**Physiology**

Depending on the predominant volcanic rock type, the southern area can be divided into three distinct units: Kinangop plain, Niadarawa and Elephant mountains of Aberdare Ranges.

The northern area is in the Ol borosat plain, consisting of Ol Kalou, Ol Joro Orok, and Ndaragwa.

Kinangop area is at an elevation of about 8800 feet near Kijabe and gently sloping towards the Northern side with an elevation of about 8200 feet at the northern side.

The area has a number of tributaries that dissect it. Mkungi, Turasha, Kitiri among others are tributaries of Malewa River which drain into L. Naivasha. Others such as Chania, Sasumua, Kimakia are tributaries of rivers Athi and Tana which discharge into Indian Ocean.

This is the area that is comprised of Niadarawa (12,816 feet) and Elephant (11,900 feet). The mountains have a radial drainage. They are covered by a forest with the vegetation rising to a height of about 10000 feet. The area consists of basaltic agglomerates.

Ol kalou is at an altitude of 7890 feet. It consists of many building rocks.

Ndaragwa is in the farthest Northern side towards the end of Aberdare Ranges. It is at an altitude of 7660. The predominant rock type in this area is Laikipian Basalt.

**Rock Types**

The common rocks observed in the area are basalts, basaltic agglomerates, trachytes, phonolites, pyroclastic and lacustrine deposits.

The oldest rocks in the area are the Simbara Series, which are believed to be of Miocene age. They are overlain by basaltic agglomerates and autobreccias. These can be observed as outcrops on Niadarawa and the Elephant.

The other type observed in the southern region is the Sattima Series which compose of phonolites and trachytes of age between Kamasian and Pliocene. These have been observed over an extensive area ranginf from the Kikuyu special area in Kiambu, through Laikipia and even up to Nyeri in Othaya. They are therefore the major rock type covering the study area.

The younger rocks in the area are the Pleistine Volcanic and Holocene Sediments. These are observed on aberdare vents and around Kijabe Hill. They are believed to be eruptions of Longonot that reached south western part of the area.

**DIGITAL Elevation Model (DEM)**

Digital Elevation Models (DEM) is a GIS raster data type that represents earth’s surface as a regular arrangement of locations where each cell stores a value corresponding to its elevation. This allows for systematic analysis of the relationships among places and their characteristics. Technological advancement of sensor and satellite imaging has contributed greatly to the generation of DEM from Remotely sensed data. The Advanced Space-borne Thermal Emission and Reflection Radiometer (ASTER) is a sensor used to record spatial data that is used to generate DEM.

To enhance and extract the exact DEM, topographical attributes play an important role. These attributes are:

1. Primary

These are the attributes that are delivered directly from DEM.

They include:

1. **Surface derivatives**

This measures the rate at which elevation changes as per the location of elevation.

1. **Slope**

This measures the rate of change of elevation in the direction of the steepest descent.

1. **Aspect and Primary flow direction**

Aspect is the orientation of the line of steepest descent. It helps in visualizing landscapes.

In this report am going to used Hill shade and Triangulated Irregular Network to represent the terrain of Nyandarua County in order to visualize the general topography of the area.

**justification**

For every economy to thrive well, good planning has to be undertaken in order to ensure that establishment of industries does not conflict with consistent food production or create ecological imbalance. Sarah (2018) states that the establishment of industries is in the very interest of the societal development but not for individual or political gain.

The population is consistently increasing while the arable land is continually reducing as an effect of desertification, urbanization and demand for more housing even in rural areas. This increased demand for food while the productive land is reducing escalates the risk of a country sustaining itself, to an extent where they have to import food products to satisfy surplus demand, thus creating a need for food security measures.

In its nature, land has vast dynamics that render its utilization uneven. Some areas are more suitable for one type of land use while others are suitable for another and some areas are not suitable at all.

It is in this essence that there is a need to conduct site suitability analysis in Nyandarua County for the possible areas that can be used to serve the different supply chain entities.

This project will be in a position to provide an applicable network analysis that can provide an optimized service area with capabilities to significantly reduce overall production cost while greatly improving quality and availability of potato products.

**Reference**

**San, Bekir & Süzen, Mehmet. (2005). Digital elevation model (DEM) generation and accuracy assessment from ASTER stereo data. International Journal of Remote Sensing. 26. 5013-5027. 10.1080/01431160500177620.**

**Paul Cote. 2019.** **Site Modeling in Context: Obtaining and Transforming Elevation Data.** **http://www.pbcgis.com/dem/**