

**AGRICULTURAL PRACTICES IN ZURU LOCAL GOVERNMENT AREA:
IMPLICATIONS FOR DEVELOPING RAINFED AGRICULTURE**

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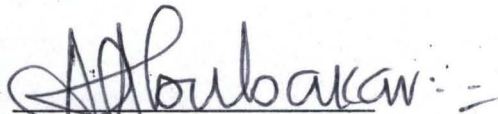
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CERTIFICATION

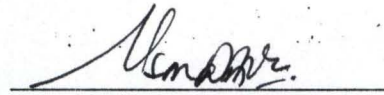
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DEDICATION

This project is dedicated to the entire family of Dazi as part time farmers and to all the sons and daughters of Zuru emirate.

ACKNOWLEDGEMENT

I have great pleasure in expressing my sincere gratitude to almighty God, and to the people who have contributed immensely towards the success of my project.

My profound gratitude, first to my project supervisor Dr. S. A. Abubakar, who read the manuscript and inspite of his numerous official engagements, and to all members of staff who assimilated a lot of knowledge about the earth's environment. My thanks also goes to all my colleagues classmates for their intellectual companionship.

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ABSTRACT

This project intend to assess the Agricultural practices in Zuru and the implication for developing rainfed agriculture.

The kind of data used were rainfall data of the study area to assess the yearly trend of rainfall amount for agricultural practices.

To profer solution to bad agricultural practices and problems through the length of rainy and dry season respectively.

The major natural climatic problem arise due to unexpected hazards and vagaries in weather or nature which usually disrupt farmers in the study area are as follows.

- Drought
- Rainfall intensity
- Erosion
- Pest and diseases which constitute risks and lead to uncertainty in farming.

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GROWING SEASON (ON SET)

In the dry tropics and sub-tropics, the growing season is often defined as the period in which rainfall exceeds some fixed fraction of potential evaporation.

Kebbi State has an annual rainfall of about 708mm by average. The rainfall usually begins in early May and lasts through to October with heaviest fall in July and August. This rainfall distribution is almost universal in the whole Local Government of the State Zuru inclusive.

Planting is carried out after the rains are established and immediately after a good rain. Early planting has been shown to benefit from the early release of mineralized nitrogen which usually occurs at the onset of rain. Too early or too late planting will result to crop failure due to inadequacy of moisture throughout the growing season.

LENGTH OF RAINY SEASON

The length of rainy season determines the plant growth, development and yield. In the Northern belt, the wet season lasts six months or less the dry season, lasts six months or less the dry season, lasts six months or more, in the middle belt, the wet season lasts seven months or more and dry season five months, and in the southern belt, the wet season lasts eight months and four or less months of dry season.

In the northern belt, the rainfall is under 102cm single maximum, in the middle belt rainfall is 115-142cm mostly single maximum, usually in September, but it can be up to 194cm in Jos Plateau and there can be some double maximum in the southern

- i) The conversion of light energy from sunlight to chemical energy from plants and animals.
- ii) The continuous functioning of the various chemical biological cycles, the hydrological cycles nitrogen cycles.
- iii) The process by which living organism adapt their environment and reproduce continually and environmentally specific.
- iv) The process of perception communication processing and transmitting of information which allows for interaction of living things amongst themselves and their environment.

1.2 **AIMS AND OBJECTIVES:**

The aim of this study is to identify the agricultural practices in Zuru Local Government and how to develop rainfed agriculture.

The specific objectives include:

- a) To identify the major bad agricultural practices in the Local Government area.
- b) To assess the yearly trend of rainfall amount.
- c) To profer solutions for the development of rainfed agriculture.

1.3 **STUDY AREA:**

Zuru Local Government area is one of the twenty one (21) Local Government areas in Kebbi State. It is located in the extreme south eastern part of the State, it lies between longitude 44000E to 56000E and latitude 42000N to 53000N of the National grid lines. And it covers area of approximately 923,768 square kilometers.

Zuru Local Government area is located on a hilly terrain and is bounded in the North east by the Danko/Wasugu Local Government Area, North west by Fakai Local Government, Southwest by Shanga Local Government southeast by Sakaba Local Government and south by Rijau Local Government of Niger State.

