

PARTICIPATORY CLIMATE RISK ASSESMENT REPORT



**KABARTONJO WARD
BARINGO NORTH SUB COUNTY
BARINGO COUNTY**

APRIL 2023

CHAPTER ONE
INTRODUCTION

1.1 Background Information

Kabartonjo Ward is located in Baringo North Sub-country in Baringo county. the ward has 3 Locations (katorin, Kelyo and Ossen) and 10 sub-locations (Lelian, Sumeiyon, Kapkirwok, Kasaka, Kapkiamo, Mosop, Kaptum, Tiriondonin, Kaimugul and Tiloi). The ward borders Saimo Kipsaramam ward to the North and East, Kabarnet to the South, to the South East Ewalel and Barwessa ward to the West and North West.

Location	Total population	Male population	Female population	households	Population density	Area in Sq. Km
KABARTONJO WARD	19804	9994	9809	4489	167.9	183
KAPKIRWOK	921	484	437	216	19.4	47
LELIAN	1,014	515	499	226	11.2	90
SUMEIYON	1,028	521	506	208	5.6	184
KAPKIAMO	1,979	996	983	446	14.9	133
KASAKA	1,251	621	630	260	14.6	86
MOSOP	2,722	1,387	1,335	727	6.9	393
KAIMOGUL	2,245	1,119	1,126	476	13.8	163
KAPTUM	3,702	1,839	1,863	795	13.4	277
TILOI	833	450	383	169	10.4	80
TIRIONDONIN	4,109	2,062	2,047	966	21.9	187

Table 1.1. demography of KabartonjoWard, ward size and administrative units

constituency	Total population	Headcount index: % of individuals below poverty line	Poverty gap as % of poverty line	Severity of poverty as % of poverty line	Contribution to national poverty %	Constituency ranking by contribution to national poverty
Tiaty	165,084	72.9	16	4.4	0.566	30
Baringo North	112,897	59.5	14.4	4.5	0.326	136
Baringo Central	104,371	47	10.4	3.2	0.217	224
Baringo South	97,916	51.7	11.5	3.5	0.244	206
Eldama Ravine	139,449	29	5	1.3	0.178	222

Table 1.2 poverty index per constituency (KNBS)

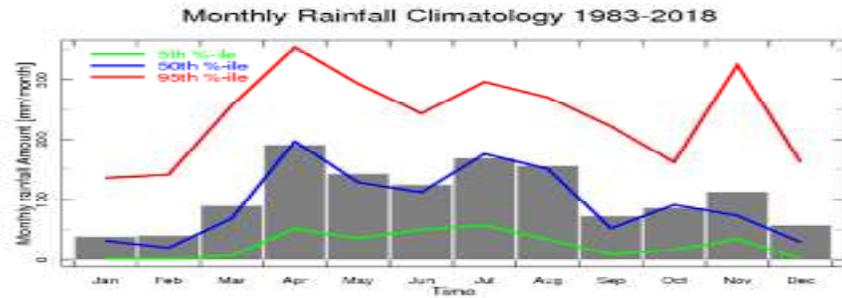
1.2 Agro ecological zones and Livelihood (characteristics of the livelihoods)- climate information, soils,

The major source of livelihood in Kabartonjo ward is small scale mixed farming crop farming is

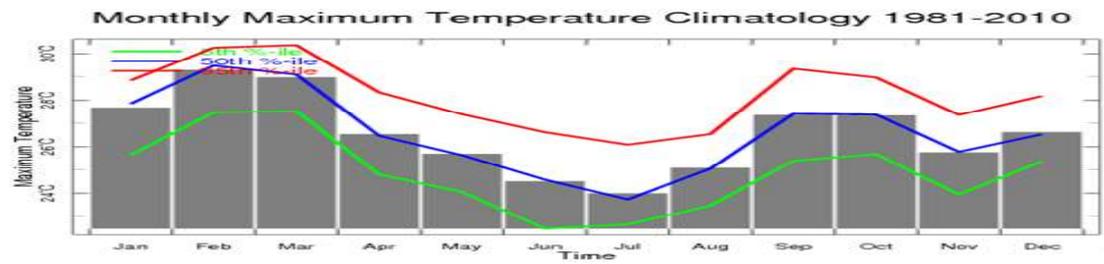
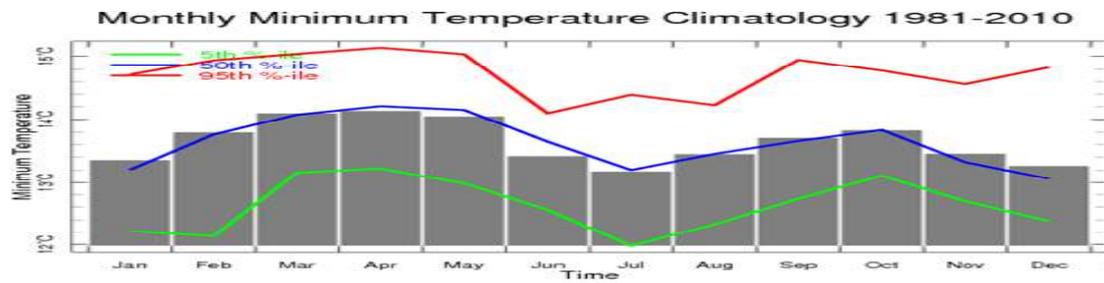
the main economic activity where maize, beans, horticultural crops, sorghum, millet and pastures are grown under rain fed agriculture. livestock kept include cattle (both improved breeds on the highland areas under zero grazing and indigenous cattle along the lowlands bordering Barwessa ward), shoats (indigenous and improved), donkeys and poultry (improved kienyeji and indigenous).

Soils: soils in the area are well-drained and varies from place to place. These soils have high water retention can therefore support crop production under rain fed agriculture. Additionally, these soils rare fertile.

