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# OFF-GRID SOLAR MARKET ASSESSMENT REPORT FOR 14 UNDERSERVED COUNTIES OF KENYA 2020



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## ACRONYMS & ABBREVIATIONS

AI	Artificial Intelligence
AOI	Area of Interest
CREO	County Renewable Energy Officer
ERPA	Energy and Petroleum Regulatory Authority
FBO	Fixed-Based Operator
FM	Frequency Modulation
FOSA	Front Office Savings Activity
GIS	Geographic Information Systems
GIZ	<i>Deutsche Gesellschaft für Internationale Zusammenarbeit</i>
HH	Household(s)
INGO	International Nongovernmental Organization
KADET	Kenya Agency for the Development of Enterprise and Technology
KBC	Kenya Broadcasting Corporation
KCB	Kenya Commercial Bank
km	Kilometers
KNBS	Kenya National Bureau of Statistics
KNES	Kenya National Electrification Strategy
KOSAP	Kenya Off-grid Solar Access Project
KPHC	Kenya Population and Housing Census
KPLC	Kenya Power and Lighting Company
KSh	Kenyan Shillings
KST	Kenya Off-grid Solar Access Project Service Territory
KTN	Kenya Television Network
KWFT	Kenya Women Finance Trust
LAPSSET	Lamu Port-Southern Sudan-Ethiopia Transport Corridor project
MFI	Microfinance Institution
MG	Mini-grid
MoE	Ministry of Energy
MSME	Micro, Small, and Medium Enterprises
NGO	Nongovernmental Organization
NIC (Now NCBA)	National Industrial Credit Bank
NTV	Nation Media Group Television (TV) Station
OVC	Orphans and Vulnerable Children
PAYGO	Pay-as-you-go

## ACRONYMS & ABBREVIATIONS

POP	Population
RBF	Results-based Financing
REA	Rural Electrification Authority
REREC	Rural Electrification and Renewable Energy Corporation
SACCO	Savings and Credit Cooperative Organization
SHS	Solar Home System
SIFA	Skills Initiative for Africa
SMEP	Small and Micro Enterprise Programme (a local microfinance institution)
TVET	Technical and Vocational Education and Training Institutes
UNHCR	United Nations High Commissioner for Refugees
UI	User Interface
USAID	United States Agency for International Development
USD	United States Dollars
VIDA	Village Data Analytics
VSLA	Village Savings and Loans Associations
WDPA	World Database on Protected Area
WEPESA	West Pokot County Economic Savings and Credit Cooperative Organization Society, Ltd.
WFP	World Food Programme

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# I. INTRODUCTION & BACKGROUND

The Kenya Off-Grid Solar Access Project (KOSAP) is a \$ 150 million flagship project of the Kenya Ministry of Energy (MoE), financed by the World Bank and jointly implemented by the MoE, the Kenya Power and Lighting Company (KPLC), and the Rural Electrification and Renewable Energy Corporation (REREC).

KOSAP, which runs from 2017 to 2023 aims to increase access to modern energy services in the 14 underserved counties of Garissa, Isiolo, Kilifi, Kwale, Lamu, Mandera, Marsabit, Narok, Samburu, Taita Taveta, Tana River, Turkana, Wajir, and West Pokot. The project is part of the MoE’s objective to achieve universal electrification by 2022 and economic growth under the Government’s [Kenya Vision 2030](#) development program.

### KOSAP 2023 ENERGY ACCESS TARGETS

#### ENERGY ACCESS

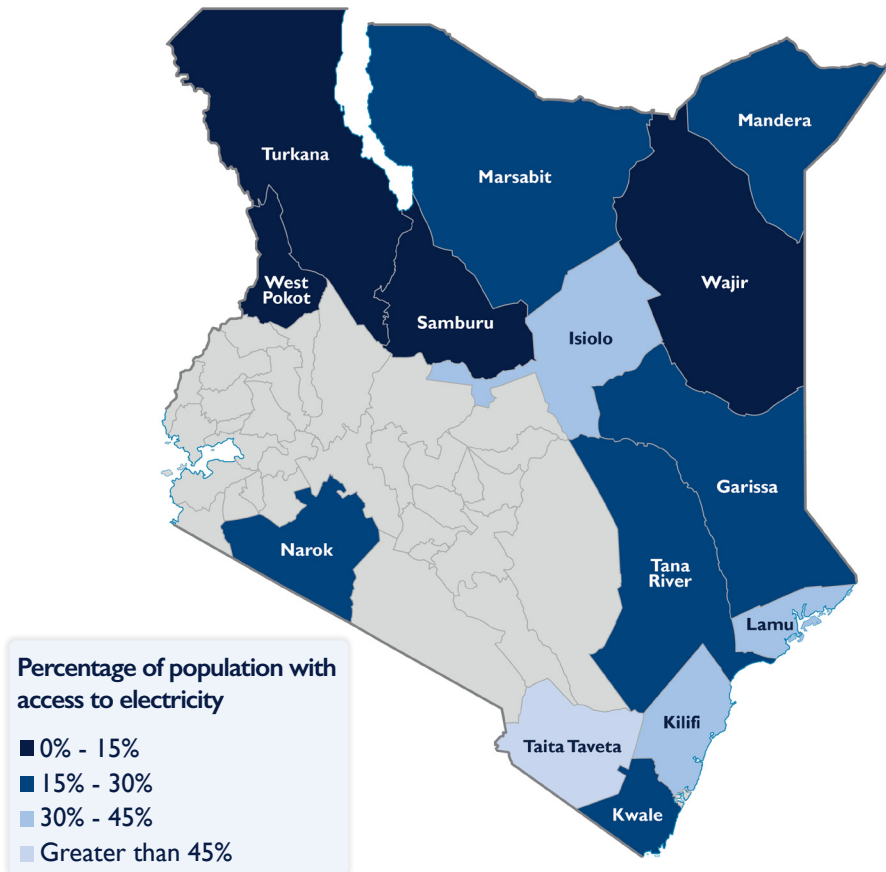
- 277,000 households (*approximately 1.3 million people*)
- 1,100 public and community facilities (e.g. schools, health facilities, administrative offices)
- 380 boreholes

#### CLEAN COOKSTOVES

- 150,000 households in Isiolo, Marsabit, Samburu, Turkana, and West Pokot Counties

The objective of this report is to provide market intelligence to companies and service providers that are active in or planning to enter the off-grid solar (OGS) market in the 14 KOSAP counties, referred to as KOSAP service territories (KSTs), as shown in Figure 1. This report draws from publicly available data and in-depth consultations with the MoE’s KOSAP-dedicated County Renewable Energy Officers (CREO) and summarizes the findings of geospatial analyses, which identify off-grid communities in KSTs and assess their potential as markets for OGS companies.

Figure 1. KOSAP Service Territories (KSTs)



## KOSAP Service Territories

The 14 KOSAP counties, which cover 72 percent of Kenya's total land area and 20 percent of its population, are generally remote and have low or unreliable access to energy services. KOSAP target counties also grapple with other challenges, including poor infrastructure; low population density; high poverty levels leading to low disposable incomes; and insecurity.

Table I below summarizes each county's key socioeconomic indicators, such as mobile ownership and mobile-money usage, that are useful to estimate market size.

Table I. County Demographics, Access to Electricity, Mobile Phones, and Mobile Money

Lot	County	Population (2019)	Households (2019)	Electricity Access Rate (%)	Solar Penetration (%)	Mobile Phone Ownership (%)	Mobile Money Usage (%)
1	Turkana	922,210	191,681	7.8	3.9	45.5	35.6
	West Pokot	618,867	117,166	11.5	6.3	47.2	34.9
2	Isiolo	267,997	39,365	37.7	7.9	81.4	75.2
	Marsabit	447,150	57,258	20.0	6.4	57.4	50.3
	Samburu	307,957	58,262	14.8	6.8	76.5	66.6
3	Mandera	862,079	252,936	15.2	2.3	68.2	12.8
	Wajir	775,302	181,973	13.9	5.1	58.9	23.6
4	Garissa	835,482	174,811	22.4	3.7	68.5	36.8
	Lamu	141,909	23,255	43.6	24.2	73.6	69.2
	Tana River	314,710	58,921	25.4	7.8	55.7	48.6
5	Kilifi	1,440,958	265,082	35.9	7.7	63.5	55.4
	Kwale	858,748	145,435	28.9	8.6	69.9	65.5
6	Narok	1,149,379	356,943	18.5	13.1	69.9	66.1
	Taita Taveta	335,747	167,501	47.3	14.1	80.0	72.8

Source: Population data from Kenya National Bureau of Statistics (KNBS) (2019). Other values estimated by Power Africa geospatial analysis.

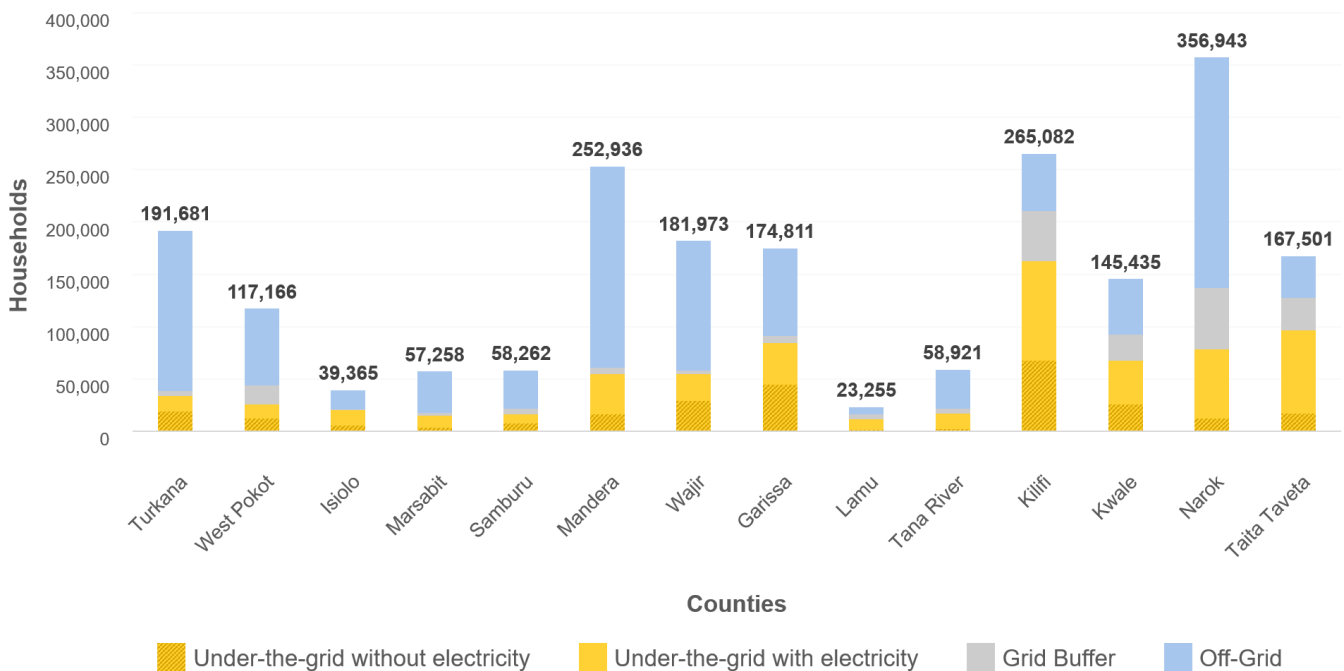
## Access to Electricity and Infrastructure

Just under 23 percent of households in KSTs have access to electricity, compared to 70 percent at the national level. Geospatial analysis conducted by Power Africa estimates that 1.1 million households in KSTs, or 54 percent of the population, are more than five kilometers (km) from the electricity grid, meaning that they are unlikely to be served by grid-expansion projects. While some of these households will eventually get access to mini-grids, most households are strong candidates for electrification with solar home systems (SHS).<sup>1</sup>

The remaining 46 percent of KST households reside within five kilometers of grid service. However, proximity to grid infrastructure is not always a guarantee of reliable access.

In some cases, unreliable electricity supply results in frequent power outages, which makes it necessary for households with grid access to purchase OGS equipment. An estimated 13 percent of KST households live within one km of the grid (referred to in this report as “under the grid”) but lack access to electricity. In some cases, high-voltage transmission lines may pass through small settlements, but the utility does not build out distribution infrastructure to electrify the community. Figure 2 below shows the distribution of households by distance from the grid.

Figure 2. Households by Distance from the Grid in KOSAP Service Territories



Source: Power Africa Geospatial Analysis

While distance from the electricity grid will factor heavily into whether a household is a target for off-grid electrification, road infrastructure is also a critical element. Communities that are more difficult to reach are more expensive to access during the customer-acquisition phase and more expensive to support post-purchase. Companies can ameliorate some of these costs by building up local support capacity, but this strategy is not likely to be feasible in all communities.

Overall, 24 percent of off-grid households are beyond five km from any road. These households are some of the most difficult communities to target with sustainable electrification solutions. Marsabit and Turkana have the highest proportions of households that are far from roads, while Taita-Taveta and Narok have some of the most accessible off-grid communities.

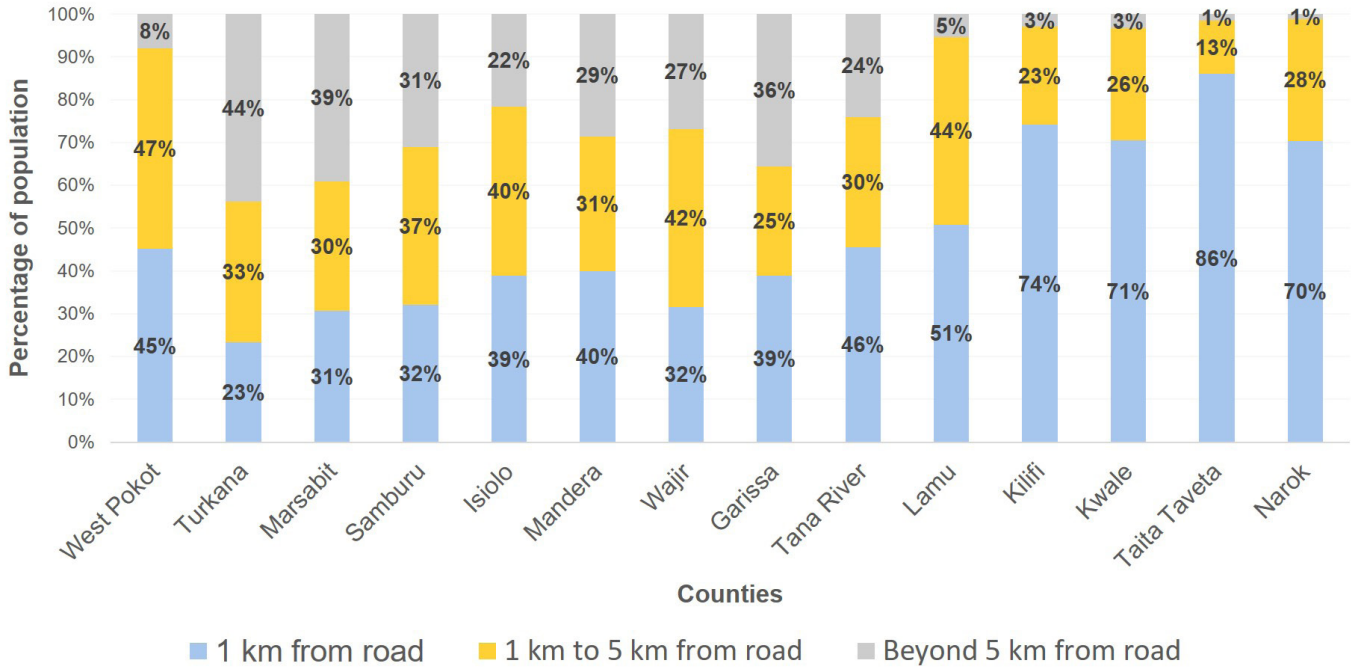
<sup>1</sup> Ministry of Energy, Kenya. 2018. Kenya National Electrification Strategy. <https://energy.go.ke>



Even if a community is accessible by road, some roads may not be passable throughout the entire year due to flooding. With the reliable data that is available, this report identifies roads that are seasonally flooded in the county fact sheets.

Figure 3 breaks down each county’s off-grid population by distance from road infrastructure.

Figure 3. Off-grid Populations by Distance from All Roads



Source: Power Africa Geospatial Analysis

Note: Some values may not total 100 percent due to rounding

## Household Energy Expenditure

Household energy expenditure is a measure of what households can afford and one of the most useful inputs for estimating the size of markets for different off-grid solar products. Multiple reports and studies<sup>2</sup> provide estimates for households' monthly energy expenditures in Kenya. Using household expenditure data from the Economic Survey 2018 by the Kenya National Bureau of Statistics (KNBS)<sup>3</sup>, the average monthly household energy expenditure in KSTs is Kenya Shillings (KSh) 1,674 (\$ 15).<sup>4</sup> To put this average energy expenditure in context, the current average daily cost of pay-as-you-go (PAYGO) SHS is KSh 50 (\$ 0.50) for a four-point lighting product, or KSh 1,500 (\$ 14) monthly.

Table 2 presents county-level estimates of average energy expenditure. The average monthly household energy expenditure in KSTs of KSh 1,674 may

be somewhat misleading, because counties such as Lamu, Kilifi, Narok, and Taita Taveta all have estimated monthly household energy expenditures of more than KSh 2,000 (\$ 18), which drive the average higher. Eight KSTs have estimated energy expenditures that are below the monthly cost of the PAYGO SHS product example above, suggesting that the addressable market for PAYGO SHS might be smaller for some counties.

On the other hand, these county-level estimates are also averages, which may or may not be a strong indication of how many households have the ability to pay for SHS. All KSTs are above the overall poverty rate of KSh 3,252 (\$ 30) per month in rural and peri-urban areas.<sup>5</sup> Localized surveys of energy expenditures and consumer preferences may be warranted for companies that are entering a new market.