The Local Government area has four (4) administrative district namely: Dabai, Rikoto, Rafin Zuru and Senchi. The estimated population of Local Government area is 171,963 (1999 provision census). The various indigenes cultural and linguistic groups in the area are the Ielna (Dakarkari) and Fakkawa. Other non-indigenous linguistic groups in the Local Government area are the Hausa, Fulani, Yoruba, Ibo etc.

AGRICULTURAL ACTIVITIES

The majority of the people of Zuru Local Government area are predominately peasant farmers who engaged in cultivation of various types of food crops ranging from cereal crops (maize, sorghum, millet, rice etc) and pulse crops (cowpea, groundnut, banbranut) also they produce vegetable crops such as (tomatoes, pepper, spinach of animals like (goat, sheep, cattle, poultry birds).

The forms of agricultural activity which have evolved within the ecological zones of West Africa and which may be described in general terms.

The term subsistence agriculture is generally used to described agricultural activity which produces only sufficient food for the cultivation and his family. Subsistence agriculture thus defined will exist side by side with other forms of agriculture which

1.4 SIGNIFICANCE OF THE STUDY:

The environment impact assessment in meteorological studies possesses a wide range of importance that is universal particularly to man, animals, plant and machineries for irrigation etc.

This importance could be in form of projection to human environmental economic development, provision of food for man and feed for animals. Adequate understanding of these are helps in longterm agricultural planning.

1.5 STATEMENT OF THE PROBLEM:

The agricultural practices in Zuru area are faced with specific problems of agriculture include the following:

- The incidence of drought and desertification
- Rainfall fluctuations, rainfall intensity, wind and flood
- Problem of soil salinity
- Problem of soil infertility etc
- Problem of pest and disease infection
- Problem of harvesting, processing and storage of farm product
- Problems of land and air pollution

The problems can be reduced by mass education farmers in modern agricultural practice, mass supplies of crop protection inputs such as spraying chemical sprayers and subsidized rate.

These inputs have negative and positive impact in the environment. The negative effect on chemical application on the soil such as fertilizers and insecticides have

long term effect in agricultural practices mostly used subsistence farmer in the study area destroy the ecological system and other component of the environment. The positive effect is short term yield of abundant crop production within the environment. The local community should be in a watchful position of the agricultural environment to detect the presence of any vulnerable attack of either pest or diseases for prompt solution that is beneficial to the local community.

1.6 **SCOPE AND LIMITATION OF THE STUDY:**

The research is carried out in Zuru Local Government area of Kebbi State to assess agricultural practices.

The problem facing this research work is lack of enough equipment for data collection. But the available data was collected from College of Agriculture Zuru.

This research is limited to Zuru Local Government alone because the research lack enough fund for distant traveling to look for data and many other logistic for effective research work.

"Climate factor that influence soil formation are rainfall (precipitation), wind, temperature changes and light. The kind of vegetation found in an area is influenced to large extent by climate.

A combination of the amount and distribution of rainfall and temperature changes would cause drastic soil transformation chemical weathering is slow in an area of low rainfall and cold temperatures but is relatively fast in areas with high rainfall and intense temperature (Adefolalu 1986).

2.3 RAINFALL

(Ilesanmi 1972) reported that rainfall help in determining the type of Agricultural activities that can be practiced in an area. It is a fact of life, often taken for granted. Rainfall has a great importance on nearly everything that man does. Rainfall is the most limiting factor in crop production. It determines when cultivation starts and when it ends.

In Nigeria, the rainfall distribution is not the same and this has direct effect on the type of crops grown and the type of livestock raised. In the southern part of the country, we have two rainfall peaks which makes production of certain crop plant like maize possible twice a year.

In the area of low rainfall, growing season for crops are usually short viz: in the northern states of Nigeria the rainfall is small and hence we have only one growing season for maize where as in the southern states of same country, where there is plenty of rainfall there are two growing season for maize.

Again certain plant which will grow in one climate will not grow in another, for example wheat (a crop of temperate region area, but it will not grow in any part of the southern rainforest. Cocoa survives and grows well in the upper savannah area of Northern Nigeria, where the harmattan is harsh prolonged (Maunder 1970).

According to Kipps (1986) "Rainfall is the most important element of the climate of West Africa. The amount of rain that falls and where and when it falls is largely determined by the interaction of the tropical continental and tropical maritime air mass the whole pattern of agriculture depends on the pattern of rainfall.

