

# Characteristics of major agro ecological zones environmental sciences essay

[Environment](#), [Ecology](#)



Africa is a really big continent with highly broad scope of dirt ( Bationo et al. , 2006 ) . The soils scope from shoal with meager vital capacities to deeply weather-beaten profiles that recycle and back up big biomass. In many parts of Africa, inappropriate land usage, hapless direction and deficiency of inputs have led to dirty eroding, salinization and loss of flora ensuing in a diminution of agricultural productiveness ( Bationo et al. , 2006 ) . In Africa and peculiarly Southern Africa, the most confining factor to agricultural productiveness is soil birthrate ( Ramaru et al. , 2000 ) . Soil birthrate is defined as a status of the dirt that enables it to supply foods in equal sums and in proper balance for the growing of specified workss when other growing factors, such as visible radiation, H<sub>2</sub>O, temperature, and physical, chemical and biological conditions of dirt, are favourable ( van der Watt and new wave Rooyen, 1995 ) .

Large countries of sub-Saharan African ( SSA ) soils, in peculiar, are affected by assorted types of debasement, including birthrate diminution ( FAO, 2001 ) . Soil birthrate diminution is a impairment of chemical, physical and biological dirt belongings. The chief contributing procedures, besides dirt eroding, are: diminution in organic affair and dirty biological activity ; debasement of dirt construction and loss of other dirt physical qualities ; decrease in handiness of major foods ( N, P, K ) and micro-nutrients ; and increase in toxicity, due to acidification or pollution( FAO, 2001 ) . Soils in most of SSA have inherently low birthrate and do non have equal alimentary refilling ( FAO, 2001 ) . The SSA has the lowest mineral fertiliser ingestion, about 10 kilogram foods ( N, P<sub>2</sub>O<sub>5</sub>, K<sub>2</sub>O ) /ha per twelvemonth, compared to the universe norm of 90 kilograms, 60 kilogram in the Near East and 130

kg/ha per twelvemonth in Asia ( Stoorvogel and Smaling, 1990 ) . Agricultural growing in sub-Saharan African states somewhat increased over the past three decennaries, although non in line with the high population growing rate ( FAO, 2001 ) . Foodproduction per capita in sub-Saharan Africa ( SSA ) has declined since the 1970s, in contrast with the addition in Asia and South America ( Figure 1. 1 ) . Soil productiveness in SSA is besides constrained by fruitlessness ( low rainfall ) and sourness ( FAO, 2001 ) ( Table 1. 1 ) . South Africa has to confront high population growing, poorness, accelerated dirt debasement and increasing force per unit area on land ( FAO, 1999b ) ( Table 1. 1 ) .

Depletion of dirt birthrate, along with the related jobs of weeds, plagues, and diseases, is a major biophysical cause of low per capita nutrient production in Africa. This is the consequence of the dislocation of traditional patterns and the low precedence given by authoritiess to the rural sector ( Sanchez, 1997 ) . The 1996 World Food Summit highlighted sub-Saharan Africa as the staying part in the universe with diminishing nutrient production per capita ( Figure 1. 1 ) . The worst degrees of poorness and malnutrition in the universe exist in this part ( Sanchez et al. , 1997 ) . A squad of scientists has identified worsening dirt birthrate as the cardinal agronomic cause for worsening nutrient productiveness in Africa. A `` Soil Fertility Initiative for Africa '' has been created by a group of international organisations including the World Bank, Food and Agriculture Organization ( FAO ) , International Center for Research on Agroforestry ( ICRAF ) , International Fertilizer

Development Center ( IFDC ) , International Fertilizer Association ( IFA ) , and International Food Policy Research Institute ( IFPRI ) .

Table 1. 1: Features of major agro-ecological zones in Africa ( FAO, 1986 )

Figure 1. 1: Regional tendencies in nutrient production per capita ( FAO, Statistical Analysis Service, 2000 )

As the chief beginning of economic activity in SSA is agricultural production, worsening dirt productiveness means non merely that less nutrient can be grown but besides that production of hard currency harvests for export is endangered ( FAO, 1999a ) . It is hence indispensable that production and dirt be managed in a sustainable manner, so that the present coevals is fed and soil conditions are improved to back up future coevals.

