, feedlot house,	- Training for introduction of feedlot system, - Training for environmental management committee. - Follow-up with project staff for O&M	Human 720 persons (Direct benefit: Pastoralists who lives in the community.)	(i) Feedlot are operated well in dry and wet season. (ii) Pasture are cultivated. Vegetation in the feedlot is recovered (iii) 2 times of fattening & trading programme were executed successfully.	△		◎		△
	(7) Sub-project of New Construction and up-grading of Livestock Markets Facilities and Organization	1) Dirib Gombo community, Dirib Gombo, Dirib Locations, Marsabit Central District	Holding pen, water tank, loading lump, management office, perimeter fence, shade houses	- Training for environmental management committee. - Follow-up with project staff for O&M	Human 26,000 persons/year, (persons who related to 13,000 heads/annual)	(i) Dirib Gombo new livestock market has been well established and operated since start time. (ii) Trading data at 7,137 heads offered, 4,710 heads sold (for 20months: Jan13-Aug14)	△		◎		△
		2) Jirime community, Jirime Locations, Marsabit Central District	Shade house, and accessories	- ditto -		(i) Jirime market was resumed to operate and has been operated very well. (ii) 8,105 heads offered, 6,268 heads sold (for 15months: Jul13-Aug14)	△		◎		△
		3) Korr community, Korr Location, Marsabit South District	Shade house, and accessories	- ditto -		(i) Korr market has been operated very well. (ii) 25,973 heads offered, 18,089 heads sold (for 20months: Jan13-Aug14)	△		◎		△
	(8) Rural Road Improvement for Livestock Value Chain	1) Hurri Hills Access Road Improvement, Marsabit North District	Concrete lining pavement	None	36,500 person/year (All users who pass those facilities)	(i) Road access to Hurri Hill market was improved especially in rainy season.	△		◎		△
		2) Gnurunit Access Road Improvement, Marsabit South District	Concrete lining pavement	None		(i) Road access to Ngurunit market was improved especially in rainy season.	△		◎		△
	(9) Chicken Merry-go-round Sub-project	1) Dakabaricha community, Dakabaricha Location in Marsabit Central District	Provision of chicken house	- Training for Chicken marry-go-round groups. - Follow-up with project staff for O&M	8 groups in both locations, around 160 group members in Jirime and Dakabaricha.	(i) 9 sets of chicks were delivered to next recipient from the 23 initial recipients. (ii) Hatching rate is not so high, and number of transfer of chicks are limited.	△			◎	△
		2) Jirime community, Jirime Location in Marsabit Central District				(iii) One member successfully acquired all the techniques of handling Sasso and plans his expansion of the chicken business.	△			◎	△
	(10) Goat Merry-go-round Sub-project	1) Gar Qarsa community, Gar Qarsa Location in Marsabit Central District	Provision of chicken house	- Training for Chicken marry-go-round groups. - Follow-up with project staff for O&M	15 groups in all locations, around 290 group members in Kalacha, Gar Qarsa, and Arapal	(i) 32 goats were delivered from 86 female goats of initial inputs. (ii) 8 received baby goats from initial recipients. (iii) Delivery rate is low (37%), consequently number of transfer are limited.	△			◎	△
		2) Kalacha community, Kalacha Location in Marsabit North District				(iv) Some women groups (e.g. in Arapal) have been empowered and their group cohesion has been strengthened through our mentoring activities.	△			◎	△
		3) Arapal community, Arapal Location in Loiyangarani District					△			◎	△

