

# Land Use Pattern and Conservative Measures: A Case Study of Longkhum Village, Mokokchung District, Nagaland

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**Abstract:** Land, a natural and renewable resource, is a gift of nature. Land may be defined as “a sum total of the natural resources over which the possession of the earth’s surface gives control”. The concept covers the earth’s surface, building sites, farm soil, growing forest, mineral deposits and water resources. Land supplies all the basic needs of the people. It is the basis for the production of food and raw materials; it is also the source of income, employment, economic security and power. Land which is single to all human kinds is, however a distinctly a limited resources. The land use pattern is an important theme in all aspects towards environment. Land use pattern is conditioned by the association of two sets of factors: Firstly, a physical factor such as geology, relief features, climate, soil and vegetation which limit the use capabilities of land. Secondly, cultural factors which include both economic and institution. Land use thus deals with the problems involved in conversion of land from one major use of another general use. The pattern of land use of a country at any particular time is determined by the physical, economic and institutional framework taken together. The time, methods and intensity of land use together with large number of environmental factors determined the potentials as well as long term sustainability of land productivity. Traditionally, Ao-Nagas do Jhumming, hunting and trapping of wild animals for domestic use, medicinal values and festival purposes. This trend still continues despite the Government enacting Wildlife Protection Act. At present some Village Councils and NGOs has initiated conservation of wildlife in their village jurisdiction. Longkhum village has rich and varied heritages of biodiversity owing to its varying physiographic, geo-climatic conditions and large forest cover. However, in recent times due to agriculture, logging, expansion of settlement areas, random hunting and trapping, and unplanned project and promises in the name of development has affected the land leading to degradation of environment. This study aims to find conservative measures and suggestions to minimize the adverse effect on environment by the activities of the people in the village so that the balance between nature and development remains stable.

**Keywords:** Land, Pattern, Degradation, Conservative Measures.

## 1. Introduction

Land, a natural and renewable resource, is a free gift of nature. Land may be defined as “a sum total of the natural

resources over which the possession of the earth’s surface gives control”. The concept covers the earth’s surface, building sites, farm soil, growing forest, mineral deposits and water resources. Land use as Vink (1975) defines as “any kind of permanent or cycle of human interaction to satisfy human needs either natural or both from the complex of natural and artificial resources which together are called land.”Land supplies all the basic needs of the people. It is the basis for the production of food and raw materials; it is also the source of income, employment, economic security and power. Land which is single to all human kinds needs an activities, is, however a distinctly a limited resources. Given that limited in supply the quality and quantity of land resource available to men may either hinder or assist the level of development of the country’s economy.

The pattern of land use has been affected by population pressure, law of inheritance, misuse of irrigation facilities, overgrazing, and deforestation, haphazard growth of industries, unplanned developmental project, and environmental disaster both natural and manmade. One of the inefficient land is that the policy for each specific land use has been evolved in isolation. Thus, the requirements of one form of land use have often reduced efficiency of other uses of land. So long as different uses of land are assessed in isolation and as the pressure mounts, the claims of each form of land use are bound to become difficult to meet.

Food and Agricultural Organization (FAO 1977) has defined soil (land) degradation as 'a process which lowers the current and/or the potential capability of soil to produce (quantitatively and/or qualitatively) goods or services'. Soil or land degradation then affects the 'flow' or renewable characteristics of soils by reducing the productivity of the resource. In other words, land degradation connotes loss of land productivity, qualitatively quantitatively through a-number of process. The degradation of land may be either by natural agencies or its over-exploitation by man. Of course, change in soils over geologic times is a natural process but the acceleration in degradation in recent years is caused mainly by increasing anthropogenic intervention in the form of shifting cultivation (Jhum),

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deforestation, forest fire, stone quarry, developmental activities, etc. However, degradation of land is one of the major causes of ecological imbalance in the village. It poses great challenge to crop productivity in a number of ways simultaneously for the villagers.