The Republic of South Africa covers an country of 121, 9 million hour angle and has a entire population of about 46, 6 million people ( NDA, 2007 ) . Approximately 83 % of agricultural land in South Africa is used for graze, while 17 % is cultivated for hard currency harvests. Forestry comprises less than 2 % of the land and about 12 % is reserved for preservation intents ( NDA, 2007, Land Type Survey Staff, 1972-2002 & A ; Land Type Survey Staff, 1972-2006 ) . Land used for agribusiness comprises 81 % of the state 's entire country, while natural countries account for approximately 9 % ( Abstract, 2005 ) . High-voltage cultivable land comprises merely 22 % of the entire cultivable land and merely approximately 13 % of South Africa 's surface country can be used for harvest production ( NDA, 2007 ) . Slightly more than 1, 3 million hour angle of land is under irrigation. Rainfall is

distributed unevenly across the state, with humid, semitropical conditions happening in the E and dry, desert conditions in the West ( NDA, 2007 ) . The most of import factor that limits agricultural production is the non-availability of H<sub>2</sub>O. About 50 % of South Africa 's H<sub>2</sub>O is used for agricultural intents.

Areas of moderate to high cultivable possible occur chiefly in the eastern portion of the state, in Mpumalanga and Gauteng states ( Figure 1. 2 ) . Scattered spots besides occur in KwaZulu-Natal, Eastern Cape and Limpopo states. Low to marginal possible countries occur in the eastern half of the state and in parts of the Western Cape. Map in Figure 1 shows big countries in the desiccant parts of South Africa ( e. g. south-western Free State ; western parts of the Eastern Cape and the North West Province ) that are being cultivated, but which are non classified as holding any possible for cultivable agribusiness. Repeated harvestfailureand subsequent forsaking of these less than fringy lands can hold of import effects for dirt eroding and land debasement in general ( Hoffman, M. T. & A ; A. Ashwell, 2001 ) .

Figure 1. 2: The distribution of cultivable possible land in South Africa ( ARC - ISCW, 2002 ) .

Soil birthrate challenges coupled with deficits of rainfall could ensue in a compounded job of nutrient deficit and dearth. For dirt birthrate to be sustained, extracted dirt foods must be replenished dirt foods, but in big countries of Africa and other parts of the universe, more dirt foods are extracted than replenished ( Ndala and Mabuza, 2006 ) . There is hence planetary concern of birthrate direction particularly with the recent additions

in nutrient monetary values. Soil birthrate and its direction therefore have continued to play an of import function in farm productiveness. Farmers, their advisers, and any agriculturists need to be knowing of the dirt belongings which have an influence on dirt birthrate, some of which include dirt texture, construction, organic affair, cation exchange capacity, base impregnation, bulk denseness and pH. These belongings besides have an influence in finding land capableness for agribusiness as they are besides cardinal indexes for dirt quality.

Although important advancement has been made in research in developing methodological analysiss and engineerings for battling dirt birthrate depletion, the low acceptance rate is a ground for the big difference between husbandmans ' outputs and possible outputs ( Bationo et al. , 2006 ) . This survey therefore aims to find the influence of dirt physico-chemistry and clay fraction mineralogy on the birthrate position of selected potency uncultivated cultivable dirt of University of Limpopo Experimental farm ( Syferkuil ) in Limpopo Province. This will promote enlargement of cultivable agribusiness in the country to better the supports in footings of relieving nutrient insecurity and poorness.

## **PROBLEM STATEMENT**

When measuring land for agricultural capablenesss, properties such as incline, stoniness and thickness of the dirt stratum are taken into consideration. Soil physico-chemical and dirt clay mineralogical belongings are frequently overlooked. Ekosse et Al. ( 2011 ) showed that these dirt physico-chemical and clay mineralogical belongings and their composings

play a important function in suitability of land for cultivable agribusiness. Information on the mineralogy and alimentary position of uncultivated dirt in Limpopo Province is missing, particularly of dirt found in the communal countries where smallholder agribusiness is practiced. Such information is important for any scheme that seeks to increase and better the productiveness of cropped or possible cultivable agricultural land.

One of import requirement of nutrient security is entree to land, as more people need to bring forth their nutrient supplies and do a life from the land. Traditional land direction systems are dependent on the handiness of sufficient land to let long fallow periods to keep dirt birthrate. When there is no more entree to new land, the fallow land has to be used and soil birthrate falls. More intensive usage of the land besides implies that it becomes more prone to dirt eroding. To keep and raise its productiveness, new sustainable direction steps have to be introduced.