Table 2. Household Energy Expenditure Estimates

Lot <sup>a</sup>	County	Mean Total Monthly Expenditure per Adult (KSh)	Estimated Total Monthly Household Expenditure (KSh) <sup>b</sup>	Monthly Non-Wood Energy Expenditure, 5% of Total expenditure (KSh)	Monthly Non-Wood Energy Expenditure, 10% of Total Expenditure (KSh)
1	Turkana	4,862	14,586	729	1,459
	West Pokot	3,914	11,742	587	1,174
2	Isiolo	6,252	18,756	938	1,876
	Marsabit	4,493	13,479	674	1,348
	Samburu	4,477	13,431	672	1,343
3	Mandera	3,461	10,383	519	1,038
	Wajir	3,784	11,352	568	1,135
4	Garissa	4,622	13,866	693	1,387
	Lamu	7,725	23,175	1,159	2,318
	Tana River	4,952	14,856	743	1,486
5	Kilifi	7,908	23,724	1,186	2,372
	Kwale	6,470	19,410	971	1,941
6	Narok	8,265	24,795	1,240	2,480
	Taita Taveta	6,917	20,751	1,038	2,075

Source: Kenya Integrated Household Budget Survey, 2015/2016.

<sup>a</sup> Counties are categorized in lots for the purposes of funding. Companies and partnerships can apply to market their products and services to one or more lots.

<sup>b</sup> This estimate assumes three adults per household, on average.

<sup>2</sup> Hystra. Reaching Scale in Access to Energy. 2017. <https://www.adb.org/sites/default/files/publication/372436/access-energy-lessons.pdf>

<sup>3</sup> KNBS. Household Economic Survey. 2018. <https://www.knbs.or.ke>

<sup>4</sup> Based on a conservative number of three adult equivalent per household

<sup>5</sup> Kenya Integrated Household Budget Survey 2015/2016.

## Scoring Off-Grid Potential

To better understand which settlements may be the most promising markets for OGS companies to enter, Power Africa's geospatial analysis includes assigning an *OGS Potential Score* to each off-grid settlement identified by the analysis.

The *OGS Potential Score* is based on the settlement's physical size, population size, and population density. This report considers larger and denser settlements more promising for several reasons. First, larger communities offer a larger pool of potential customers. Second, marketing OGS products and supporting them post-sale carries some fixed costs, regardless of the size of a settlement.

If a company can spread these fixed costs across a larger customer base, per-customer acquisition costs and support costs go down. In addition, groups with common interests within communities offer opportunities for peer-to-peer sales to increase the market base. Finally, larger communities tend to be more accessible through existing road infrastructure and will be more likely to have reliable mobile-phone coverage, which can be critical for making PAYGO schemes workable.

Table 3 presents the count of off-grid settlements broken down by low, medium, and high *OGS Potential Scores*.

Table 3. *OGS Potential Score by County*

Lot	County	Low Potential Settlements		Medium Potential Settlements		High Potential Settlements		Average Potential Score (out of 8)
		Settlements	HHs	Settlements	HHs	Settlements	HHs	
1	Turkana	7	614	75	614	12	25,225	5.0
	West Pokot	16	2,348	65	2,348	0	0	4.3
2	Isiolo	1	27	34	27	7	7,649	5.3
	Marsabit	5	105	50	105	3	3,626	4.8
	Samburu	2	496	30	496	2	2,696	4.9
3	Mandera	16	1,028	50	1,028	26	129,782	5.3
	Wajir	5	63	62	63	22	55,349	5.1
4	Garissa	6	1,382	60	1,382	13	41,346	5.2
	Lamu	4	438	4	438	0	0	3.8
	Tana River	26	4,744	68	4,744	2	4,935	4.4
5	Kilifi	4	761	39	761	2	6,799	4.7
	Kwale	9	1,465	70	1,465	1	2,357	4.4
6	Narok	18	1,630	108	1,630	1	1,617	4.4
	Taita Taveta	5	196	48	196	1	1,507	4.5
<b>Total</b>		<b>124</b>	<b>15,297</b>	<b>763</b>	<b>15,297</b>	<b>92</b>	<b>282,888</b>	<b>4.7</b>

Source: Power Africa Geospatial Analysis

It is important to note that there are many factors that determine a market's potential that are not included in the *OGS Potential Score*. This scoring approach is intended to be one of many factors that OGS companies consider when deciding where to invest their marketing efforts.

## Cross-Cutting Challenges and Mitigation Measures

Every KST has unique challenges that require companies to adapt their business models and marketing strategies. This report presents key cross-cutting challenges and potential mitigation measures, as summarized in Table 4 below.

Table 4. KST Market Conditions and Potential Solutions

Market Condition	Description	Recommendation
Poor transport infrastructure	Supply routes from Nairobi, the main hub for manufacturers and distributors, are long, cover rough terrain, and may pass through unsafe territory, substantially raising distribution costs.	Establish smaller distribution hubs in central locations close to key markets or partner with local businesses and micro-entrepreneurs. This will reduce costs for the distribution and provision of after-sales service.
Limited mobile phone coverage	Patchy mobile phone coverage limits the integration of GSM and mobile money technology, which is necessary for PAYGO SHS.	Provide customers the ability to choose cash purchases. For PAYGO products, consider working with local partners (e.g., microfinance institutions [MFIs] and table banking groups that can collect payments in remote areas.
Few suitable distribution partners	A lack of local or regional distribution partners with entrepreneurial backgrounds means that companies must operate costly distribution infrastructure in house; there are also limited options for inventory storage and warehousing.	Use local partners such as nongovernmental organizations (NGOs) with a longstanding presence in the area, MFIs, county government, and County Renewable Energy Officers (CREO) to identify suitable sales agents and build local capacity. To encourage payments from households, consider competitive compensations and smart incentives (e.g., commission on payments, not sales) for the sales team, which encourages sustainable sales behaviors.
Few commercial centers and low population density	Low population density and levels of urbanization make it costly to access end consumers, even from local distribution centers. This also complicates collections, particularly in the absence of strong mobile phone networks and mobile money.	Multiple companies may consider collaborating to develop distribution centers to lower the cost of developing the last mile of the supply and service chain. Leveraging referrals among customers or village entrepreneurs remains a best practice and further drives satisfaction and market penetration. Consider linking incentives to customer repayments.
Low levels of consumer product awareness	The lack of consumer education means that consumers do not always understand the benefits of solar versus traditional lighting, as well as benefits of Lighting Global-approved products over low-quality alternatives. Failure-prone imitation products harm the overall reputation of the sector along with market spoilage caused by the informal supply from neighboring countries.	Use local structures and institutions to pass messages and leverage existing programs (e.g., the livestock value chain). Leverage KOSAP awareness efforts. Partner with awareness-creation companies (e.g., Media Edge). Integrating the distribution chain into the solar results-based financing (RBF) facility to enhance their capacities (sharing RBF along the value chain) is also recommended.
Inadequate understanding of income and consumption patterns	There is uncertainty about the true purchasing power of consumers, as county-level data suggest substantially lower incomes per household, compared to non-underserved counties, and high seasonality of incomes. However, there is often widespread asset ownership in the form of livestock. Operators anecdotally report high demand at isolated sales events.	Use local surveys to better understand the market. Review customer selection and segmentation practices (including reviews of down payments), putting less focus on fast customer acquisition and more focus on retention and satisfaction, investing in strong customer care and service.

## 2. COUNTY FACT SHEETS

The following fact sheets highlight important market characteristics and key trends that are likely to influence the OGS markets in each of the 14 KSTs. Fact sheets are ordered by lot number. Counties are categorized in lots for the purposes of funding. Companies and partnerships can apply to market their products and services to one or more lots.

The following notes are important to interpreting the data presented on each fact sheet:

- In the *Population and the Grid* section of each fact sheet, the “under-the-grid” population is within one kilometer of the grid; the “buffer” population is one to 2.5 km from the grid; and the “off-grid” population is beyond 2.5 km of the grid.
- *High Potential Settlements* received a 7 or 8 OGS Potential Score – see above for more methodology details.
- Map and population/off-grid characteristics come from the Power Africa geospatial analysis. See Methodology Annex for more details.

<b>County Overview</b>	General county characteristics, estimates of off-grid populations, and their distributions in the county, with rough estimates of pertinent markets.
<b>Economic Activities</b>	Primary economic sectors and major market centers in the county.
<b>Electricity Connection</b>	Grid connectivity rates for county populations, trading centers, and constituencies; primary sources of lighting for households and trading centers, etc.
<b>Local Dynamics</b>	Common standards for communicating and relationship-building among local communities.
<b>Accessibility</b>	Road network, information and communication technology, and security concerns.
<b>Economics and Ability to Pay</b>	Presence of markets and community activities, with information to guide awareness-raising and marketing activities.
<b>Financial Services</b>	Information about financial service providers in the county.
<b>Market Entry</b>	Best practices for engaging local markets.

## 2.1. LOT 1: TURKANA

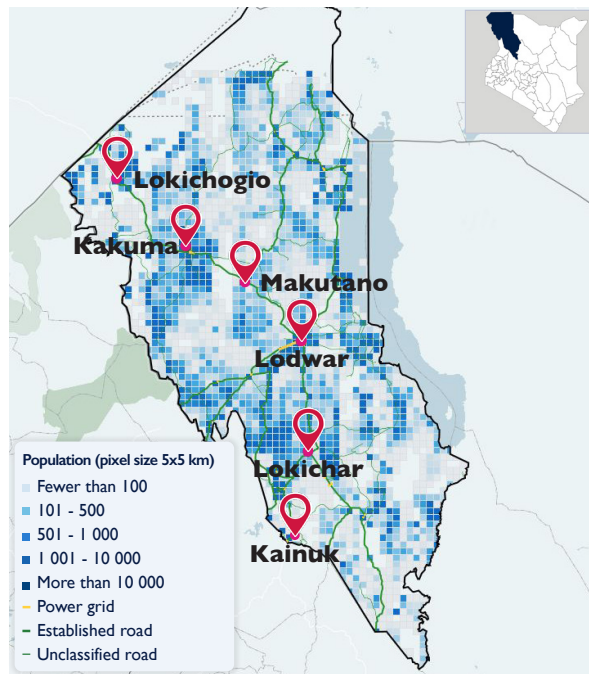
**POPULATION**  
**1,032,055**  
 (191,681 households)

**ELECTRICITY ACCESS**  
**7.8%**  
 (14,951 households)

**OFF-GRID POPULATION**  
**80%**  
 (153,269 households)

Turkana is a moderately sized county in northwest Kenya that borders Lake Turkana, Uganda, South Sudan, and Ethiopia.

Most inhabitants of Turkana practice nomadic pastoralism and keep livestock as their primary assets. Livestock markets form economic hubs across the county. Because men often travel with their herds, it is critical for off-grid energy companies to engage women as household decisionmakers when marketing off-grid solar products. Both electricity access and mobile network coverage in the county are sparse. Only Kainuk is connected to the grid, leaving most other urban centers either disconnected or reliant on mini-grids.



Infrastructure	
Mini-grids	23
Post Offices	2
Courier Services	1
Local Radio Stations	N/A
Paved Road Network (km)	N/A

Population and the Grid (Households)	
Electricity Access	7.8% (14,951)
Under-the-grid Population	17.6% (33,676)
Buffer Population	2.5% (4,736)
Off-grid Population	80% (153,269)
Served by Planned Mini-grids	1,379

Off-Grid Characteristics	
Total Settlements	81
High Potential Settlements	None
Health Facilities	68
Schools	197

Off-Grid Accessibility (Distance from Road)	
Within 1 km	23.2% (35,635)
Within 1-5 km	33% (50,538)
Beyond 5 km	43.8% (67,097)

Financial Services	
Financial inclusion (%)	N/A
Commercial Banks	Equity, KCB, Post
Micro-Finance Institutions	KWFT, KADET
Savings and Credit Cooperatives	Elimu, Kapenguria Teachers', Turkana Teachers'

**Economic Activities**  
 Pastoralism, fishing, irrigated small-scaling farming, charcoal and wood production, honey production, artisanal mining, and basket weaving.

Livestock Market Schedule					
Monday Kakuma, Lodwar, Lokichar	Tuesday Kakuma, Lodwar, Lokichar	Wednesday Kakuma, Lodwar, Lokichar	Thursday Kakuma, Lodwar, Lokichar	Friday Kakuma, Lodwar, Lokichar	Saturday Kakuma, Lodwar, Lokichar

### Renewable Energy Officer

✉ Caleb Ewoi Nakain

## 2.1.LOT I: TURKANA

### Market Centers

Major market centers and economic activities: Kainuk, Lokichar, Lokichoggio, Lodwar  
Other: Kakuma, Kalemngorok, Kerio, Lokirama, Lokitaung', Lokori, and Lorugum

### Electricity Connection

Turkana County suffers from one of the lowest grid electricity-access rates in Kenya at less than eight percent, translating to about 15,000 households. Besides Kainuk in the south, the rest of the county is isolated from the main electricity grid. Lokori, Lokichoggio, and Lodwar are powered by Kenya Power's and RREC's isolated mini-grids. Additionally, plans are underway to power Lokitaung, Lokirama, Lorugum, Kakuma, Kerio, Lokichar, and Kalemngorok. Nevertheless, several trading centers in Turkana do not have centralized forms of electrification. It also seems unlikely that these sites will be electrified within the next five years through centralized approaches due to their distance from existing infrastructure.

Electric torches are the main devices used for lighting, followed by open fires at 26.5 percent. Mobile phones are also predominantly used for lighting at 17.9 percent.

While nearly 18 percent of households live under the grid, Power Africa's geospatial analysis estimates that less than half have a grid connection. Roughly 14 percent of households own solar panels, which they use for lighting and powering electrical appliances. After mobile phones, radios are the most common devices among Turkana households. Pico-SHS systems may be promising solutions for households that primarily need power for phones, radios, and lighting.<sup>6</sup>

An estimated 11,000 households in Turkana county still use kerosene for lighting, representing about six percent of the total. Each household consumes an average 3.24 liters of kerosene per month, equivalent to KSh 350 (\$ 3) on lighting only.

Table 5 Turkana Sub-county Populations with Estimates of Off-grid Households

Sub-county	Population	Total Households	Estimated Off-grid Households
Turkana Central	183,121	38,173	37,257
Turkana North	65,125	13,119	12,804
Turkana West	239,323	45,451	44,360
Loima	106,625	19,438	18,971
Turkana East	138,265	17,981	17,549
Turkana South	153,350	24,552	23,963
Kibish	36,401	5,805	5,666

Source: KNBS (2019)

### Local Dynamics

The Turkana people are traditionally structured around clans and families with elders that are entrusted with decision making on behalf of the group. As urbanization progresses, the traditional structures are less influential, but are still relevant among those who lead a traditional lifestyle (primarily nomadic pastoralists).

<sup>6</sup>Turkana Energy Sector Plan, 2017-2022

## 2.1.LOT I: TURKANA

The more rural the community, the higher the likelihood of the members relying on traditional elders and the office of the chief to provide direction on important livelihood issues affecting the community.

### Accessibility

#### Road

The county road network is poorly developed. The challenges faced by this sub-sector include seasonal rivers that cut through roads and poor soils that increase the cost of road construction and maintenance. As a result, several roads are rendered impassable during the rainy seasons.

#### Information and Communication Technology

There are three mobile service operators in the county: Safaricom, Airtel, and Orange. The mobile network coverage in the county is approximately 25 percent.

### Financial Services

There are three banks in Turkana County. Kenya Commercial Bank has two branches at Lodwar and Lokichoggio, while Equity Bank and Post Bank both have branches in Lodwar. There are also three major SACCOs: Turkana Teachers SACCO, Elimu SACCO, and Kapenguria Teachers SACCO. The MFIs within the county include Kenya Women Finance Trust and Kenya Agency for Development of Enterprise and Technology (KADET).<sup>7</sup>

### Market Entry

Livestock is the main economic activity in Turkana county, with both main and secondary livestock markets held daily in various towns. For ease of entry to the county, it is advisable for companies to build close working relationships with the county government, which encourages easy cooperation from other players and departments. The Office of the County Commissioner is also an important local player, mainly on security issues.

Partnerships with organizations implementing livelihood programs in the county can also ease entry. These include Mercy Corps, USAID, World Vision, Oxfam, GIZ, the United Nations High Commissioner for Refugees (UNHCR), the World Food Programme (WFP), Friends of Lake Turkana, and others. These organizations can provide necessary linkages to the community and/or opportunities for leveraging their projects.

Partnerships with TVETs, youth groups, and CBOs can also ease entry, as the youth constitute more than 30 percent of the population in the county.

Turkana herders (traditionally men) frequently migrate across borders, especially to Uganda, South Sudan, and Ethiopia, to access resources and markets. These movements are often affected by occurrences such as violent conflicts, diseases outbreaks, and recurrent droughts, in some cases limiting herders' abilities to return home. As a result, male heads of households are often away, increasing the importance of off-grid energy companies engaging women as potential customers, especially regarding PAYGO product payment. In addition, more women are participating in economic activities and actively contributing to household incomes.

<sup>7</sup>Turkana County Integrated Development Plan, 2013/14- 2017/18





## 2.2 LOT I: WEST POKOT

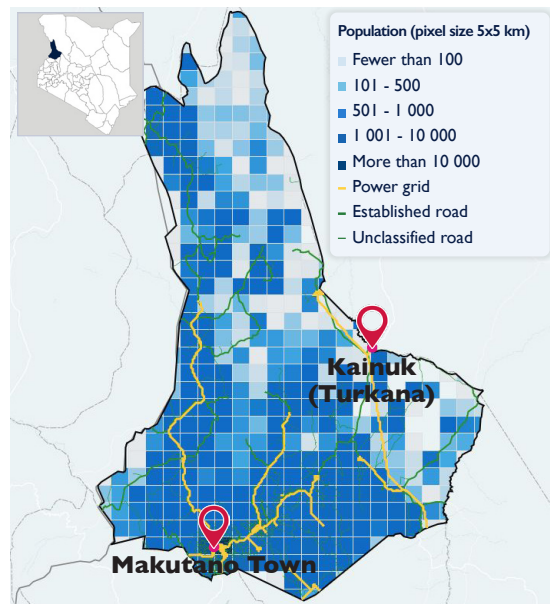
**POPULATION**  
**624,107**  
 (117,166 households)

**ELECTRICITY ACCESS**  
**11.5%**  
 (13,474 households)

**OFF-GRID POPULATION**  
**62.7%**  
 (73,500 households)

West Pokot is a small, cosmopolitan county in western Kenya on the Ugandan border. Rural parts of the county are primarily occupied by Pokot communities, which follow a communal way of life. Financial services and mobile/internet connectivity are concentrated in the south, which may pose challenges for reaching rural consumers, particularly with pay-as-you-go schemes.

