

# Participatory mapping of livestock routes in Samburu county, Kenya



RESEARCH  
PROGRAM ON  
Dryland Systems

ILRI PROJECT REPORT



**SNV**

# Participatory mapping of livestock routes in Samburu county, Kenya

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# Overview

In November 2014, a workshop was held in Samburu, Kenya, to carry out an exercise on participatory mapping of livestock routes in the county. This workshop attracted 54 participants representing different stakeholders including Livestock Market Association members (LMA), area chiefs, District Livestock Production Officers (DLPO), District Water Officers and District Livestock Marketing Council and Kenya Rural Development Program (KRDP) and Northern Rangeland trust (See annex 1 for list of participants). The participants were mobilized by Samburu Integrated Development Program (SIDEP).

The exercise was part of interventions by a project implemented by the International Livestock Research Institute (ILRI) in collaboration with SNV- Netherlands Development Organization and the Kenya Livestock Marketing Council (KLMC), and funded by the European Union and the government of Kenya under the Kenya Rural Development Programme (KRDP). The three year project on 'Enhanced community resilience to drought through innovative market based systems approaches' is implemented in six counties of Baringo, Isiolo, Wajir, Marsabit, Samburu and Tana River.

The project's objective is to promote pastoral livelihoods diversification, facilitate robust markets for livestock and livestock products, and enhance consolidation of knowledge base to enhance climate change adaptation and market orientation.

Giving the opening remarks during the workshop, the county drought coordinator of Samburu emphasized the importance of livestock mapping to the county and other stakeholders for planning purposes and called for a validation/dissemination forum after the completion of the exercise. Water and pasture related conflict and insecurity have been rampant in Samburu county and he urged the participants to play an active role in ensuring reduction of the same so as not to scare the participants.

The project's Monitoring and Evaluation (M & E) officer gave an overview of the project, and highlighted its result areas which include a strong Arid and Semi-Arid Land (ASAL) knowledge base that would enhance pastoralist ability to manage climate risk among others. Thus, the mapping exercise directly contributed to this key result area (see project's online space here: <http://asals-markets.wikispaces.com/>).

The mode of delivery in the workshop included a mix of models key among them being use of presentations and brainstorming sessions among the participants as well as focus group discussions for groups with similar interests.

## Objectives of the exercise

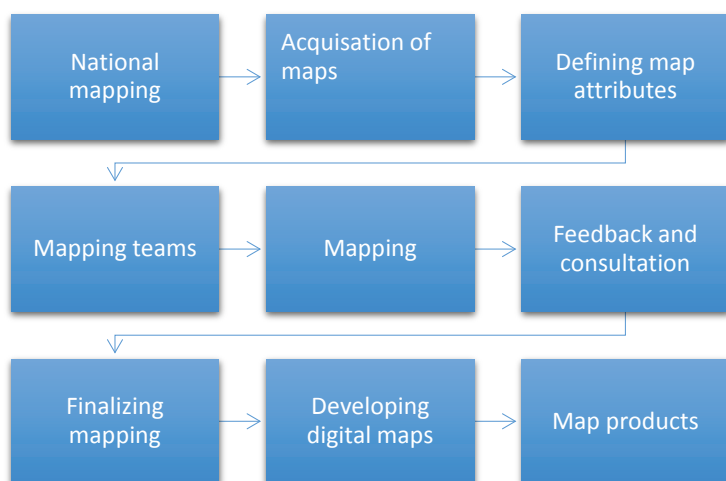
Objectives of the mapping exercise included:

- i. To produce a geographical information on livestock routes, infrastructures, markets that would be useful for county livestock plans
- ii. To consolidate Geographic information together with remote sensing to guide NDMA on major routes likely to be effected by droughts and hence dispatch of relief on good time
- iii. To build the capacity of participants on the importance of mapping and protecting livestock routes in the livestock sector development through sustainable resource use

# The process of mapping livestock migratory routes-Tanzania case study

To introduce the concept to the participants, a presentation was delivered on a similar exercise carried out in Tanzania. A detail of the steps followed in the Tanzania exercise was presented as captured in figure 1 below.