Kabartonjo Ward Climatology



Position of Kabartonjo Ward in Baringo County



Rainfall

Month	January	February	March	April	May	June	July	August	September	October	November	December
Rainfall(mm)	40	40	80	200	150	130	180	170	70	90	130	60

Average monthly rainfall(mm)

Major Rainfall seasons

MAM (430), JJA (480), OND (280)

1.3 Natural resources (Rivers, Hills, Conservancies etc)-(tabulated)

Natural resource	Existing resource	Location
Rivers/streams	Takuryan, tebengwo, mintinai, mbininyiny, torkopus, embaraa	katorin
	Simet, churelwa, koitos, lomet, oinomotio, kasaka,kaporoso, trilechun, barmugon, nyoker, tepsarache, kapkai	Kelyo
	kilingot, kirisoi,emboter, sigerger, nyogek emno, naikoi perekei	Ossen
Hills	Kabarmoi,	kelyo
	Noregoi	ossen
	Koitallam, sagai, keneshon	katorin
forests	Katimok	The whole ward

Table 1.3 natural resource distribution for Kabartonjo ward

1.4 Critical facilities (Health facilities, markets, livestock facilities (Dips, markets, crushes) (Tabulated)

Critical facility	Existing facility	Location	Status
Health facilities	Seremwo dispensary (not operational), sumeyion dispensary	katorin	Nyaunyau non-operational.
	Tiloi, ngeiwan dispensaries, kaimugul, kaptum H/C, Kaptumin, root, tiriondonin, Kabartonjo Sub County Hospital, Norego dispensary (not operational)	Ossen	Operational
Markets/shopping	Kabartonjo, Burkupu, Kipsaraman,	Kabartonjo	Operational

centres	Barwessa and Kabarnet markets serves the whole ward	and Burkupu markets within the ward	
	Sumeiyon, tiloi, kapkirwok, ossen, koimogul, lelian, kapkiamo, kilingot, kasakabosei, ngeiwan, seremwo, tiriondonin, kaptum, tiloi, kabarbet shopping centres	Kabartonjo ward	
Livestock facilities	Sumeyon cattle dip kapkirwook	Katorin	Operational
	Tiloi, tiriondonin, kalel, sumot, koimugul, kilingot, kapkoron	ossen	Operational
	Kiprel, chobogen, kalawan and kasaka	Kelyo	None-operational
Strategic water points	Dam (kapkai) Water pipelines	Ossen- piped to kilingot high school Sigerger- kasiryo- kaptumwater line	
	Boreholes kapkiamo B.H, KIPKOKON,	Kelyo	
	Tiriondonin, kalel, Kabartonjo hospital borehole	ossen	

Table 1.3 critical facilities distribution in Kabartonjo Ward

1.5 Social facilities e.g social halls, churches, stadium, cultural areas, etc.

Social facility	Existing Facility	Location
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Churches	A.IC, CATHOLIC, FGCK, SDA, Kingdom Aflame, end time, worldwide, living water, kings outreach	The whole ward
schools	Primary schools- Kasaka, mormoryo, korosejun, root, Kaptumin, kapkwang, Kapkiamo, Bosei, kings hill academy Secondary schools- Kapkiamo, Bosei, kapkwang ECDE- Kasaka, mormoryo, korosejun, root, Kaptumin, kapkwang, Kapkiamo, Bosei, Kaporo, Kipkokom, Kaptulo, Kingshill academy	Kelyo
	Primary schools- tiloi, Ngeino, noregoi, sak, tiriondonin, kalel, bartogon, moi kbo, star mark, kaptum, ossen, kilingot, koimugul sogom, termet Secondary schools-ossen girls, kilingot secondary, moi high school kabartonjo, tiriondonin, moi kabartonjo day school, koimugul, ECDE- All primary school have ECDEs	ossen
	Primary schools- kapkirwok, seremwo, sumeyon primary and ECDEs Secondary schools- kapkirkwok	Katorin
	Vocational training centres- lelian dicece, rapasin youth polytechnic	Katorin and kelyo respectively
Social halls	Yputh empowerment hall	Kelyo

Table 1.4 social facilities distribution in Kabartonjo ward

1.6 Telecommunication and road network

Road networks	Telecommunication	Electricity powerlines
Pemwai-kapkirwok	Safaricom and at Telcom boosters Ossen	Katorin Location- Pemwai-kapkirwok powerline Kapkokwon-seremo Kabarnet kabartonjo
Kabarnet kabartonjo-kipsaraman road	airtell boosters-Kelyo	Ossen Location- barwessa –kabartonjo

		Kabartonjo tiriondonin Kabartonjo-kilingot Kabartonjo koimugul
Ossen-keturwo		Kapkiamo location- kabartonjo-kapkiamo Kabartonjo town connection Kabartonjo-kapkiamo- kasaka powerline
Tiriondonin-Kipkokon-kapkiamo-kasaka- barwessa road		
Koimugul-Kaptum-Tiloi Road		
K.B.O-Kapkiamo-Barwessa		

Table 1.5 telecommunication and road network distribution in kabartonjoward

2.0 TARGETING, OBJECTIVES AND METHODOLOGIES

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

3.0 PCRA FINDINGS

3.1 Environmental & Socio-Economic Baseline Information

3.1.1 Community Resource-Hazard map

The participants were tasked to come up with a Resource-Hazard map of their ward. The aim of this exercise was get knowledge on resource endowment of Kabartonjo Ward and areas of frequently occurring hazards. This also enabled the participants and the facilitators understand the impacts of these hazards on the livelihood resources in the hazard prone areas and understand the relationship between livelihood resource availability and hazard occurrence. From their presentations and discussions, it came out clearly that some hazards occur all over the ward such as livestock diseases and crop pest and diseases. Both men and women, the old, the young, PLWD & PLW are all affected however PLWDs, children under the age of 5 years, the elderly and persons with special conditions such as pregnant and lactating women are the most vulnerable to these hazards. Among the Hazards identified included; Rock falls, landslides, flash floods, natural fires, locust invasion, human wild life conflicts, livestock diseases, human diseases



3.1.2 Historical Trends about Climate & Non- Climate Hazards

Both climate and non- climate hazards were reported to affecting the people of Kabartonjo ward and their livelihood resources. In the recent past with the onset of climate change, hazard occurrence has been recurrent and frequency has risen. The magnitude and intensity of these hazards is high and affects larger areas than in the past.