The most important economic activity in West Pokot is livestock rearing. A livestock market is open six days a week in a different town each day, forming a hub for other services and industries.



### Infrastructure

Mini-grids	N/A
Post Offices	5
Courier Services	3
Local Radio Stations	1
Paved Road Network (km)	151

### Population and the Grid (Households)

Electricity Access	11.5% (13,474)
Under-the-grid Population	22% (25,788)
Buffer Population	15.3% (17,877)
Off-grid Population	62.7% (73,500)
Served by Planned Mini-grids	None

### Off-Grid Characteristics

Total Settlements	81
High Potential Settlements	None
Health Facilities	68
Schools	197

### Off-Grid Accessibility (Distance from Road)

Within 1 km	45.1% (33,161)
Within 1-5 km	46.9% (34,482)
Beyond 5 km	8.0% (5,857)

### Financial Services

Financial inclusion (%)	23%
Commercial Banks	Barclays, Equity, KCB
Micro-Finance Institutions	Faulu, KWFT, Rafode
Savings and Credit Cooperatives	Kapenguria Teachers', Muruny Rural, Sigor FSA Rural, WEPESA

### Economic Activities

Livestock, retail, and wholesale trading; fresh produce and cereals; entertainment and hospitality; and service industries (motor garages; cyber cafes; law firms; livestock auctions; private education businesses; honey processing; banking and financial services; real estate enterprises; and road transport services).

### Livestock Market Schedule

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Kishaunet	Orolwo	Chepkono, Kacheliba	Chepareria	Kishaunet	Lomut

### Renewable Energy Officer

✉ Stanley Kipchoge Sitienei

## 2.2. LOT I: WEST POKOT

### Market Centers

Major market centers and economic activities: Chepareria, Kapenguria  
 Other: Alale, Chepkondol, Chepkono, Cheptuya, Chesegon, Kabichbich, Kacheliba, Kachemogen, Kamelei, Kamketo, Kanyarkwat, Kapsait, Kapsangar, Kaptabuk, Kasei, Kiwawa, Kodich, Konyaod, Lomut, Nyangaita, Orolwo, Ortum, Orwa, Sarmach, Sebit, Serewo, Sigor, Sina, Tamkal, Tapach

### Electricity Connection

Electricity access is still low with only three percent of the population accessing electricity and only ten trading centers connected with power. The main lighting source for 47 percent of the population is fuel wood, while 24 percent use lanterns and 25 percent use tin lamps. Kapenguria constituency has the highest level of electricity use at eight percent. Kacheliba constituency has the lowest level of electricity use. Sook, Kodich, Kapchok, Kiwawa, and Alale wards have no electricity connections.

Table 6. West Pokot Sub-county Populations with Estimates of Off-grid Households

Sub-county	Population	Total Households	Estimated Off-grid Households
Pokot North	134,012	25,804	25,287
Pokot Central	118,721	21,850	21,413
Pokot South	80,590	13,817	13,541
Kipkomo	102,311	18,370	18,003
West Pokot	183,233	36,341	35,614

Source: KNBS (2019)

### Local Dynamics

West Pokot is a county containing diverse peoples from many different areas; however, the rural areas are only inhabited by Pokot communities, who have a high regard for communal life. As part of communal living, these communities favor a group-centric way of life, thinking, and decision-making more than individual pursuits. The Pokot emphasize the development and maintenance of relationships with others, and every member of the community is expected to demonstrate loyalty and respect to their parents, older siblings, elders, age mates, and friends. Among the benefits of communal living is a sense of belonging and collective cooperation.<sup>8</sup> This communal way of life and thinking can accelerate the diffusion of positive messages and adoption of technologies, such as solar, if companies are successful with market entry.

### Accessibility

#### Mobile network coverage and communication

Current mobile telephone coverage is estimated to be 70 percent, mainly around Kapenguria town and the plains. There is no information and communication technology in Alale, Kiwawa, Seger, Tapach, and other hilly areas in Pokot Central and South. This may be a barrier to households needing to pay using PAYGO technology. Television access is limited to some areas in the county. The county has one local frequency modulation (FM) radio station, with external FM radio stations also playing a big role in the dissemination of information.

<sup>8</sup> Matwetwe H. 2017. A Study of the Pokot Cultural Worldview: Missiological Implications for Seventh-Day Adventist Witness among the Pastoral Nomads of Kenya. <https://digitalcommons.andrews.edu/cgi/viewcontent.cgi?article=2912&context=dissertations>



## 2.2. LOT I: WEST POKOT

### Road network

There are no roads to get to the hilly areas of Sigor and Kapenguria, so one must use motorcycles or walk. The road network in the county is predominantly earth and gravel, which makes up 87 percent of the road network. These gravel-surface roads cover 349 km, while the earth-surface roads cover 697 km. The total length of bitumen-surface (tarmac) roads is only 151 km. This means that for every 61 km<sup>2</sup>, there is one km of a tarmac road, and there are 4,180 persons for every one km of tarmac road. The general status of the road network in the county is poor. The tarmac road is poorly maintained, while the earth and gravel roads become impassable during rainy seasons. A rugged and hilly terrain within the county poses another challenge to road connectivity. The county has no rail network, ports, or airports, and local airstrips are completely inactive.

### Economics and Ability to Pay

The two main segments in the off-grid market are households and businesses. The households can further be divided into low-income households and middle-income households. Low-income households spend very little on lighting and phone-charging. Middle-income households typically include salaried individuals and those with recurrent income, such as small traders or employees of organizations and the government. Middle-income households represent a key market for early off-grid energy companies to reach. To engage lower-income households, this report recommends that companies offer systems in lower price ranges.

The poverty level in West Pokot is at 57.3 percent, which is mainly in the rural areas in which households have limited disposable income. Based on anecdotal evidence and interviews with key informant interviews (county officials and other stakeholders), the range of estimates on customers' ability to pay for energy is between KSh 600 (\$ 5.50) per month for the low-income households in Pokot North to KSh 1,500 (\$ 14) per month in the rural centers across the county and among middle- and high-income households.

Payments for most services happen during market days, when customers are likely to buy high-value products. It is important to note that the West Pokot Community is patriarchal and most large purchasing decisions are made by men. However, men are also often away from home, traveling with their livestock. Therefore, it is important to find the right balance between respecting the patriarchal culture and engaging women in marketing efforts.

### Financial Services

The county has three commercial banks (Barclays, Equity, and KCB), four MFIs namely KWFT, Faulu, Mwalimu Teachers', Rafode, and six Savings and Credit Cooperatives (SACCOs) including WEPESA, Sigor FSA Rural, and Muruny Rural. Most of these financial institutions have services concentrated in Makutano Town. Pokot Central and Pokot North Sub-counties do not have banks or MFIs, thus limiting access to financial services. Financial inclusion (the percentage of the adult population that has a bank account) remains low in the county at 23 percent. Loan uptake and repayment is also low, and more effort is necessary to reverse this trend. Agency banking is expected to play a key role in enhancing the penetration of financial services into rural areas and in mobilizing savings for investment.

## 2.2. LOT I: WEST POKOT

### Market Entry

Livestock being the main livelihood in the county, there are scheduled livestock markets. These markets serve as centers for many services and bring large gatherings together. The markets provide a good platform for off-grid energy companies to pursue market-activation opportunities. Some market centers might have power, but neighboring villages often have no access to power, nor do many people living in the market centers.

For ease of entry to the county, it is advisable to build a close working relationship with the county government, as this will ensure the ease of cooperation from other players and departments. Establishing relationships with local leadership, including county government officials and CREOs, can help raise awareness and provide security updates, which the Office of the County Commissioner issues. During the dry season, most pastoral communities in Pokot North move to Uganda in search of pastures. Men often move with their cattle and leave behind their women and children. Hence, it is highly recommended that off-grid energy companies engage the participation of women in households, especially with PAYGO product opportunities.

Other opportunities include the establishment of partnerships with organizations implementing livelihood programs in the county, and these include West Pokot County Economic Savings and Credit Cooperative Organization Society, Ltd. (WEPESA), SACCOs, Mercy Corps, World Vision and Village Enterprise, Technical and Vocational Education and Training Institutes (TVET), Youth Alive, and others. These organizations can provide necessary linkages to the community and/or opportunities for leveraging their projects.

## 2.3. LOT 2: ISIOLO

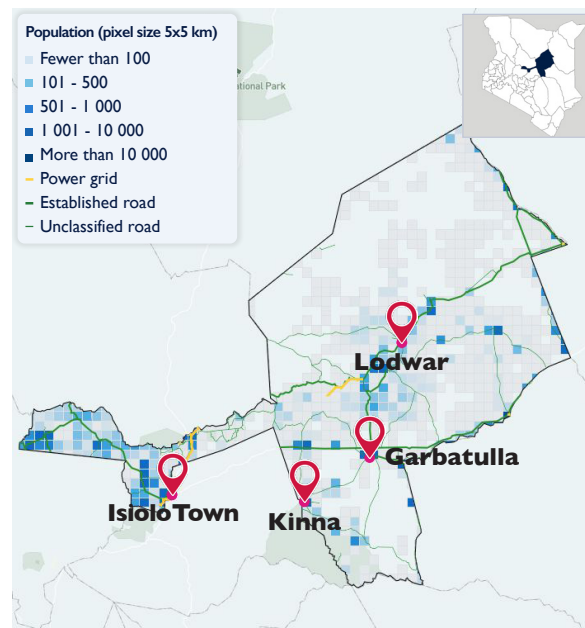
**POPULATION**  
**181,664**  
(39,365 households)

**ELECTRICITY ACCESS**  
**37.7%**  
(14,840 households)

**OFF-GRID POPULATION**  
**46.8%**  
(18,416 households)

Isiolo is a county located in the upper Eastern Region of Kenya, bordering seven other counties, including Marsabit, Wajir, Garissa, Tana River, Maru, Laikipia, and Samburu. The major towns of Isiolo and Garbatulla host most of the county’s urban population. Much of the electrical connectivity in the county is focused on urban centers and mobile networks, which cover less than ten percent of the county’s population. Most rural populations lack any mobile network coverage at all.

Livestock selling is the most common economic activity in the county and small livestock rearing, such as sheep and goats, account for roughly half of household assets. Camels and cattle account for about a quarter of household assets as well. Milk vending and charcoal trading are also practiced in the county.



### Infrastructure

Mini-grids	11
Post Offices	3
Courier Services	5+
Local Radio Stations	N/A
Paved Road Network (km)	N/A

### Population and the Grid (Households)

Electricity Access	37.7% (14,840)
Under-the-grid Population	51.5% (20,289)
Buffer Population	1.7% (659)
Off-grid Population	46.8% (18,416)
Served by Planned Mini-grids	3,273

### Off-Grid Characteristics

Total Settlements	39
High Potential Settlements	7
Health Facilities	25
Schools	50

### Off-Grid Accessibility (Distance from Road)

Within 1 km	38.8% (7,146)
Within 1-5 km	39.6% (7,300)
Beyond 5 km	21.6% (3,971)

### Financial Services

Financial inclusion (%)	N/A
Commercial Banks	Barclay, Consolidated, Cooperative, Equity, Family, First Community, KCB, National, Sidian
Micro-Finance Institutions	Faulu Kenya, KWFT
Savings and Credit Cooperatives	Isiolo Teachers', Solution, Trans National

### Economic Activities

Agriculture, livestock selling (especially small stock like goats/sheep) – small stock make up roughly 50 percent of assets; camels and cattle form about 25 percent; milk vending; charcoal trade.

### Livestock Market Schedule

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Isiolo	Isiolo, Oldonyiro	Isiolo	Isiolo	Kipsing, Isiolo	Eskot, Isiolo

### Renewable Energy Officer

✉ Abdi Osman Guyo

## 2.3. LOT 2: ISIOLO

### Market Centers

Major market centers and economic activities: Isiolo town, Kinna, Kipsing, Merti, and Oldonyiro  
 Other: Belgesh, Duse, Eskot, Garbatulla, Kiwanja, and Modogashe

### Electricity Connection

Electricity access in Isiolo is 38 percent, but most households with access live in the Isiolo sub-county. Additionally, 85 percent of the trading centers, schools, and health facilities have electricity access. Roughly 42 percent of the population use petroleum products, 8.5 percent use wood fuel, and 13.8 percent use solar. The rest of the population (7.3 percent) use other means.<sup>9</sup>

Table 7 Isiolo Sub-county Populations with Estimates of Off-grid Households

Sub-county	Population	Total Households	Estimated Off-grid Households
Isiolo	121,061	29,853	24,330
Garbatula	99,730	18,661	15,209
Merti	47,206	9,558	7,790

Source: KNBS (2019)

### Local Dynamics

The county population consists largely of Oromo-speaking Borana and Sakuye, but Isiolo county is also home to Turkana, Samburu, Meru, Somali, and other immigrant communities. Most of the rural unelectrified households dwell in manyattas, which are traditional houses constructed using mud, grass, and sticks. Males own a significant share of assets within their households. The majority of Isiolo residents are Muslim, and over 41 percent of the population have a nomadic lifestyle.

The county has strong ethnic and clan politics, which has led to violence in the past. Scarcity of resources (i.e., mainly pastures for these largely pastoral communities) has resulted in violent conflict. Youth unemployment has also been another contributing factor to violence, with regional insecurity and porous borders with Ethiopia, Southern Sudan, and Somalia further exacerbating the situation. Electoral contests for county leadership exacerbate the longstanding tensions, primarily pitting the dominant Boran against minority ethnic groups.<sup>10</sup>

### Accessibility

#### Road Network

Isiolo Town, the capital of the county is located on the main Nanyuki-Isiolo highway, making the county easily accessible by road. Isiolo Town also lies in the middle of the Lamu Port-Southern Sudan-Ethiopia Transport (LAPSSET) Corridor project, which will see it develop into a resort city by the year 2030. While this is a massive project with its own complexities, it has the potential to open up the town and the county.

The rest of the mainly gravel- and earth-surfaced roads in the county become impassable during the rainy season.

<sup>9</sup> Isiolo County Integrated Development Plan 2018-2022

<sup>10</sup> International Crisis Group. 2017. Ethnic Contest and Electoral Violence in Northern Kenya, <https://refworld.org/docid/596f3fb54.html>



## 2.3. LOT 2: ISIOLO

### Information and Communication Technology

Just eight percent of the county's land area has mobile service coverage, complicating the use of PAYGO and mobile money payments for OGS companies. Most households do not have access to information about new technologies and gain exposure primarily through visiting and observing in the local markets or through radio broadcasts. Other notable sources of market information include information passed from peers and neighbors.

### Economics and Ability to Pay

The main economic activities include pastoralism and cattle trading, subsistence agriculture, tourism, small-scale trade, and limited harvesting of gum Arabica resin. Fifteen percent of the population are wage earners in Isiolo County, and the rest are engaged in different economic activities. Livestock provides 70 percent of income, small-scale businesses provide 20 percent, and tourism and wildlife provide ten percent.<sup>11</sup>

Due to Isiolo's good supply of water and pastureland, dairy-camel herders have converged to engage in the profitable trade of camel milk in Isiolo, supplying the larger Somali-populated Eastleigh market in Nairobi. The bulk of the camel milk is marketed through three main marketing groups, which target both men and women. The milk is also sold through retailers in Isiolo Town, including milk bars, vendors who are mostly women, and restaurants. This trade is deeply rooted in clan and family relations, with some individual traders of bulk camel-milk earning a monthly income of KSh 36,000 (\$ 331) during the dry season and KSh 50,000 (\$ 461) during the wet season.<sup>12</sup>

### Financial Services

There are nine commercial banks, five deposit-taking MFIs, mobile banking agents, and 35 SACCOs. The commercial banks are Kenya Commercial Bank, Equity, Sidiyan Bank, National Bank, Cooperative Bank, Post Bank, Barclays, First Community Bank, Family Bank, and Consolidated Bank. The MFIs are Faulu Kenya and Kenya Women Finance Trust. Mobile banking includes M-Pesa agents as well as agents from banks, such as Equity and Cooperative. Isiolo Teachers SACCO, Solution SACCO, and Transnational SACCO operate in the county. Dahabshil, an international money transfer company, is also available. These are all found in Isiolo Town. Merti and Garbatulla Sub-counties are serviced by M-Pesa and banking agents with no deposit-taking Front Office Savings Activities (FOSAs).


### Market Entry

OGS companies considering market entry in Isiolo County should consider partnerships with local stakeholders, including: the county government, CREOs, the Kenya School of Government Youth Center, camel-milk marketing groups and transporters, financial institutions (especially MFIs), the World Vision Imarisha Program, the Frontier Counties Development Council, Act!, the Nomadic Women for Sustainable Development, Anglican Development Services, Caritas Isiolo, the Catholic Diocese of Isiolo, Catholic Relief Services, and others.


<sup>11</sup> Government of Isiolo website. [isiolo.go.ke](http://isiolo.go.ke)

<sup>12</sup> IIED. 2015. Economic Contribution of the Camel Milk Trade in Isiolo Town, Kenya. <https://pubs.iied.org/sites/default/files/pdfs/migrate/I0123IIED.pdf>


## 2.4.LOT2:MARSABIT



**POPULATION**  
**330,381**  
(57,258 households)



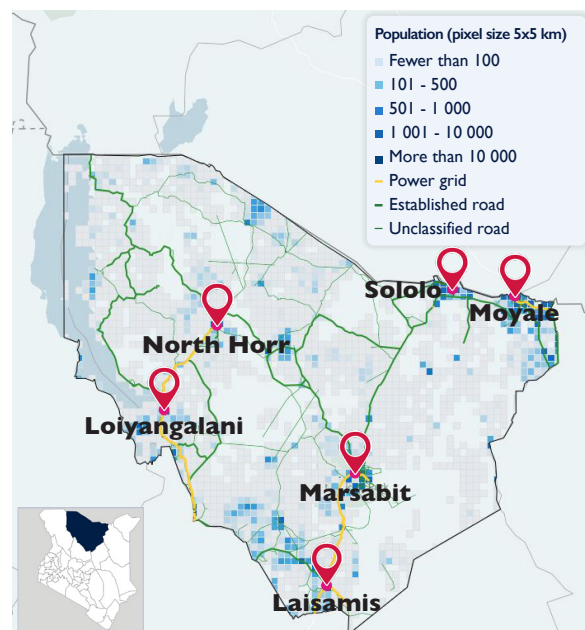
**ELECTRICITY ACCESS**  
**20%**  
(11,452 households)



**OFF-GRID POPULATION**  
**69.2%**  
(36,649 households)

Marsabit is the largest county centrally located at the northern tip of Kenya on the border with Ethiopia. The county borders Lake Turkana and Samburu County to the west.