Figure 1: Mapping process for livestock migratory routes in Tanzania



## Routes

The participants were organized into groups to engage in a brainstorming session to identify major and minor livestock routes in the county characterized by volume of animals in the routes, and size of markets they serve. The two types of routes were further reclassified based on their target use either for marketing or for grazing during both dry and wet seasons. The season was classified by the Samburu County Livestock Production office (CLPO). Where the volume of stock was identified as high, it qualified to be a major route. In addition, time of use and markets' size and days/intervals were also used to define a route. A total of six routes were identified:

- Major functional market day
- Major functional seasonal
- Major nonfunctional Market
- Minor functional Market
- Minor functional seasonal
- Minor nonfunctional markets



**Markets**

Three market types (minor, major and boarder) were identified based on the following characteristics:

- Volume of livestock
- Prices
- Number of players
- External traders, local traders, middlemen and market days

Big volumes, high prices, more external prayers than local and 1 or 2 market days qualified for major market. Minor markets are characterized by low volumes, low prices, local traders, and are mostly daily.

**Infrastructure**

The participants identified the following infrastructure in the county: Slaughter houses, sale yards, dips, crush for massive vaccination, holding pens, hay stores, salt licks, watering points- boreholes, wells, and water pans.

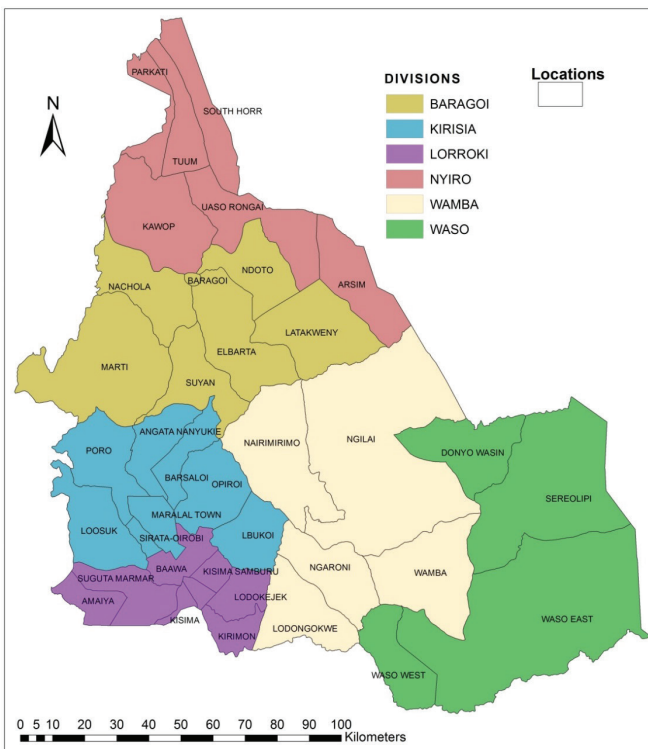
**Developing the mapping teams**

The participants were divided into 6 groups based on the number of sub-counties in the county as shown in table 1 and presented in the figure 2 below:

Table 1: Composition of the different mapping groups

Groups	Sub county	Locations
1	Baragoi	Ndoto,Latakweny,Elbarta,Suyan,Marti,Nachola,Baragoi
2	Kirisia	Poro,Loosuk,Barsalon,Oproi,Sirata,Chirobii,Angata
3	Lorroki	Amaiya,Suguta_marmar,Baawa,Kisima,Lodokejek,Kirimon,Kisim
4	Nyiro	Tuum,Parkati,North Horr,Uso Romgai,Kawop
5	Wamba	Ngila,Wamba,Ngaroni,Londongkwe,Nairimirimo
6	Waso	Ndoyo Wasin,Sereolipi,Waso East,Waso West

Figure 2: Map showing the various sub counties in Samburu.



## Features coding

For the purpose of mapping, each route type was given a color and symbol. Markets were numbered in different colors and infrastructures were also assigned unique numbers.