As the chief beginning of economic activity in Limpopo Province besides excavation is the agricultural production, worsening dirt productiveness non merely means less harvests is grown but besides that, production of hard currency harvests and income are endangered. Huge bulk of South Africans, peculiarly Limpopo occupants, purchase their staple nutrient from commercial providers, instead than turning them themselves ( Statistics South Africa, 2009 ) . Rising nutrient monetary values, peculiarly of corn and wheat which are the staple diet of the hapless in South Africa, pose serious jobs for the urban and rural hapless as most are net purchasers instead than agriculturists of their basic nutrient. Recent information from the Food and

Agricultural Organisation ( 2009 ) and Heady & A ; Fan ( 2008 ) suggest that nutrient monetary values will increase steadily over the following decennary even if there are some fluctuations and the occasional bead in monetary values ( Evans, 2009 ) . This therefore poses the demand for more enlargement of cultivable land for agribusiness so as to better supports of the hapless families.

Population force per unit area and urban enlargement seem to be doing the loss of high possible agricultural lands. Hence nutrient demand is lifting which leads to nutrient insecurity, therefore extension of cultivable agricultural lands would extremely be required. In a recent survey, Van Averbeke and Khosa ( 2007 ) reported that while income is the most of import determiner offamilynutrient security in some countries around Limpopo Province, nutrient obtained from assorted types of dry-land agribusiness contributed significantly to household nutrition. They argue that without farming the nutrient security of these families would be reduced, particularly for the ultra-poor.

The land is used beyond its capableness, the type of use would non be sustainable and the land debasement would ensue. Equally of import is the fact that if land is used below its true capableness so the full economic potency of the usage of the land would non be realized. Although small production addition has taken topographic point at the Experimental farm ( Syferkuil farm ) , which has been obtained by cultivation of hapless and fringy lands, the productiveness of most bing lands has been ignored. With population go oning to increase in the country and the state as a whole, the



demand to take note of the fallow or abundant lands on the farm has become more of import. Bettering dirt birthrate could trip rural and national economic development, achieve long-run nutrient security and better husbandmans ' criteria of life, while extenuating environmental and rural migration. Therefore, rectifying land debasement and heightening productiveness through appropriate dirt direction and preservation can play a major function in accomplishing farm family nutrient security and agricultural development in the country.

This research will therefore contribute to the bing database on the physico-chemistry and mineralogy of agricultural dirts of Limpopo Province, peculiarly those at Syferkuil farm. It will besides help husbandmans and persons around the country with information and consciousness on the birthrate position and capableness of the dirts in their community, so they can originate agricultural activities on those lands which are left fallow or abundant.

### **1. 3. AIM OF THE STUDY**

The purpose of this survey is to find the dirt physico-chemistry, clay mineralogy and birthrate position of selected uncultivated cultivable dirts within the University Of Limpopo Experimental Farm Of Capricorn District in Limpopo Province, with the position of placing extra potency cultivable lands for agribusiness in the part.

## **1. 4. Aim OF THE STUDY**

To find physico-chemical belongings of selected uncultivated and cultivated dirts on the farm and their influence on dirt birthrate.

To find the clay mineralogical composing of the selected uncultivated and cultivated dirts on the farm and their influence on dirt birthrate.

To find the chemical science of the selected uncultivated and cultivated dirts on the farm and their influence on dirt birthrate.

To find the birthrate index of the selected uncultivated and cultivated dirts on farm and their influence on dirt birthrate.

To bring out and understand the function of dirt physico-chemical and clay mineralogical belongings act uponing the birthrate of the selected dirts on the farm.

## **RESEARCH QUESTIONS**

These inquiries will help in achieving the aims of the survey:

What are the physico-chemical belongings of the selected dirts?

What is the clay mineralogical composing of the selected dirts?

What is the chemical composing of the selected dirts?

What is the birthrate index of the selected dirts?

Make the dirt physico-chemical and clay mineralogical belongings affect the birthrate position of the selected dirt on the farm for sustainable agribusiness?

## **Hypothesis**

This research will be guided by the undermentioned hypotheses:

Most possible uncultivated cultivable lands on the farm could be used to spread out and better agricultural outputs.

Soil physico-chemical and clay mineralogical belongings with their influence on dirt birthrate are cardinal indexes for sustainable agribusiness.

## **1. 7. Rationale OF THE STUDY**

South Africa has a broad scope of dirt of different physico-chemical and clay mineralogical composing. Limpopo Province entirely has a diverseness of dirt and climatic conditions allowing a assortment of different signifiers of agribusiness, ( White Paper on Agriculture, 1995 ) . In support of nutrient security and ego saving, it is now strategically of import for any country to hold available information on the comparative suitability of their dirt for agribusiness, so that penchant may be given for the land more suited for agribusiness. In this procedure, it is of import to cognize the comparative quality of the land so that its usage can be regulated in conformity with the suitability of the peculiar dirt.