Marsabit	(11) Resin and Honey Business Sub-project	1) Ngurnit community, Ngurnit Location in Marsabit South District	Provision of chicken house	- Training for regin and honey groups. - Market trips - Follow-up with project staff for O&M - Exposure tour to Nairobi, Nyanyuki, Eldoret, Ishioro - Participation of inventors conference	2 groups and individual, around 22 group members/individuals	(i) 3,690 bottles of honey were prepared by 22 members, and 3,651bottles (99%) were sold since the project introduced plastic containers. (ii) The members have started buying raw honeycomb mainly from this dry season. Already, some of the capable members have purchased containers.	△			◎	△	○
	(12) Salt Business Program Sub-project	1) Kalacha community, Kalacha Location in Marsabit North District	Provision of chicken house	- Training for Chicken marry-go-round committee. - Follow-up with project staff for O&M - Implementation of PFS with goat marry-go-round groups	1 group, around 17 group members	(i) The 1st cycle of salt business that started since 2013, sold 296 bags (=14.8tons), and earned about Ksh.350,000	△			◎	△	○
	(13) Sub-project for Peace Building	1) Arapal, Gas and other communities, in Loiyangalani and North Horr Districts		- Children peace camp - Peace family twining - Peace club establishment in schools	856 pupils in 11 schools	(i) Peace clubs in 11 primary schools were formulated and more than 5,000 correspondents were exchange in total among the clubs.	○			◎		○
		2) Dirib Gombo, Shurr, Songa communities, in Marsabit Central District		- Intra-community peace training - inter-community peace training	265 participants in 5 communities	(i) Operation of Dololo Dukatu water pan was so organized by 2 communities. (ii) No any conflicts or troubles were observed regarding the water pan.	○			◎		○
Turkana	(1) New Construction and Rehabilitation of Water Pan Sub-project	1) Kaabilikeret Water Pan, Yapakuno Location in Turkana North Sub-county	Water pan (cascade type 24,000cu.m), connection channel	- Training for water users association. - Follow-up with project staff for O&M	Livestock: 57,500 heads	(i) Ready to operate in next rainy season.	○	◎			△	○
		2) Kasuguru Water Pan , Yapakuno Location in Turkana North Sub-county	Water pan (cascade type 7,000cu.m), connection channel	- ditto -		(i) Ready to operate in next rainy season.	○	◎			△	○
		3) Edukon Water Pan, Nanam Location in Turkana west Sub-county	Water pan (cascade type 23,000cu.m), connection channel	- ditto -		(i) Under construction.	○	◎			△	○
		4) Kaalale Water Pan, Lorengkippi Location in Loima Sub-county	Water pan (cascade type 19,000cu.m), connection channel	- ditto -		(i) Ready to operate in next rainy season.	○	◎			△	○
		5) Nasikiria water pan, Mogila location in Turkana west Sub-county	Water pan (cascade type 25,000cu.m), connection channel	- ditto -		(i) Ready to operate in next rainy season.	○	◎			△	○
		6) Nachuro water pan, Lomeyan Location in Loima Sub-county	Water pan (cascade type 23,000cu.m), connection channel	- ditto -		(i) Ready to operate in next rainy season.	○	◎			△	○
	(2) Sub-Project for Groundwater Development	1) 20 boreholes in 6 Sub-counties	Borehole, handpump, animal trough	- Training for water users association. - Follow-up with project staff for O&M	Approximately, Human) 6,500 persons Livestock) 90,000 heads	(i) In total, 2,442m of boreholes were drilled at 25 sites. (ii) 20 boreholes out of 27 holes at 25 sites got water and 7 wells were dry holes. (iii) 15 sites have registered to the repairing insurance. (iv) 1 site can be operated without pump due to pressured flow.	○	◎			△	○
	(3) Rehabilitation of Sand Dam Sub-project	1) Kangakipur Sand dam, Kaeris Location in Turkana North Sub-county	Concrete walls and accessories	- Training for water users association. - Follow-up with project staff for O&M	Livestock) 5,000 heads	(i) Ready to operate in next rainy season.	○	◎			△	○