Heavy rainfall often washes the minerals out of the crop soil thus making the soil unsuitable growing crop, and very heavy rainfall, say over 25000mm, falling in one season prevent the cultivation of such crops as cereals (excluding rice).

Plant growth, development and yield in the tropics, as elsewhere is influenced by a wide range of physical factors including various climatic elements such as rainfall and humidity in many cases water availability to plants or crops is by a major control. Only in the humid tropics does water shortage not have an impact, but even were the characteristics of tropical rainfall and the fact that many crops require dry period at certain growth stages have marked influence on Agriculture (Girma, 1999).

Adefolalu (1983) rightly point out that plants do not depend on the amount of rainfall received for growth, development and yield but on how much water is available to them (plants) as soil moisture.

When the amount becomes available and the length in days/months during which the soil is able to retain enough moisture required, it will enhance good yield.

Nievwoh (1982) equally points out that rainfall in the tropic is the principal controlling factor or element in agriculture.

This is because the amount of rainfall normally received decides which type of agriculture can be carried out and which crops can be cultivated in a region. The seasonal distribution regulates the agricultural calendar and the rainfall variability from year to year is the main factor responsible for fluctuations in yields and total production.

Therefore, water is an essential element to plant growth. Its role in photosynthesis is important and it also acts as the solvent and transportation agent for plant nutrients and provides turgidity in stem and leaves. Water use in plant, takes place in the process of transpiration by which water, absorbed by the roots is transformed into water vapour exhaled by the stomata of the leaves.

This process is also necessary because it serves as a coolant to leaves, especially when these are exposed to the sun for long periods and therefore in danger of being damaged by excessive temperature. Because of these many functions, it is not surprising that lack of water or moisture stress, reduces the growth and development of plants.

From the ongoing discussion, Macdonald et al. 1990 agricultural compendium (1989) concludes that millet can be the most effective crop of the desert fringe zone because it does not only tolerate drought, (adaptable to drought) withstands hotter conditions and the water requirements for millets are the lowest of the cereals. Generally 200-300mm of well distributed rainfall during the growing season will

support a crop even if drought conditions are often be meteorological and agriculture.

The study of the physical process taking place constantly in the atmosphere which are used to forecast the features trend of the weather this is very useful in agriculture in planning the cropping pattern.

It is important to have adequate knowledge of a climate in a particular place this helps the agriculturist to know the period of planting, the time of planting and where crop is to be planted.

During a particular season base on the knowledge of the amount of rainfall and during and duration of rainfall help farmers to take necessary precaution of possible flooding or drought or wind damages (Joy 1980)

Infrequent agricultural bulletines issued by the meteorological office will assist farmers to take due precautions against flood, rainfall intensity and a period of possible drought (Adebayo 1978).

The term rainfall used to include rain and hails. It is better referred to as precipitation a term, which includes rain, hail and snow.

region, on both national and regional scale, such as for desert locust or Senegalese grasshopper control.

2.5 : WEATHER AND CLIMATE

The term "weather" and climate are often used interchangeably, but they are not synonymous in meteorology. The climate of a region is a comprehensive description of how weather changes both in time and space. Farmers recognize a distinction too.

"Climate determines what crops a farmer can grow; weather influences the annual yield and hence the farmer's profit.. and how much food there is to eat" (Watso, 1963). This review deals with broad relations between crop processes and weather.

Weekly mean values of solar irradiation differ relatively little between stations at the same attitude even when they are 50 to 100 km apart. In the absence of frontal systems, the same is true of temperature, vapour pressure, and wind speed measured at some standard height, usually between 1 and 2m above the ground. In contrast, rainfall from corrective storms common in the tropics is extremely variable over distances of few hundred meters (Savakummar and Hotfield, 1990).

All these elements of weather have characteristic diurnal variations but in most countries are measured only once or twice daily either as totals (radiation and rainfall) or as instantaneous values (temperature, etc).

Many workers have tried to relate the microclimates of crop stands to development, growth, yield, water use, fertilizer need, disease etc from such information, (as frequently published in the Journal Agricultural and forest meteorology, for example)

CHAPTER THREE

3.0 DATA AND COMPUTATIONAL METHODS:

This section of the research highlights the types of instruments and parameters used in data collection as well as methods used. Maunder (1970) has generally observed three ways of establishing the importance of climate in agriculture.