The majority of the population of Marsabit practices pastoralism and livestock herding as productive assets. Communities here are very widespread and dispersed, with settlement patterns adjusting to water availability, land arability, and access to social services. There are more dense populations in the towns of Marsabit and Moyale, where the county's five major banks are located. Mobile network coverage reaches most urban centers and a fair amount of the rural population, but grid connectivity remains low in Marsabit.



### Infrastructure

Mini-grids	14
Post Offices	5
Courier Services	1+
Local Radio Stations	3
Paved Road Network (km)	N/A

### Population and the Grid (Households)

Electricity Access	20.0% (11,452)
Under-the-grid Population	26.2% (15,017)
Buffer Population	4.5% (2,592)
Off-grid Population	69.2% (39,649)
Served by Planned Mini-grids	521

### Off-Grid Characteristics

Total Settlements	58
High Potential Settlements	3
Health Facilities	50
Schools	77

### Off-Grid Accessibility (Distance from Road)

Within 1 km	30.7% (12,153)
Within 1-5 km	30.2% (11,993)
Beyond 5 km	39.1% (15,503)

### Financial Services

Financial inclusion (%)	N/A
Commercial Banks	Cooperative, Equity, First Community, KCB, Post
Micro-Finance Institutions	Equatorial Debit Solutions, Ltd., Liqui Solve, KWFT
Savings and Credit Cooperatives	N/A

### Economic Activities

Pastoralism and livestock herding for productive assets. Small stock like sheep and goats are used for petty cash. They are preferred due to higher reproduction frequency and drought resistance.

### Livestock Market Schedule

Monday Forole, Jirime, Moyale	Tuesday Jirime, Merile, Moyale	Wednesday Jirime, Moyale	Thursday Jirime, Moyale	Friday Jirime, Moyale	Saturday Jirime, Moyale
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### Renewable Energy Officer

✉ Jalle Gesile Gideon



**2.4.LOT2:MARSABIT****Market Centers**

Major market centers and economic activities: Marsabit Town, and Moyale Town

Other: Dabel, Godoma, Kargi, Korr, Loiyangalani, Nana, North Horr, Chalbi Centers along the Isiolo-Moyale Highway: Karare, Laisamis, Logologo, Manyatta Jillo, Merille, Sololo, and Turbi

**Electricity Connection**

Residents of Marsabit County use a broad energy mix to light their households. The total number of households with electricity connections is estimated at more than 11,000, mainly in the urban centers of Marsabit, Moyale, Sololo, and Laisamis. Additionally, 71.1 percent of households use kerosene for lighting, 61.4 percent use firewood, seven percent use candles, and 2.1 percent use standalone generators.

Only 6.7 percent of households are connected to and use electricity from either the Ethiopian grid or isolated mini-grids. To satisfy lighting needs, 1.5 percent of households use solar energy, either through solar lanterns or SHS. Even for those with PV systems, a major recurrent challenge is maintenance and the low capability of users and available technicians for repairs.<sup>13</sup>

The county currently has four isolated mini-grids situated in Laisamis, Marsabit Central, Maikona, and North Horr. Only isolated grids in Marsabit Central and Laisamis are currently operational. North Horr, which is awaiting commissioning, comprises 2.4 MW from diesel, 0.5 MW from wind, and 0.15 MW from solar. These isolated grids, together with the Moyale interconnection, currently serve an estimated 4,200 customers (connections), resulting in an electrification level in Marsabit County of 7.5 percent, which is significantly below the national electrification rate.

Most households connected to the isolated grids spend between KSh 1,000 and 2,000 (\$ 9 to \$ 18) per month on electricity. Kerosene, though the principal source of fuel for lighting, is costly and largely inaccessible due to the poor distribution infrastructure.

Table 8 Marsabit Sub-county Populations with Estimates of Off-grid Households

Sub-county	Population	Total Households	Estimated Off-grid Households
Loiyangalani	35,274	7,774	7,191
Marsabit Central	78,167	15,849	14,660
Marsabit North	49,056	7,521	6,957
Marsabit South	64,937	11,615	10,744
Moyale	108,223	17,709	16,381
North Horr	67,154	9,789	9,055
Sololo	44,339	7,238	6,695

Source: KNBS (2019)

<sup>13</sup> Marsabit County Sector Plan 2015-2025

## 2.4.LOT2:MARSABIT

### Local Dynamics

The population in Marsabit County predominantly resides in small, low-density settlements, making the provision of infrastructure and services more expensive. The two most significant towns are Marsabit and Moyale with emerging urban centers at Nana, Godoma, Dabel, Loiyangalani, Korr, Kargi, North Horr, and Chalbi. The Isiolo-Moyale highway is an important artery for transportation and logistics through the county. Merille, Laisamis, Logologo, Karare, Manyatta Jillo, Turbi, and Sololo all lie along this road. Cattle and camels are sold for major expenses or investments, such as dowries or children's school fees. Sheep and goats are used as petty cash for smaller family needs, such as purchasing clothing or cereals, and ensuring that food is always available in the house. This is important in customer acquisition, since it is likely that a sheep or goat will be sold to acquire a solar product.

Both women and men frequent market centers, with some making treks of up to 30 kilometers. Women frequent markets to purchase food and engage in petty trade, while men engage in livestock trade and participate in council of elders' meetings, commonly referred to as wazee baraza. The wazee baraza is an established institution that may be a good vehicle for off-grid energy companies to communicate to men about the benefits of solar products.

At a household level, while decisions are taken jointly, men typically have a final say on major expenses (e.g., school fees, large asset purchases). Women more traditionally are responsible for daily decisions, such as food purchases and healthcare products. Nevertheless, it is important for companies to engage both women and men as decisionmakers when marketing solar products. Both women and men own and use mobile phones and access informal financial services, but women are sometimes constrained due to their lack of national identity cards, which is a common phenomenon in the KSTs.

Marsabit County is one of the most conflict-prone counties in Kenya and has witnessed a spate of ethnic and inter-clan clashes that stem from competition for grazing land, water access points, ethnic territorial expansion, with accusations of political instigation. Conflicts between the ethnic groups of Borana and Gabra, which straddle Kenya and Ethiopia, are cyclical. It is, therefore, important to understand the conflict-prone areas.

### Accessibility

#### Road

Apart from the road from Nairobi to Moyale, most of the roads have a gravel and earth surface, making many of them impassable during rainy seasons.

#### Information and Communication Technology

Mobile phone coverage extends to all major urban centers and many rural areas. All major towns are connected to television services, and the entire county has radio signals covered by three local FM stations—Radio Jangwani (Catholic Church), SIFA, and Star Radio—running from Marsabit Central.

### Financial Services

There are five major banks in the county, based in Marsabit and Moyale towns: Kenya Commercial Bank (KCB), Equity Bank, Post Bank, Cooperative Bank of Kenya, and First Community Bank. Three MFIs also have a presence: Kenya Women Finance Trust, Equatorial Debit Solutions, Ltd., and Liqui Solve.

## 2.4.LOT2:MARSABIT

Equity Bank has opened several satellite branches in main urban centers, such as North Horr, Maikona, Laisamis, Loiyangalani, Dukana, and Sololo. Kenya Commercial Bank is also expected to roll out its agency networks within the county. Many Marsabit residents still prefer informal financial service mechanisms, such as shopkeepers, savings groups, and barter traders, because they are easy to access.

### Market Entry

Companies' awareness-raising efforts should target both men and women. Companies can consider using the wazee baraza to reach men to prioritize solar products when considering major household expenses. Companies should give priority to markets and areas where market risks are low—areas with stronger market integration, better road connectivity, financial services, and other services, such as sub-county headquarters. Companies should be aware of seasonal variations, which affect commodity prices. The lean seasons are usually July through September.

## 2.5. LOT 2: SAMBURU

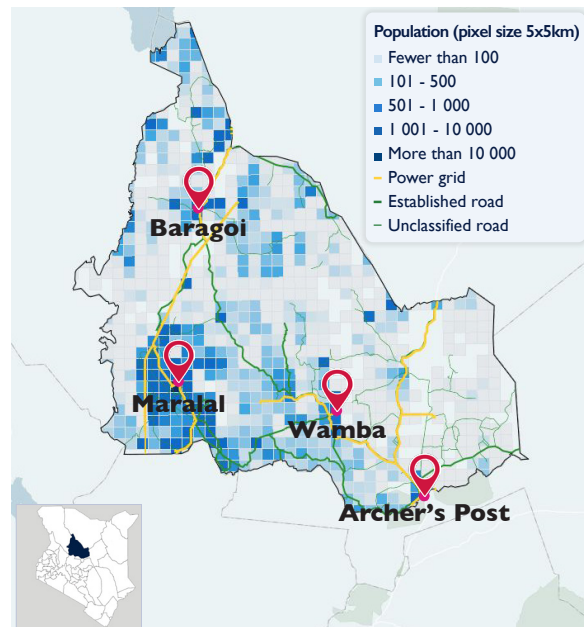
**POPULATION**  
**272,223**  
 (58,262 households)

**ELECTRICITY ACCESS**  
**14.8%**  
 (8,623 households)

**OFF-GRID POPULATION**  
**62.4%**  
 (36,329 households)

Samburu is a relatively small county in Kenya, situated at the southern tip of Lake Turkana, between Turkana and Marsabit County.

Pastoralism and herding are the dominant practices among the people of Samburu, although activities are more diversified on the Lorroki Plateau. Livestock marketing, rain-fed maize (corn) cropping, petty trade, and tourism serve as alternate sources of income.



### Infrastructure

Mini-grids	9
Post Offices	4
Courier Services	1
Local Radio Stations	3
Paved Road Network (km)	N/A

### Population and the Grid (Households)

Electricity Access	14.8% (8,623)
Under-the-grid Population	27.4% (15,979)
Buffer Population	10.2% (5,954)
Off-grid Population	62.4% (36,329)
Served by Planned Mini-grids	334

### Off-Grid Characteristics

Total Settlements	34
High Potential Settlements	2
Health Facilities	54
Schools	80

### Off-Grid Accessibility (Distance from Road)

Within 1 km	32.1% (11,657)
Within 1-5 km	36.9% (13,392)
Beyond 5 km	31.0% (11,280)

### Financial Services

Financial inclusion (%)	N/A
Commercial Banks	Equity, KCB, Post
Micro-Finance Institutions	Faulu, KWFT
Savings and Credit Cooperatives	Dumish, Supa, Tower, Trans National

### Economic Activities

Pastoralism (cattle, goats, sheep, and camels most importantly), herding, rain-fed maize cropping, petty trade, livestock marketing, and tourism.

### Livestock Market Schedule

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	Baragoi		Lolkuniani	Suguta	Lekuru

### Renewable Energy Officer

✉ Wyclef Munene Ngunu

**2.5. LOT2: SAMBURU****Market Centers**

Major market centers and economic activities: Baragoi, Legusaka, Lekuru, Lolkuniani, Lpusi, Maralal, Ndonyo Wasin, Porro, Sere-olipi, Suguta Marmar, and Wamba

Other: Archer's Post, Kisima, Loibor Nkare, and Loosuk

**Electricity Connection**

Nearly 15 percent of residents in Samburu County use electricity as their main source of lighting. A further 11 percent use lanterns, and 19 percent use tin lamps, while 61 percent use fuelwood. The Samburu West constituency has the highest level of electricity use, while Samburu North has the lowest level of electricity use.

There are a total of 30 trading centers, 13 of which are connected to electricity. Approximately 5,000 households in the main centers are connected to electricity.<sup>14</sup> The details of areas and potential customers are presented in Annex 3.

Table 9 Samburu Sub-county Populations with Estimates of Off-grid Households

Sub-county	Population	Total Households	Estimated Off-grid Households
Samburu North	66,879	13,284	12,460
Samburu East	77,136	18,424	17,282
Samburu Central	163,942	34,202	32,081

Source: KNBS (2019)

**Local Dynamics**

The Samburu people practice nomadic pastoralism, although in the recent past there, they have increasingly lived in settlements. The likely factor driving this shift has been changes in land tenure resulting from the formation of group ranches and reduction of communal land. Herd mobility takes place on a regular but gradual basis; during the rainy season or in areas where pastures were abundant, the elders set certain areas aside for either settlement or grazing. The majority of the households live in settlements called manyattas of various types, including combinations of sticks and mud or sticks and plastics/boxes. Approximately 34 percent of the population can read and write, which may hamper the benefits of communication on solar products, especially products with PAYGO functionality.

Across the three sub-counties, more than 60 percent of the population are persons below 18 years, while persons aged above 60 years constitute less than five percent of the population, indicating that the youth are important to the county.<sup>15</sup>

Like a few of the other Northern counties, in the recent past, Samburu County has experienced a series of ethnic clashes between tribes, leading to displacements and deaths, which has halted income-generating activities. Off-grid energy companies, therefore, need to keep up to date to identify hot spots.

<sup>14</sup> Main centers include Maralal, Suguta Marmar, Kisima, Loosuk, Loibor Nkare, Porro, Wamba, Archer's Post, Sere-olipi, and Baragoi.

<sup>15</sup> Reach Initiative. 2020. Vulnerability and Needs Assessment of Samburu East Sub-County. Available at [https://www.impact-repository.org/document/reach/bda3bddf/REACH\\_KEN\\_1905\\_Situation-overview\\_SAMBURU-East\\_MARCH2020.pdf](https://www.impact-repository.org/document/reach/bda3bddf/REACH_KEN_1905_Situation-overview_SAMBURU-East_MARCH2020.pdf).

**2.5. LOT 2: SAMBURU****Accessibility****Road**

The main access road to Samburu County is the road from Rumuruti-Maralal-Baragoi, which as of 2019, was being tarmacked from Rumuruti to Maralal.

Most of the other roads in the county have a gravel or earth surface, which make them mostly impassable during the rainy seasons.

**Information and Communication Technology**

There are four post offices in the county in Maralal, Baragoi, Suguta, and Wamba. Mobile network coverage in the county is 30 percent. Apart from the national radio stations, there are local radio stations, including Serian FM, Watchman FM, and Radio Mchungaji.

**Economics and Ability to Pay**

There are 4,215 wage earners in the public service, which include those on permanent and pensionable terms, those on contracts, and casual laborers. The private sector employs 3,000, which includes hotels, banks, retail stores, MFIs, insurance agencies, and private hospitals. Wage earners working for civil society organizations, Fixed Based Operators (FBOs), NGOs, and international nongovernmental organizations (INGOs) are approximately 5,000. Finally, roughly 3,000 individuals are self-employed. They are engaged in business activities, such as livestock marketing, poultry farming, clothing and textiles, the sale of secondhand clothes, apiaries, horticulture, and crop farming.<sup>16</sup> Drought and raids, however, threaten the activities of livestock and crop farming in the county and lead to poverty. The wage earners are, therefore, a target for off-grid energy companies' early sales in the county.

**Financial Services**

Kenya Commercial Bank (KCB), Equity Bank, and Post Bank operate in Samburu. MFIs in Samburu include Faulu Kenya and Kenya Women Finance Trust. The county also has some active mobile money agents and SACCOs. Dumisha SACCO and Supa SACCO have branches in Maralal, Baragoi, Wamba, and Archers Post; Tower SACCO has a branch in Maralal; and Trans National CCO has a branch in Wamba.

**Market Entry**

For ease of entry, off-grid energy companies can establish partnerships with projects active in the county, either implemented by the county government or NGOs. These institutions have established relationships and mechanisms that provide a platform for reaching out to the large potential customer base. These partnerships could be with Caritas Maralal, World Vision, and others. Companies can also explore financial institutions, such as SACCOs and MFIs, which can provide access to a pool of customers.

Like other counties, weekly livestock markets bring many people to one location and can be a good platform for awareness-raising. In Samburu, these markets include Lolkuniani, Poro, Lpusi, Suguta Marmar, Lekuru, Maralal Town, Legusaka, Sereolipi, Ndonyo Wasin. The schedules are provided in Annex I.

<sup>16</sup>Samburu County Integrated Development Plan 2018-2022

## 2.6. LOT 3: MANDERA

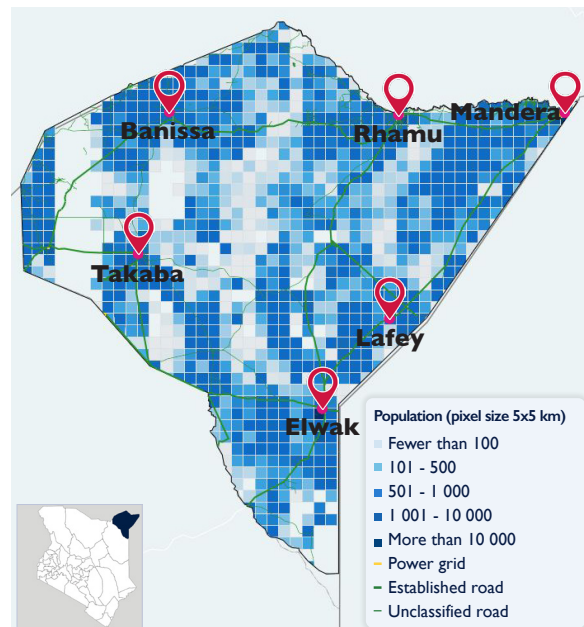
**POPULATION**  
**1,705,505**  
 (252,936 households)

**ELECTRICITY ACCESS**  
**15.2%**  
 (38,446 households)

**OFF-GRID POPULATION**  
**76%**  
 (192,154 households)

Mandera is a relatively small but heavily populated county that is situated in the North Eastern part of Kenya between Ethiopia in the north and Somalia in the east. Mobile network coverage and grid connectivity are very low outside of major urban centers like Mandera town.