Hazard profiling

Hazard event	when	impacts	How did they cope
Human disease	Yellow fever (1993-1997) Chicken pox (1992-	Deaths, low productivity Stigmatization	Mass vaccination, treatment, isolation, awareness creation

	date) Mumps (recurrent) Hiv/aids (1984-date) T.B (1968) Covid 19 2020- date	Spread of diseases Low immunity to other diseases Increased costs of living Increased infant mortalities	Voluntary counselling, provision of PPEs and Contraceptives including Condoms Working from home Immunization
Livestock diseases	ECF Crecurrent) FMD (recurrent) Anthrax (recurrent) Coccidiosis(recurrent) Newcastle (recurrent) Lumpy skin disease (recurrent)	Low livestock production, poor animal health, livestock sickness Zoonotic diseases Emaciation of animals	Use of locally available treatments e.g aloe verra and Busaa (local brews) for FMD, mass vaccination, treatment, destocking deworming Migration
Crop pests and diseases	Aphids Fall army warms Locust invasion 2020-2021 Maize rust Coffer berry berry Gnawing animals (rodents)- all these crop pests and diseases are recurrent	Crop damage, crop failure Low crop yields Increased costs of production	Use of recommended farm chemicals Proper farm management Use of traps for gnawing animals Proper timing Crop rotation Spraying Proper storage and handling

3.2 Wealth Ranking

Wealth ranking is attributed to:

- House structures and assets (types)
- Size of land
- Business premises and activities
- Properties owned (plots, vehicles)
- Type of Livestock owned

Very rich	Rich	Poor
Cattle (zero grazing-7 and 50 indigenous)	Cows- 20	Cows- 2
Goats- 100 and above	Goats 70	Goats- < 10
Permanent housing structures	Semi-permanent	Temporary structures(made

(iron sheet roofed, stone walled, cemented floors)	structures(iron sheet roofed, mud-walled/iron sheet walled)	of twigs and grass thatched houses
15 acres	3 acres	1 acre
Owens plots, vehicles, businesses	none	None
Employed permanently	On contract basis	Casual labour
grows coffee, large scale maize production	Small scale crop farming	Less than 1 acre of indigenous crop growing

Table 3.1 wealth ranking in Kabartonjo ward

3.3 Hazard Identification, Prioritization, Characterization and Analysis

3.3.1 Hazard identification & prioritization

During the PCRA data collection process, the participants identified a number of hazards. The hazards identified were: landslides, livestock diseases, bush fires, human wildlife conflicts, human diseases, invasive species (*locust*), soil erosion, crop pests and diseases and flash floods. With guidance of the facilitator, the participants were able to compare two hazards at a time and ranked them based on their perceived severity, frequency of occurrence, and potential impact on the community. This pairwise ranking process was repeated several times with different pairs of hazards until a consensus was reached. It was found that crop pests and diseases is the number one impacting hazard, livestock disease came the second while Human diseases came the third in their hazard prioritization list. Prioritization was based on the frequency of occurrence and the magnitude of the hazard's impacts on livelihood resources. All participants present derived their livelihoods from livestock and thus more vulnerable to the impacts of drought and livestock disease.

Issue I.D	CPD	L.D	HD	BF	F	S.E	RF	LS	IS	HWC	Score	rank
Crop pests and diseases		CPD	CPD	CPD	CPD	CPDD	CPD	CPD	CPD	CPD	9	1
Livestock disease			L.D	LD	L.D	L.D	L.D	LD	L.D	L.D	8	2
Human diseases				HD	HD	HD	H.D	HD	HD	HD	7	3
Bush fires					F	BF	RF	LS	BF	HWC	2	7
Flash Floods						F	F	F	F	F	6	4
Soil erosion							SE	SE	S.E	S.E	4	3

Rock falls								LS	RF	HWC	1	10
Land slides									LS	HWC	2	7
Invasive species										HWC	0	10
Human wildlife conflicts											5	3

3.3.2 Hazard characterization and Profiling analysis

This was done to further understand on the nature of a hazard. Problem tree/source force tree was used to map out the causes and effects of the prioritized hazards (Crop pests and diseases and livestock diseases). The structure of the problem tree as used is:

- I. **roots-** are the causes of the hazard
- II. **stem/trunk-** represents the hazard
- III. **leaves and the fruits-** are the consequences and effects of the hazard

The prioritized hazards were characterized using **the problem tree and** the following were the results

Courses of crop pests and diseases

- poor farming practices
- use of uncertified and substandard seeds
- pathogens (bacteria, fungi, virus)
- excessive moisture
- Poor timing
- Pests and invasive species

Effects of crop pests and diseases

Direct impacts	Indirect impacts
Crop failure	Igh dependency syndrome
High costs of production	Malnutrition and starvation
Low yields	Food insecurity
Unhealthy/ poor growth	High cost living
	Increased community vices

LIVESTOCK DESEASES- It was reported that most of the livestock diseases occur during the dry season and a time during onset of rainfall. Example of diseases include: ECF, PPR, RVF, CCPP, anthrax, foot and mouth diseases, poor body conditions.

1) Causes of livestock diseases

- Pathogens (bacteria, viruses)
- Pest and insects
- Uncontrolled movement
- Poor management and lack of vaccinations
- Interaction with sick animals and improper disposal of carcasses
- Transfer from wild animals e.g rabies
- Contaminated feeds
- parasites

2. Effects of livestock diseases

Direct impacts	Indirect impacts
Livestock sickness	Spread of zoonotic diseases such as brucellosis and rift valley fever
Loss of livestock	Loss of livelihood
Low livestock productivity	Food insecurity
Migration	Low household income
	Reduced price value for livestock
	Malnutrition in both livestock and human beings
	High costs of production



Hazard characterization

CHARACTERISTICS	ELEMENTS	EXPOSURE VARIABLES	
Crop pests and diseases			
characterization		HOW WILL IT AFFECT ME	HOW WILL IT AFFECT