- i) The study of the fundamentals of plant-climate relationship namely the radiation and moisture balance for various crops in various climate environments.
- ii) The study of Agricultural and climate data for a number of places within a given area in order to deduce agro climatic relationships from the analysis of data.
- iii) The method involves studying plant climate relationship under controlled environment. Therefore in relation to the objectives of this study the second method which involves the analysis of Agricultural and climatic data will be considered.

The reasons for choosing this method is to show rainfall as one of the climatic element and agricultural production this method enable the prediction of agricultural production based on a statistical analysis of climate and crop yield.

3.1 METHOD OF DATA COLLECTION

The basic data collection for all meteorological purposes are those recorded at observation stations distributed at representative site over the study area.

extension service strategies and sometimes non-relevant research as well as exorbitant cost of the recommended agronomic packages.

- Increasing population pressure on the land and poor extension services and contract with farmers (Okigbo 1983) and World Bank, 1983).
- Increasing environmental degradation and adoption of non-sustainable agricultural practices (Eicher, 1985 Brown and Wolf, 1985).
- The natural-climatic problems arise because of unexpected hazards and vagaries in weather or nature which usually disrupt agricultural activities as follows drought, erosion, flood, and different kinds of crop and livestock pests and diseases which constitute risks and lead to uncertainty in farming.

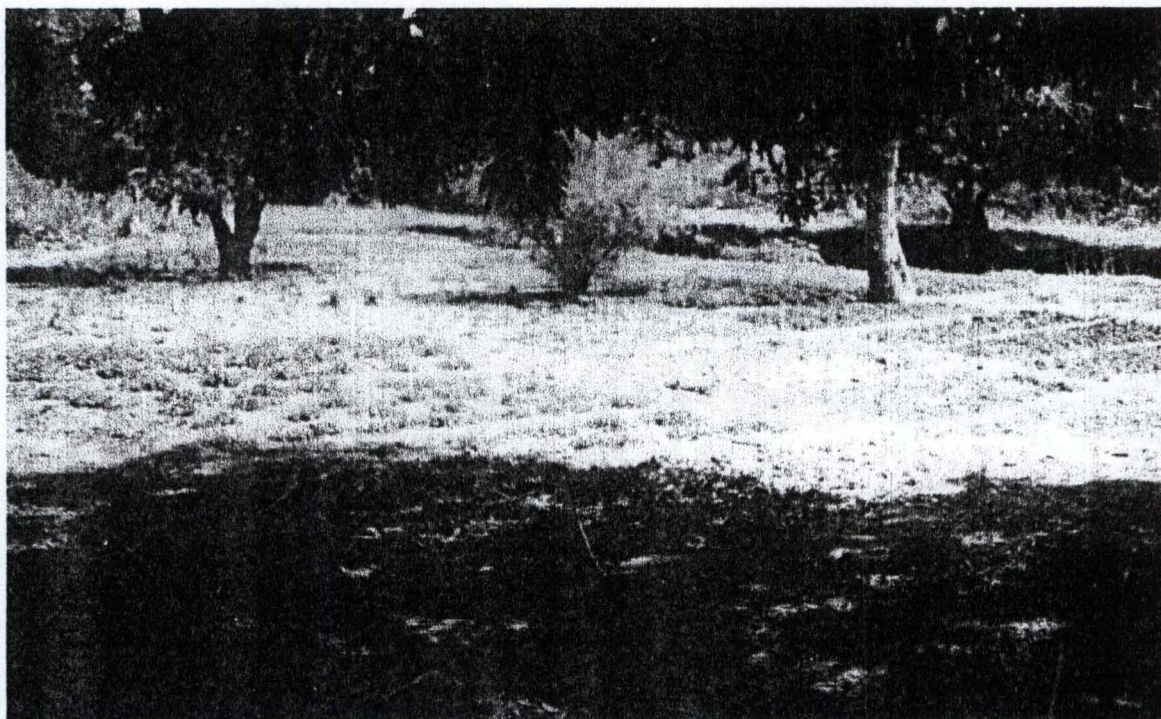
The above listed factors contribute to the low farm productivity and bad agricultural production or practices in the study area were detected.

4.2 **ASSESSMENT OF THE YEARLY TREND OF RAINFALL AMOUNT:**

The trend of rainfall amount in the study areas is generally sufficient to sustain concentrated planting. In most cases rainfall is also extremely unreliable as regard both quantity and time of occurrence. The amount of rainfall were significant contribution to plant water requirements may be calculated.