An estimated 35 percent of residents in Mandera are wage earners. These include county staff, agricultural and quarry workers, and shopkeepers. Pastoralism trade contributes to 72 percent of the county’s total household income. Mobile money is used widely in the county, which could ease access to off-grid solar products through pay-as-you-go.



Infrastructure	
Mini-grids	30
Post Offices	4
Courier Services	3+
Local Radio Stations	N/A
Paved Road Network (km)	24

Population and the Grid (Households)	
Electricity Access	15.2% (38,446)
Under-the-grid Population	21.7% (54,765)
Buffer Population	2.4% (6,017)
Off-grid Population	76.0% (192,154)
Served by Planned Mini-grids	1,579

Off-Grid Characteristics	
Total Settlements	92
High Potential Settlements	26
Health Facilities	37
Schools	67

Off-Grid Accessibility (Distance from Road)	
Within 1 km	39.9% (76,751)
Within 1-5 km	31.5% (60,524)
Beyond 5 km	28.6% (54,879)

Financial Services	
Financial inclusion (%)	N/A
Commercial Banks	Equity, KCB, National
Micro-Finance Institutions	Takaful Insurance
Savings and Credit Cooperatives	N/A

**Economic Activities**  
 Livestock sale, livestock products, casual wage labor, and petty trade.

Livestock Market Schedule					
Monday Mandera, Rhamu, Banisa, Takaba	Tuesday Mandera, Rhamu, Banisa, Takaba	Wednesday Mandera, Rhamu, Banisa, Takaba	Thursday Mandera, Rhamu, Banisa, Takaba	Friday Mandera, Rhamu, Banisa, Takaba	Saturday Mandera, Rhamu, Banisa, Takaba

**Renewable Energy Officer**  
 ✉ Osman Hassan Mohamed

**2.6. LOT 3: MANDERA****Market Centers**

Major market centers and economic activities: Ashabito, Dandu, Rhamu Dimtu, Shambir Fatuma

Other: Arabia, Gither, Guticha, Khalalio, Laghsure, Marothile, Sala and Fino wards

Major towns with mobile coverage: Banisa, Eldanaba, Elwak, Guba, Kutulo, Lafey, Malkamari,

Mandera Town, Takaba, and Wargadud

**Electricity Connection**

Mandera East, Mandera North, Mandera South, and Mandera West Sub-county headquarters have electricity supply, as new electricity coverage extends to Lafey and Banissa Sub-counties. Slightly more than 15 percent of Mandera County residents use electricity for lighting. A further 33 percent use lanterns, 13 percent tin lamps, and 37 percent use wood.

The Mandera East constituency has the highest level of electricity use. The wards of Laghsure, Dandu, Gither, Ashabito, Guticha, Marothile, Rhamu Dimtu, Shambir Fatuma, Arabia, Khalalio, Sala, and Fino have no electricity access.

Mandera East, Mandera North, Mandera South, and Mandera West Sub-county headquarters have electricity supply, as new electricity coverage extends to Lafey and Banissa Sub-counties.<sup>17</sup>

Table 10 Mandera Sub-county Populations with Estimates of Off-grid Households

Sub-county	Population	Total Households	Estimated Off-grid Households
Banisa	152,043	24,285	23,678
Mandera West	97,983	14,274	13,917
Mandera East	158,586	25,904	25,256
Lafey	83,001	11,597	11,307
Mandera North	142,241	19,117	18,639
Mandera South	71,602	9,446	9,210

Source: KNBS (2019)

**Accessibility****Road and Air transport Network**

The county has one paved road, 24 km in length, while the surface of all other roads is murrum, which is a gravel-clay material. The county also has four functional airstrips in Rhamu, Elwak, Mandera, and Takaba.

**Information and Communication Technology**

The county has three main data and voice operators—Safaricom, Airtel, and Orange. The network signals are weak, with 2G network coverage at 30 percent while 3G is at six percent. There is mobile network coverage in the major towns of Elwak, Rhamu, Mandera Town, Takaba, Banisa. Mobile network coverage is also available in a few heavily populated areas, such as Ashabito, Wargadud, Guba, Malkamari, Dandu, Eldanaba, Shambir Fatuma, Kutulo, and Lafey.

<sup>17</sup> Mandera County Integrated Development Plan 2018-2022



## 2.6.LOT3:MANDERA

### Economics and Ability to Pay

An estimated 35 percent of residents in Mandera are wage earners. These include county staff, agricultural and quarry workers, and shopkeepers. Pastoralism trade contributes to 72 percent of the county's total household income.

### Financial Services

There are three banks in the county—Kenya Commercial Bank, Equity Bank, and National Bank. Equity Bank also has an auto branch in Elwak Town. There is also one MFI, Takaful Insurance, in Mandera East Sub-county. Across the county, a large percentage of the population uses mobile money. Money-transfer agents are also available locally—Hawilad has a presence in Elwak, Mandera Town, and some of the major towns.

### Market Entry

It is recommended that off-grid energy companies partner with organizations that have an existing presence, create relationships within the community, and liaise with organizations implementing programs in the county, such as Kenya Red Cross, Somali Aid, and others.

## 2.7. LOT 3: WAJIR

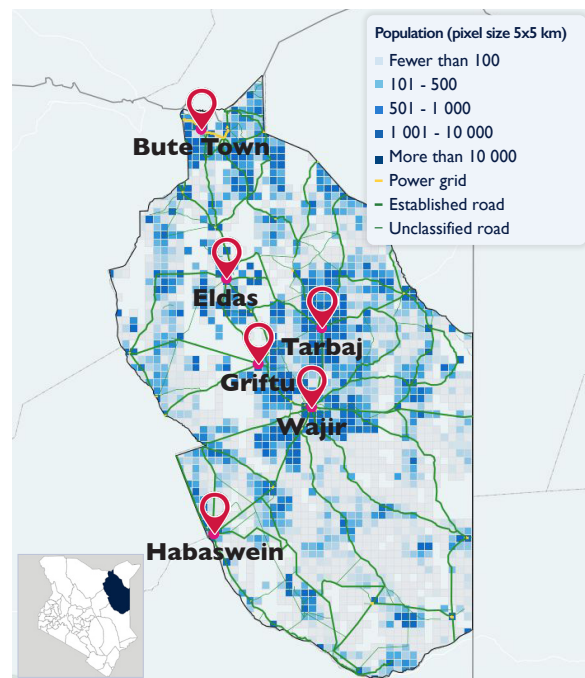
**POPULATION**  
**1,102,803**  
 (181,973 households)

**ELECTRICITY ACCESS**  
**13.9%**  
 (25,294 households)

**OFF-GRID POPULATION**  
**68.2%**  
 (124,106 households)

Wajir is a large county in east Kenya that is located on the border of Somalia, between Mandera and Marsabit Counties. Its capital and largest town is Wajir. In Wajir County, the population density is relatively low except in towns; this is attributed to vibrant economies in towns, driven by businesses, employment opportunities, and income-generating activities of the informal sector that are concentrated there.

The economy in Wajir is largely livestock-based and the county is a major supplier of the beef and small stock sold in Nairobi and Mombasa. Grid connectivity in Wajir is very low, but some of the major urban centers, such as Wajir and Griftu, are connected to diesel power plants.



Infrastructure	
Mini-grids	25
Post Offices	3
Courier Services	3+
Local Radio Stations	N/A
Paved Road Network (km)	N/A

Population and the Grid (Households)	
Electricity Access	13.9% (25,294)
Under-the-grid Population	29.9% (54,366)
Buffer Population	1.9% (3,501)
Off-grid Population	68.2% (124,106)
Served by Planned Mini-grids	1,720

Off-Grid Characteristics	
Total Settlements	85
High Potential Settlements	22
Health Facilities	69
Schools	67

Off-Grid Accessibility (Distance from Road)	
Within 1 km	31.6% (39,240)
Within 1-5 km	41.5% (51,528)
Beyond 5 km	26.9% (33,338)

Financial Services	
Financial inclusion (%)	N/A
Commercial Banks	Equity, First Commercial Bank, KCB
Micro-Finance Institutions	N/A
Savings and Credit Cooperatives	Crescent Takaful

**Economic Activities**  
 Pastoralism, livestock, and livestock products; thriving goat/sheep markets that trade daily; cattle and camels traded every Monday; small-scale crop agriculture.

Livestock Market Schedule					
Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Bute, Wajir	Bute	Bute	Bute	Bute	Bute, Habaswein

### Renewable Energy Officer

✉ Fahma Yussuf Adan

**2.7. LOT 3: WAJIR****Market Centers**

Major market centers and economic activities: Wajir

Other: Abakore, Bute, Eldas, Griftu, Habaswein, Lorian Swamp, and Tarbaj

**Electricity Connection**

Nearly 14 percent of residents in Wajir County have electricity access. Additionally, 31 percent use lanterns, and 17 percent use tin lamps. Twenty-nine percent use fuel wood. Among sub-counties, the Wajir East constituency has the highest level of electricity use at 15 percent. The Wajir North constituency has no level of electricity use. Township ward has the highest level of electricity use at 36 percent. Wajir, Griftu, Abakore, Tarbaj, Habaswein, and Eldas centers are connected to diesel mini-grids, which supply power to more than 20,000 households. Bute is connected to the Ethiopian electricity grid through Moyale.

Table 11 Wajir Sub-county Populations with Estimates of Off Grid Households

Sub-county	Population	Total Households	Estimated Off-grid Households
Wajir South	116,225	21,364	20,638
Wajir North	61,867	10,490	10,133
Wajir East	109,316	18,674	18,039
Tarbaj	56,983	9,378	9,059
Eldas	88,310	13,892	13,420
Wajir West	121,038	16,362	15,806
Buna	48,117	6,480	6,260
Habaswein	173,446	31,292	30,228

Source: KNBS (2019)

**Local Dynamics**

Wajir County is inhabited predominantly by people of Somali ethnic descent, accounting for 99 percent of the county population. The main Somali clans found in the county are the Ogaden (representing 95 percent of the population), Digodia, Ajwan, Gare, and Murwe.

Ogaden is divided into six main sub-clans: Auliyahan; Abduwak; Abdallah; Makabul; Mohamed Zubeir; and Bahgari. The main sub-clans in Wajir are Makabul, Mohamed Zubeir, and Bahgari. The Bahgari are still predominantly pastoral.

Muslims comprise 99 percent of the population, and religious leaders play a significant role in decisions that affect their communities. Still, clan affiliation is even more influential to community decisions than religious leaders. These two dynamics are important for off-grid energy companies to consider when identifying key influencers to engage in town and communities.

Most of the urban settlements in the county are found in the sub-county headquarters, which also serve as market centers. Other settlements center around clans and pastoral resources, such as grazing reserves and watering points. These settlements often double as locations for other administrative services. The rural population predominantly leads a pastoralist lifestyle.

## 2.7. LOT 3: WAJIR

### Economics and Ability to Pay

Roughly 70 percent of the population is self-employed in pastoral activities. The livestock value chain, which includes livestock and livestock products marketing is a major earner. An estimated 10,000 people are employed in livestock value-addition-related activities; between 2,000 and 3,000 people in quarry activities; 6,000 people in carpentry; 1,000 people in tailoring, and about 5,000 people in the crafting of mats, thatches, and beads as part-time income-generating activities.

### Market Entry

Considering the dynamics in Wajir County, off-grid energy companies need to consider working with local traders as agents. Traders understand local social and cultural dynamics, including clans and how clans influence business. Of importance is the understanding of local insecurity hotspots.

## 2.8. LOT 4: GARISSA

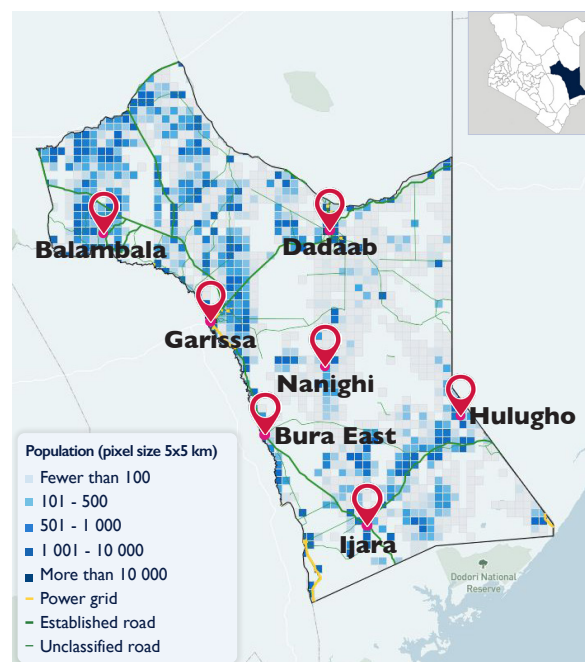
**POPULATION**  
**1,013,306**  
 (174,811 households)

**ELECTRICITY ACCESS**  
**22.4%**  
 (39,158 households)

**OFF-GRID POPULATION**  
**47.8%**  
 (83,583 households)

Garissa is a large county located in eastern Kenya with its side along the Somalian border. This border has been a source of security issues for the county, and there have been attacks in recent years, primarily in Fafi sub-county. The county’s settlement pattern consists of six urban and commercial centers with populations of fewer than 10,000 inhabitants, namely Balambala, Bura East, Dadaab, Hulugho, Modogashe, and Nanighi. In addition, Garissa and Masalani Townships have populations of fewer than 10,000 inhabitants.

Most of the county’s population practices pastoralism. Livestock include indigenous sheep, goats, and cattle – found in the southern parts of Garissa, which receive more rain – and camels in the drier north. Agriculture is also more active along the Tana River, with an average farm size of 1.3 hectares. Some pastoralists also cross county lines in search of pastures.



Infrastructure	
Mini-grids	17
Post Offices	6
Courier Services	6+
Local Radio Stations	N/A
Paved Road Network (km)	N/A

Population and the Grid (Households)	
Electricity Access	22.4% (39,158)
Under-the-grid Population	48.0% (83,974)
Buffer Population	4.1% (7,254)
Off-grid Population	47.8% (83,583)
Served by Planned Mini-grids	1,092

Off-Grid Characteristics	
Total Settlements	76
High Potential Settlements	13
Health Facilities	70
Schools	66

Off-Grid Accessibility (Distance from Road)	
Within 1 km	39.0% (32,560)
Within 1-5 km	25.5% (21,272)
Beyond 5 km	35.6% (29,751)

Financial Services	
Financial inclusion (%)	N/A
Commercial Banks	Barclays, Cooperative, Equity, First Community, Gulf, KCB, National, Post
Micro-Finance Institutions	KWFT
Savings and Credit Cooperatives	Amaco, Garissa Teacher’s, REMA, Takaful

Economic Activities
Pastoralism and agriculture

Livestock Market Schedule					
Monday Hulugho, Ijara, Modogashe	Tuesday	Wednesday Garissa	Thursday	Friday	Saturday

**Renewable Energy Officer**  
 ✉ Salah Abdi Maalim

**2.8. LOT 4: GARISSA****Market Centers**

Major market centers and economic activities: Garissa and Masalani Towns

Other: Balambala, Bura East, Dadaab, Fafi, Hulugho, Lagdera, Modogashe, and Nanighi

There are 19 market centers throughout the county.

**Electricity Connection**

Garissa County electricity access is estimated at just over 22 percent. Access is concentrated in Garissa, Ijara, Dadaab, Bura East, Balambala, Modogashe, and their environs. A further 19 percent use lanterns, and 31 percent use tin lamps. Only 13 percent use fuel wood. The constituency of Garissa Township has the highest level of electricity use in the county at 53 percent. Township Ward in Garissa Township has the highest level of electricity use at 92 percent. Eight wards have no electricity access.

Table 12 Garissa Sub-county Populations with Estimates of Off-grid Households

Sub-county	Population	Total Households	Estimated Off-grid Households
Garissa Township	161,951	30,518	26,978
Balambala	31,819	4,337	3,834
Lagdera	49,852	8,340	7,373
Daadab	183,410	35,793	31,641
Fafi	133,746	23,671	20,925
Ijara	141,418	18,481	16,337

Source: KNBS (2019)

**Local Dynamics**

The county is predominantly inhabited by the Somali community, and clan affiliation determines settlement patterns. The predominant clan is Ogaden, which accounts for approximately 95 percent of the population. Ogaden is divided into six main sub-clans: Auliyahan, Abduwak, Abdallah, Makabul, Mohamed Zubeir, and Bahgari. The main sub-clans in Garissa are Auliyahan, Abduwak, and Abdallah.

Muslims comprise 99 percent of the population, and religious leaders play a significant role in decisions that affect their communities. Still, clan affiliation is even more influential than religious leaders. These two dynamics are important to consider when identifying key influencers to engage in towns and communities. Garissa has a long border with Somalia for which insecurity a major concern. Security concerns are greatest in Fafi sub-county, which is very rural and has relatively poor infrastructure.

**Accessibility****Road Network**

The county roads are mainly gravel and earth. They are in poor condition, and most of them are rendered impassable during the rainy season, which curtails all movement by road in the county. The county has three bridges across River Tana that are in good condition. Movement across Laghas (seasonal rivers) is facilitated through concrete drifts that are also rendered impassable during floods. There are eight airstrips in the county: Garissa, Lagdera, Hulugho, Fafi, Balambala, and Ijara having one each, and Dadaab has two.

## 2.8. LOT 4: GARISSA

### Information and Communication Technology

Three mobile service providers serve the county (Safaricom, Telkom, and Telkom) with 62-percent coverage. However, a large section of the county still has no network coverage, especially in Balambala and Fafi. The radio coverage is more than 95 percent, since most of the rural population depends on radio for news.

### Financial Services

The county is served by a total of 22 financial institutions. These include nine commercial banks, 13 village banks, and one MFI. The financial institutions are Kenya Commercial Bank, National Bank, Cooperative Bank, Barclays Bank, Equity Bank, Gulf Bank, Post Bank, First Community Bank, Kenya Women Finance Trust, and others. In addition, there are also ten SACCOs, including Garissa Teachers, Rema, and others, and two insurance companies, including Takaful and Amaco. Most of these financial institutions are based in Garissa Township.