			COMMUNITY
Course origin	Pathogens (bacteria, viruses, fungi) Pests	<5 years Malnutrition Food insecurity, less parental care, starvation, weakened immunity	Poverty Loss of livelihoods Increased dependence ratio
Direct impact/ force	Crop failure, crop damage	>5<18yrs School drop outs Increased community vices Food insecurity	School drop outs Declining economy, malnutrition and starvation
Warning signs	leaf spots (coffee berry berry), wilting, discoloration, abortion of flowers stunted and abnormal growth	>18<35yrs Low crop yield Crop failure Low income Loss of livelihood High costs of production	
Speed onset	Unpredictable/ varies	>35<60yrs Loss of livelihood Low household income High input costs	
Frequency	Seasonal	Elderly Sicknesses Depression and stress Deaths Abandonment by community members, stigmatization Depletion of accumulated resources	
Period of occurrence	Spread throughout the growing season	Special groups: Food insecurity Loss of livelihoods difficulty in accessing some livelihood resources Weakened immune system	

		Malnutrition Increased vulnerability Less cared and protection by family members	
Duration	Entire growing season	-	
Summary	Crop pests and diseases affect people of different age categories differently. People below five years, the elderly and people with special conditions were said to be affected the most because of their vulnerability and low capacity.		

CHARACTERISTICS	ELEMENTS	EXPOSURE VARIABLES	
Livestock diseases			
		HOW WILL IT AFFECT ME	HOW WILL IT AFFECT COMMUNITY
Cause/origin	Pathogen (bacteria, viruses, micro-organisms) Pests and parasites	Under 5 years – malnutrition weakened immunity increased infant mortalities reduced parental care food insecurity	Malnutrition in children and special groups low economic development high illiteracy level increased community vices
Force	Emaciation, poor livestock body conditions	6-18 years slow development school dropouts Reduced parental care	Increased poverty rates high School drop outs high dependency ratio mental health disturbance reduced business in the area
Warning signs	Change of animal droppings / color of urine Poor feeding Rough skin/ skin irritation Watery and reddened eyes Decrease in yields Swollen lymph Fever and increased breathing rates	18-35 years high rates of crime migration to urban areas psychological disturbance 35-60years psychological disturbance family wrangles low income loss of livelihood poverty Elderly	

Forewarning	3-5 days	weakened immunity psychological disturbance deaths Stigmatization Abandonment Special group Malnutrition Deaths Weakened immune system Stigmatization High dependency rates	
Speed of onset	Varies		
Frequency	Yearly		
Period of occurrence	January –July		
Duration	7 months		
SUMMARY	Livestock diseases are a hazard to the people of Kabartonjo ward and most of the livestock keepers have applied ITK in livestock management and has worked for them however vaccination and regular disease surveillance and use of modern treatments have proven effective and sustainable. The warning signs have enabled them to act faster thus reducing losses as a result of livestock diseases		

3.3.3 Seasonality calendar – seasons and trends of community activities

The PCRA participants were to make a seasonal calendar for Kabartonjo ward showing important events in the year including livelihood activities and periods of hazard occurrence. From their presentation, it was concluded that most of the events are climate based. They first named all the activities and distributed them to various months of the year when the specific event or activity is being carried out

Event	J	F	M	A	M	J	J	A	S	O	N	D
Rainy season	■	■	■	■	■	■	■	■	■	■	■	■
Dry season	■	■				■				■	■	■
Migration of livestock	■	■	■									■
Destocking	■											■
Restocking						■	■	■	■			
Breeding	■	■	■	■	■	■	■	■	■	■	■	■
Calving	■	■	■	■	■	■	■	■	■	■	■	■
Kidding	■	■	■	■	■	■	■	■	■	■	■	■
Land preparation	■	■	■									
Planting			All crops	All crops	All crops			beans	beans			

Drought											
Food insecurity											
Harvesting						Beans millet	Beans, sorghum millet	Sorghum millet	maize	maize	Maize and beans
Marriages/weddings											
Games & sports											
Financial stress											
Dehorning and docking											
Livestock diseases											
afforestation											
reforestation											
deforestation											
Castration											

3.4 Vulnerability Assessment

Vulnerability assessment was conducted to help in identification of the people, assets and livelihood resources who are most vulnerable to hazards in Kabartonjo ward. Both human and non-human elements were considered for assessment.

3.4.1 Non-Human Elements

The non-Human elements assessed included livelihood resources and assets that are most important to the community's livelihood against the common hazards. The livelihood resources (non-human elements) identified included; physical infrastructures, natural resources and social amenities . The following scoring system was used to rate the impacts of the prioritized hazards on the none-human elements:

- (3-high impact)
- (2-Medium impact)
- (1-low impact)
- (0- no impact/positive impact)

The table below shows a summary of the results from livelihood resource vulnerability to hazards. it was found out that drought has the highest impact on the livelihood resources identified.

Resources	Livelihood resource	Crop pests and	Livestock diseases	Total	Rankings
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		diseases			
Physical resources	Roads	2	3	5	2
	powerline	0	1	1	6
	Coffee mill	3	0	0	5
	Cattle dips	0	3	3	4
	Agro vets	3	3	6	1
Totals		8	10		
Natural resources	Rivers/streams	3	3	6	1
	Forest	3	3	6	1
	Swamps	3	3	3	4
	Hills	2	2	4	3
	Rocks	0	1	1	6
	Land	3	0	3	4
	Soil	3	0	3	4
	Totals	17	12		
Social amenities	Schools	2	3	6	5
	Churches	3	3	3	4
	Social halls	1	1	2	5
	Hospitals	3	3	6	1
	Markets	3	3		
	Totals	12	13		
Economic resources	Livestock selling	3	3	6	1
	Businesses	3	3	6	1
	cooperatives	3	3	6	1

	Crop selling	3	3	6	1
	Totals	12	12		
Humans	Farmers	3	3	6	1
	Teachers	2	2	4	3
	Doctors	3	2	5	2
	Pastors	2	2	4	3
	Business people	3	3	6	1
	PLWD	3	3	6	1
	PLW	3	3	6	1
	Totals	19	18		
Total	68	65			

Table 3.2 vulnerability assessment of non-human elements to prioritized hazards.