- **Major market- 1 – Green**
- **Minor market -2 –Blue**
- **Boarder market - 3– Red**

## Maps selection for each group

Each group was guided on how to pick maps that corresponds to their division and also to create a mosaic on the floor.

Teams completing the mosaic of the maps for each of the divisions



### Edge matching

Three main groups were constituted from the original 6 groups. This was done on the basis on edge matching between groups to ensure routes flow from one division to another. Maps from different divisions were brought together and groups engage in discussion in order make information flow from one division to another. Each group had to document what appeared in their maps.



# Narations

## Waso Division

Table 2: Major markets

Major markets	Volume (approximate)	Main traders from	Market day
Archers post	Goats -500	Meru, Isiolo, Nairobi, Marsabit, Moyale and Garissa	Saturday
	Cattle- 60		
	Camel-20		
Sele-Olipi	Shoats-600	Isiolo, Meru, Nairobi, Moyale, Marsabit, Wamba and local traders	Monday
	Cattle- 50		
	Camel-30		
Donyo Wasin	Shoats-500	Meru, Isiolo, and Local traders	Wednesdays
	Cattle- 50		
	Camel- 20		

Note: There is no minor market

Table 3: Boarder markets

Market	Volume (approximate)	Main traders from	Market day
Isiolo	Shoats- 1000	Meru, Nairobi, Nanyuki, Marsabit, Moyale, Garissa, Mandera and local traders	Monday & Friday
	Cattle -300		
	Camels -100		
Merille	Shoats- 1000	Marsabit, Meru, Isiolo, Nairobi, Moyale, Nanyuki and local traders	Tuesday
	Cattle -100		
	Camel- 200		

### Routes

- Major functional market

(a) Start point from Merille trading centre- through Merille river to Sere-Olipi trading centre through Sere-Olipi water well and water pan- Jarafa Kalama trading center and Water pump-archers post-Ewaso river water point to Isiolo market.

Means of Transport: Cattle and shoats – tracks

Cattle and camel – driven on foot to markets

(b) Starting point from Ndonyo Wasin market – Ndonyo Wasin water pans- Sere-Olipi –Isiolo

Mode of transport: By Tracks and driven on foot

(c) Another route runs through Ndonyo Wasin through Merit water point to Lolkuniowii.

- Major Functional Seasonal

(a) Starts from Marti eldepe through Laresero water point and salt lick through Leseria water well and salt licks to Lowash Ngare water well and grazing area

Use time: During dry spells between June to October.

(b) Another starts from Ndonyo Eloilei through Nasuruan along Waso water point and corridors it runs until it joins Losesia grazing area

Use time: Dry Spells- between May and October

(c) Starts at Laresoro water wells and salt licks, Ndonyo Elkina salt lick to Lependira grazing zone area

(d) Start at Naishamunye water point and ndonyo elkono grazing area

(e) Start at Ololokwe springs, Loloslean water points to Losesian grazing area

(f) Starts from Loidekidiko water pan through Soito narok to Chapulo wells through Narok koon wells to Ntumot water wells, Naparpar water wells Lenkaya water wells to Merille river Nkeposorogi grazing area  
Use time: Between April and November

(g) Lchoro Lelekureyia to Naok Koon to Kawro grazing area

(h) Ekeleleni to Sere-Olipi water pans, wells and water hole to Naoka Kooni, Lenkolii water wells, Sera wells (Kisima) Amsini to Laantana water wells, to Turgang wells, Nolkote to Koya wells to Merille river wells to Marti eserteta grazing area.,

Use time: Between May to October.

(i) Lolritopi springs kapau Lchoro Lolosouan to Nturmoit well, Saintit wells, Lodosol wells and salt licks to Ndonyo Wasin wells, water pans and waterholes to Langatq grazing areas.

(k) Ndoyo Wasin Lodosoit, Kureleyio water wells to Merille water wells, Sirirua grazing area

Use time: Between April to July

(l) Ndoyo Wasin Lolkudoigoi swamps, Lengaya wells to Lerapanga Grazing area Use time: Between June and October.