Local husbandmans have ever relied on the agricultural research end product and extension from Syferkuil experimental farm since their clime,

and the dirt they farm on developed from the same parent stuff as the 1s at Syferkuil. The enviroing farm community and governments of the country, will therefore benefit from this survey by obtaining information on the physico-chemistry and clay mineralogy of their dirt every bit good as the dirt ' comparative suitability for agribusiness. Economically, capability categorization of the dirt in Mankweng country can help in promoting the governments toward induction of the assorted farming systems on the identified possible cultivable lands. In this manner single dirt could be best utilised for the types of agricultural production for which they are best and most economically suited.

## **1. 8. STUDY AREA**

The location, topography, climate, flora, dirt, geology and hydrology of the country are briefly described below in the subsequent subdivisions.

### **1. 8. 1. Location of the survey country**

Limpopo is South Africa 's northernmost state, lying within the great curve of the Limpopo River. The state borders the states of Botswana to the West, Zimbabwe to the North and Mozambique and Swaziland to the E as shown in Figure 1. 3 ( DBSA, 1998 ) . Limpopo Province is divided into five Municipal territories ( Figure 1. 3 ) : Capricorn, Mopani, Sekhukhune, Vhembe and Waterberg, which are further divided into 24 local Municipalities ( Limpopo Province Natural Resource Maps, 2003 ) . The Province occupies a entire surface country of 125A 755 km<sup>2</sup>, approximately 10. 3 % of South Africa 's land country ( Limpopo Province Natural Resource Map, 2003 ) . The

population is about 5 355A 172 which is 11. 3 % of South African population ( Statistics SA, 2003 ) .

Syferkuil is the experimental farm of the University of Limpopo ( 23o49 ' S ; 29o41 ' Tocopherol ) situated in the Mankweng country, in Capricorn territory municipality, South Africa. The farm is 1 650 hour angle in size ( Moshia et al. , 2008 ) . Syferkuil experimental farm, for about 39 old ages now ( Moshia et al. , 2008 ) has served as the chief Centre of University of Limpopo 's horticultural, agronomic, and carnal production researches, on which both undergraduate and alumnus pupil researches along with hands-on preparations are conducted. The farm is bordered by five populated rural agriculture communities which are Mamotintane, Ga-Makanye, Ga-Thoka, Solomondale and Mankweng. On this farm, approximately 25 hour angles are presently allocated for rain fed harvests, 80 hour angle for irrigated harvests, and 40 hour angle are used for rotary motion of winter and summer harvests. The 80 hour angle irrigated harvests are served by an machine-controlled additive move irrigation system ( Moshia, 2008 ) .

Figure 1. 3: Locality Map of the survey country

Figure 1. 4: A scale aerial exposure map ( scaly 1: 10 000 ) of University of Limpopo ( Syferkuil ) 's experimental farm ( Moshia et al. , 2008 )

## **1. 8. 2. Land-Use of the survey country**

Limpopo Province constitute a sum of 12. 3 million hectares land, out of which about 9. 24 million hour angle. is utilised as farming area ( LDA, 2002 ) . This 9. 24 million hectares of farming area about 0. 93 million hour angle. of

it is utilised as cultivable land, 6. 68 million hour angle. as natural graze, 1. 7 million hour angle. For nature preservation, 0. 1 million hour angle for forestry and for other intents. Seventy six per centum of the cultivable Land is allocated to dry land ( 0. 7 million hour angle ) cultivation and merely 0. 223 million hour angle for irrigation systems.

### **1. 8. 3. Geology of the survey country**

The geology of Limpopo is complex and diverse ; it varies from Palaeo-Archaeon mafic, ultramafic and felsic extrusives to Mesozoic sedimentary stones and inundation basalts ( RSA Geological Map series, 1984) . The stone formations in the State can be considered in four chief divisions based on clip and general homogeneousness viz. : the Archaeon, by and large known as the 'Basal ' or 'Fundamental ' Complex ; the Pre-Cambrian, or Algonquian Systems ; the Palaeozoic, pre-Karoo Formations ; the Mesozoic and the Karoo System. The topography of the part varies from comparatively level countries to cragged terrain ( Barker et al. , 2006 ) .