From the above results, crop pests and diseases has the highest vertical sum hence has the most impacting hazard on livelihood resources. The most vulnerable livelihood resources included farmers and business people, economic resources and natural resources

3.4.2 Human Elements

Vulnerability of human elements to crop pests and diseases

Hazard profile	VULNERABLE ELEMENT AT RISK		Location of element vis-à-vis crop pests and diseases				Why is the element at risk in that location and exposed to hazard
			Location of the element	high	Medium	Low	
Crop pests and diseases	Human elements						
	By gender	Female/girl	homesteads, work places,	✓			Have no alternative place to go, poverty, dependency
		Male/boy	schools, children's homes,		✓		
	By age	<5 boys	Home, schools, churches, children's homes	✓			High dependency, no capacity, require protection and parental guidance
		Girls		✓			
		5-18yrs boys	Home Schools		✓		Mobile, low exposure to hazard occurrence, energetic
		5-18 yrs. Girls	School Home		✓		Mobile, low exposure to hazard occurrence, energetic
		18-35yrs females	Home Colleges Work places, business places		✓		Mobile, resilient, self-reliant, alternative sources of livelihoods, energetic
	18-35 males	Home Colleges, workplaces, business		✓		Mobile, resilient, self-reliant, alternative sources of livelihoods, energetic , resource owners	

			places				
		35-60yrs males	Home, work places, farms, business areas	✓			Are independent, have energy, are resourceful have accumulated resources, ITK and EWS, employed
		35-60yrs females	Home, work places, farms	✓			Are independent, have energy, are resourceful have accumulated resources, employed
		Elderly	Homes Hospice, hospitals Nursing homes	✓			Dependent on children and others Low mobility, exhausted resources, weak immune system, pensionable, cash transfers, high cost of living, limited options,
	Special conditions	pregnant and lactating mothers	Homes places of work	✓			Less resourceful, low mobility, some are employed, high costs of living, limited options
		PLWDs	Homesteads, hospitals, work places	✓			Less resources, weak, health conditions, dependent on family members and well-wishers, dependency, face stigmatization, limited options

Vulnerability assessment for human elements to livestock diseases

Hazard profile	VULNERABLE ELEMENT AT RISK		Location of element vis-à-vis livestock diseases				Why is the element at risk in that location and exposed to hazard
			Location of the element	High	Medium	Low	
Livestock diseases	Human elements						
	By gender	Female/girl	homesteads, work places, trading centres,		✓		Dependency, limited/no option

		Male/boy	schools, work place	✓				
By age	<5 boys	schools, homes		✓			Dependent on parents, require parental care, limited/no option	
				✓				
		Girls						
		5-18yrs boys	Home Schools		✓			Herders, mobile low exposure
		5-18 yrs. Girls	School Home			✓		Dependent on parents, Herders, mobile low exposure
		18-35yrs females	Home Colleges Work places			✓		Mobile resilient, self-reliant, resource owners,
		18-35 males	Home Colleges, workplaces			✓		Independent, businesses
		35-60yrs males	Home, work places, shopping centres		✓			High dependency, resource owners, resource owners
		35-60yrs females	Home, work places, shopping centres		✓			Dependency, high cost of living, resource owners
	Elderly males and females	Homes Hospice, hospitals Nursing homes		✓			Low resilience, no options	
	Special conditions	pregnant and lactating	Homes places of work,	✓			Dependency ratio, limited options, stigmatization	

		mothers					
		PLWDs	Homesteads, hospitals, work places	✓			Dependency ratio, limited options, stigmatization, immobility

Males are more vulnerable to livestock diseases compared to their female counterparts because in the community, it is believed that livestock ownership is a male affair. On the other hand, females are more vulnerable to crop pests and diseases because they are mostly found in farms attending to crops. However, the impacts cut across all genders with young children of up to 18 years, the elderly, PLWD, PLW and people of 35-60 years being highly impacted. It was said so because of the low capacity of children in all decision making processes, limited options on resource ownership, and conditioned health status..

3.5 Capacity Assessment

3.5.1 Non-Human Elements

Hazard	Impacts	Local responses	Effective-ness	Sustainability
Crop pest and diseases	Low yield production	Use of certified seeds	3	3
		mechanization	1	1
		Spraying	3	3
		Weeding	3	3
		Crop rotation	2	2
		Planting resistant crops	3	3
		Timely planting	2	1
		Use of organic manure	3	3
	High cost productions and High maintenances	Agri-silvi-culture	3	3
		Crop rotation	2	2
		Use of organic manure	3	3
		Use of human labour	3	3
		intercropping	2	2
	Crop failure and damage	Livelihood diversification	3	3
	Livestock diseases	Low productivity	Intensive care	3
destocking			2	2
Cross breeding			2	3
	Livestock deaths/sickness	Treatment with local treatments e.g local brews for FMD and aloe vera	2	2
		Quarantine	2	1
		Restocking & destocking	2	2
		Vet services	2	3
	High maintenance costs	Destocking & restocking	2	2
		Livelihood diversification	3	3
		Treatment with local treatments e.g local brews for FMD and aloe vera	2	2

3.5.2 Human Elements

Review and evaluation of local responses on crop pests and diseases

Element at risk	Time element	Capacities		
		Existing	Required	Gap
<5 years boys and girls	Before	Good Health Food sufficient	Food reservation Food supplements Storage facilities	Funds Skills on food reservation
	During	Malnutrition Starvation Parental care	safe nets school feeding programs enhanced food reservation	Funds capacity building
5-18yrs boys & girls	Before	Good health, schooling food sufficient	Storage facilities (food and water) Insurance cover	Funds Training facilities
	During	Reserved food, food insecurity School feeding program	Regular School feeding program, safe nets	Funds Food
18-35yrs males	Before	Energetic Resourceful Employed Mobile Independent, adequate Pastures	Job opportunities EWS Enhanced application of ITK Insurance cover	Funds Training facilities
	during	Alternative sources of livelihood, employment, overdependence	capacity building awareness creation on livelihood diversification employment opportunities	Fund Donors/partners
18-35yrs females	before	Healthy resourceful active mobile employed	job opportunities savings insurance	Funds Donors and partners
	during	Joblessness Food insecurity Lack of basic needs	Capacity building Savings insurance	Fund Donors/partners
35-60yrs men	before	Good health Accumulated wealth Resourceful Mobile, Pasture fields	savings insurance	Funds Stakeholders/donors and partners support
	During	psychological disturbance	guidance & counselling	Funds Donors and partners

