PARTICIPATORY CLIMATE RISK AND ASSESSMENT REPORT FOR BARWESSA WARD

PRELIMINARY CHAPTER

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CHAPTER ONE

Introduction

Barwessa ward Participatory Climate Risk assessment was carried out from 17th to 21st April 2023 at Barwessa Trading Centre. The attendance composition was comprised of 5 females and 15 men. It followed with the introduction to FLLOCA, where in 2020 the Government of Kenya launched the Government Financing Locally- led Climate Action Program (G-FLLOCA).The G-FLLOCA's objectives is to strengthen the local resilience to the impact of climate, natural hazards and other shocks by building the country's capacity to plan, implement and monitor resilience investments in partnership with the county government and communities which is a National Government Program and is funded by the World Bank. The fund from World Bank is channeled to the national treasury then trickles down to the respective wards to run the prioritized project by the community.

1.1. Background Information about the Ward

Barwessa ward is made up of three locations namely Kabutiei, Lawan and Kaboskei and with a total of 10 sub locations. The distribution of the sub locations in the three locations is as indicated in table 1.

Table 1: sub locations in Slilale Ward

Ward location	**Sub-location**
Kabutei	Kapluk, Muchukwo & Katibel
Lawan	Keturwo, Konoo, Kaptilomwo & Barwessa
Kabosgei	Kuikui, Marigut & Ayatia

Demographic Information

Barwessa ward has a total land area of 10,984.6 Sq. Km with a population of 29,905 (with males 14,931 and females 14,974). This is 4% of the population in Baringo County. It has a population density of 61 persons per sq. km and 1,559 households. The population of population in the three locations Kaboskei, Kabutiei and Lawan are 7,736, 8,786 and 13,383 respectively.(KNBS, 2019) The general population distribution is shown in table 2.

Table 2:Distribution of Population by Sex, Number of Households, Land Area, Population Density and Sub Locations in Barwessa ward

	Sex*			Households			Land	Density
	Total	**Male**	**Female**	**Total**	**Conventional**	**Group Quarters**	**Area Sq. Km**	**Persons per Sq. Km**
BARINGO	**666,763**	**336,322**	**330,428**	**142,518**	**141,877**	**641**	**10,984.6**	**61**
BARWESSA	29,905	14,931	14,974	6,402	6,402	-	498.7	60
KABOSKEI KERIO	7,736	3,808	3,928	1,559	1,559	-	188.9	41
AYATIA	1,210	618	592	223	223	-	29.7	41
KUIKUI	4,660	2,269	2,391	973	973	-	105.8	44
MAREGUT	1,866	921	945	363	363	-	53.4	35
KABUTIEI	8,786	4,355	4,431	1,882	1,882	-	102.0	86
KABITEL	3,022	1,486	1,536	620	620	-	39.1	77
KAPLUK	3,323	1,661	1,662	730	730	-	36.3	92
MUCHUKWO	2,441	1,208	1,233	532	532	-	26.5	92
LAWAN	13,383	6,768	6,615	2,961	2,961	-	207.8	64
BARWESSA	3,215	1,595	1,620	643	643	-	36.2	89
KAPTILOMWO	1,987	1,033	954	399	399	-	48.1	41
KONOO	4,454	2,285	2,169	1,078	1,078	-	68.7	65
KETURWO	3,727	1,855	1,872	841	841	-	54.7	68

Description of Poverty index in Barwessa Ward

PCRA participants said that the men are the property owners especially the livestock, only a small percentage of women are allowed to own the property i.e. widows, single mothers and orphans. Therefore, poverty rate is higher in women than men.

1.2. Physiographic Information

Climate information

The climate of the area is semi- arid climate. Rainfall in Kerio Valley where Barwessa Ward lies is bimodal and relatively low amounts up to below 600mm per year. This amount is received from March to July and again from October to November. The period from December to February is practically dry. In addition to that droughts in this area are common and given climate change phenomenon it is likely the situation will become worse. The ward also experiences strong winds which have caused damage to property.

Topography, Soil and Drainage in the ward

The main topographic feature in the ward is the Kerio Valley. Others include hills. All rivers and streams in the ward flow westwards towards the Kerio. The ward is generally approximately between 800- 1000M asl in the lowlands.

The dominant soils in Barwesa ward are well drained, deep, and dark brown, friable, moderately calcareous clay loams with a sodic deep subsoil-Calcic CAMBISOLS, sodic phase.

It was cited that during planting fertilizers are used majorly in the irrigation scheme areas and rarely used by farmers outside the scheme areas. land in the ward is highly degraded with large and deep gullies.

Agro-Ecological Zones and Livelihoods (Characteristics of the Livelihood)

The main livelihoods in Barwessa ward are: livestock keeping (including goats, cows, sheep, donkey, poultry farming and bee- keeping); crop farming comprising both rainfed and irrigation farming. Irrigation is carried out only in Lawan location (under Kiboi and Barwessa irrigation schemes). Due to water shortage irrigation is done seasonally. The irrigation schemes receives water from Barwessa river. Kiboi irrigation scheme is 200 acres and Barwessa scheme 2,729 acres. The crops planted in the irrigation schemes are paw paws, cow peas, green grams, maize, mangoes and bananas. The schemes are managed by a committee. Other economic activities in the ward are sand harvesting in the Kerio river, trade particularly in the trading centers and quarrying specifically in Kamogoi, Senebo, Kombosang and Kormor.

1.3. Natural Resources

Natural resources in the ward identified through the resource mapping activity include seasonal rivers, hills (beside being catchment areas they are also used for grazing the livestock during prolonged drought). There are no permanent rivers in the ward. Kerio Valley River crosses the ward The ward has several springs some of which have been developed as water sources.

Lake Kamnarok an ox bow lake in the ward has the largest concentration of crocodiles and elephants in one ecosystem is found in the ward. The lake is however, dying due to human activities such as felling of trees for charcoal burning and farming and proliferation of water hyacinth that contributed to blocking the shorelines and tributaries feeding into the lake. The dried up part of the lake is used for grazing animals and farming. Large gulleys as the Kiptilit gulley are draining water from the lake. Lake Kamnarok was gazetted as a game reserve in 1983.

