

ENVIRONMENT AND RESOURCES

Topography and Slope Analysis

Kabare Ward exists in a topographically diverse region with the existence of both mountain slopes and gentle terrain. This has resulted in differentiation in socio-economic characteristics, agricultural practice, the built environment and even unique adaption to cultural practice.

Geological and Soil Characteristics

Kabare Ward has a general composition of deep well-drained basic red-volcanic soils, referred to as **Andisols**. The soils are characteristically fertile for arable agriculture. They can be defined as having closely packed particles and lacking sand which results in the soil being sticky during wet seasons making weather roads unsustainable year-round.

Hydrology and Drainage Systems

Perched on the slopes of Mt. Kenya to a point of directly interacting with Mt. Kenya Forest, Kabare Ward can be considered an extension of the Mt. Kenya Forest catchment area. The ward can be characterized as gently sloping on average. There exists numerous springs, streams and rivers whose origin can be traced back to Mt. Kenya Forest. The soil-type and the ridges created as a consequence of movement of surface run-off has resulted in distinct drainage features, mostly rivers. The Ward is serviced by water originating from sumps created in the streams from Mt. Kenya Forest. This system utilizes natural gradient and the year-round flow of the rivers to serve the area.

However, from an infrastructure point of view, the drainage systems, especially from occupied areas are sorely lacking. The facilities needed to drain surface run-off, storm-water and waste water are inadequate, poorly designed and lacking altogether in many a sub-location within Kabare Ward. This may also be as a consequence of the unstructured road network, lack of a feasible sewer network and missing transport and infrastructure links throughout the Ward.

Agro-Ecological Zones (AEZ)

Kabare Ward is considered a Humid Agro-ecological zone. The high altitude and location on the wind-ward side of Mt. Kenya consequently results in the high rainfall experienced in the area. The anabatic winds however, result in significantly low temperatures that discourages arable agriculture practice. Sustainable large-scale food production, especially for cereals and pulses is therefore unfeasible in the Ward. Native vegetables; non-citric fruits such as apples, peaches, pears and cherries; and a few bespoke cold-resistant tubers have nonetheless been known to thrive in this Ward. As an agro-ecological zone, this Ward can be pivotal in production of tea, which is well adapted to both the altitude and low temperatures.

For livestock husbandry, the Ward is considered well-placed for specific dairy cattle (notably Guernsey, Jersey, Friesian-Holsteins, Fleckvieh, Limousin, Highlands and Brown-Swiss), dairy goats and merino sheep which carry heavy fleeces and can adapt to

the harsh cold. The genetic specification can be adopted based on a farmer's needs and animal need matrices, necessitating contextualization of breeding practices.

Availability of feeds is a rather contentious issue. Proximity to Mwea provides convenient access to feed-production. However, in a bid to motivate internal self-reliance, zoning for optimal feeds production in the tea-dominated Ward is necessary to maintain sustainability in animal husbandry.

Apiaries, though economically unfeasible, are very necessary for food production. Low bee population in areas around the ecologically-sterile Mt-Kenya forest has become a rising concern for the entire region, creating the need for anthropogenic incentivization of bee re-population. This is also evident within Kabare Ward. This directly impacts food production as levels of pollination are directly linked to bee population.

Vegetation/Forestry Characteristics

The Nyayo-Tea-zones create a unique buffer zone for Mt. Kenya Forest. The vegetation cover in Kabare Ward can be characterized as mixed. While tea-trees are categorically trees, their exploitation as a cash-crop vertically demotes the canopy and tree line. While the tree population may be considerably low, it is important to note that presence of tea does contribute to the vegetation cover. The only forest in Kabare Ward is technically the Mt. Kenya Forest. The forest cover is negligible, necessitating interrogation. This is due to the fact that firewood is used in almost all homestead in Kabare ward. Need for timber has been on the increase considering the increase in construction due to population, and also the heavy dependence of firewood by the tea factories. These factories serve as an economic bloodline for Kabare Ward.

Natural Resources

Such would include the wealth of water, fertile soils and potential for agro-production.