The present paper is an attempt to discuss new methods of farming and conservative measures on land by the Ao Nagas tribe of Nagaland. It may be stated that, Longkhum village under Mokokchung district like many other tribals in Nagaland still practice the traditional methods of shifting cultivation (Jhumming). However in recent times shifting cultivation has been termed as slow and low productivity especially in the context of rapid economic growing situation when nations focuses its national economics through the idea of liberalization and global markets. (Temjensosang: 2015). Of late, there is a steady decline in the traditional method of cultivation. The new method of cultivation such as horticulture, animal husbandry, plantation, fishery, is showing positive the paper also attempts to look into the challenges and obstacles faced by the villagers and bring out conservative measures to protect the land.

## 2. Objectives, Data Base and Methodology of the Study

1. To understand the land use pattern of rural community in the study area.
2. To find out the changing pattern of land use and its conservation.
3. To identify the consequences of Jhumming and other human activities.
4. To investigate the decrease of traditional method of farming and its result

Necessary primary data for this paper was collected from Longkhum village and the secondary data was collected from various books, journals, articles, official records and annual reports etc, the data were systematically analyzed in order to have an objective picture of the current land use pattern and traditional methods use for protection of land from erosion.

## 3. Area of Study

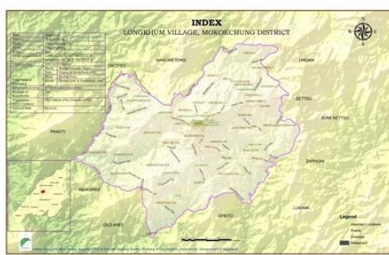


Fig. 1. Map of Longkhum Village

Longkhum village is situated about 17 Km southwest of Mokokchung district under Ongpangkong range located between 26°11'46"N and 26°18'22" N Latitude and 94°20'4"E and 94°28'33"E Longitude . It has an altitude of 1601 meters above the mean sea level which is one of the highest altitude in the entire district of Mokokchung from where one can view the Himalayas from the top of its hillocks. It is surrounded by Mangmetong and Ungma village on the North, Ungma, Settsu

and Zunheboto district (Shisimi, Zaphumi and Lumami) on the East, Wokha district old Are, New Are, Sungro, Okotso and Pangtion the West and Zunheboto district (Izheto and Sastami) on the South. It has an average rainfall of 2500mm with average temperature of minimum 10°C and Maximum 28°C. The total geographical area of the village is 8790 hectares of which 3709 hectares is under total cultivated areas. It has a total population of 3811 (2011 census). The main occupation of the people is agriculture which is practiced in the form of Jhum cultivation based on simple technology. Out of 546 households nearly 152 households are engaged in Jhumming covering an area of nearly 200 hectares and they cultivate both new Jhum filed (locally called as Ludi) and old Jhum field (locally called as Pentong).

## 4. Land Use Pattern Changes (2010-2019)

Agriculture is the most important activity of the villager, which constitutes the major land use changes of the study area. Agricultural activities dominate the occupational pattern of the village, which is also the most important source of livelihood. Majority of the villagers are engaged in Jhum cultivation an age old traditional method which is an extremely complex system and its production is economically low as compared to other activities. The forest of the Jhum field is cut and dried and generally burn in the month of March or April with proper fire line. No manure or pesticides are used apart from ashes and the residue from the burned forest which adds nutrients like potassium and phosphorous, directly to the soil. The burned soil is spread uniformly throughout the field so that the nutrients are evenly distributed. Burning of jungle also control potential weed re-growth, fungus and insect infestations and the high temperature during burning also enhances the release of other native soil nutrient elements (Hormila. G. Zingkhai, 2015).The study reveals that Jhum cultivators in the village are constantly modifying and innovating upon their traditional practices to improve its production. At present the practice of Jhum is rapidly decreasing giving priority to horticulture, commercial and plantation farming as shown in Table-1. The villagers give emphasis to organic farming and cash crops like tomato, potato, broccoli and cauliflower are cultivated. Since, the crops grown are organic there is a huge demand in the local market and in the nearby district. The village has been selected as the 'Vegetable Village' in the year 2009 by the Agriculture and Horticulture department, Government of Nagaland. The villagers are environmentally conscious as they have banned hunting in the community forests.