### Market Entry

Considering the dynamics in Garissa County, off-grid companies will need to consider working with local traders as agents that understand the social and cultural dynamics, including clans and how clans can influence the business. It also critically important for companies to understand the local insecurity hotspots.

## 2.9. LOT 4: LAMU

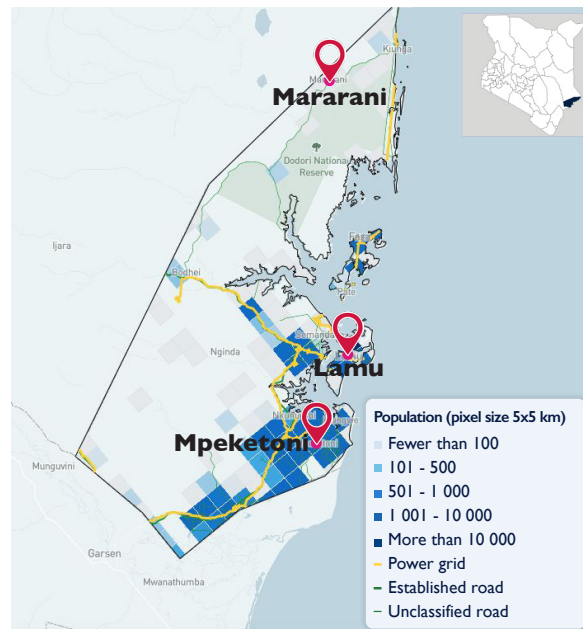
**POPULATION**  
**99,991**  
 (23,255 households)

**ELECTRICITY ACCESS**  
**43.6%**  
 (10,139 households)

**OFF-GRID POPULATION**  
**30.9%**  
 (7,196 households)

Lamu is a small county that is situated in southern Kenya, along the Indian Ocean. Lamu's northern border is shared with Garissa County, while Tana River County borders Lamu to the west. The highest population densities are within town centers and archipelago villages. Population distribution is concentrated where economic activities arise, with livestock raising, fishing, and trade being the most common forms.

Ninety percent of rural household incomes are derived from agriculture and agriculture-related activities. Electrical connectivity in Lamu is low, but mobile network coverage reaches roughly 75 percent of the population.



### Infrastructure

Mini-grids	3
Post Offices	5
Courier Services	1
Local Radio Stations	N/A
Paved Road Network (km)	N/A

### Population and the Grid (Households)

Electricity Access	43.6% (10,139)
Under-the-grid Population	50.7% (11,779)
Buffer Population	18.4% (4,280)
Off-grid Population	30.9% (7,196)
Served by Planned Mini-grids	137

### Off-Grid Characteristics

Total Settlements	7
High Potential Settlements	None
Health Facilities	25
Schools	26

### Off-Grid Accessibility (Distance from Road)

Within 1 km	50.9% (3,659)
Within 1-5 km	43.8% (3,150)
Beyond 5 km	5.4% (386)

### Financial Services

Financial inclusion (%)	N/A
Commercial Banks	Cooperative, Diamond Trust, Equity, KCB, Gulf Africa, Selic Capital
Micro-Finance Institutions	Faulu, KWFT, Yehu
Savings and Credit Cooperatives	Lamu Teacher's

### Economic Activities

Agriculture and agricultural-related activities, tourism, wage employment, and urban self-employment.

### Livestock Market Schedule

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Amu, Faza, Kiunga, Mokowe, Nagele	Amu, Faza, Kiunga, Mokowe, Nagele	Amu, Faza, Kiunga, Mokowe, Mpeketoni, Nagele	Amu, Faza, Kiunga, Mokowe, Nagele	Amu, Faza, Kiunga, Mokowe, Nagele	Amu, Faza, Kiunga, Mokowe, Mpeketoni, Nagele

### Renewable Energy Officer

✉ George Otula Nyagwa



**2.9. LOT 4: LAMU****Market Centers**

Major market centers and economic activities: Amu Heritage Town, Lamu Town, Mpeketoni Central, Other: Basuba, Hindi, Katsakairu, Kiunga, Kizingitini, Mhamarani, Mkokoni, Mkomani, Moa, Mokowe, Pate, Siyu, and Witu Pate Island has a large population in the biggest villages of Faza and Kizingitini

**Electricity Connection**

Close to 44 percent of Lamu County residents have access to electricity. A further 33 percent use lanterns, 39 percent use tin lamps, and two percent use fuel wood. Lamu West Constituency has the highest level of electricity use at 19 percent. Lamu East Constituency has the lowest connectivity at eight percent. Mkomani Ward has highest level of electricity use at 57 percent. Basuba Ward has no electricity connections.

Table 13 Lamu Sub-county and Division Populations with Estimates of Off-grid Households

Sub-county	Division	Population	Total Households	Estimated Off-grid Households
Lamu East	Amu	30,189	7021	5617
	Hindi	14,442	3359	2687
	Mpeketoni	49,303	11466	9173
	Witu	17,689	4114	3291
Lamu West	Kizingitini	11265	2620	2096
	Faza	8,877	2064	1652
	Kiunga	5,288	1230	984

Source: KNBS (2019)

**Local Dynamics**

The population distribution in the county is influenced by several factors, including access to economic opportunities, such as agriculture, livestock keeping, fishing, and trade. This trend can be demonstrated by the fact that more than 50 percent of the county population lives in Amu and Mpeketoni in Lamu West Constituency; whereas, Lamu East Constituency accounts for just 17 percent of the county's population. Witu is dominated by livestock activity and is occupied mainly by the Orma community. The mainland areas of Mpeketoni, Hindi, and Witu with huge arable land are important for food security. Livestock, especially cattle, goats, sheep, and poultry are kept in Mpeketoni and Hindi. Ndaou and Siyu are mainly occupied by the Bajuni community. Kiunga is inhabited by the Boni and Bajunis communities. The low density in Kiunga, Witu, and Hindi is attributed to poor infrastructure, a lack of essential services, and a long history of insecurity in the area.<sup>18</sup>

<sup>18</sup>Lamu County Integrated Development 2018-2022

**2.9. LOT 4: LAMU****Accessibility****Transport**

Because Lamu is a coastal county with some heavily populated islands, air and sea transportation are just as important as road infrastructure. Lamu Island has the majority of the county's inhabitants. Lamu residents living in Amu Heritage Town, Langoni, Wiyuooni, Shella, Matondoni Village, and Kipungani Village are connected to the mainland via the Mokowe Jetty. However, within Lamu Island, the settlements are not well linked by road infrastructure, and there are no motorable roads except along the seashore. The preferred modes of transport on streets and within settlements by extension are donkeys, walking, and cycling.

Pate Island has a large population concentrated in its largest villages (Faza and Kizingitini), which include approximately 8,000 and 6,000 people, respectively.<sup>19</sup> The island settlements are connected through one major Class-E road, which connects with all other roads. Donkeys are the major transport mode in Amu and Pate. The roads are unpaved and often impassable during rainy seasons. All settlements within the island from Faza Village—including Tchundwa, Nyabogi, Mbwajumwali, Kizingitini, Siyu, and Shanga—are connected by the major road to the Mtangawanda Jetty.

**Information and Communication Technology**

As of November 2018, the mobile service coverage was estimated to cover 75 percent of the county, and 80 percent of the population owned a mobile phone.

**Economics and Ability to Pay**

There are only two physical markets for farm produce in Lamu County—one in Amu and one in Mpeketoni. The county government administers these markets. Markets in other areas of Witu, Hindi, Kiunga, and Faza are mostly vegetable kiosks situated in the town centers and along the major roads. The kiosks mainly sell vegetables, fruits, and cereals sourced from local farmers.

**Financial Services**

Lamu County has eight commercial banks and several other non-bank financial institutions providing financial services to residents. These are the Lamu Teachers SACCO, Selic Capital, KCB, Equity Bank, Gulf Africa Bank, Diamond Trust Bank, Kenya Women Finance Trust, Lamu Teachers SACCO, Cooperative Bank, Faulu, and Yehu. However, these institutions are all located in Lamu West Sub-county in Lau, Mpeketoni, Hindi, and Witu. Agency banking and mobile money-service providers are located in almost all of the trading centers.

<sup>19</sup> KNBS, 2009.

## 2.10. LOT 4: TANA RIVER

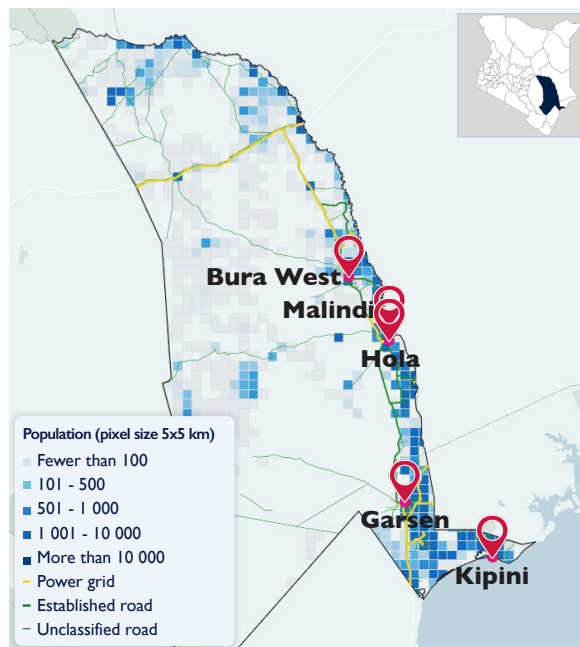
**POPULATION**  
**271,724**  
 (58,921 households)

**ELECTRICITY ACCESS**  
**25.4%**  
 (14,996 households)

**OFF-GRID POPULATION**  
**62.9%**  
 (37,063 households)

Tana River is a large county with a small border along the Indian Ocean, situated between Kilifi and Lamu Counties. The majority of Tana River is situated between Kitui County (west) and Garissa County (east). The road network in Tana River is over 3,000 kilometers long, but grid connectivity remains low. Mobile network coverage reaches just over half of the county’s population.

Most people in Tana River have livelihoods in agriculture, but nearly two-thirds of the county’s population are experiencing absolute poverty, which makes food security the highest priority for most households. The county is largely dry and prone to drought.



### Infrastructure

Mini-grids	6
Post Offices	3
Courier Services	4+
Local Radio Stations	1
Paved Road Network (km)	1,688

### Population and the Grid (Households)

Electricity Access	25.4% (14,966)
Under-the-grid Population	29.0% (17,078)
Buffer Population	8.1% (4,780)
Off-grid Population	62.9% (37,063)
Served by Planned Mini-grids	282

### Off-Grid Characteristics

Total Settlements	93
High Potential Settlements	2
Health Facilities	37
Schools	116

### Off-Grid Accessibility (Distance from Road)

Within 1 km	45.6% (16,884)
Within 1-5 km	30.3% (11,241)
Beyond 5 km	24.1% (8,937)

### Financial Services

Financial inclusion (%)	N/A
Commercial Banks	Cooperative, Equity, KCB
Micro-Finance Institutions	1
Savings and Credit Cooperatives	1

### Economic Activities

Agriculture

### Livestock Market Schedule

Monday	Tuesday Bangale	Wednesday Bura	Thursday	Friday	Saturday Bura, Garsen
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### Renewable Energy Officer

✉ Jackbed Gakii Mugo

**2.10. LOT 4: TANA RIVER****Market Centers**

Major market centers and economic activities: Garsen and Hola  
Other: Bangale, Bura, and Chewani

**Electricity Connection**

Slightly more than 25 percent of Tana River County households have access to electricity. A further 20 percent use lanterns, 67 percent use tin lamps, and six percent use fuel wood. Galole Constituency has the highest level of electricity use at three percent. Chewani Ward in Galole has the highest level of electricity use at seven percent. Bangale Ward in Bura Constituency has no electricity connections.

Table 14 Tana River Sub-county Populations with Estimates of Off-grid Households

Sub-county	Population	Total Households	Estimated Off-grid Households
Galole (Tana River)	87,954	18,565	18,101
Bura (Tana North)	110,293	22,791	22,221
Garsen (Tana Delta)	116,463	26,886	26,214

Source: KNBS (2019)

**Local Dynamics**

In Tana River County, 62 percent of the population, a relatively high proportion, live in absolute poverty. This low level of income has a direct impact on the population's ability to meet basic needs, such as food, water, health, and education for all ages. The priority for most households is food security. Conflicts have occurred between farmers and nomadic people over access to water. Flooding is also a regular problem, caused by heavy rainfall in upstream areas of the Tana River. It is against this background that the county was selected for the Regional Pastoral Livelihoods Resilience Project (RPLRP)<sup>20</sup> a World Bank aided project to enhance livelihood resilience of pastoral and agro-pastoral communities in cross-border drought prone areas of Ethiopia, Kenya and Uganda Countries and improve the capacity of these Countries' governments to respond promptly and effectively to an eligible crisis or emergency.

**Accessibility****Road network**

Of the 3,377 km of road network in Tana River County, 55 percent of it is in usable condition. One of the major roads in the county is the Madogo-Hola-Malindi road, which is in poor condition and impassable at various points during heavy rains.

**Information and Communication Technology**

Three mobile phone service providers (Safaricom, Airtel and Telkom) cover 55 percent of the county. However, these services are concentrated along the Garissa-Malindi road. There are three post offices in the county, located at Bura, Hola, and Garsen. The Kenya Broadcasting Corporation (KBC) Radio is the only media house that has a signal in the county. Mobile banking is relatively well distributed within the county, though it is more limited in areas with limited mobile-service coverage.

<sup>20</sup> Regional Pastoral Livelihoods Resilience Project. <http://www.resilience.go.ke/tana-river/>

## 2.10. LOT 4: TANA RIVER


### Financial Services

There are two national banks (KCB and Equity bank), three bank agencies (KCB, Equity Bank, and Coop Bank), one SACCO, one MFI, and ten village banks in the county. The banks, SACCOs, and the MFIs are in Hola and Garsen, which have electricity connections with many commercial activities. Despite the existence of financial institutions, access to financial credit (loans and insurance) is very low. The lack of awareness about credit services, particularly among farmers and pastoralists is also a contributing factor.


### Market Entry

Off-grid companies are encouraged to work with local community organizations such as village savings groups and livelihoods projects. Market days also present an opportunity to reach a large number of potential customers.


## 2.11. LOT 5: KILIFI



**POPULATION**  
**1,279,758**  
 (265,082 households)



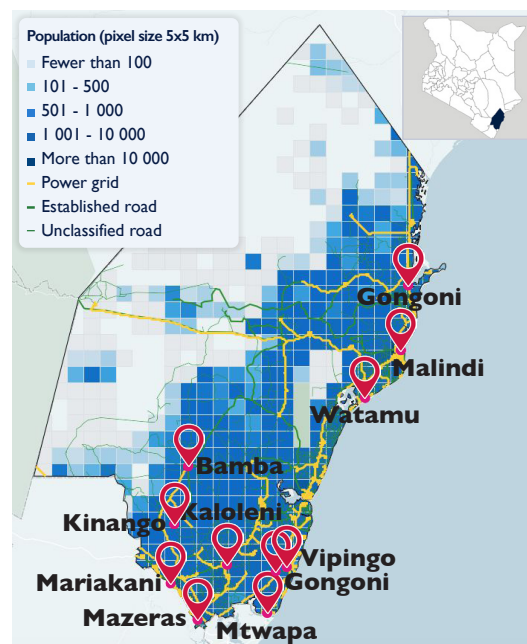
**ELECTRICITY ACCESS**  
**35.9%**  
 (95,164 households)



**OFF-GRID POPULATION**  
**20.6%**  
 (54,571 households)

Kilifi is a moderately sized county that borders the Indian Ocean in southern Kenya. Kilifi also borders Tana River, Taita Taveta, and Kwale County. Out of 78 trading centers in the county, 50 are electrified. Mobile network coverage reaches 75 percent of the total population.

Tourism and fishing are major economic activities due to the county's proximity to the Indian Ocean. The county also has some of the most popular beaches, hotels, and resorts in the country, but 64 percent of households in the county still lack electricity access.



### Infrastructure

Mini-grids	3
Post Offices	7
Courier Services	6
Local Radio Stations	N/A
Paved Road Network (km)	N/A

### Population and the Grid (Households)

Electricity Access	35.9% (95,164)
Under-the-grid Population	61.2% (162,304)
Buffer Population	18.2% (48,208)
Off-grid Population	20.6% (54,571)
Served by Planned Mini-grids	33

### Off-Grid Characteristics

Total Settlements	45
High Potential Settlements	2
Health Facilities	67
Schools	163

### Off-Grid Accessibility (Distance from Road)

Within 1 km	74.1% (40,450)
Within 1-5 km	22.9% (12,501)
Beyond 5 km	3.0% (1,620)

### Financial Services

Financial inclusion (%)	N/A
Commercial Banks	Barclays, Chase, Cooperative, Diamond Trust, Eco, Equity, Imperial, Jamii, KCB, KWFT, National, NIC, Post, Sidian, Stanbic, Standard Chartered
Micro-Finance Institutions	Fadhili, Faulu, Jitegemee, KWFT, Platinum Finance, Rafiki Microfinance, SMEP
Savings and Credit Cooperatives	Imarika, Lengo (there are over 171 in the county)

### Economic Activities

The Kilifi county boasts 78 trading centers with 31,998 licensed retailers and 641 wholesalers.

### Livestock Market Schedule (Not available)

### Renewable Energy Officer

✉ Habel Mwatata Mwarabu



**2.11. LOT 5: KILIFI****Market Centers**

Major market centers and economic activities: Kaloleni, Kilifi, Malindi, Mariakani, Mtwapa, and Watamu  
Other: Bamba

**Electricity Connection**

According to the Kilifi County Integrated Development Plan (CIDP) for 2013-2017, out of the 78 trading centers in Kilifi, 50 are connected to electricity. Nearly 36 percent of households in Kilifi County have electricity access, and six percent use solar as their main source of lighting. A further 17 percent use lanterns, and 63 percent use tin lamps. Two percent use fuel wood. The Malindi constituency has the highest level of electricity use at 29 percent. The Ganze constituency has the lowest level of electricity use at six percent.