Renewable Energy

As a consequence of location, solar energy is unfeasible. This is due to low UV-index, high cloud cover and minimal solid-exposure of the built environment. Wind energy may be considered a viable option. However, due to proximity to Mt. Kenya Forest, wind turbines would be an ecological catastrophe, as they are often responsible for mass extinction of bird-life, and of gliding/ flying animals such as bats and flying squirrels. The colossal turbines are also unsightly and quite detrimental to tree-clad environments. All considered, Kabare Ward is located within a water endowed region with numerous rivers, streams and springs. This creates an avenue for generation of Hydro-electric power. While environmentally controversial, HEP generation is still a sustainable source of renewable energy. Damming of rivers from the mountain could go a long way in enhancing sustainable localized energy and availability of usable water. This is also while considering that almost all homesteads are serviced by electricity from the national grid.

Emerging Planning Issues on Population and Demographics

One of the most controversial issues in a population would have to do with the judicial system. The department of probation, dealing with non-custodial services is an active

element in the correctional and rehabilitation. In Kirinyaga East Sub-County, the issues arising are quite unnerving. While custodial service is considered the final alternative in the correctional system, it is evident that there is an overwhelming problem. The issues sited as causative to incursions into the system include drug and substance abuse. This has been seen to be as a result of frustration and depression especially among the youth. Substance abuse is **not the problem**, rather a symptom of an existing problem. This has been deduced to be as a consequence of poor, inadequate or lack thereof parenting. The lack of a physical outlet, a claustrophobic sense of being stranded and economically disenfranchisement, especially among the 20 – 35-year-old bracket has been seen to fall prey to the cycle of poverty created by the

Planning Emerging Issues on Provision of Social Infrastructure

REGIONAL ECONOMY

Agriculture is the backbone of Kirinyaga-East sub-county. Kabare, being in a geographically high-altitude area, experiences cold and wet climate. The high precipitation rates and fertile soils make Kabare ripe for agricultural exploitation. The growth of tea is easily sustained as the characteristics do well with the conditioning. The low temperatures however restrain production of food crops. This is due to the fact that Kenyan staples are mostly based on produce that requires higher temperatures to grow. Except for arrow-roots, other tubers suffer from the blight caused by the cold. Cereals and pulses encounter the same problem. Hence, economically, the ward is currently mostly suitable for growing tea, nut trees such as macadamia, hazelnut, etc and fruit trees that do well in high altitude low temperature areas like apples, plums, cherries and pears. Crop production is thereby economically unfeasible.

Livestock Farming

Livestock production is limited by the inadequacy of animal feed, low temperature and harsh terrain. Economically, the ward cannot sustain large-scale production of livestock production as the constraints outweigh the opportunities available.

Trade and Commerce (trade, markets, banking facilities etc. refer to Key Informants/FDG guide)

The capacity for trade is high in Kabare Ward. However, constraints exist due to monopsony created by the supply outlets for a majority of the outputs. These include:

- **Macadamia** – whose processing is done abroad, the farmers only sell raw products, and at deplorable rates that disadvantage farmers. this necessitates the creation of factories for processing and value addition.
- **Avocado** – which is produced in bulk but exported as a raw product through Kakuzi factory, which in itself is in a different county. There is dire need to a local value addition system and availability of factories to process avocado
- **Bananas and plantains** – though the production is considerably low, there is vast opportunity for innovation and industry. Banana fibre is highly valuable and can be used as an alternative to yarn and plastic twine. The low temperature discourages the consumption of the banana stems by livestock. The tough fibres again are incredibly difficult to decompose, so utilising them as a raw material for industry

would go a long way in creating sustainable, durable biodegradable fibre alternatives.

Markets are a testy point of reference in the sub-county. The poor road network, makes transport unfavourable especially during the rainy season. While considering that this area experiences about 8months of precipitation, this is a long time to be incapacitated. Considerable efforts need be tapped into for creation of functional, efficient transportation networks.

This would open up the small markets to the wider national and regional markets that have need for the products from the county. Redundancy may be considered a problem in production within the ward due to ow internal demand. However, external markets can prove to be the solution for the impeding disadvantages in production. The local exchange of currency is not sufficient to sustain the local economy, hence interventions need be sort to enhance additional injection of revenue without destroying the local identity. The aim is to identify means of disposal of agricultural surplus.