- Minor functional seasonal

(a) Sere-Olipi trading centre, Lare-ibo wells, Sere-Rongai water wells, Cahpulo wells, Lechoro lerkurayia, Ngartamani, Lowash-gare grazing area

Use time: May to October.

(b) Ngartamani, Laantana water wells, Turgung water well, Lerikaya grazing area.

Use time: May to September

(c) Ndume water pan, Erer Wells, Napaasha Kurleyio, Lolkidorigoi to Nkeposorogoi area.

Use time :Between April and August.

(d) Ndonyo Wasin,Nolpor salt lick and wells,Napaasha Kutuk well to Lodosoit grazing area

Use time: Bbetween March and April

(e) Ndonyo Wasin,Merit wells

Use time:Between January and April.

• Minor functional Market

(a) Ndonyo wasin, Ndume wells, Lkerei grazing area, Salt lick and Water point

(b) Lkerei wells, Leangata wells, Kibartare wells, Mwuwa water wells to Murit grazing zone to marketss

(c) Use time: : January and December

(d) Meuwa,Ndonyo wasin Market days Daily

• Minor none functional Market

(a) Lodosoit, Santait, Ndonyo Wasin.

Market closed due to insecurity

Table 4: Infrastructure

Market	Archers post		Sere-Olipi	Ndonyo Wasin
	Sales yard: Accommodates 100 shoats, 200 cattle, 100 camels	Available but non functional	Status: Functional  No sale yard  Not connected to water sources	Market is functional and big  No sale yard  No slaughter house
	Connected to loading ramps which is connected to water		No holding ground	It is connected to water
	No weighing balance		No cattle dip	No cattle dip/crushes, hay store and watering troughs
	No cattle dip		No crush	
Infrastructure	No holding ground		No hay stores	No holding ground
			No check points and saltlick	No check point
	Slaughter house: Small size and can only accommodate 10 shoats	Functional	Water points: Boreholes (Sere-olipi)	Water points:  Oldonyo Wasin boreholes
	Connected to water tap, No Weighing scale		Water hand pump	
			Water wells	Kirwar water points
	Water point: Near Waso Ngiro River			
	Wind mills			
	Water Supplies			

## Baragoi division

Table 5: Major Markets

Market	Status	Volume-approximate	Trades from	Market day
Latakweny	Functional	Cows- 150, Camels-60, Goats-1800, Sheep-300, Donkeys-10	Braagoi ,Maralal, Barsaloi, Llkunuyani, Lesirika n, Loikumkum, Sereit, Urah, Suyan, Ngurnitiseren	-
Tangar	Functional	Cows-150, Camels-30, Donkeys-10, Goats-2000, Sheep-400	Baragoi, Maralal, South Horr, Tillaut, Latakweny, Lolkuniyani, Suyani, Ngilai	Tuesday

Table 6: Minor Markets

Markets	Status	Volume (per week)	Traders from	Market days
Baragoi	Functional	Cows- 40, Camels-30, Goats-1000, Sheep-500, Donkeys-20	Isiolo, Nairobi, Maralal, Wamba, Lesirikan, Nachola, Kawap, South Horr and Marti	Daily
Nachola	Functional	Cows- 30, Goats-600, Camels-30, Sheep-300, Donkeys-40	Baragoi, Marti, Kawap, Lokorri and Kamwinge	Daily
Marti	Functional	Cows 60, Goats-500, Sheep-100, Donkeys-30, Camels-30	Maralal, Baragoi, Barsaloi, Wamba, Isiolo	Friday
Suyan	Functional	Cows-10, Camels-10, Goats-600, Sheep-250 and Donkeys-3 to 4	Masikiti, Barsaloi, Marti, Maralal, Wamba	Thursday
Urah	Functional	Cows-30, Goats-300, Camels-7-10, Sheep-100, Donkeys 2 to3	Baragoi	-