Table 15 Kilifi Sub-county Populations with Estimates of Off-grid Households

Sub-county	Population	Total Households	Estimated Off-grid Households
Kilifi North	177,527	39,512	32,913
Kilifi South	203,891	53,074	44,211
Ganze	143,590	23,258	19,374
Malindi	326,991	73,547	61,265
Magarini	190,644	33,017	27,503
Kaloleni	192,905	36,355	30,284
Rabai	120,479	24,809	20,666
Chonyi	62,318	11,421	9,514
Kauma	22,613	3,479	2,898

Source: KNBS (2019)

**Local Dynamics**

Kilifi County is predominantly inhabited by the Mijikenda community with representatives of the other tribes of Kenya and foreigners.

**Accessibility**

Kilifi County has a network of roads of differing quality and a 40-km rail network which forms part of the Mombasa-Kisumu railway stretch passing through Kaloleni Sub-county. The county is covered by all the major mobile-telephone service providers with mobile-telephone coverage of 75 percent. The county has seven post offices.

**Financial Services**

The county is served by 14 commercial banks and ten microfinance institutions (MFIs), which are mainly located in major towns, such as Mtwapa, Mariakani, Kilifi and Malindi. Major banks include KCB, Co-operative Bank, Equity, Sidian, National Bank, Post Bank, Eco Bank, Kenya Women Finance Trust Bank, NIC, Barclays, Standard Chartered, Stanbic, Jamii Bank, Chase Bank, Imperial, and Diamond Trust Bank.

## 2.1.1. LOT 5: KILIFI

The main MFIs in the county include Rafiki Microfinance, SMEP, Faulu, Yehu, Kenya Women, Fadhili, Platinum Credit, Jitegemee, and others. Most financial institutions are in major towns, effectively limiting access to banking and financial services for those residing in remote areas, such as Rabai, Magarini, and Ganze. However, to some extent, the presence of merry-go-rounds, table banking, Village Savings and Loans associations (VSLAs), Savings and Credit Societies (SACCOs), agency banking, and mobile money agents have helped alleviate this problem. Cash-transfer programs in the county have introduced banking services to the unbanked segment of the community, including the elderly, orphans, vulnerable children, and other vulnerable members of the community, thereby boosting the demand for banking services in the rural areas.

SACCOs remain the most vibrant societies in the subsector and have continued to register tremendous growth in recent times. The county boasts 171 SACCOs, of which two are licensed to carry out deposit-taking business, using the FOSA model. These SACCOs can broadly be classified as urban and rural SACCOs, and they play an important role in mobilizing savings from their members and giving out affordable loans. The two SACCOs that undertake FOSA are Lengo and Imarika SACCOs. Lengo has branches in Malindi and Kilifi, while Imarika has branches in Kilifi, Mtwapa, Malindi, Bamba, and Mariakani.

### Market Entry

Off-grid companies are encouraged to engage with the community through community organizations (such as Kwetu Training Center), agricultural cooperatives as well as other cooperatives that could facilitate access to a large number of income earning customers. Market days also present an opportunity to reach a large number of potential customers, for example Tezo open air market attracts about 3,000 people weekly. There is also an opportunity for companies to align themselves with gender empowerment programs in the county. Off-grid companies may also engage the County government which has set up the Kilifi County Microfinance (Mbegu) fund that provides seed capital and training to small and medium enterprises.



## 2.12. LOT 5: KWALE

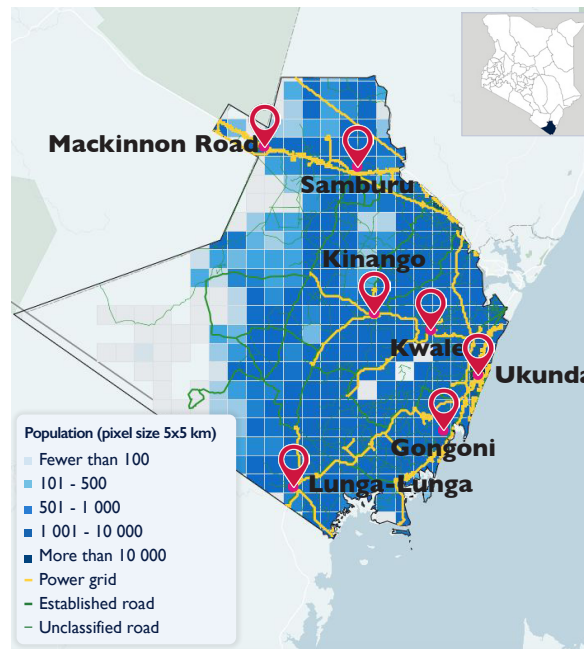
**POPULATION**  
**721,184**  
 (145,435 households)

**ELECTRICITY ACCESS**  
**28.9%**  
 (42,031 households)

**OFF-GRID POPULATION**  
**36.7%**  
 (53,380 households)

Kwale is Kenya’s southernmost county, which is situated with the Tanzanian border to the south and the Indian Ocean to the east.

Agriculture is one of the main economic activities carried out in Kwale County, with 85 percent households practicing subsistence farming. The agricultural sector plays a crucial role in guaranteeing food security, poverty reduction, and employment creation in the county.



### Infrastructure

Mini-grids	8
Post Offices	7
Courier Services	4+
Local Radio Stations	6
Paved Road Network (km)	N/A

### Population and the Grid (Households)

Electricity Access	28.9% (42,031)
Under-the-grid Population	46.3% (67,393)
Buffer Population	17.0% (24,661)
Off-grid Population	36.7% (53,380)
Served by Planned Mini-grids	307

### Off-Grid Characteristics

Total Settlements	80
High Potential Settlements	1
Health Facilities	40
Schools	155

### Off-Grid Accessibility (Distance from Road)

Within 1 km	70.6% (37,686)
Within 1-5 km	26.1% (13,957)
Beyond 5 km	3.3% (1,737)

### Financial Services

Financial inclusion (%)	N/A
Commercial Banks	Equity, KCB, Post
Micro-Finance Institutions	KWFT, Yehu
Savings and Credit Cooperatives	N/A

### Economic Activities

Agriculture, education, general labor, mining, and tourism. Tourism significantly contributes to the economy of Kwale County, with employment mainly concentrated in the hospitality sector, catering to tourist sites, such as the natural marine reserves, historic sites, forests, coral and sand beaches, and wildlife habitats.

### Livestock Market Schedule (not available)

### Renewable Energy Officer

✉ Salama Mwafrika Mwasafari

## 2.12. LOT 5: KWALE

### Market Centers

Major market centers and economic activities: Kwale, Msambweni, and Ukunda  
Other: Diani and Kinango

### Electricity Connection

Nearly 30 percent of Kwale County households have access to electricity. A further 17.6-percent use lanterns, and 41.8 percent use tin lamps. Msambweni Sub-county has the highest level of electricity use at 27 percent, while Kinango and Lunga-Lunga have the lowest levels of electricity use. In Msambweni, Ukunda Ward has the highest level of electricity access at 44 percent.

Table 16 Kwale Sub-county Populations with Estimates of Off-grid Households

Sub-county	Population	Total Households	Estimated Off-grid Households
Matuga	192,999	39,231	35,073
Kinango	93,789	16,043	14,342
Msambweni	173,213	45,466	40,647
Lunga-Lunga	198,195	37,366	33,405
Samburu-Kwale	200,552	35,070	31,353

Source: KNBS (2019)

### Local Dynamics

Kwale County is inhabited mainly by the native populations of Digo and Durumas communities, but there are also other Kenyan and foreign communities. In the arid and semi-arid areas, the population is dispersed/scattered due to harsh climatic conditions and poor infertile soils.

### Accessibility

#### Road network

The surfaces of the road networks include bitumen, gravel, and earth. They are passable most of the year.

#### Information and Communication Technology

The three major mobile telephone service providers cover about 75 percent of the county and have good coverage for major towns, such as Kwale, Ukunda, Diani, Msambweni, and Kinango. Equally, coverage extends to most of the highway from Likoni to Lunga-Lunga as well as the Mombasa–Nairobi Highway.

However, most of the hinterland areas experience a patchy mobile-network connection. The most affected areas include Kubo Division, Vanga, Samburu, Ndavaya, and parts of Lunga-Lunga. Access and uptake of ICT has increased.

Over 75 percent of households in the county own radios, making it the most prevalent medium of communication. Television coverage is mainly concentrated in urban centers. KTN, KBC, Citizen, KISS Radio, and NTV media channels cover the areas.

## 2.12. LOT 5: KWALE

### Financial Services

The county is served by more than ten commercial banks and five MFIs. Most of the banking services are distributed within Ukunda and Kwale towns, thus limiting banking and financial services access to majority of the residents of Kinango, Lunga-Lunga, and Msambweni Sub-counties. Kwale Town is served by KCB, Equity, Post Bank, Yehu Microfinance, and the Kenya Women Finance Trust (KWFT).

### Market Entry

Social networks are important in the county, especially in the interior, therefore off-grid companies are encouraged to engage closely with cooperatives in agriculture, fishing, and other SACCOs, as well as local markets, grass root youth initiatives, and other NGOs.

## 2.13. LOT 6: NAROK

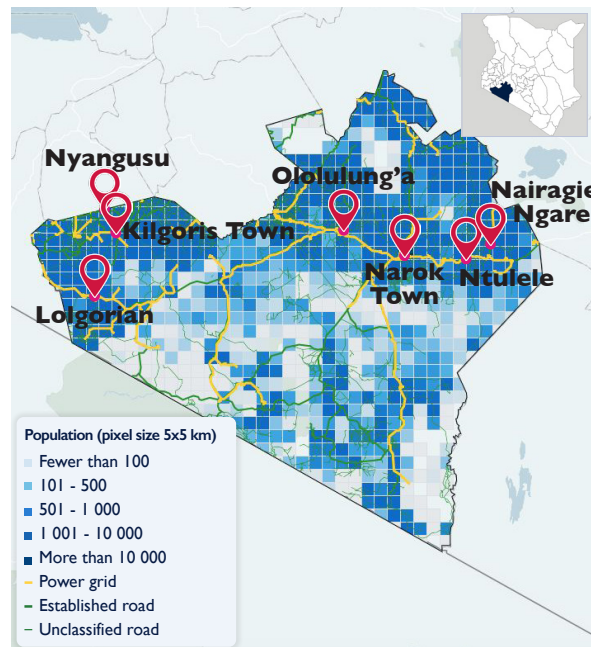
**POPULATION**  
**1,044,713**  
 (356,943 households)

**ELECTRICITY ACCESS**  
**18.5%**  
 (66,034 households)

**OFF-GRID POPULATION**  
**61.6%**  
 (219,899 households)

Narok is a moderately sized county situated on the Tanzanian border in southwest Kenya. The county has low electricity access and low telecom penetration. Urban centers with denser populations, such as Narok or Kilgoris, experience patchy mobile connectivity and have slightly higher electricity access rates.

The major challenges adversely affecting economic prosperity in the county include effects of climate change, poorly developed economic infrastructure, unplanned human settlements, and high levels of unemployment among youth. The dominant tribes in Narok are Maasai and Kalenjin.



Infrastructure	
Mini-grids	2
Post Offices	5
Courier Services	5+
Local Radio Stations	N/A
Paved Road Network (km)	N/A

Population and the Grid (Households)	
Electricity Access	18.5% (66,034)
Under-the-grid Population	21.9% (78,105)
Buffer Population	16.5% (58,940)
Off-grid Population	61.6% (219,899)
Served by Planned Mini-grids	98

Off-Grid Characteristics	
Total Settlements	127
High Potential Settlements	1
Health Facilities	96
Schools	413

Off-Grid Accessibility (Distance from Road)	
Within 1 km	70.4% (154,795)
Within 1-5 km	28.5% (62,625)
Beyond 5 km	1.1% (2,479)

Financial Services	
Financial inclusion (%)	N/A
Commercial Banks	Absa, Cooperative, DTB, Equity, Family, KCB, National, Post, Transnational
Micro-Finance Institutions	Faulu, Eclaf, KWFT, Musoni, SMEP
Savings and Credit Cooperatives	Narok Eagles, Narok Teachers'

**Economic Activities**  
 Pastoralism, crop farming, tourism, trade, mining (Kilimapesa Goldmine, Lolgorian Quarry, and sand). Small livestock (sheep and goats) is sold to meet household needs, including both food and non-food items.

Livestock Market Schedule					
Monday	Tuesday	Wednesday Suswa	Thursday	Friday Ewaso Nyiro	Saturday Ewaso Nyiro, Mulot

### Renewable Energy Officer

✉ Tom Kipkemai Sego

**2.13. LOT 6: NAROK****Market Centers**

Major market centers and economic activities: Kilgoris and Narok towns

Other: Aitong, Ewaso Nyiro, Loita, Mosiro, Mulot, Nairege Enkare, Naroosura, Ntulele, Olokurto, Suswa, and Tipis

**Electricity Connection**

In Narok County, 19 percent of residents have access to electricity. Approximately 51 percent of households are using kerosene for lighting. Most of the bigger facilities in the rural areas, including hotels and lodges around Mara, continue to use generators to meet their energy needs.

The constituency of Narok North has the highest level of electricity access at 32 percent. Emurua Dikirr has the lowest level of electricity access.

Table 17 Narok Sub-county Populations with Estimates of Off-grid Households

Sub-county	Population	Total Households	Estimated Off-grid Households
Narok North	250,105	59,996	56,456
Narok South	238,301	46,723	43,966
Narok West	190,237	190,237	179,013
Narok East	115,091	25,078	23,598
Trans Mara East	111,119	20,506	19,296
Trans Mara West	244,494	50,132	47,174
Mau Forest	32	32	30

Source: KNBS (2019)

**Accessibility****Road network**

The roads to the rural trading centers have gravel and earth surfaces. Rainy season renders some of the gravel and earth roads impassable, which hinders trade in most of highly agricultural areas.

**Information and Communication Technology**

52 percent of the county is covered by Information and Communication Technology. Some areas, such as Loita and Mosiro, have patchy mobile-network reception. Less than ten percent of the population has access to radio and television services in their homes.<sup>21</sup>

**Financial Services**

Narok County is served by several financial institutions. 15 national commercial banks including Equity, Post Bank, Transnational, National Bank, Absa, Equity, Co-op, KCB, Family, DTB have branches in Narok, and there are eight MFIs including Musoni, Faulu, KWFT, SMEP, and Ecluf, and 15 SACCOs including Narok Teachers', and Narok Eagles. These institutions offer a variety of credit products to the residents of the county for investment. In addition, some of the institutions undertake trainings to traders, including youth and women's groups, on financial-management skills and investment opportunities available in the county.

<sup>21</sup> At the time of development of the County Integrated Development Plan in November 2018

## 2.13. LOT 6: NAROK

Although there seems to be a relatively good number of financial institutions operating in Narok County, distribution is uneven across the six sub-counties. Narok North and Transmara West Sub-counties, where Narok Town and Kilgoris Town are based, contain more than 95 percent of all financial institutions. Emurrua Dikirr and Narok West have the lowest number of financial institutions.

### Market Entry

Like many other predominantly pastoral counties, markets act as important hubs of activity, so off-grid energy companies should regard them as focal points for outreach and awareness efforts. The main markets in the county are Narok, Ntulele, Ewaso Nyiro, Olokurto, Suswa, Nairege Enkare, Mulot, Aitong, Tipis, and Naroosura. These markets are important because they offer basic household requirements and facilitate trade in livestock and livestock product. In many cases, individuals sell small livestock, goats, and sheep to meet household needs.

Working with organizations with local outreach mechanisms is also an important strategy for companies. These organizations include Nguzo Africa, Christian Aid, and World Vision. Most of these organizations have a presence in off-grid regions of the county.

## 2.14. LOT 6: TAITA TAVETA

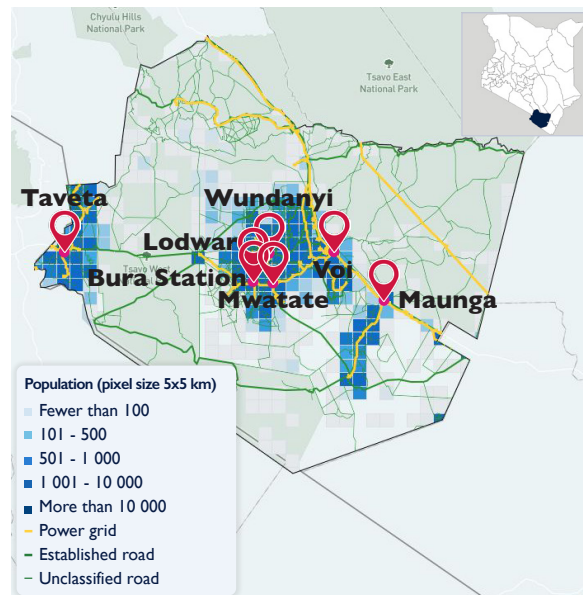
**POPULATION**  
**332,454**  
 (167,501 households)

**ELECTRICITY ACCESS**  
**47.3%**  
 (79,228 households)

**OFF-GRID POPULATION**  
**23.8%**  
 (39,898 households)

Taita Taveta is a small county situated on the Tanzanian border in southern Kenya, just north of Kwale County. Taveta and Wundanyi are the most densely populated sub-counties, and grid connectivity is stronger in these areas. Mwatate and Voi have more dispersed communities and much lower electricity access. There are also urban centers like Mghange, which are home to government-initiated Community Resource Centers.

Mining is the primary source of income to an estimated 10,000 people working in the mining sites at Lualenyi in Voi, Kabanga, Shako Ranch in Mwatate, Scorpion Mine, Shetani Lava Cave, John Saul Mine (Rockland Mine), and Penny Lane Mine.