Other natural resources in the ward are building stones quarried in Kapngoi, Serubo, Bolambu, Kambosony and Korimor. Table 3 indicates the specific natural resources in the ward.

Wildlife including both flora and fauna also comprise the natural resources in the ward. Important fauna are elephants, crocodiles, monkeys, hyenas, tortoise, among others. Presence of these animals in the ward has led to human wildlife conflict particularly during the dry spells.

Flora

Vegetation cover in the area comprises of grass patches and thick bush of indigenous shrubs. Along major river courses, more luxuriant vegetation abound. Much of the volcanic areas comprises of vast grassland. Additionally, some volcanic areas are covered by dense forest. The vegetation cover of project area comprises of, Croton spp., and Acacia tortilis, Balanitis aegyptica, Ficus thonningii, and grass and bushes.

Table 3: Locations of Natural Resources in the Ward

Natural Resource	**Names**
Rivers	Ketiborok. Cheplogoi, Kuikui, Kipchar, Marigut, Embassos, Kerein, Kerio, Kipkwai, Kipkolowo
Hills	Norogoi, Burbur, Ngarau, Cherungu, Koiser, Kitaiwa, Mutarai, Marmar, Elgut, Kipyemit, Kaisirma,Chebuny, Barsitebwo, Kibarter, Sananda
Springs	Turuturu,Kembei, Barwessa, Kipcahr, Chebortole, Kuikui, Ewalel, Enot, Oinapkor, Kitire, Kipsigar, Kibuliak, Tekwet, Moigutwonin.
Building stones	Kapngoi, Serubo, Bolambu,Kambosony, Korimor
Lakes	Lake Kapnarok

1.4. Physical Infrastructure (critical facilities)

The Physical infrastructures are shown in the table 4 below. The physical infrastructures identified are health centers, livestock facilities such as dips and crushes, boreholes and water pans. Most boreholes are not functional and people are using the manual way to draw water (hand pumps).

There is no solid waste disposal site in the ward. Solid waste is either disposed off in pits or burnt in homesteads.

Table 4: Physical infrastructures in Barwessa ward

Physical infrastructure	Names
Health centers	Kapluk Dispensary, Kiptaiwa Dispensary, Katibel, Kiturwo, Ayatia, Kuikui, Keturwo, Barwessa Health Center, Chemura, Kipkolong (Oldest Health Center), Likwon, Maregut,
Livestock facilities	Dips –Terenin, Turuturu, Katibel, Litein, Konoo, Barwessa, Kaptiony, Kambi Nyasi, Kebulwonin, Kimaa, Enot, Chemosei, Keturwo, Kormoi
	Crushes-maregut, kapterut, chesugich, kapkieng, ayatia, oinopkor, koisere
Strategic water sources	Boreholes- Kapkien, Theland, Ngenyin, Kaptigit, Chesangech, Marigut, Katibel, Muchukwo, Kabuliat, Kapluk, Konoo, Barwessa, Kamogoi, Chepkotut, Kipkolong, Cheptewonin, Turbei, Kuikui, Hayshed,
	Water pans- Kapchore, Kaptilingo, Kipkelwo, Enot, Kapatwa, Likwon, Koiser, Marigut, Kalel, Sibongoi, Kaptigit, Chesangoch.

1.5. Social Amenities

Christianity is the main religion in the ward. The ward has both primary and secondary schools. There are three livestock markets in the ward located in Turuturu, Barwessa and Kampi ya Nyasi.

The ward has also cultural areas where traditional ceremonies are carried out and a number of shrines.

Table 5: Social Amenities in the ward

Social place	Names
Churches	Full gospel, AIC, Catholic, SDA, Church Of Christ, Fellowship, Worship, AGC, Kings Outreach.
Primary school	Chemura, Kapluk, Barwessa, Kiptawa, Keturwo, Bartogo, Emitik, Chebore, Royal Hills Academy, Kaptolelyo, Turuturu, Kapkarani, Yegut, Seretion, Lake Kaptara, Resondonin, Lekepchun, Senebo, Kaptiony, Kaptigit, Chesawany,Kaptilingo, Chesumbo, Litein, Kormor, Siboo, , Kipkolony, Torolokwonin, Mutaran, Kibulwonin, Maregut, Murterit, Kuikui, Chesangich, Cheptigit, Kampinyasi, Turbei, Kombasang, Maramar, Likwon, Ayatia, Lawan, Chebukar, Kamogoi
Secondary school	Barwessa, Kapluk, Kuikui, Kinyach, Muchukwo, Katibel & Keturwo
Markets	Turuturu, Barwessa, Kambi Nyasi
Social hall	Barwessa Youth Social hall
Cultural areas	Chepkokel, Kapchereren
Trading centers	Barwessa, Kapluk, Muchukwo,Konoo, Keturwo,Kormor, Kampi Nyasi, Katibel, Maregut,Kuikui
Shrines	Noregoi Shrine-Lawan, -Chepkogel-Kabosgei-Kerio, Burbur-Kabutei, Sonondo-Kabutei, Ngarau-Lawan

Shrines are used as the places of offering sacrifices and consulting the ancestor in the time of disasters and hazard. Specific elderly men are allowed to go uphill and offer burnt sacrifices and appease the ancestors, burnt sacrifices included (cows and goats). This is traditional way of seeking solutions to natural disasters in the community.

1.6. Road and Telecommunication Network

Kabarnet to Barwessa road is the only tarmacked road in the ward. The ward is endowed with good road connectivity. The hinterlands is composed of earth roads, most of them eroded by surface water runoff and impassable in the rainy season.

Safaricom and Airtel are the main telecommunication provider. Signal strength varies across the ward with some areas having no signal.