### Routes

Table 7: Major functional (market) routes

Starting	Mode of transport	Passing through	End point
South Horr	On foot	(a) Baragoi (b) Tangar (c) Latakweny	Lolguniyani
Tuum	By vehicles	(a) Nachola (b) Baragoi (c) Marti	Maralal
South Horr	On foot	(a) Tagar (b) Latakweny (c) Barsaloi	Maralal

Table 8: Major functional seasonal routes

Starting	Passing through	End
Illaut Market	Lesinkan, Tangar, Urah	Latakweny
Time of the year	Dec, April, May, July	January, April, October

#### b) Major functional (market)

Starting	Passing through	End
Nachola	Logetei	Baragoi

#### (b) Minor functional (Seasonal)

Starting	Passing through	End
Tangar	Barsaloi and Suyan	Maralal
Baragoi	Suyan	Maralal

#### (b) Minor Non- functional (market)

Starting	Passing through	End
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Ngurait	Laparaan			Latakweny		
Infrastructure						
Market	Latakweny	Tangar	Baragoi	Nachola	Marti	Suyan
Infrastructure	Crush- Non Functional  Water Points: Borehole- Non functional	Sale yard- Functional, Size- Standard  Water points  Borehole/ trough- Functional, Size Standard	Crush- Non functional  Cattle Dip- Non functional  Sale Yard- Non Functional  Slaughter Houser- Functional  Size Standard, Fenced  Water points: Borehole- Functional, Size Standard  Weighing machine-Non Functional	Water points- Borehole- Functional  Slaughtering Slamp- Functional  Crush Non Functional  Sale yard – None  Salt lick – Functional	Crush-Non Functional  Water points- Boreholes/  Troughs- All Functional  Slaughtering Slump- Functional	Water points: 2 boreholes/  troughs – 1 functional

## Nyiro Division

### Major Markets

Market	Status	Day	Trader	Stock	Volume	Structures
Kurungu	Functional	Saturday	Local and external (Nairobi, Burji, Marsabit)	Sheep, goats, foodstuff, clothes	Sheeps-300; Goats-300, Camels-50 to80,  Cattle 50to80	Sale Yard (complete); Loading Ramp (complete)

### Challenges:

- No toilets; no water; few buyers
- Means of transport of moving stock: Trucks and trekking to Wamba, Lolkinifani

### Minor markets

Market	Status	Day	Trader	Stock	Volume	Structures
Tuum	Functional	Monday	Local and external ( baragoi, lesirkan, parati)mixed tribes	Sheep, goats, foodstuff, clothes	Sheep50 to100  Goats50 to100	no structures, no security, few buyers
Sumuruai	Functional	Monday	Local and external ( Baragoi, lesirkan, parati)mixed tribes	Sheep, goats, foodstuff, clothes	Sheep40 to50  Goats40 to50	no structures, no security, few buyers



Boarder Market						
Market	Status	Day	Trader	Stock	Volume	Structures
Illaot	Functional	Saturday	Local and external (Nairobi,Baragoi,Korr, Marsabit)  mixed tribes	Sheep  goats foodstuff clothes	Sheep500 to600  Goats500 to600, Camels50 to100, Cattle 50 to 100	no structures, no security, few buyers

## Routes

### Major functional trekking routes

- (a) Kurung -Silhorr Illaot
- (b) Tuum –Wazerongai-Silhorr-Kurungu
- (c) Parsati-Tuum-Larenk

### Major functional seasonal route

#### Dry season Grazing route

- (a) Mputaputa-Lkotikal-Neesidan-Keleswa-Lowasira: Animals (goats, sheep, cattle,camels, donkeys)
- (b) Wasorangai-Kawal-Angaata-Llosurkol-Marti nanykie
- (c) Wasorangai-Kawal-Angaata-Losurkol-Nalembo
- (d) Kawap-Marotngakirim-Terrterr
- (e) Kawap-Lwatani-Soit elpayani-Ngorishe: Animals (cattle,camels,donkeys)
- (f) Parikati-Nakwei-Sarima-Losam-Sarima: Animals: (sheep and goats)
- (g) Nonjonin-Loibor- Sedire-Koross