Table 1  
Longkhum Village Jhum

Year	House-hold	No. of Jhum Cultivator	(%)
2010	488	380	77.86
2019	546	152	27.83

Source: Field Study 2019

Forest is the second major land use component. Typologically, forest of Longkhum village ranges from tropical semi-evergreen forest, sub-tropical broad leaved with hill forest and Montana wet temperate forest. These factors enable to thrive and abound with vary rich biodiversity in the land. It is

endowed with rich biotic resources of plants and animals having a total forest cover of 150 hectares over the decades. Forest is found to have influenced in shaping the economic life of the area. However, there is a sizeable decline of forest cover due to the large scale of felling of trees for firewood. Logging and wild fires is also another problem of deforestation which are all inter-linked with the practice of shifting cultivation. Today, numerous natural abode diversity of flora and fauna are also disappearing due to destruction of evergreen and moist-deciduous forest. The destruction of the world’s tropical forest, which is disappearing at an alarming rate, is one of the today’s most urgent global environmental issues (K.C.AgrawaI, 1998). The indigenous plant species *Rhododendrom Arboretum* (locally known as *Metsubennaro*) which once abundantly embellishes the forest of Longkhum village has reduced expressively.

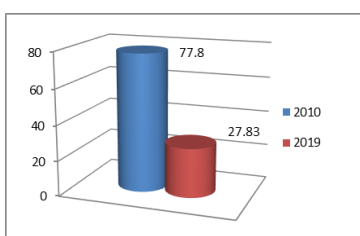


Fig. 2. Longkhum Village Jhum Cultivation in 2010 and 2019

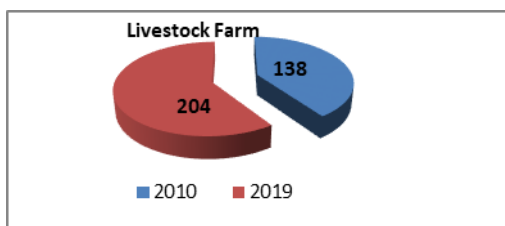


Fig. 3. Livestock Farming (2010 & 2019)

Livestock is the third major constituent of land use changes and act as an important source of supplementary income for the villagers. Rearing of domesticated animals such as pigs, cows, chicken, ducks, goats, has been an important source of supplementary income. It is usually practiced to provide a source of protein in the diet, a ready source of cash for emergency situations and to meet common household and family expenses. Today, a sizeable land cover is used for poultry and piggery and other components such as fishery, dairy and bee keeping are also taken up but at a lesser scale. Farmers are combining animals and fish culture which assures good production of fish but a sizeable number of fish ponds are left abandoned due to lack of knowledge.

Table 2  
Livestock Farming (2010)

Category	No. of Livestock Farm	
	2010	Acres
Piggery Farm	5	8
Poultry Farm	12	20
Fishery Pond	40	60
Dairy Farm	6	20
Bee Keeping	24	30
Total		138

Source: Field Study 2019

### A. Population Growth & Development

Activities are some of the major problems that are being created by human being itself. With population growth in the village, demand for food and firewood has increased substantially. The construction of roads in rural areas under various developmental schemes and central schemes has lead to decline of huge land and forest cover. With the increase and expansion of National Highway and State Highways passing through the agricultural land, farm land, village forest, etc., has damage large area of land leaving farmers at great risk. The opening up of roads to forests that had been previously inaccessible leads to an inflow of farmers, settlers and loggers, whose activities degrade the environment. Land resources are a necessity for economic growth of many rural populations and for developmental purposes. Today, the villagers leased out their land to business man for fire wood, timber and for modern developmental activities as a result big machineries are installed on the roadside for the purpose of road development, construction of recreational places and various institutions which occupies large area of land. Although land is usually used for development activities, its impact on environment cannot be neglected.