Table 6: Table 6:Road and telecommunication network

Physical infrastructure	Names
Telecommunication mast	Safaricom and Airtel, boosters
Road network	Kabarnet - Barwessa road **(tarmacked);** Barwessa - Kabartonjo road; Keturwo – Tiloi - Ossen Road; Muchukwo-Kabarnet; Konoo-Ossen; Kampinyaei-Kipsarama; Kampi Nyasi-Kabulwo; Kampinyasi-Barbarchun Kampiyasi- Kabulwo; Marigut-Cheglet; Kuikui-Tunoiwo; Ayatya-Kilos Maregut-Terenin & Katibel- Pemwai

CHAPTER TWO

2.3. Methodologies (methodologies and tools) – description

2.1 Targeting (criteria for selection of participants in the PCRA process)

While selecting PCRA participants, the ward administrators help in identifying potential community members. The criterion used were:

Social inclusivity; the PCRA data collection process aimed at involving all members of the community, including marginalized and vulnerable groups, such as women, children, elderly, people with disabilities, and indigenous communities.

Willingness and availability: it was a requirement that the participants per ward should be available and willing to participate in the data collection process for the set 5 days' period.

Resident of the respective ward: the participants should have a good understanding of the local environment, climate change, and its impact on the community. The selected team should have some ITK on trends in climate change and hazard occurrence.

2.2 Objective (PCRA)

The objectives of Participatory Climate Risk Assessment is to empower the communities to understand the climate risks they face and assess their ability to manage these risks as the basis for identifying and undertaking concrete climate actions that will be linked with community climate change action plans with existing ward level participatory planning

2.3 Methodologies (Methodologies and tools) –*Description*

PCRA Data collection process incorporated a number of methodologies and tools. they included: Climate risk assessment; this involved identification and analysis of risk/ hazard related with climate change. It involved assessing the vulnerability of different both human and non-human elements within the ward to impacts of hazard occurrence and identifying the local responses and coping strategies. Participatory appraisal; involved visiting the local communities to collect data on their knowledge, perceptions, and experiences of climate change and hazard occurrence. The following methodologies were employed under this tool;

FGDs- this involved grouping the participants into smaller groups of male and female and given a task for them to complete and present.

Participatory mapping; this involved identification of livelihood resources within the ward, common hazards and areas where these hazards and risks frequently occurs. They then represented the identified hazards, areas and resources visually in a hazard-resource map' the same was done for stakeholder analysis.

Chapter 3 Participatory Climate Risk Assessment (PCRA) Findings

3.1.1 Community Resource-Hazard map

Following the environmental, ecological and social economic baseline information gathered through a questions and answer as guided by the facilitator, the community participants drew a map of the ward indicating the main administrative units, natural, social and critical resources in the ward. A representation of the community map drawn is as shown in the figure below.

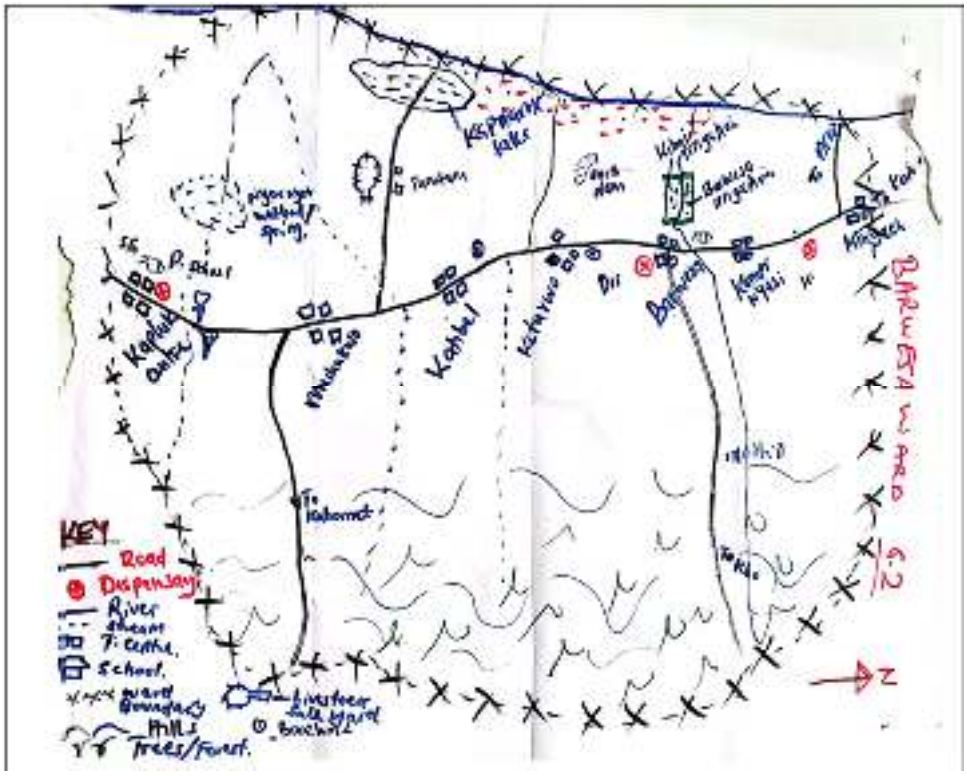

Figure 1: Community Resource Map of Barwessa Ward

Through brainstorming and probing from the facilitator the participants identified the common climate and non-climatic hazards in the ward. The hazards identified are: drought affecting the whole ward every part of the ward; landslides-occurs along the Ngarau hills; floods along the Kerio River; human and livestock diseases in the whole ward; land degradation (all ward); environmental degradation (hills); catchment degradation; insecurity along the borders; human-wildlife conflict; strong winds and bush fires.

3.1.2. Historical Trends about Climate and Non-Climate Hazards

Hazards identified were further categorized into climate and non- climate hazards.

Climate coursed hazards	**Non-climate coursed hazards**
Floods	Insecurity
Drought	Environmental degradation
Land slides	Bush fires
Human diseases	Catchment areas degradation
Livestock diseases	Human-wildlife conflicts
Strong winds	

Hazard Prioritization Using the Pairwise Method

Hazard prioritisation was carried out using the pairwise ranking. The results of the prioritisation is as shown in the table below.