### Minor functional seasonal route

- a) Tuum-Simale-Naikicho: Salt lick route
- b) Maputaputa-Naikisho: Salt lick route
- c) Lorsukol-Marti nanyakie-Lemuny: Salt lick route
- d) Lokoto- Marulem: Pasture
- e) Lokuto-Katakirion: Pasture
- f) Lokuto-Lorsukoi-Pparkatin: Pasture/ Salt lick route
- g) Parkat-Elkayo-Nkwei-Nagaramaisen: Pasture/ Salt lick route

### Minor nonfunctional market

- Kawap, Tereterr, Ikato, Mputaput, Kogiza and Moran

These are non-functional due to lack of security and lack of water points.

### Infrastructure

- Slaughter house (south horror goats, small), water
- Not fenced; no weigh balance
- Crush (ill out, under construction); Kawap (nonfunctioning),Laredo, losurkoi
- Cattle dip (Natiti, non-functioning)
- Water points: Kawap (lack of pumping machine) lack of security, 4 wells Lokoto,Kilepol,Lenkima andKwap centre
- Holding ground

## Kirisia division

- Mararal major market

It is functional market on daily basis, situated in Mararal town near DEB primary school. Large stocks are cattle (50 per day) and camels (5 per day). Small stocks include goats (200 per day) sheep (300 per day) and chicken (100 per day). The main traders in the market are locals from Mararal town and Marsabit, Naivasha, Nairobi, Nyeri, Narok. The main market day is Monday but the market is still open daily on small scale.

- Nkorika-Minor markets

Status	Volume	Main traders	Market days
Nkorika	Cattle 10, goats 100 sheep 100	Local traders	Thursday
Poro	Cattle 20 shoats 150 chicken 100	Local traders	Monday
Loibonnakare	Cattle 10 shoats 200 chicken 200	Local traders	Saturday
Pora market	Cattle 20, shoats 400 donkeys 30	Local traders	Fridays
Losuk market	Sheep 200, goats 50	Local traders	Tuesday

### Routes

- Major functional route

This is route to major markets like Nkorika Poso, Loosuk, Laibor and Nkare. Animals are transported on foot to Mararal major markets.

- Major functional seasonal route

This is through grazing areas:Lowo, Bor-Sere endeke Nolkera-Lorian borehole, Manga-water pan. This route is mainly used during the dry season, and the main animals moved include cattle, goats sheep, camels and donkeys. Grazing is free range, with the end of the grazing zone marked by the boundary of the sub county.

- Minor functional route

Trough Poro,Ngorika,Pora and Loosuk.

- Minor non-functional route

Morijor is nonfunctional due to high insecurity cases around the area.

Infrastructure	Status	Size
Morigo boreholes	Functional	Deep
Nkorika dam	Functional	Medium
Dam poro	Functional	Medium
Siamba	Functional	Medium
Borehole poro	Non functional	Deep
Mugor poro dam	Functional	Medium
Mugorborehole	Non functional	Medium
Lesidai dam	Functional	Big
Lakira borehole	Functional	Big
Laibor bore	Functional	Deep
Loibokare	Functional	Small
Pura borehole	Functional	Deep
Lowasuk dam	Functional	Medium
Borehole loosuk	Functional	Deep
Nolkere	Functional	Deep
Dam Noolkera	Functional	Small
Borehole Lochngei, Sirata, Noontoto, Nkejemuat	Functional	Deep
Borehole w/mill	Non functional	
Dams Noomotio	Functional	Big
Lpartuk	Functional	Deep
Borehole milimani	Functional	Deep
Slaughter house (Maralal)	Functional	Big
Slaughter house (Nomotioo)	Under construction	Big
Hay store Noomtioo	Functional	and medium size
Slaughter slabPoro	Functional	small size
Sale yardMararal	Functional	
Weighing machine (Maralal market)	Non functional	
Two cattle dips (Loosuk)	Functional	