### Infrastructure

Mini-grids	N/A
Post Offices	10
Courier Services	5+
Local Radio Stations	N/A
Paved Road Network (km)	N/A

### Population and the Grid (Households)

Electricity Access	47.3% (79,228)
Under-the-grid Population	57.5% (96,256)
Buffer Population	18.7% (62,218)
Off-grid Population	23.8% (39,898)
Served by Planned Mini-grids	None

### Off-Grid Characteristics

Total Settlements	54
High Potential Settlements	1
Health Facilities	19
Schools	70

### Off-Grid Accessibility (Distance from Road)

Within 1 km	86.0% (34,323)
Within 1-5 km	12.5% (4,995)
Beyond 5 km	1.5% (580)

### Financial Services

Financial inclusion (%)	N/A
Commercial Banks	Absa, Cooperative, DTB, Equity, KCB
Micro-Finance Institutions	Faulu, KWFT, SMEP, Yehu
Savings and Credit Cooperatives	Ark, Qwetu, Taita Teachers', Zoghoru

### Economic Activities

Formal wage earners consist of people in public service, construction sites, and sisal plantations.

**Urban:** Shops, hotels, money-transfer services, spare-parts outlets, groceries, petrol stations, hardware stores, and the transport sector (especially the motorcycle industry).

**Rural:** Agriculture, livestock, brickmaking.

### Livestock Market Schedule (not available)

### Renewable Energy Officer

✉ Deogratius Mwakio Ndonge

## 2.14. LOT 6: TAITA TAVETA

### Market Centers

Major market centers and economic activities: Mwatate, Taveta, Voi, and Wundanyi  
 Other: Kasigau and Mghange

### Electricity Connection

Roughly 47 percent of residents in Taita Taveta County use electricity as their main source of lighting—Voi has the highest level of electricity access at 19 percent. Mwatate has the lowest level of electricity access at eight percent. Forty-six percent use kerosene lanterns, 35 percent use tin lamps, and one percent use fuel wood. A significant percentage of the urban areas have been connected to the national electricity grid, and a growing number of the villages are being connected to the grid through the National Rural Electrification Program. However, there is still much more progress to be made; for example, some areas in Taveta and Wundanyi Sub-counties have yet to be reached.

Table 18 Taita Taveta Sub-county Populations with Estimates of Off-grid Households

Sub-county	Population	Total Households	Estimated Off-grid Households
Mwatate	81,389	96,429	89,004
Taita	55,643	15,094	13,932
Taveta	89,319	24,115	22,258
Voi	109,396	33,522	30,941

Source: KNBS (2019)

### Local Dynamics

The county government initiated the establishment of Community Resource Centers to complement what is currently available through various other players in the public and private sector. These Community Resource Centers are in areas, such as Mghange and Kasigau. These Community Resource Centers can provide a valuable space for sharing information about the benefits of off-grid energy technology.

### Accessibility

#### Roads

Taita Taveta County has all types of roads, including bitumen standards, gravel, and earth. The conditions of most roads, however, remains a major challenge, particularly during the rainy seasons.

#### Information and Communication Technology

Mobile penetration has been improving over the years. It is estimated that over 80 percent of the county is covered by mobile service providers, with most of the national operators having a presence in the county. Local radio stations, national television stations, national radio stations, and digital satellite services have well-distributed coverage across the county, with most of the county population at least having access to radio services.





## 2.14 LOT 6: TAITA TAVETA

### Economics and Ability to Pay

The wage earners consist of people in public service, construction sites, and sisal plantations. The self-employed in the urban areas include mainly very small-to-medium-sized business enterprises, including shops, hotels, money-transfer services, spare-parts outlets, groceries, petrol stations, hardware stores, and the transport sector, especially the motorcycle industry. Others include Jua Kali businesses, such as garages, furniture production, metal fabrication and welding, car-tire repairs, brickmaking, and cyber cafés.

In the rural areas, self-employed people are mainly engaged in agricultural and livestock ventures as well as brickmaking. With the expansion of the Last Mile Connectivity Project, more people are engaged in welding, furniture making, barber shops, salons, and money-transfer services. Small-scale mining, quarrying, and sand harvesting are other ventures involving several people, especially youth and more so in Mwatate, Voi, and Taveta Sub-counties.

In the most gemstone-reliant sub-counties, Mwatate and Voi, artisanal small mining provides the main source of employment for 57 percent of women and men of economically active ages. This source of employment outranks agriculture (39 percent), trading (35 percent), and other activities. Taita Taveta has approximately 10,000 miners in the extractive and processing sector.<sup>22</sup> Miners have monthly incomes averaging KSh 15,000 (\$ 138).

Other main industries in the county are sisal industries in Voi, Mwatate, and Taveta. Other smaller industries include maize millers and bakeries in Taveta and Voi.

### Financial Services

The county has five banks namely KCB, Absa, Co-op, DTB, and Equity, MFIs include Yehu, SMEP, Faulu and KWFT, and several SACCOs including Qwetu, Zoghoru, Taita Taveta Teachers', and Ark, which provide various financial services. These financial institutions have branches in Voi and agents in various trading centers. Mobile money-transfer services operated by telephones providers are also widespread in all of the major trading centers.

### Market Entry

There are promising opportunities for off-grid energy companies in the mining communities, which employ 10,000 people with good wages. The main mining sites in Taita Taveta include Lualenyi in Voi, Kabanga, Shako Ranch in Mwatate, Scorpion Mine, Shetani Lava Cave, John Saul Mine (Rockland Mine), and Penny Lane. It is important to note that human-wildlife conflicts have been reported in the county, mainly linked to marauding elephants in areas of lower Sagalla and Kasigau Wards of Voi Sub-county.

<sup>22</sup>Alliance for Responsible Mining. 2018. Economic Contributions of Artisanal and Small-Scale Mining in Kenya: Gold and Gemstones. [https://assets.publishing.service.gov.uk/media/5a392bb8e5274a79051c9d7c/Kenya\\_case\\_study.pdf](https://assets.publishing.service.gov.uk/media/5a392bb8e5274a79051c9d7c/Kenya_case_study.pdf)

### 3. MORE INFORMATION

In addition to the data provided in the county fact sheets in this report, readers may contact the Kenya office of the Power Africa Off-Grid Project at [kenya@powerafrica-offgrid.org](mailto:kenya@powerafrica-offgrid.org) to request more detailed data from the geospatial analysis.

In 2019, Power Africa also published an off-grid solar market assessment for the entire country of Kenya, which is available on the Power Africa website.<sup>23</sup>

Annex 4 also contains a list of publicly available data that may be useful to companies entering off-grid markets in Kenya.

<sup>23</sup> Power Africa. 2019. Off-Grid Solar Market Assessment: Kenya. [www.usaid.gov/powerafrica/beyondthegrid/off-grid-solar-market-assessments/#Kenya](http://www.usaid.gov/powerafrica/beyondthegrid/off-grid-solar-market-assessments/#Kenya)

# ANNEX I: GEOSPATIAL ANALYSIS METHODOLOGY

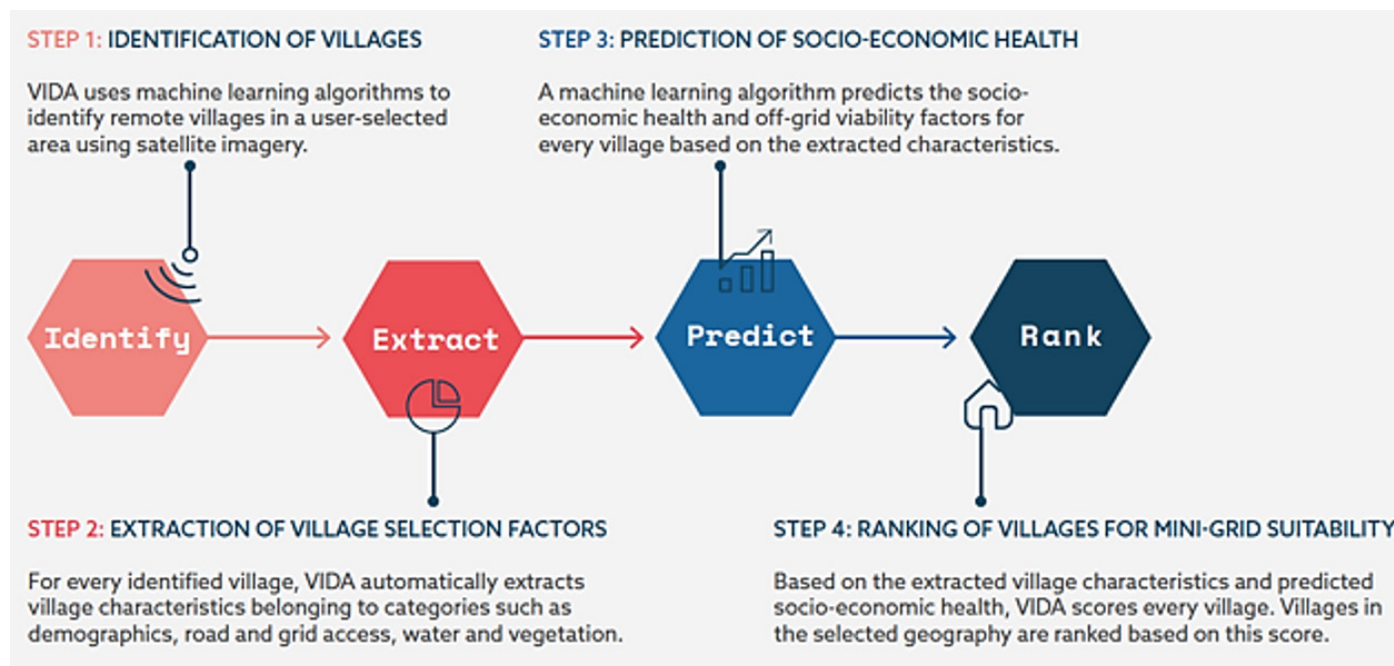
## Village Data Analytics (VIDA) by TFE Energy

Village Data Analytics (VIDA) is a technology-enabled service that increases viability, reduces risk, time and costs for electrification product sales, infrastructure planning and investment at scale. It uses artificial intelligence (AI), satellite imagery, GIS data, survey data and energy modelling to identify and extract insights about rural villages. It can be deployed anywhere in the world to assess rural villages for their suitability for off-grid electrification, including grid-extension, mini-grids or solar products. Users are governments, DFIs, and companies offering electrification solutions.

VIDA is a product by TFE Energy and is supported by the European Space Agency and by appliedAI.

## How it works: satellite imagery, ai and socio-economic health prediction

VIDA identifies and ranks off-grid villages across a large area of interest (AOI) and presents the results in an interactive map-based user interface (UI). The methodology is as follows:



- Automatic identification of off-grid villages:** A set of AI algorithms automatically identifies off-grid villages in the selected AOI. This module uses daytime (visible), nightlight and radar-based satellite imagery.
- Extraction of village characteristics:** The second module of VIDA automatically extracts information layers (characteristics) from satellite imagery of every identified off-grid villages, such as village demographics, road and accessibility, agricultural, and water body analysis. In total, 10 to 15 quantifiable village characteristics are extracted from every identified village.

3. **Prediction of socio-economic health:** VIDA uses AI algorithms and energy modelling to predict the socio-economic health of every identified off-grid village. This AI algorithm is trained using on-ground data.
4. **Ranking:** Based on the predicted socio-economic health of village and extracted village characteristics, VIDA predicts a score reflecting off-grid viability. Off-grid villages in the AOI are ranked based on this score.

The output of the VIDA analysis is a “smart map”, showing a list of identified off-grid villages in the selected country/region (AOI), ranked based on their viability for development of mini-grids. Extracted data from every identified village is displayed in the map and made available to the customer.

## VIDA’s Analysis for this Report on Kenya

For this report, VIDA was used initially to conduct geospatial analysis and identify off-grid settlements. Apart from proprietary data-sets and VIDA’s machine learning algorithms, VIDA also ingested and analyzed a number of publicly available data-sets. These include, [Gridfinder](#), preliminary version of the World Settlement Footprint 2019 (WSF2019) data from [DLR](#), the high resolution settlement layer from [Facebook](#), [OpenStreetMap](#), [the Energy Access Explorer](#), [WorldPop data](#), [World Database on Protected Area \(WDPA\)](#) and other relevant data-sets from the [Humanitarian Data Exchange](#). Before using the data for analysis, the VIDA team conducted quality testing using triangulation and data-science techniques.

To learn more about Village Data Analytics (VIDA), visit: [www.villagedata.io](http://www.villagedata.io).

# ANNEX 2: LIVESTOCK MARKETS IN SELECTED KSTs

## Lot 1: Turkana

Monday Kakuma, Lodwar, Lokichar	Tuesday Kakuma, Lodwar, Lokichar	Wednesday Kakuma, Lodwar, Lokichar	Thursday Kakuma, Lodwar, Lokichar	Friday Kakuma, Lodwar, Lokichar	Saturday Kakuma, Lodwar, Lokichar
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## Lot 1: West Pokot

Monday Kishaunet	Tuesday Orolwo	Wednesday Chepkono, Kacheliba	Thursday Chepareria	Friday Kishaunet	Saturday Lomut
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## Lot 2: Isiolo

Monday Isiolo	Tuesday Isiolo, Oldonyiro	Wednesday Isiolo	Thursday Isiolo	Friday Kipsing, Isiolo	Saturday Eskot, Isiolo
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## Lot 2: Marsabit

Monday Forole, Jirime, Moyale	Tuesday Jirime, Merile, Moyale	Wednesday Jirime, Moyale	Thursday Jirime, Moyale	Friday Jirime, Moyale	Saturday Jirime, Moyale
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## Lot 2: Samburu

Monday	Tuesday Baragoi	Wednesday	Thursday Lolkuniani	Friday Suguta	Saturday Lekuru
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## Lot 3: Mandera

Monday Mandera, Rhamu, Banisa, Takaba	Tuesday Mandera, Rhamu, Banisa, Takaba	Wednesday Mandera, Rhamu, Banisa, Takaba	Thursday Mandera, Rhamu, Banisa, Takaba	Friday Mandera, Rhamu, Banisa, Takaba	Saturday Mandera, Rhamu, Banisa, Takaba
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## Lot 3: Wajir

Monday Bute, Wajir	Tuesday Bute	Wednesday Bute	Thursday Bute	Friday Bute	Saturday Bute, Habaswein
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## Lot 4: Garissa

Monday Hulugho, Ijara, Modogashe	Tuesday	Wednesday Garissa	Thursday	Friday	Saturday
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## Lot 4: Lamu

Monday Amu, Faza, Kiunga, Mokowe, Nagele	Tuesday Amu, Faza, Kiunga, Mokowe, Nagele	Wednesday Amu, Faza, Kiunga, Mokowe, Mpeketoni, Nagele	Thursday Amu, Faza, Kiunga, Mokowe, Nagele	Friday Amu, Faza, Kiunga, Mokowe, Nagele	Saturday Amu, Faza, Kiunga, Mokowe, Mpeketoni, Nagele
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## Lot 4: Tana River

Monday	Tuesday Bangale	Wednesday Bura	Thursday	Friday	Saturday Bura, Garsen
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## Lot 6: Narok

Monday	Tuesday	Wednesday Suswa	Thursday	Friday Ewaso Nyiro	Saturday Ewaso Nyiro, Mulot
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## ANNEX 3: SHS TARGET SALES PER COUNTY

Lot/Service Territory	County	Target Systems (June 2023)
1. North West	Turkana	42,953
	West Pokot	
2. North	Isiolo	45,432
	Marsabit	
	Samburu	
3. North East	Mandera	40,537
	Wajir	
4. East	Garissa	46,695
	Lamu	
	Tana River	
5. South East	Kilifi	39,568
	Kwale	
6. South	Narok	34,815
	Taita-Taveta	
Total		250,000

## ANNEX 4: DATA RESOURCES

- [Energy and Petroleum Regulatory Authority \(EPRA\)](#): Source for a variety of energy-sector economic data, including petroleum prices and electricity tariffs.
- [PAOP Kenya Market Assessment](#): Provides off-grid market insights for all of Kenya.
- [Kenya Postal Service](#): Source of post office locations to use as distribution points.
- [2018-2022 County Integrated Development Plans](#): Download links for each county's Integrated Development Plan.
- [Village Data Maps](#) (Available up to October 2021).

## ANNEX 5: COUNTY RENEWABLE ENERGY OFFICER CONTACTS

County	County Renewable Energy Officer	Email Address
Lot 1: Turkana	Caleb Ewoi Nakain	<a href="mailto:calebewoi@gmail.com">calebewoi@gmail.com</a>
Lot 1: West Pokot	Stanley Kipchoge Sitienei	<a href="mailto:ssitienei32@gmail.com">ssitienei32@gmail.com</a>
Lot 2: Isiolo	Abdi Osman Guyo	<a href="mailto:kotileabdi@gmail.com">kotileabdi@gmail.com</a>
Lot 2: Marsabit	Jalle Gesile Gideon	<a href="mailto:jallegesile@gmail.com">jallegesile@gmail.com</a>
Lot 2: Samburu	Wyclef Munene Ngure	<a href="mailto:ngure.wyclef@gmail.com">ngure.wyclef@gmail.com</a>
Lot 3: Mandera	Osman Hassan Mohamed	<a href="mailto:osmanhassan8@gmail.com">osmanhassan8@gmail.com</a>
Lot 3: Wajir	Fahma Yussuf Adan	<a href="mailto:fahmayussuf@gmail.com">fahmayussuf@gmail.com</a>
Lot 4: Garissa	Salah Abdi Maalim	<a href="mailto:swaleh161@gmail.com">swaleh161@gmail.com</a>
Lot 4: Lamu	George Otula Nyagwa	<a href="mailto:george.otula50@gmail.com">george.otula50@gmail.com</a>
Lot 4: Tana River	Jackbed Gakii Mugo	<a href="mailto:jacquebedg@gmail.com">jacquebedg@gmail.com</a>
Lot 5: Kilifi	Habel Mwatata Mwarabu	<a href="mailto:hmwatata07@yahoo.com">hmwatata07@yahoo.com</a>
Lot 5: Kwale	Salama Mwafrika Mwasafari	<a href="mailto:salamamwafrika@gmail.com">salamamwafrika@gmail.com</a>
Lot 6: Narok	Tom Kipkemoi Sego	<a href="mailto:datasegotom@gmail.com">datasegotom@gmail.com</a>
Lot 6: Taita-Taveta	Deogratious Mwakio Ndonge	<a href="mailto:d_ndonye@ymail.com">d_ndonye@ymail.com</a>