Table 7: Hazard Prioritisation Results

Hazard	D	L	F	LD	HD	SW	I	ED	B	CD	HW	SCORE	RANKING
D		D	D	D	D	D	D	D	D	D	D	10	1
L			F	LD	HD	SW	I	ED	L	CD	HW	1	10
F				F	HD	SW	I	ED	F	CD	HW	3	8
LD					LD	LD	LD	ED	LD	LD	LD	6	5
HD						HD	HD	HD	HD	CD	HW	7	4
SW							I	ED	SW	CD	HW	3	8
I								ED	I	CD	HW	4	7
ED									ED	ED	ED	8	2
B										CD	HW	0	11
CD											CD	8	2
HW												5	6

KEY:

D	Drought
L	Landslide
F	Flood
LD	Livestock diseases
HD	Human Diseases
SW	Strong winds
I	Insecurity
ED	Environmental Degradation
B	Bushfire
CD	Crop diseases
HW	Human Wildlife conflict

The hazards identified were ranked as follows starting with one with most impact to the community to the one with less impact.

RANK	Hazard	RANK	Hazard
1	Drought	**7**	Human- wildlife conflicts
2	Environmental degradation	**8**	Insecurity
3	Catchment distraction	**9**	Floods
4	Human diseases	**10**	Landslides
5	Livestock diseases	**11**	Bushfires
6	Livestock diseases		

The first two hazards *drought and environmental degradation* were picked were for further analysis.

- Human diseases include- malaria, typhoid which occurs during onset of rains and when rains delays to come.
- In 1960- **Drought** that was called (kenyii po lamoo) meaning a year of wild-fruits. It was stated that the drought was so devastating that the community had to forage for wild fruits. It coursed a lot effects including, loss of livestock, loss of people lives, malnutrition, and spread of human and animal diseases and shortage of water.
- 1965-it was nicknamed Lomong…which coursed the same impacts like that of 1960.
- 1984- Was called Kaplel Kowo- which means white bones. It had the same impacts.
- Year 2000 and 2017 which largely contributed to insecurity issues which are experienced up to date along the borders which is considered as one of the hazards by the community.

  Environmental Degradation.

  It was stated that this hazard has been occurring over the years up to date and is because of anthropogenic activities. This has been coursed by increased in human population, overstocking of livestock and deforestation.

3.1.3 Wealth Ranking

PCRA stated that in their community in order to consider someone rich, one must be having a good number of livestock.

A criterion for consideration is therefore is;

i. Number of livestock owned.

Quantitave data was used to assess the number of livestock that a very rich person, rich person and poor person is estimated to own.

Livestock	Very rich	Medium rich	Poor
Cows	30-50	10-20	0-4
Goats	80-100	30-50	0-10
sheep	80-100	30-50	0-10

The PCRA team stated that during time of disasters all both rich and the poor are affected by the effect of the hazard, which could be drought. Bust affected are the poor people who own less property in terms of livestock, therefore considered vulnerable group

3.3. Hazard Identification, Prioritization, Characterization and Analysis

3.3.1 Hazard Identification and Prioritization (findings and photo)

Ranking/ prioritization

Hazards identified were ranked as follows starting with one with most impact to the community to the one with less impact.

1. Drought
2. Environmental degradation
3. Catchment distraction
4. Human diseases
5. Livestock diseases
6. Livestock diseases
7. Human- wildlife conflicts
8. Insecurity
9. Floods
10. Landslides
11. Bushfires

The first two hazards were prioritized to be analyzed

3.3.2 Hazard characterization and profiling analysis (finding and photos)

Hazard characterization using problem tree method

Hazard assessment characterization on Drought

Hazard	Courses	Impacts
Drought	Lack of rains	Lack of water Shortage of food High temperature Strong winds Movement/ displacement of people Shortage of pasture Human wildlife conflicts Loss of livestock

Hazard Assessment Characterization on Environmental Degradation

Hazard	Course	Impact
Environmental degradation	Overstocking Deforestation Heavy rains Strong winds	High temperatures Soil erosion Shortage of food Extinction of some wildlife species Lack of pasture Distraction of catchment areas Frequency of drought

		Environmental pollution

Hazard Assessment Characterization of Drought on Human Elements

characterization	**Description /element**	**Exposure variables**	
		How it will affect me	How it will affect the community
Course origin	Low rainfall during the rainy season	<5 years Malnutrition	Rise of insecurity and threats
force/ impact	Water shortage High temperature	5-18yrs Stunted growth Drop out of schools	Inflation of commodity prices
Warning signs	Drying of water sources Rising of temperature Abnormal coldness in the night	18-35yrs Migration Loss of property Family breakages	Frequency of disease outbreaks i.e. kwashiorkor and waterborne diseases
forewarning	Some plants shade their leaves Migration of some birds and wildlife	35-60yrs Conflicts and death	
Speed onset	Slow	Elderly Death Increase dependency ratio	
Frequency	Yearly	PWDs/special groups Rise in dependency ratio	
Period of occurrence	Fluctuating normally 1-7 yrs.		
duration	4-7 months		
Summery			

Hazard Assessment Characterization of Environmental Degradation on Human Elements

Characterization	**Description element**	**Exposure variable(how will affect me)**	**How it will affect the community**
Course origin	Tree cutting Overstocking Landslides	<5 years Sicknesses I.e flue Malnutrition	Migration of people and livestock

Direct impact/ force	Soil erosion Strong wind	6-18yrs Schools affected by floods due to rise in water levels	Low animal production Loss of livestock
Warning signs	Siltation in the rivers	18-35yrs Low crop yield Loss of livestock	Rise in water levels Low crop yields
Speed onset	Slow	35-60yrs Land wastage due soil erosion	Rise in human-wildlife conflicts Migration of wildlife and birds
Frequency	Often	Elderly Sicknesses Death Rise in dependency ratio	Food insecurity Loss of lives and rising cases of school dropouts due to hunger
Period of occurrence	Continuous	Special groups High dependency rate	Diseases outbreaks
duration	Infinity	-	-
summery			