		jobless depletion of resources pension, resources, energetic, mobile, ITK	trainings EWS ITK	support
35-60yrs women	Before	Resourceful Good health Employed educated Mobile	savings insurance	Funds
	During	low mobility joblessness depletion of resources pension, resources, energetic, mobile, ITK	trainings guidance & counselling	Fund Donors/partners for resource mobilization
Elderly	before	Weak immobile pensionable inua jamii/cash transfers accumulated wealth ITK	Insurance cover Capacity building on EWS	Funds Training facilities
	During	Stress Abandonment Cash transfers,	Medical care Special diet Social protection Cash transfers	Funds
Special conditions (PLW &PLWDs	Before hazard	Medical insurance Employment Special care Low mobility Social protection	Medical care Job opportunities Insurance covers Social protection	Trainings Funds
	during	Low mobility Overdependence Jobless Abandoned Depletion of resource stigmatization	insurance cover social protection medical care employment opportunities	Trainings Partners &stakeholders
Community readiness	before	ITK Insurance cover Preparedness	insurance EWS Awareness creation	Trainings Funding Donors
	during	Joblessness Increase in crimes Declining economy Food insecurity	Insurance EWS Awareness creation	Trainings Funds donors

Review and evaluation of local responses on livestock diseases

Elements at risk	Time element	capacities		
Individual survivability		Existing	required	Gap
< 5 years boys and girls	Before Hazard	Good health Parental care Food security Active Feeding program	Food preservation and value addition, food storage facilities	Funds Modern knowledge on food storage
	During Hazard	School feeding programs Safe nets Water trucking Reduced parental care Food insecurity malnutrition	regular school feeding programs access to safe nets water tracking for households	Funds
5-18yrs boys & girls	Before Hazard	School going/ good performance Healthy Energetic, active Access to basic needs	School feeding programs Scholarships and bursaries Building nomadic schools	Learning infrastructure Funds
	During Hazard	Migration to disease free grounds, school dropouts, reduced parental care, resilience, reserved foods Vet services	Improved access to vet services	Fund Extension services and officers
18-35 years female	Before Hazard	Schooling (colleges), food secured, ability to provide for their families, active, energetic, resourceful, employed	CDF funds and scholarships Trainings on family planning Introduction of sustainable livelihood diversification Value addition of the value chain	funds trainings
	During Hazard	Water fetching for sick animals, employed	Extended water tracking	Donor funding

			to homesteads, access to financial institutions	
18-35yrs male	Before Hazard	Livestock Trading Resourceful, ITK on livestock diseases, EWS, Energetic,	veterinary services & extension services advanced application of ITK &EWK	Fund Skilled personnel/extension officers
	During Hazard	Depleted resources, alternative livelihoods/employment I.T.K	Disease and vector control Increase of veterinary services	Dips Veterinary skilled personnel
35-60 years male	Before Hazard	resourceful ITK, EWS, accumulated wealth, Long term coping strategies	Training on financial literacy Provision of more veterinary services/ extension officers	Funds Training centres
	During Hazard	Reduced resources, ITK, EWS, savings	Advancement in ITK application Increase veterinary / extension services	Trainings Funds Extension officers
35-60 female	Before Hazard	Other source of livelihood, ITK, EWS, Accumulated wealth,	Enhancement in ITK, Documentation of EWS	Funds Training centers
	During Hazard	Diversified livelihood, Cash transfers Coping strategies,	Enhancement in ITK, Documentation of EWS	Training facilities
Elderly male and female	before	Conditioned health Immobile I.T.K	Safe nets Application of ITK Security	Trainings Capacity building Donors/partners

			Social protection Medical covers	
	During	Conditioned health Immobile I.T.K, cash transfers	Safe nets Application of ITK Security Social protection/cash transfers Medical covers	Trainings Capacity building Donors/partners
PLWDs, marginalized groups	Before	Protected Educated Social protection	Medical covers Safe nets ITK Social protection	Funds Trainings Capacity building Donors/partners
	During	Migration Prepared Other charity groups	moral support insurance application of I.T.K	Funds Trainings Capacity building Donors/partners
Community readiness	before	ITK, EWS, Resource ownership,	Trainings Awareness creation Enhancement in EWS and ITK	Trainings Funding Donors
	during	Prepared Educated Depletion of resources	Insurance Natural regeneration	Trainings Funds donors

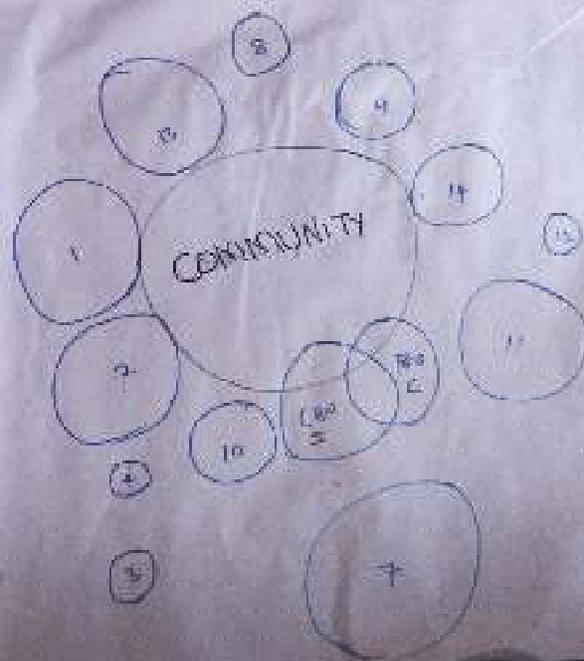
3.6 Stakeholder analysis (*Venn diagram 1 and 2 combined*)

The PCRA participants in Kabartonjo ward Identified and named a number of stakeholders and analyzed that are already and those that shall be involved in Climate Change Action in the ward. Larger pieces of papers represented important stakeholders while small pieces represented less important stake holders. Closeness of these papers mapped the closeness in relationship between the community and the stakeholder. The identified stakeholders included; BCG, N.D.G.O.K, Action Aid, W.F.P, C.B.O, F.B.O, W.B- FLOCCA, NDMA, Local leaders, SHA, KELCOP, SNV, NGAAF, NG-CDF, financial institutions and community.