## Lorroki division

### Minor functional route

This route starts from Kadomo, through Amaiya to Lowanyikie. Animals are transported by tracks and there are three water dams namely Logewan, Lgorate, and Agata Lera

- There is a hay store

The markets along the route are as illustrated in the table below

Markets	Details
SUGUTA Marmar market	Major market Sale Yard big but not functional Slaughter house functional Saltlick Checkpoint functional
Lekuru market	Dam and borehole are operational Saleyard big and requires repair of fencing Borehole and hand pump
Kisima market	Slaughter Slump requires improvement Sale yard big without loading ramp Slaughter Slump
Bourder market kadomo	Dam and pipe water Market day is on Tuesdays Volume is low because of insecurity Goats- 200 Sheep- - Cattle - 120 Donkeys - 40 Camels 20
Kilimon market	Traders include locals and outsiders from other countries including Laikipia and Nairobi Water pipe, holding ground Weighing machine requires repair

### Major functional route

- From Lekuru market to Gilgil
- Both Cattle and Shoaat
- Means of transportation is on foot
- Tracking route is Kinmon-Oldonyogiro-Kimajo
- There is enough water on the way from Lekuru to Rumuritu market

The major market along the route are Suguta marmar and Kisima markets

## Wamba division

- Major markets

Market	Status	Day	Traders	Stock	Volumes	Structures
Lokuniyani	Functional	Thursday	Local and external (Burji, Meru, Kikuyus, Borana)	Camel Cattle Sheep Goats	Camels-70 Cattle-120 Sheep-1100 Goats-2500	Sale yard (complete) Pens(complete) Loading Ramp(complete) Hay Store(complete) LMA office (complete) Market stalls(complete)

Challenges: No toilets; no water on the sale yard; no sheds; few external buyers; insecurity along Isukunyi- Lereta area. Means of transport for moving stock include: Lorries to terminal markets; Trekking to terminal markets for camels and cattle and Trucks

- Major markets

Market	Status	Day	Traders	Stock	Volumes	Structures
Lpus	Functional	Wednesday	Local and few external (Burji,Meru)	Sheep Goats	Sheep-100 Goats-500	Sale Yard (complete) Loading Ramp (complete)
Lengusaka	Functional	Wednesday	Local and external (Samburu, Burji,Meru)	Sheep Goats	Sheep-20 Goats-100	Sale Yard (complete) Loading Ramp (complete)
Ngutuk and Lmuget	Functional	Saturday	Local	Sheep Goats	Sheep-150 Goats-350	Thorn bushes, open air
Lturoto	Functional	Saturday	Locals	Sheep Goats Camel Cattle	Sheep-50 Goats-200 Camel-20 Cattle-20	T thorn bushes, open air
Lorrok Onyeki	Functional	Tuesday	Local	Sheep Goats Camel Cattle	Sheep-40 Goats-100 Camels-5	No structure, open bushes
Ndonyo Nasipa	Functional	Monday	Local	Sheep Goats Camel Cattle	Sheep-50 Goats-100 Camels-10 Cattle -10	No structure, thorn bushes, open air
Ngilai central	Functional	Tuesday	Local	Sheep Goats Camel Cattle	Sheep-10 Goats-30	No structure
Wamba town	Functional	Tuesday	Local and external (Samburu, Burji,Meru)	Sheep Goats Camel Cattle	Sheep-30 Ggoats-100 Cattle-20 Camels-4	No structure

- Major functional routes

- Sereolipi & Kanjo

Lolkuniyani market- Nchorro nyiro

Infrastructure: Shallow wells

- Ndonyo Wasin – Murit river – Ngilai – Lolkuniyani market

Infrastructure - Murit river, murit springs, Loosikiriashi river

Lturoto dam, Lkuasi springs, Seiya river, Lendekut borehole, Lbaaonyekie river, Lolkuniyani dam, Lolkuniyani borehole.