Hazard Profiling Analysis

Hazard event	**Year of occurrence**	**impact**	**How did the people cope**
Drought	1960-(kenyi po lamoo) And 1965 (lomong)	Loss of livestock Migration/ displacement of people Shortage of water Malnutrition Increased mortality rates on humans	Migration in search of water and pasture Cutting of leafy branches and leaves used as animals feeds Traditional herbs and wild fruits Digging of local water springs
	1984(kaplel kowo) and the year 2000	Similar impacts	Governmental and non - governmental relief food Medications distribution by the government
	2017	Increased insecurity rates along the borders	Planting of pastures Construction of water pans Drilling of boreholes

			Introduction of drought resistant crops
Environmental degradation	Rainy season	Soil erosion' Land slides Flooding Human diseases Livestock diseases	Construction of gabions Cover crops Introduction of vaccines
	Dry season	Wild fires Deforestation Strong winds Loss of livestock Water shortage	Eradication of charcoal burning Establishment of hay shades Planting of trees Reduction of livestock Construction of water pans

3.3.3. Seasonal calendar-seasons and trends of community activities (findings and photos)

Seasonal calendar for Barwessa ward

months	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Rainy seasons												
Dry seasons												
Land preparation												
planting												
weeding												
harvesting												
Caving												
Kidding												
Livestock diseases												
Human diseases												
Floods												
droughts												

3.4 VULNARABILITY ASSESSMENT

3.4.1 Vulnerability Assessment on Non- Human Elements

The non- human elements comprises of the physical infrastructure (human made) and natural resources. A scale of 0-3 was used to achieve the vulnerability of the respective physical and natural structures and resources to the hazards prioritized.

i. 3-very high
ii. 2-high
iii. 1-medium

iv. 0- no impact

Physical structure	Drought	Environmental degradation	Score
Boreholes	3	2	5
Pan dams	3	2	5
Seasonal rivers	3	3	6
Springs	3	3	6
Cattle dips	2	1	3
Schools	2	3	5
Churches	2	3	5
health facilities	3	3	6
Grazing lands	3	2	5
Farm lands	3	2	5
National game reserve	3	3	6
Markets	2	1	3
Roads	1	2	3
Administrative offices	3	3	6
Lakes	3	3	6
Solar energy sources	0	3	3
Electricity	0	0	0
Hills	1	3	4
TOTAL SCORES	40/18= 2.22	42/18= 2.33	82/18= 4.56

Summary of the Analysis

From the above analysis it is clear that the two prioritized hazards have high impacts on the physical resources, however, in general the prioritized hazards have a very high impacts on the physical resources according to the average score.

3.4.2 Vulnerability Assessment on Human Elements

Elements at risk	Drought	Environmental degradation	SCORE
<5yrs	3	3	6
5-18yrs boys	2	3	5
5-18yrs girls	3	3	6
18-35yrs boys	2	2	4
18-35yrs girls	3	2	5
35-60yrs men	3	3	6
35-60yrs women	3	3	6
Special conditions(pregnant and lactating mothers)	3	3	6
Minority and disadvantaged groups	3	3	6
PLWDs	3	3	6
Elderly	3	3	6
TOTAL SCORE	31/11= 2.81	31/11= 2.81	62/11= 5.64

Analysis:

i. Very high-3
ii. High-2
iii. Medium-1
iv. No impact-0

Summary of the analysis

According to the analyzed data, the two hazards have a high impacts on different age groups and generally have a very high impacts on them all according to the average score

3.5 CAPACITY ASSESSMENT ON HUMAN ELEMENTS

The assessment started with first looking at the means of livelihoods in the ward. The following are the main sources of livelihoods in the ward;

I. Livestock keeping-cattle, poultry (cows, goats and sheep), bee keeping,

II. Crop farming- which is done in schemes and private lands. Crops include; maize, horticulture, bananas, mangoes, green grams and cow peas

III. Cash crop farming- cotton

3.5.1 Capacity assessment on Non- Human Elements

Capacity Assessment on Drought

Impact							
Direct impact	**Local responses**	**Effectiv-eness**	**Sustain a-bility**	**Indirect impact**	**Local responses**	**Effecti e-ness**	**Sustain-ability**
Drying up of water sources	• Buying of water • Digging of shallow wells	1	0	• Human and livestock diseases • Food insecurity • Loss of livestock	• Planting of pasture	2	3
					• Boiling of water • Planting of cover	2	1
					• crops and drought resistant crops	2	3
Reduction in crop yield	• Buying alternati	1	0	• Malnutrition • Domestic violence	• Governme ntal interventi	1	0

	ve food staffs			• Loss of lives	ons i.e. relief food		
				insecurity	• Gathering of wild fruits and honey	1	0
					• Irrigation	2	1
					• Planting of drought resistant crops	2	3
High temperatures	• Building of cool shades using locally available materials	2	1	Skin diseases i.e. skin cancer	• Seeking medical attention	1	1
				Dehydration	• Drinking a lot of water	1	1
Shortage of water	• Water pans	2	1	Loss of livestock Loss human wildlife conflicts	• Off take programs	1	0
	• Boreholes	2	1		• Selling of livestock	1	0
					• Migration /movement	1	0
					• Compensation by the KWS	1	0
					• Assigning of rangers and guards	1	1
	• Purchasing of water	2	1				
Increased dust generation	• Tree planting	2	3	Respiratory diseases	• Seeking medications	2	1
	• Community sensitization on conservation	2	3				