Limpopo is rich in minerals with economic value ( White Paper on Agriculture, 1995 ) . Prevailing minerals in the eastern portion of Limpopo include Pt and its group metals, chrome, Cu, phosphate and andalusite. The Western side is characterised by Pt, granite, and coal minerals, while diamonds, coal, magnesite, and hints of granite dominate the Northern portion of the Province. Mineral resources that are presently being mined in the state are Andalusite, Antimony, calcite, chrome, clay, coal, Cu, diamonds, emeralds, feldspar, fluorite, gold, granite, limestone, magnesite, manganese, cosmetic

stone-Slate, phosphate, Pt, salt, sand & A ; rock, silicon oxide and Zn  
( Dramstad et al. , 1996 ) .

#### **1. 8. 4. Climate of the survey country**

Limpopo falls in the summer rainfall part with the western portion of the Province being semi-arid, and the eastern portion mostly sub-tropical, ( Limpopo Province Natural Resource Maps, 2003 ) . The western and far northern parts of the Province experience frequent droughts. Winter throughout Limpopo is mild and largely frost-free. The mean one-year temperatures for the southern to cardinal plateau countries of the state is by and large below 20°C ; in the Lowveld and northern parts mean one-year temperatures are above 20°C. The state receives summer rainfall between October and March peaking in January. The average one-year precipitation ranges between 380mm in the North and merely over 700mm in parts of the Waterberg ( Koch, 2005 ) .

The climate of the survey site is classified as semi-arid with the one-year precipitation of approximately  $A \pm 495$  mm per annum. The average one-year temperature of  $25A \pm 10C$  ( soap ) and  $10A \pm 10C$  ( min ) was common during the old ages of survey. Annually, the farm averages 170 frost-free years widening from late October to mid April.

Figure 1. 5: Monthly norm rainfall as recorded in the Limpopo Province ( LDA, 2002 )

Rainfall informations ( figure 1. 5 ) indicating that most rainfall occurs between November and March, ranging between 80 millimeters and 130mm.

It should, nevertheless, be noted that these figures indicate an mean rainfall and lower rainfall can be expected in most territories.

### **1. 8. 5. Dirts of the survey country**

There are broad assortments of dirts that occur in the Province, be giving to be sandy in the West, but with more clay content toward the E, ( Limpopo Province Natural Resource Maps, 2003 ) . The dirts are differentiated based on deepness, the nature ofdiagnosticskylines and parent stuffs, ( FAO, 1999 ) . Those dirts are chiefly developed on basalt, sandstone and biotite gneiss and are by and large of low built-in dirt birthrate ( FAO, 1999 ) .

Limpopo Province has diverse dirts, nevertheless, five major dirt associations have been identified, ( FAO, 1999 ) : of which Dystrophic, ruddy and xanthous, good drained clayed dirts are extremely leached, clay-like, acidic dirts found in the high rainfall countries of Drakensberg and Soutpansberg scope. They are bouldery, found on steep inclines and are of low birthrate. As such, they by and large have limited value as cultivable land but are suited for afforestation. Red, yellow and Grey dirts in caternary association are flaxen and loamy dirts in the 300-600 millimeter rainfall belt in the western and northwesterly portion of the Province. They are suited for cultivable agriculture, but by and large occur in the low rainfall countries west and north of Thabazimbi, Vaalwater, Lephalale and Polokwane. Black and ruddy clay dirts have with changing sums of stone and lithosol, found in a narrow strip analogue to the eastern boundary line, the Springbok Flats ( Settlers and Roedtan ) and the southwesterly boundary near Dwaalpoort



and Derdepoort. Although extremely erodible, they are utilised extensively for dryland harvests such as cotton and winter cereals.

Duplex and paraduplex soils are characterized by surface soil that is distinguishable from sub-soil with respect to texture, construction and consistency. Major occurrences are in Sekhukhune, south to southwest of Lephalale in Waterberg territory, between Louis Trichardt and Tshipise, and subdivisions of Vhembe District near the eastern boundary line. They are by and large non utilised as cultivable land due to high erodibility. Poorly developed soils on stone consist of surface soil overlying stone or weathered stone. They are found to the E of the Drakensberg, including a big subdivision of Mopani District, and E and West of Musina. They tend to be bouldery, with shallow soils and hence by and large unsuitable for cultivable agriculture.

Black and ruddy, fertile clay soils occur on the Springbok Flats, with ruddy brown sandy loam to the Northern and Western portion of the state, ( FAO, 1999 ) . The mountains have deeper, extremely leached ruddy soils in wetting agent countries, with more open stone where it is besides dry. Red brown, gravelly soils, which have a low birthrate, predominate on the Lowveld, the best agricultural soils being alluvial soils next to the rivers. The Province has a few high possible countries for dryland harvest production and many chances for extended ranching and irrigated fruit and harvest production, ( Limpopo Province Natural Resource Maps, 2003 ) .