3. Lpus – Lusen Gap- Lolkuniyani market.

Infrastructure - Barsilinga river, Barsilinga cattle crush, Nagoroworu river

4. Ngutok – Ongirori – Lengusaka river, Slorita stream,

Shallow wells – Lengusaka market, Wamba market

Lkisin River – Lolkuniyani market

5. Ngutuk elmuget – Ungei – Loroki, Lakasawo spring, Nentorit – Lengusaka market

Infrastructure - Nagoroworu river

6. Sarara – Nendia River – Lengusaka market

Infrastructure – Nkongu river, Parkakara river, Nendia river, lengusaka river, sirata cattle crush

**Major non-functional market**

1. Colonial road from KWS (Wamba) to Naisunyai through Lpashie destroyed by soil erosion.
2. Wamba, Lengusaka, Lpus, Ngilai, Ltiroto, Lorrokyekie, Ngutuk-Elmuget, Ndonyo Nasipa

**Minor functional routes**

- Raraiti – Lturoto market: Infrastructure- Rarati borehole – Lturoto
- Lorrok – Onyekie market – Lturoto market: Infrastructure - Lturoto borehole
- Lorrok – Onyekie market – Lolkuniyani market: Infrastructure – Rigrig river, Seiya River, Lkwasi springs, Lponyokie springs, lenolekut borehole
- Resim - Lpus market: No infrastructure
- Resim – Lolkuniyani market: Infrastructure – Lbaa onyekie river, Lottepes borehole, Lolkuniyani market

**Minor functional routes (seasonal)**

1. Milgis river – Lorrok onyekie market. No Infrastructure
2. Milgis Ndonyo naripa market- Laka – Milgis
3. Sirata – Reteti and then joining major functional routes to Wamba town market or Lolkuniyani market.
4. Or Ka – Lolkineegi/Mbagas-Lolkuniyani market

**Infrastructure**

- Lantare spring
- Orka spring
- Lolkinyi spring
- Pesu spring

## Infrastructure

Infrastructure	Location
Slaughter house	Wamba
Sale Yard	Lolkuniyani market (completely constructed)
	Legusaka market (holding yard, no sale yard only for small stock)
	Ilpus market (holding yard, no sale yard only small stock)
Dips	Wamba town – Structure vandalized no roof only plunges dip
	Lodunyokwe - Structure vandalized no roof only plunges dip
Crushes	All the constructed structures destroyed or vandalized.
	Lekat
	Wamba town
	Nagoroworu
	Ngilai
	Swari
	Remot
	Ndonyo Naropa Nendia
Hay store	– Lolkuniyani market, newly constructed not yet used
Watering troughs	Lanchekul dams (newly construction in use)
	Naisunyai dam
	Namanyaro dam
Salt Licks	Nagoroworu, Lkisin, Losikiriashi, Ibaa onyekie, Seyia, Lkuasi, Laarapa, Tepelel river, Lodosoit
Watering Points	Ndorro ngiso river, Reteti river, Nkongu river, Wamba river, Margwe river, Lkesen river, Nagorrooworu river, worka river, Lolkweji river, lipito river, Lendadapoi shallow well, Wamba town, losikiriashi, Ngeny, Seneya, Lturoto, Raraiti dam, Waso river, Milgis, Nkare Narok, Leangata, Ndonyo Wasin dams, Meiwua river, Murit river, Nkii river, Lodosoit river, Andow river, Lmugut (Lorian) shallow well.

## Way forward

### Conversion of routes, markets and Infrastructure to GIS Database

The marked topographic maps will be scanned. Digitization of routes markets and infrastructure will be done onscreen and assigned codes as was done during participatory mapping exercise. The geographic database will be available and will be integrated with any other relevant GIS data for the county to give more information for decision making.

Expected outputs:

- Development of various thematic maps which would include;
- Stock routes, protected areas (parks and forests), wetlands
- Stock routes with livestock densities (cattle, sheep, goats and camels)
- Stock routes with human population density and agriculture
- Stock routes with range condition (based on remotely sensed indices – Normalized Differential Vegetation Index (NDVI))
- Stock routes and disease or potential areas of diseases

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