Turkana	(4) Sub-project of Introduction of Solar Power Pumping System in Lodwar Water and Sanitation Company	1) Borehole No.1A, Lodwar Town, Lodwar Location, Turkana Central Sub-county	Solar modules (28.08kW) & accessories	- Training for water users association. - Follow-up with project staff for O&M	100,000 persons in 5,400 connections (in total LOWASCO system)	(i) Ksh 970,000 of cost saving are expected annually. (ii) Pumping up with solar system is adequately operated.	○	◎			△	○
		2) Borehole No.3, Lodwar Town, Lodwar Location, Turkana Central Sub-county	Solar modules (28.08kW) & accessories	- ditto -		(i) Ksh 943,000 of cost saving are expected annually. (ii) Pumping up with solar system is adequately operated.	○	◎			△	○
		3) Borehole No.6, Lodwar Town, Lodwar Location, Turkana Central Sub-county	Solar modules (17.55kW) & accessories	- ditto -		(i) Ksh 580,000 of cost saving are expected annually. (ii) Pumping up with solar system is adequately operated.	○	◎			△	○
	(5) Sub-project for Construction, Upgrading and Improvement of Livestock Market Facilities	1) Kerio livestock Market, Kerio Location in Turkana Central Sub-County	Holding pen, water tank, loading lump, management office, perimeter fence, shade houses	None	127,750 person/year (All users who use/pass those facilities)	(i) The facility is functioned well without any problems.	△		◎		△	○
		2) Lodwar livestock market pipe culvert, Lodwar Town, Lodwar Location in Turkana Central Sub-county	Concrete pipe culvert for entrance	None		- ditto -	△		◎		△	○
		3) Milimatatu Drift Slab, Yapakuno Location in Turkana North Sub-county	Concrete drift for river crossing	None		- ditto -	△		◎		△	○
		4) Keekorsogol Drift Slab, Lochwa-angikamatak Location in Turkana South Sub-county	Concrete drift for river crossing	None		- ditto -	△		◎		△	○
		5) Kabulit 1 Drift Slab, Letea Location in Turkana West Sub-County	Concrete drift for river crossing	None		- ditto -	△		◎		△	○
		6) Kokopito Drift Slab, Namoruputh Location in Loima Sub-county	Concrete drift for river crossing	None		- ditto -	△		◎		△	○
		7) Kabulit 2 Drift Slab, Letea Location in Turkana west Sub-county	Concrete drift for river crossing	None		- ditto -	△		◎		△	○
	(6) Livestock Market Linkage and Vitalization Sub-project	1) Kakuma community, Kakuma Location, Loima Sub-county	None	- Training for market information system	28 officers (Direct benefits)	(i) Each Livestock Market Association collect necessary data and delivered to the central office.	△		◎		△	○
		2) Lodwar, Lodwar Location, Turkana Central Sub-county					△		◎		△	○
		3) Lokichar, Lokichar Location in Turkana South Sub-county					△		◎		△	○
		4) Kerio livestock Market, Kerio Location in Turkana Central Sub-County		- Training for livestock market, - Training for M-pesa utilization for livestock transaction		(i) The facility is functioned well without any problems. (ii) Producers has intention to organize a producer association.	△		◎		△	○