### **1. 8. 6. Vegetation of the survey country**

The geographical location, rainfall forms and varied physical and climatic conditions have given rise to diverse flora across the state. The flora found in the state have been classified into inland tropical wood ; tropical shrub and Savannah ; pure grassveld ; and false grassveld types ( Development Bank of South Africa, 1998 ) . The inland tropical woods include the northeasterly mountain sourveld and Lowveld rancid Bushveld types. Tropical shrub and savannah comprise the Lowveld, waterless Lowveld, Springbok flats turf thornveld, other sod thornveld, waterless sweet bushveld, mopani veld, assorted bushveld, lemony assorted bushveld and rancid Bushveld types ( Limpopo Province Natural Resource Maps, 2003 ) . Pure grassveld types include the northeasterly flaxen Highveld types. The false grassveld types include the Polokwane tableland false grassveld.

### **1. 8. 7. Topography of the survey country**

Limpopo Province has diverse topographic characteristics. In the E is the level to gently undulating Lowveld field, at an height of 300 to 600 m, bounded in the West by the Northern Drakensberg escarpment and Soutpansberg, with steep inclines and peaks up to the 2000m ( LDA, 2002 ) . The about degree Springbok flats in the South prevarication at an height of 900 m, while the Waterberg and Blouberg to the North, with rippling to really steep terrain, reach 2 000 m. The North- Western zone is a level to rippling field, which slopes down to the North and West at 800 to 1 000 m.

### **1. 8. 8. Hydrology/Water Resources of the survey country**

The Department of Water Affairs and Forestry ( DWAF ) classifies South Africa as a water-stressed state, prone to fickle and unpredictable extremes such as inundations and drouths that cut down land to a dry and waterless barren ( Water Research Commission, 2002 ) . Water resources in South Africa are limited doing them critically of import for the sustainable economic and societal development of the state ( Dennis and Nell, 2002 ) . This is one of the grounds why it is of import to protect the scarce H<sub>2</sub>O resources of the state. Rivers are the chief beginning of H<sub>2</sub>O for the state. In the Limpopo Province, there are Four Management Areas viz. : Limpopo ; Luvubu & A ; Letaba ; Krokodil Wee & A ; Merico and Olifants ( NDA, 2000 ) .

Applied research on irrigation and fertiliser methods are practiced on the research secret plans on the farm. There are two 10-ha secret plans fitted with separate irrigation systems used by research workers and pupils for research on field harvests.

### **1. 8. 9. Agricultural activities of the survey country**

The agricultural sector in the state is divided into three wide sub-sectors viz. commercial farms, emerging commercial farms and subsistence farms, ( Development Bank of South Africa, 1998 ) . The commercial farms fall in the larger farm size class, emerging commercial farms in the medium size and subsistence farms in the smallest size ( LDA, 2002 ) . The emerging and subsistence farms are jointly called small-scale farms which are largely located in the former fatherlands. The varied climes of Limpopo Province allows it to bring forth a broad assortment of agricultural green goodss

running from tropical fruits such as banana, *Mangifera indica* to cereals such as corn, wheat and veggies such as tomatoes, onion and mushrooms ( NDA, 2001 ) .

Limpopo Province has big country of land suited for dry-land production ( LDA, 2002 ) . Maize is the staple nutrient of bulk of people in Limpopo Province and is mostly grown by the different classes of husbandmans both for family, industrial and carnal ingestion. On the footing of country and volume of production, it remains the most of import cereal grain produced in the Province despite the dry and drought prone agro-ecology of much of the part ( LDA, 2002 ) . Climatic fluctuation could take to fluctuations in maize outputs. As a basic nutrient in the Province, corn has a big and stable market and is the most of import agricultural merchandise in South Africa ( NDA, 2001 ) .

## **1. 9. Summary of chapter**

The chapter has clearly provided the background of the survey sketching the general construct of clay mineral and their influence on dirt birthrate for harvest production. It has besides outlined the purposes, aims, research inquiries, job statement, principle and hypothesis of the research undertaking. The map of the survey site exemplifying the location of the site in Capricorn territory municipality and the suitability map of the survey site has been provided. The geology, mineralogy, climate, soils and agricultural activities of the survey site have besides been outlined. The soil physico-chemical and clay mineralogical belongings are reviewed in the subsequent chapter.