Identification of stakeholders

- 1. B.C.G
- 2. G.O.A
- 3. Action Aid
- 4. K.F.P
- 5. C.B.D
- 6. F.B.D
- 7. N.E.F.B.O.F.E.A
- 8. N.D.M.A
- 9. Local Leaders
- 10. S.H.A
- 11. K.E.L.C.O.P
- 12. S.N.V
- 13. N.G.C.D.F
- 14. Financial Institutions/Companies
- 15. Community

Kisumu County Stakeholder Analysis Using Von Dornik



CHAPTER FOUR

4.0 WARD CLIMATE ACTION PLANNING PROCESS

4.1 Adaptation Strategies (including hazard, impacts, goals-short & long term), objectives, strategies)

Adaptations strategies for coping with the climate hazards and impacts were identified by the participants. The goals of these adaptation strategies were identified. It was agreed that Short term goals lasted between 1-3 years while long term goals lasted for between 3-30 years.

Hazard	Impact	Adaptation strategy	Adaptation Goal	
			Short term	Long term
Crop pests and diseases	Loss of income	livelihood diversification agroforestry (planting of trees along the edges)	Capacity building of farmers across Kabartonjo ward Enhanced research and development on crop pests and diseases Enhanced access to extension services Enhancement in the use of I.TK	Reduced crop pests and diseases in Kabartonjo ward for food security
	Low crop yields	Growing of disease resistant crops Use certified seeds Crop rotation		
	High cost of living	Resort for family labour		
	High cost maintenance	Use biological method of weed and pest control Subsidized farm inputs Timely planting Reusing and recycling of organic wastes		
	Food shortage	Proper handling and storage of crop yields, livelihood diversification Feeding on		

		natural fibres, leaves and roots		
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Table 4.1 adaptation strategies and goals for crop pests and diseases

Hazard	Impact	Adaptation strategy	Adaptation Goal	
			Short term	Long term
Livestock disease	Loss of livelihood/dependency syndrome	Engagement in non-livestock enterprises (livelihood diversification)	To ensure a continued livelihood sources for decent living standards	Enabled research and development on livestock diseases and management livelihood
	Loss of livestock through deaths	Vaccination and treatment using locally available herbs	Livestock health enhancement	Reduced livestock diseases in Kabartonjo Ward
		Vaccination, treatment, spraying, culling, quarantine and migration	Enhancement of cattle dips Deployment of extension officers	Reduced livestock morbidity and mobility
	low production	Introduction of hybrid species and disease resistant livestock breeds	Livestock disease resistant breeds for continuous and improved livestock production	Sustainable livelihood system towards food security and poverty eradication
	Increased poverty	Capacity building of farmers on proper livestock management such as zero grazing	Enhanced zero grazing	
	High costs of maintenance	Planting of fodder crops	An informed community on livestock disease management	

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Table 4.2 adaptation strategies and goals for livestock diseases

CO-BENEFITS OF ADAPTATION STRATEGIES

ADAPTATION STRATEGIES	CO-BENEFITS	FURTHER IMPROVEMENT FOR CO-BENEFITS
Crop pests and diseases		
Agroforestry	Soil conservation Wind breakers Carbon sequestration Fresh air and shade Biodiversity Income Attracts rain	Encourage bee friendly flowers for further livelihood diversification Use indigenous and fruit trees Use of fodder trees
Capacity Building	Acquisition of knowledge on water harvesting and storage and conservation Improved living standards	Inclusivity of all community members during training and capacity building programs Further Community empowerment
Diversification	Increased income Reduced pressure on the available livelihood resources Improved food security	Sustainable livelihoods
Growing of disease resistant crops	Food security Reduced costs of crop inputs Increased crop yields	Research on crop pests and disease development Access to certified seeds and recommended organic chemicals
Use biological method of weed and pest control	food security Reduced costs of production	Research development Enhanced food
Subsidized farm inputs	High yields affordable costs of production	Enhanced crop yields towards food security
Timely planting	Reduce chances of disease attack	

Reusing and recycling of organic wastes	Improve soil fertility Food security	Trainings on compost making (go organic)
Proper handling of crop yields (food storage and reservation)	Food security Reduced post-harvest losses Prolonged food use	Value addition of the value chain Enhancement in the storage structures and materials
LIVESTOCK DISEASES		
Introduction of zero grazing	Controlled livestock movement Increased yields Improved livestock health Reduced green-house gas emission	Enhancement in Technology (construction of bio-digesters) for farm manure and environmental friendly cooking gas
Introduction of high breed species	High yields High resistance to diseases Increased income Improved quality of livestock	Use of high quality breeds e.g Sahiwal bulls, dopper rams and galla bucks Operationalization and equipment of infrastructure Proper management of livestock infrastructure Select breeds that can do well within the locality Advancement in livestock breeding (AI synchronization)
Destocking	Reduced livestock losses Reducing green-house gas emissions Reduced pressure on herders and pastures	Diversification of livelihoods Enhancement of livestock infrastructures e.g Access to livestock markets

Vaccination, treatment, Quarantine and migration	Improved livestock health Increased production Disease resistances Improved food security	Proper handling and storage of vaccines Regular disease surveillance Access to timely vet services Enhancement in the application of ITK
Use of locally available treatments	Improved livestock health Reduced costs of maintenance and production	Enhancement in ITK
Planting of fodder crops and trees	Soil erosion check Carbon sequestration Supplements livestock feeds	Sustainable livelihood Improved incomes
Livelihood diversification	Increased income	Sustainable livelihoods Avail markets for the diversified livelihood products