Capacity Assessment on Environmental Degradation

Impact

Direct impact	Local responses	Effecti-veness	Sustaina-bility	SCORE	Indirect impact	Local Reponses	Effecti v-eness	Sustain a-bility	SCORES
Soil erosion and gulley development	Planting of cover crops and trees	3	2	5	Reduction in farm yield	Purchase of food products	2	1	3
						Adjusting to lower consumption rates	3	3	6
	Building of local gabions	2	1	3					
	Digging of contours	1	1	2					
Strong winds	Planting of trees	3	3	6	Lack of pasture	Buying of pasture	2	1	3
	Purchase of pasture	2	1	3		Cutting off tree branches	2	2	4
	Cutting tree branches for fodder	2	2	4		Migration to greener areas	1	1	2
						Reduction in livestock selling	1	1	2
	Increase in imports of local products	1	1	2					
High temperature	Building of shades	1	1	2	Outbreak of diseases	Vaccination and treatment for both human and livestock Creation of quarantine areas Selling of emaciated livestock	3 1	2 1	5 2

							at lower prices			
							Off take programs and government restocking	1	1	2
	TOTAL SCORES	15/8=1.88	13/8=1.62	27/8=3.38				17/9=1.89	13/9=1.44	29/9=3.22

Summary of the analysis

1. **Direct impacts-** the effectiveness and sustainability of the local responses on the direct impacts of the hazards is at a medium level and at an average score, the effectiveness and sustainability of the local responses toward the direct impacts to the community is very high
2. **Indirect impacts-** from the above analysis, the effectiveness and sustainability of the local Reponses towards the direct impacts of the hazards are at an average level while generally the effectiveness and sustainability of the local responses towards the indirect impacts is at a very high capacity.

3.5.2 Capacity Assessment on Human Elements

Capacity Assessment of Drought on Human Elements

Element at risk	**Time element**	**Capacities**		
		Existing	**Required**	**Gap**
<5 yrs	before	• Good Healthy Enough food • Parental care	• Good child monitoring • Training of the care givers	Training facilities Fund

		• Health facilities • School feeding programs	• Restocking of health centers • Training on balanced diet	
	During	• Malnutrition • Less parental care • Increase in child diseases • Using of the preserved food	• Distribution of food supplements • Enhancing of school feeding programs	Funds
5-18yrs boys	before	• School going • Good health school feeding programs • Parental care	• Enhanced school feeding programs • Vaccinations • Training of the care givers	Funds Training facilities
5-18yrs boys	during	• Use of preserved food • Water tracking • School going • School feeding programs	• Enhance school feeding programs • Increase water bowser for water tracking • Movement to greener area for pasture	Funds Donors – scholarships and relief food
5-18yrs girls	before	• School going • Good health • Enough food • School feeding programs • Parental care	• Enhanced school feeding programs • Vaccination • Training of the care givers • Dignity kits	Fund Donors Training facilities
5-18yrs girls	during	• Using preserved foods	• Restocking of the health centers	Funds Donors and partners

		• Water tracking • School feeding programs • Use of borehole water	• Increase distribution of the dignity kits • Increase of water bowsers • Drilling of more boreholes	
18-35yrs boys	before	• School going • Herding • Trading • Property ownership • Decision makers • Food preservation	• Training on financial literacy • Training on food preservation skills • Market provision	Funds
18-35yrs boys	during	• Selling of livestock • Use of preserved food • Water tracking • Herding far • Purchase of pasture • schooling	• Off take programs • Inverse in water tracking • Market provision • Distribution of hay • Training on food preservation techniques • Increase distribution of the relief food	Fund Donors/partners
18-35yrs girls	before	• Schooling • Preservation of food • Care care/ full parental care	• Training on parental care • Establishment and restocking of more health centers	Funds Donors and partners
18-35yrs girls	during	• Foraging far distance for water	• Increase of the water bowsers	Fund Donors/patners

		• Using of the preserved food • Relief food	• Scholarships • Increase amount of relief food • Training on food preservation techniques	
35-60yrs men	before	• Livestock owners • Trading • Food preservation	• Market provision • Training on financial literacy • Training on food restocking and preservation techniques	Funds Stakeholders'/donors and partners support
35-60yrs men	During	• Using preserved food • Migration in search of pasture and water • Water tracking	• Off-take programs • Market provision • Increase water tracking • Distribution of the water storage facilities • hay shades	Funds Donors and partners support
35-60yrs women	Before	• Trading • Decision makers • Property ownership	• Training financial literacy • Capacity building • Training on food preservation and restocking • Training facilitators	Funds
35-60yrs women	During	• Trekking far distance looking for water • Trading	• Training on alternative sources of livelihood • Distribution of drought	Fund Donors/partners for resource mobilization

			resilience seed crop and grass	
Elderly/ marginalized and PLWDs	before	• Enough food • Close family care • Cash transfers • Relief food	• Enhanced relief food programs	Funds
	During	• Neglect • Diseases • Death • water tracking	• Increase water bowser • Enhanced relief food distribution • Development of support programs for them	Funds

Capacity Assessment of Environmental Degradation on Human Elements.

Element at risk	**Time element**	**Capacity**		
		Existing	**Required**	**Gap**
<5yrs	Before	• Healthy • Enough food • Parental care • Health facilities	• Training of the care givers • Restocking of the health centers	• Funds • Training facilities
	During	• Minimal parental care • Breakout of diseases • Vaccination • Relief food • Food supplements	• Increases supply of food • supplements • Restocking of the health centers • Training care givers	•
5-18yrs boys	Before	• Schooling • School feeding program	• Enhanced school feeding program • Scholarships	• Funds • Donors/ partnership
5-18yrs boys	During	• Schooling • Herding	• Enhanced school	• Funds • Donors/partnership • More schools

		• School feeding program • Water tracking	feeding program • Water tracking	
5-18girls	Before	• Schooling • Dignity kits • Relief food • Food supplements • Use of borehole water	• Increase water bowsers • Increase supply of dignity kits • Instalments of solar panels in the boreholes	• funds
5-18girls	During	• Water tracking • Relief food • School feeding program • Trekking long distance for water • Using preserved food	• Increase water bowsers • Training on food preservation techniques	• funds
18-35yrs boys	Before	• School going • School feeding program • Herding • Trading • Business owners	•	• Health centers • Funds • Donors/ partners
18-35yrs boys	During	• Using relief food • Use preserved • Movement to greener area • School dropout	• Scholarships • Increase school feeding programs • Enhance supply of relief food • Off-take programs	• Funds • Donors/partners • Health centres
18-35girls	Before	• School going • Enough food • Water tracking • Trading	• Enhanced school feeding program • Increase water bowsers	• Fund • Restocking of health centers
18-35girls	During	• Water tracking • School drop out • Tracking far for water	• Increase water bowser • Providence of medicines	• Training and counseling centers • Fund • Donors/partners