Turkana	(7) Sub-project for Pasture Establishment by Reseeding	1) Lokichoggio community, Lokichoggio Locations, Turkana West District	None	- Training for reseeding farms - Exposure tours	185 members in 2 reseeding farm groups in Lokichoggio, and Loritit, 42 individuals in Kangakipur, and Lopii communities.	(i) In Lokichoggio, due to shortage of rainfall, germination of seeds is not expected much. (ii) In Loritit, there was rainfall in November 2014. Then pasture grew much. (iii) In Kangakipur, individual reseeding farm had rainfall and germination.	△	△	○		△	○
		2) Loritit community, Lotea Locations, Turkana West District					△	△	○		△	○
	(8) Income Generating Activities Sub-project	1) 1 group in Loritit community, Lotea Locations, Turkana West District	None	- Entrepreneurship business training	7 groups, and 125 group members	(i) Selected groups prioritized livestock trade and retail shop as their IGA (Income Generating Activities; here meaning small business) (ii) Most of the group members learned and appreciated the business knowledge obtained through the training, and monitoring results show that they increased income from these business activities.	△			◎	△	○
		2) 2 group in Lokiriama community, Lokiriama Location, Loima Sub-county					△			◎	△	○
		3) 2 group in Lochwa-angikamatak community, Lochwa-angikamatak Location, Turkana South Sub-county					△			◎	△	○
		4) 2 group in Lopii community, Kochodin Location, Turkana East Sub-county					△			◎	△	○
	(9) Small Scale Rain-fed Agriculture Sub-project of	1) Loritit community, Lotea Locations, Turkana West District	None	- Entrepreneurship business training, - PFS rainfed cultivation training	1 group, and 11 group members	(i) In the experimental plot, the sorghum plants by line planting are healthier than those by their traditional broadcasting planting. (ii) One member has already applied this technique in her own plot as her late planting exercise expecting late rains. (iii) New learning is observed to involve reduction of labor work and production increase by line planting.	△			◎	△	○
	(10) Fishery Sub-project of	1) Eliye community, Kangatotha Location, Turkana Central Sub-county	None	- Entrepreneurship business training - Training for fishery	2 groups, and 30 group members	(i) After the training, members learned the importance of marketing and securing buyers.	△			◎	△	○
	(11) Dry-meat Sub-project	1) Lokiriama community, Lokiriama Location, Loima Sub-county	None	- Entrepreneurship business training - Training for dry meat technical production	Human 1,800persons, livestock 3,500 heads	(i) The members learned improved technique that adds value to the traditional way: i.e. cutting thin strands without fat and ligament and enables faster dry and long preservation period. They said they can use it for their home consumption and also want to start IGA with this.	△			◎	△	○

Figures



*: The size of new "Sub-County" is similar to the one of previous "District" which was further created (much smaller one compared with the one established initially following the act of 1992).
**: The size of new "Ward" ranges from previous "Division" to "Location"

Prepared by JICA Project Team based on hearing from the county government

Figure B2.3.1 Decentralised Administration Structure

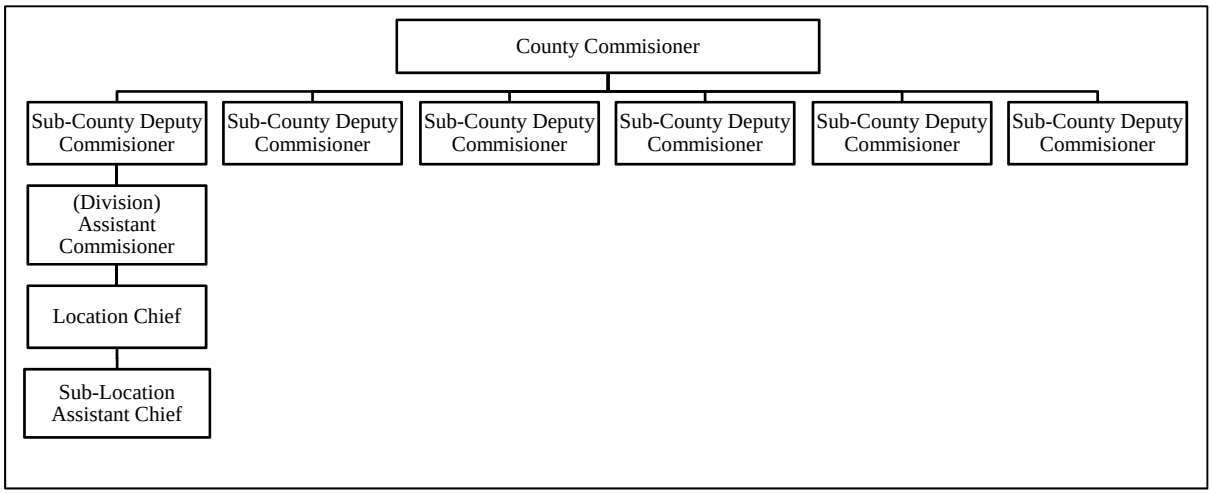


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Figure B2.3.2 Centralised Administration Structure