Table 3  
Livestock Farming (2019)

Category	No. of Livestock Farm	
	2019	Acres
Piggery Farm	14	44
Poultry Farm	30	60
Fishery Pond	18	40
Dairy Farm	4	10
Bee Keeping	45	50
		204

Source: Field Study 2019

Table 4  
Land use Changes

Land Use	Household in %	
	2010	2019
Shifting Cultivation (Jhum)	77.86	27.83
Paddy	0	0
Horticulture/Crop Plantation/Forest/Others	16.42	54.20
Livestock Farming	4.18	12.16
Development & Recreation	2.54	5.81
Total	100.00	100.00

Source: (Field Study 2015 - 2019)

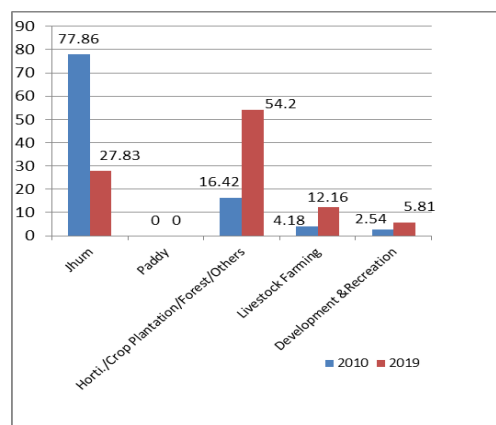


Fig. 4. Land use Changes (2010 & 2019)

## 5. Conservative Measures

The response of society to land degradation is soil conservation, defined as any set of measures that controls or prevents soil erosion or maintains soil fertility (Stocking 1995). Land use refers to the management and modification of the natural environment or wilderness into built environment, semi-natural habitat, arable fields, pasture and managed woodlands. It also describes the arrangement of activities and input that people undertake in certain land cover types to produce change or maintain it (FOA 1997; FOA/UNEP, 1999). Land use changes in areas such as forestry, farmland and around waterways are being driven by the need to provide food, shelter, fibre and water for more than seven billion people of the world (Foley *et al.*, 2005).

Recently, the relationship between human being and environment has reached to such a situation where proper conservative measures have become an essential part of our development policy. Ao-Naga's were traditionally attached to environment for their survival and they had traditional knowledge of managing their immediate environment since time immemorial. However, the traditional knowledge which is usually transferred from older generation to the young one in the form of anecdotes and physical demonstration of conserving natural resources is fast degrading in the state, as the younger generations are more into modern methods and there is an urgent need to collect and preserve this rich traditional knowledge. Today, realizing the decline of our environmental values many villagers has initiated the policy of converting their village forest to conserve and manage flora and fauna. Taking the financial and technical support of government and NGOs villagers have initiated:

1. Converting Jhum land areas into economically sound and sustainable cultivation, woodland, etc.
2. Wildlife conservation,
3. Raising and developing important commercial crops.
4. Regulating harvesting of forest resources on the principles of sustainability.
5. To protect and conserve, biodiversity such as Reserved Forest Sanctuaries based on scientific and in-situ conservation.

However, in some parts of the area implementation was not successful because of landownership problem and rapid change in agricultural activities.

## 6. Conclusion

The changing nature of Jhum cultivation and allied activities has witnessed a percentile decline in agricultural occupation in the village. In 2010, the Jhum cultivators accounted for more than 77.8% .and within a span of nine years it has been drastically declined to 27.83% in- 2019. This clearly shows a shift in the occupational structure in the village. Horticulture, plantation crop, animal husbandry, fisheries, etc., is progressing largely as it gives better sustenance and traditional cultivation

(Jhumming) is declining rapidly. But, the impact of new methods in agricultural land use is not much affective due to lack of marketing facilities, lack of infrastructure, lack of proper planning as well as the strong connection of Jhumming with the culture of the villagers. Land use is a dynamic concept. It changes over both in time and in space. However, this dynamism of land use changes increase through the involvement of modern technology and skill. This is shown in intensive farming and appropriate utilization of land for maximum production with minimum use of land. But the study area, as has been said before, land is lacking in the modern technology and skill and the change of land use is a very slow one. Therefore, in order to bring a successful land use changes for economy and to reduce the extent of land damage caused by the agricultural and developmental activities, environment-friendly technology and improvised traditional method of cultivation is indispensable. Besides, environmental regulations must be strictly enforce to bring a balance between nature and development. Awareness programmes should be organized by the village councils and also the other stake holders. Rehabilitation and awareness programmes should be initiated by the concerned departments and the village council to protect the land, in the long run it will not only benefit the village but the whole district in particular and the state in general.

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