		• Family breakages and domestic violence	• Enhanced security against violence	
35-60yrs men	Before	• Decision makers • Trading livestock business owners food preservation • Cash flows • Crop farming	• Market provision • Training on food preservation measures • Training on financial literacy • Supply with drought resilience crops and livestocks	• Funds • Training centers
35-60yrs men	During	• Movement to greener area • Low livestock income • Family conflicts • Cash flows • Relief food	• Enhanced relief food and cash flow supply • Increase water bowsers	• Funds • Donors/partners
35-60women	Before	• Parenting • Livestock trading • Cash flows • Farming • Income generation • Crop farming	• Livestock market provision • Provision of hay store and supply of hay • Supplying of livestock them by government or NGOs • Training on property and financial management	• Funds • Capacity building • Training centers
35-60women	During	• No market/trading • Cash flows • Walking long distance to look for water • Use of borehole water	• Off-take programs • Increase water bowser • Supply with drought resilience	• Funds • Donors/ partners

		• Using preserved food • Crop farming	crops and livestock	
PLWDs, elderly ,marginalized groups	Before	• • Cash flows • Close family care	• Increase cash flows	Funds
	During	• High dependency rate • Neglect • Death	• Governmental support • Relief food • Water tracking	fund

3.6 STAKEHOLDER ANALYSIS (findings and photos)

PCRA team cited a number of stakeholders together with their works or activities in the area. They rated their relationship with the existing stakeholders in terms of -the stakeholder impact- fullness in the community. A scale of 0-2 was used for rating.

- 1-very high
- 2-high
- 0- no impact

Stakeholder	Relationship	Activity
World vision	1	• Sponsorship • WASH programs • Capacity building
FAO	2	• Off-take programs • Soil analysis • Supply of the animal feeds
Red cross	2	• Disaster aid and response
Self-help Africa	2	• Capacity building • Fruit tree seedling distribution
Horn of Africa	1	• Establishment of the market structures i.e. hay shades • Drilling of dams, boreholes, water pans • Seeds distribution

NCCK	1	• peace champions • smart agriculture • capacity building • seed distribution
BCG	1	• Capacity building and awareness • Smart climate
WFP	2	• Relief food and cash transfers
Local administration	1	• Security
community	1	

CHAPTER FOUR

4.0 Ward Climate Action Planning Process

4.1Adaptation strategies (including hazard, impact, goals-short term and long term), objectives, strategies

Adaptation Strategy for Drought

Hazard	Impacts	Adaptation strategy	Adaptation goal	
			Short term goals	Long term goals
Drought	• Causes livestock diseases • Increase poverty • Human wildlife conflicts • Increases malnutrition cases and diseases in children • Low purchasing power of the community • Water shortage and pressure on the existing water sources • Deforestation	• Afforestation • Drilling and equipping boreholes • Construction of dams • Introduction of the drought resistant crops • Water tracking • Introduction of food supplements • Construction of cattle dips • Fencing of the game reserves • Introduction of the vaccines for livestock and human • Establishing of the community tree nursery • Use of ITK and scientific information in climate warning systems •	• Increase water storage capacities • Reduce the impacts of the livestock diseases • Reduce malnutrition • Reduce human-wildlife conflicts • Make water available for domestic and livestock use • Enhance early warning system	• Provide reliable and sustainable water sources • Increase livestock and agriculture production • integrating traditional indigenous and scientific knowledge • Climate change information management

Adaptation Strategies for Environmental Degradation

Hazard	Impact/effect	Adaptation strategy	Adaptation goal	
			Short term	Long term

Environmental degradation	• Deep gullies and vegetation distraction • Migration of people and livestock for pastures and land cultivation • Roads are washed away during heavy rains • Strong wind frequency that's destroys buildings • Drying up of water sources • Human wildlife conflicts and migration of wildlife • Decrease in agricultural produce • Reduce in house hold income	• Construction of gabions • Livestock restocking • Planting of trees • Planting of climate resilience crops • Fencing of the water catchment areas • Fencing of the national reserves • Development of the policies that govern environment and vegetation • Distillation of the existing water pans and dams	• Land reclamation • Human and animal safety • Conservation of animal and plant species • Stable income • Access to clean water • Provide water for livestock and wildlife • Strengthen building structures • Sensitization of the building alignment to wind • Construction of the structures to reduce water flow to steep areas	• Reclamation and rehabilitation of degraded areas • Sustainable good production • Establishment of the protected areas for livestock • …… • Reduce human wildlife conflicts • Conservation and protection of the water catchment areas

1.1.1 Co-benefits of Adaptation Strategies

1.1.2 Ward Level Priorities

PCRA participants prioritized two hazards through the guidance of the technical team using pairwise method. Along with their prioritized hazards they also gave mitigations measures according to the impacts/ effects of the hazards basing on long term and short term and their effectiveness and sustainability.