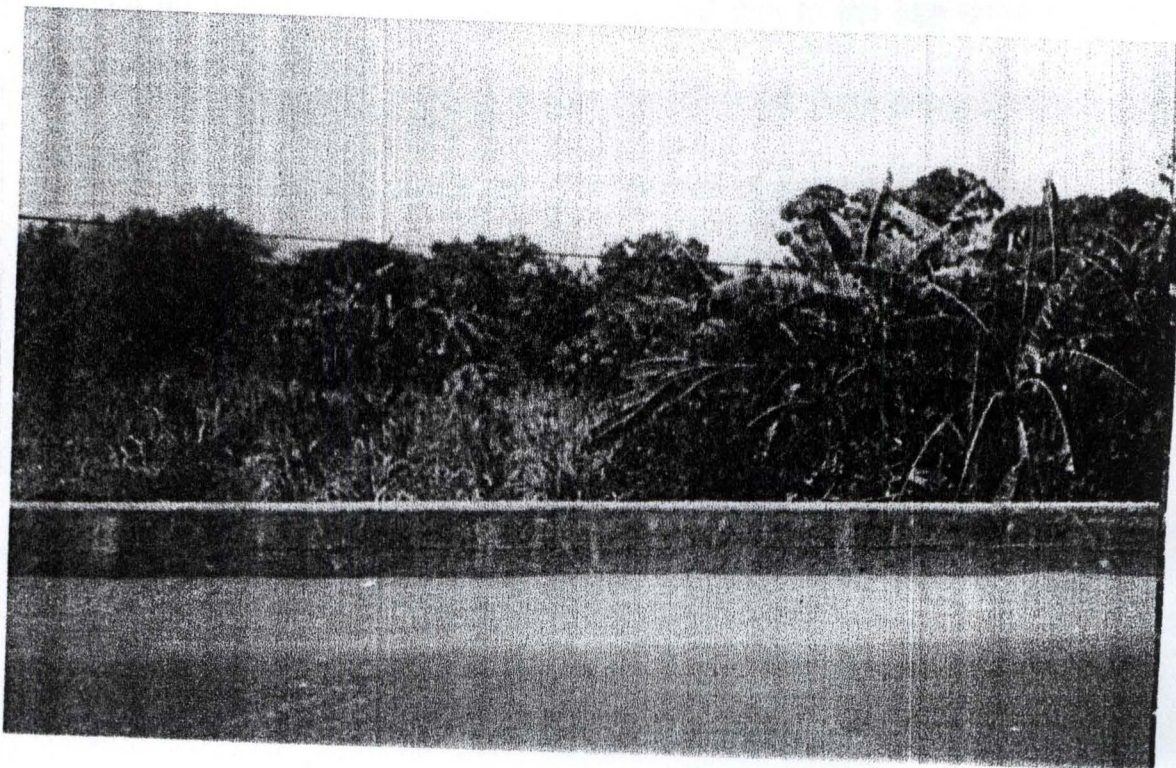
Rainfall records are kept by practically all meteorological stations and often by agricultural research stations and government farms. To evaluate the contribution rainfall can make it is necessary to consider two factors – firstly the effective rainfall, secondly the probability of receiving a given depth of rainfall.

PLATE 2



Dry season vegetable garden
Salad, Benniseed and Alafu

PLATE 3



Dry and rainy season garden Bannana, Sugarcane,
Maize etc is grown

5.1 RECOMMENDATIONS

1. Drought resistant food crops were emphasized to provide the basic source of food production. The planting of crops like sorghum and millet which are nature habitats drought escape plants. It is suggested that they will be more suitable in all years including drought years when on set of rains is normal.
2. Suggestion of any soil moisture enhancement schemes to be concentrated over the natural rainy season as far as possible.
3. If delayed onset is expected then this period should be artificially supplied from irrigation water also when pre-nature cessation is mostly likely water equivalent to avert drought should be made available to plants where they are yet reach maturity.
4. Recommend the use of data available to forecast or before carrying out any project because of the changes now been experienced in the study area.
5. Recommend irrigated agriculture eliminating the direct dependence on rainfall. This allows rainfed growing season to be extended, crops to be grown during dry season and long season crops on the same area.

The application of irrigation farming to help in producing more food, it is during the dry period of the year.

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