4.2 Ward level priorities

4.2.1 ward climate action planning

Community action plan for crop pests and diseases

Goals	Strategy	Activities	target		Time frame	Resource require	Resource gaps	Sources of funds	responsibility
			Location	population					
Enhanced sustainable crop management practice	Proper handling and storage of crop yields	Construction of modern storage facilities Proper handling of crop yield	Lelian Sub-location		2023-2024	10M	technical know-how, Funds, human resource, farm inputs, storage facilities	SHA, WFP, GOK, NCPB, BCG, Community SNV	Community, WCCC, Local leaders, CCU
	Proper farm practices	Trainings and capacity building on proper crop/farm management	Ward wide	22,804		18M			
	Introduction of disease resistant crops	Procurement of certified seeds Distribution and growing of the seeds Research and development on seeds and disease resistance	Ward wide	22804	2023-2027	20M			

	Enhancement in government support through subsidized fertilizers	Provision of extension services and subsidized farm inputs	Ward wide	22804	2023-2027	25M			
	Use of certified seeds	Procurement of certified seeds	Ward wide	22804	2023-2027	15M			
	Enhancement I ITK application	Early warning system Documentation Capacity building on ITK application	Ward wide	22804	2023-2027	10M			
	Enhanced research development	Promotion of research activities such as trainings on good agronomic practices	Ward wide	22804	2023-2027	10M			
	Value addition of value chains	Proper storage, handling, cleaning, sorting, polishing and drying	Ward wide	22804	2023-2027	20 m			
	Promotion of	Purchase of drip	Ward	22804	2023-	30M			

	irrigation activities	irrigation accessories Construction of weirs and pans	wide		2027				
Reduced crop pests and diseases	Use of certified seeds	Procurement and distribution of seeds to targeted farmers	Ward wide	22804	2023-2027	15 M			
	Timely planting and harvesting	Pre-harvesting activities	Ward wide	22804	2023-2027				
	Use of biological and cultural pest and disease control	Training on and Introduction of biological and cultural pest and disease control methods	Ward wide	22804	2023-2027				
	Crop rotation & shifting cultivation	Seasonal planning of farm use	Ward wide	22804	2023-2027				

COMMUNITY ACTION PLAN Kabartonjo WARD-Livestock diseases

Goals	Strategy	activities	target		Time frame	Resource require	Resource gaps	Sources of funds	responsibility
			Location	population					
Reduced livestock diseases in Kabartonjo ward	destocking	Construction of sale yards	Ossen and Kelyo	17611	2023-2024	20M	Low technical know-how, funding Funds, human resource, farm inputs,	SHA, WFP, SNV,KELCOP, GOK, FLOCA, BCG, Community	Community, WCCC, Local leaders, CCU
	Introduction of Zero grazing	growing of fodder crops and trees establishment of pastures	Ward wide	22804	2023-2027	20M			
	Research and development	Promotion of research activities on livestock diseases Zoning of disease prone areas	Ward wide	22804	2023-2027	10M			
	Improvement and construction of cattle dips	Renovation and rehabilitation of existing cattle dips	Ward wide	22804	2023-2027	30M			

		Construction of new livestock infrastructure Equipment of livestock infrastructure							
	Breed improvement	Upgrading of breeds through procurement of Sahiwal bulls, dopper rams and galla bucks Procurement of A.I services	Ward wide	22804	2023-2027	17M			
	Livelihood diversification	Value addition of the value chain Establishment of poultry farming Agroforestry Bee keeping	Ward wide	22804	2023-2027	20M			
Enhancement in the application of ITK	Training and capacity building on the use of	Documentation of EWS and ITK, propagation of	Ward wide	22804	2023-2027				

towards livestock disease controll	ITK	local treatments e.g herbs Awareness creation trainings							
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Annex 1: PCRA attendance list

S/No	Name	Sub-location	Identity no.	gender		age		signature
				M	F	<35	>35	
1	Elijah Chemjor	Kabartonjo ward	9172212	X			X	
2	Symon cheraste	Kelyo	20021751	X			X	
3	Agnes Kiptui	lelian	20054071		X		X	
4	Leah kurui	sumeiyon	128547758		X		X	
5	Lorine tuitoek	kapkirwork	31546600		X	X		
6	Evalyne Job	lelian	10745084		X		X	
7	Yuliba Loteng	kaimogul	26212649		X		X	
8	Ronald Kaptum	kaimogul	22080486	X			X	
9	Gilbert Kandie	sumeiyoy	28425689	X		X		
10	Mathew Cheptumo	tiloi	27332889	X		X		
11	Ruth Kiptum	mosop	33383676		X	X		
12	Vincent sumukwo	Kapkiamo	27746589	X			X	
13	Michael Kandie	tiriondonin	11841059	X			X	
14	KIptoo chelanga	kaptum	28948897	X		X		
15	Collins Bett	tiriondonin	25759037	X			X	
16	Kibowen Lettio	bossei	6597516	X			X	
17	Ezra Tarus	kasaka	37830318	X		X		
18	Abija Kulei	kasaka	35856343		X	X		
19	Gibson Rotich	kapkirwork	30272618	X		X		
20	Evans Barsongol	mosop	27930845	X		X		
21	Careen Songok	ossen	38100598		X	X		
22	Samuel mutai	Kabarnet	9601615	X			X	
23	cicilia chemobo	Kabarnet	29911566		X	X		
24	Raphael kimosop	kabarbet	22539397	X			X	

Annex 2: Ward Climate Change Planning Committee list

No	Name	Role	Gender	Sub-Location/Village	Telephone	ID. NO
1.	Leah Kurui	Female elder	Female	sumeiyon	0721256961	12854758
2.	Ronald Kaptum	Male elder	Male	Kaimogul	0721516002	22080486
3.	Evans Barsongol	Youth representative	Male	mosop	0720041439	27730845
4.	Micah Chelangat	PLWD (elected in absentia)	Male	Sumeiyon	0715203242	1098284
5.	Vincent Sumukwo	F.B.O	Male	kapkiamo	0723073522	27746589
6.	Careen Songok	CBO	Female	kaptum	0725091802	38100598
7.	Gibson Rotich	Minority	Male	Kapkirwok	0799622970	3589557
8.	Elijah Chemjor	Ward admin	Female	Kabartonjo ward	072394495	9172212
9.	Frida Kiptolong	SCEO	Female	Kabartonjoward	0724698818	

Annex 3: selected photos