Hazard	Impacts	Prioritized mitigation strategies
Drought	• Shortage of water • Food insecurity • Loss of livestock • Human and livestock diseases • Malnutrition • Environmental degradation • Shortage of pasture	• Construction of water pans, dams and drilling and equipping of boreholes • Adopting to drought resistant crops, grass seeds and livestock • Need for livelihood diversification i.e. ecotourism, macro and micro businesses
Environmental degradation	• Food insecurity • Water scarcity	• Building of gabions • Tree planting

	• Flooding • Land slides • Loss of livestock • Livestock and human diseases	• Need for livelihood diversification • Construction of water pans and dams as well as drilling and equipping of boreholes

1.1.3 Ward Climate Action Planning

Ward Climate Action Plan for Environmental Degradation

Goal	**Strategy**	**Activities**	**Target**		**Target cost**
			Location	**population**	
• Land reclamation and rehabilitation	• Soil erosion control measures • Proper drainage	• Building of gabions planting of trees • Grading and land lavelization • Construction of culverts • Construction of water pans	Kabutei Lawam Kabosgei kerio	800 house hold 1500 houses	22m 30m 25m
• Protection of water catchment areas	• Prevent access to catchment areas by livestock • Improve water ways/frontages	• Fencing water catchment areas • Planting of trees and grass • Piping of water from catchment to settlement areas • Disiltation of existing water pans, lakes and dams	Kabutei Kabosgei kerio Lawan	1600 house hold 1800house holds 3000 house holds	25m 30m 25m
• Adequet food production and pasture	• Increase agricultural production and livestock	• Planting of drought resistant crops	Kabutei Lawan Kabosgei kerio	1600 H.H 3000 H.H 1800 H.H	25M 30M 25M

		• Adopting to drought resilience livestock i.e. gala goats, saiwal and borana cows, toba sheep			
• Human-wildlife resolutions	• Prevent human-wildlife conflicts	• Fencing of the national reserve • Compensation of the affected people by wildlife	Kabutei Lawan Kabosgei kerio	800 H.H 1500 H.H 900 H.H	30M 30M 30M
• Reduced temperatures and strong winds	• Conserving vegetation	• Planting trees and grass planting tree fruits	Ward wide	3500 H.H	30M

Climate Change Action Plan for Drought

Goal	Strategy	Activities	Target		Target cost
			location	Population	
• Provide reliable sustainable sources of clean and safe water for domestic and agricultural use	• Increase water storage capacities	• Disilting and expansion of existing dams	Lawan Kabosgei Kabutie	1200H.H 8300 H.H 9700 H.H	15 m 20 m 15 m
	• Protection and management of catchment areas	• Planting of tree • Fencing of catchment area • Piping from catchment to settlement area	Lawan Kabosgei kabutie	1200 H.H 8300 H.H 9700 H.H	50 m 40 m 35 m
•	• Drilling, equipping	• Repairing and	Lawan Kabosgei	1200 H.H 8300 H.H	22 M

	and rehabilitation of the existing boreholes	equipping boreholes with solar panels • Drilling new boreholes	Kabutie	9700 H.H	25 M 25 M
• Increase of livestock and agricultural produce	• Upgrading of the livestock breeds i.e. saiwal and borana cows, galla goats	• Purchase and distribution of the quality breed of livestock	Ward wide	35000 H.H	60 m
	• Pasture development	• Provision of drought resilience pasture seeds and storage facilities • Harvesting machines	Kabutie Lawan Kabosgei location	30000 H.H	75 M
	• Water efficient irrigation	• Construction of dams to increase storage capacity • Piping extension	Kabosgei(kuikui,margut and chepkogel river) Lawan(enot,bolagich and kapchore) Kabutuie(ketiborok, chebusan, chepkoria and kabolony)	10,000H.H 15000 H.H 10000 H.H	90 m 80 m 80 m
•	• Introduction of drought resistant crops	• Use of the quality certified seeds	Kabutie Lawan kabosgei	35000 H.H	30 M
• Climate change information	• Enhance early warning systems	• Use of ITK and scientific	Ward wide	35000 H.H	15 M

management		• information • Integrating of ITK and scientific information in early warning systems • Documenting of the ITK practices			
• Livelihood diversified	• Promotion of the ecotourism	• Establishing of the Eco lodges • Eco camps • Biking • Hills and rock climbing	Ward wide	35000 H.H	45 M

ANNEX

Annex 1PCRA Participant List

NO.	Name	ID NO.	Sub-location	Phone NO.	Gender		Age		Sign
					F	M	<35yrs	>35yrs	
1	Felix k cherutoi	21048908	Ayatia	0723234933		✓		✓	
2	Ben serem	27756103	Katibel	0723932723		✓	✓		
3	Anita kandagor	32410130	Barwessa	0727978225	✓		✓		
4	Vincent cheplogoi	27689651	Konoo	07116859992		✓	✓		
5	Justine tallam	29171067	Maregut	071489807		✓	✓		

6	Geoffrey chaptarus	22471660	Ayatia	0729637063		✓		✓	
7	Daniel katamu	4542320	muchukwo	0707969727		✓		✓	
8	Cynthia kaptum	35991800	maregut	0741750806	✓	✓			
9	Eric cherutich	25925344	Barwessa	0712551185		✓	✓		
10	Symon yego	27381617	Maregut	072993860		✓		✓	
11	Cynthia jeptoo	378225788	konoo	0702399555	✓	✓			
12	Kabutie micah	26243647	Keturwo	0727825593		✓		✓	
13	Bevington kosgei	34949557	kuikui	0705299469		✓	✓		
14	Cornelius bowen	35534889	Kuikui	0791346883		✓	✓		
15	Joseph kandie	20913558	keturwo	0720324437		✓		✓	
16	Festus mutai	30310387	Keturwo	072296190		✓	✓		
17	Kilimo kandie	33650414	kuikui	0717289727		✓		✓	
18	Lucilla kandie	28401004	kapluk	0707969201	✓		✓		
19	Marion charutoi	3351728	keturwo	0798358898	✓		✓		
20	Dr Benjamin kipkulei	0339808	katibel	0723526650		✓		✓	

Annex 2 Ward Climate Change Planning Committee

Name	**Position**	**Location**	**Phone NO.**	**Sign**
Lucilla kandie	CBO representative	Kabutie	0707969201	
Festus mutai	Youth representative	Lawan	0722961915	
Anita kandagor	Women representative	Lawan	0727978225	
Geoffrey cheptarus	Representing marginalized groups	kabosgei	072963637063	
Dr Benjamin kipkulei	Male leader	Katibel	0723526650	
Vincent cheplogoi	Representing religion	lawan	0711685992	
Daniel kankwony	PLWDs representative	kabosgei	0702101297	