

# **ASSIGNMENT**

**ON**

**EVS**

**TOPIC : AGRICULTURAL PRACTICES  
(JHUM/ TERRACE CULTIVATION) AND  
IT'S IMPACT ON THE ENVIRONMENT IN  
KOHIMA VILLAGE.**

Submitted by :

*Vilakkenus Hesse*

Submitted to

*Ma'am Medoseno Thapo*  
*Dept. Environmental Education*  
*K.C.K*

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*Checked by*  
*[Signature]*



## Introduction :-

Terrace and Jhum cultivation of paddy are widely practised by the tribal communities in the hill regions of Nagaland.

Jhum cultivation is the traditional farming system in the Nagaland state. The Angami and Chakung tribes of Nagaland have terrace cultivations of paddy whenever water is available for irrigation.

Terrace cultivation, method of growing crops on sides of hills or mountains by planting on graduate terraces built into the slope. Method's of farming uses "Steps" that are built into the side of a mountain or hill. On each level, various crops are planted. When it rains. About 73% of the people in Nagaland are dependent on agriculture and most of them are involved in shifting cultivation, because of compulsion of its natural hilly topography and traditional way of cultivation. It is a known fact that shifting cultivation has negative impact on soil health and ecosystem. It won't be possible for someone whose occupation changes drastically overnight.

## Thum and Terrace cultivation :

It is considered highly destructive to environment as it involves burning and clearing vast areas of forest so that cultivation can be done for a few years. It does not only destroy forest but has a chain of effect and after-effects leading to multifarious adverse conditions of soil and climate. People like to cling to this method because it is simple and cheapest method. And also their ancestors practised it with a sense of socio-religious importance. Recognizing the adverse effect of Thum cultivation on the state Government, through the soil and water conservation Department took up Thum control programme since 1974-75 under the state plan, but it has not achieved encouraging results. Eminent scientists have recently advocated agro-forestry as an alternative to Thum cultivation.

This article attempts at giving some details about the proposed method of Agro-forestry

Key words : Cropping, Dribbling, Erosion, Denudation, Depredation.

## Thum Cultivation:-

Thum cultivation is considered destructive to the environment as vast areas of forest is released and burnt down so that cultivation can be carried out at least for 3 to 5 consecutive years. It does not only destroy forest but also disturbs the ecological balance and destroys the environment. It has a chain of effects and after-effects leading to multifarious adverse conditions of soil and climate. An assessment made by TREES-II is one of its international initiatives of shifting cultivation practice in North East India revealed that in many states due to reduction in the fallow period from 20-30 years in the past to as low as 3 years in recent times the situation has attracted the attention of planners and decision makers. The re-growth of forest was almost nil and existing forests were also decreasing. The threat to which the forests was almost being subjected to is of immediate concern. System causes far-reaching disturbance in the condition of the soil leading to changes in the climate, ecological imbalance and the environment degradation, besides fertility loss and low productivity of crops.



Fig. 1: Thum Cultivation (Zhadim village)

\* Thum cultivation, also known as slash-and-burn cultivation is a practice of cultivation where a piece of land or forest land is cleared, burnt and then used for cultivation.

This results in the soil being rich in Potash and other minerals to sustain the crop.

Agriculture system is being practiced by the tribals. And also Thum cultivation is a traditional farming method for most of the Nagaland people. Also is considered highly destructive to environment and it involves burning down of forest in different areas.

The recent trend of increase in population lead to excessive demand for food. And the areas under forest are continuously converted into crop land. As a result of soil degradation due to excessive cultivation the cropping period in Jhum land is reduced.

In Nagaland area under Jhum is about 56.50% and contribute 49.26% to total rice production. Studies show that the productivity of paddy in wet terrace cultivation is more than the Jhum cultivation. The lower production of paddy under jhum is attributable to non adoption of efficient rain water management, weeding, improper sowing and lack of sound plant protection measures. The practise of growing varieties of crops in Jhum land is not new to the people in this region.

This practise is continuing more than 20 years. This form of cultivation is done instead of shifting cultivation since shifting cultivation is causing serious soil degradation. This form cultivation is helping the farmers in the village to improve their boundaries, their household income as well.

(ICAR).

## Advantages of Jhum cultivation:

- i) First and foremost is the replenishment of soil. It helps the soil gain back all the nutrients it has lost during the cultivation. The recycling process helps the natural vegetation grow back and this is what is exactly required for the soil.
- ii) Jhum cultivation causes only temporary loss of jungle. Because once the moonsoon is over the farmers abandon the land, and so it's jungle regenerates quickly.
- iii) Organic farming, doesn't use pesticides or chemical fertilizers.
- iv) Cooperation; after jhumming, the land distributed among farmers.
- v) The Jhum cycle normally runs for around 6-10 years.
- vi) Jhumming done in steep hill slopes where secondary cultivation not possible. So it's a reflex to physiographical characters of the North east.
- vii) Overall, Jhum economically is productive + Ecologically sustainable.

## Disadvantages of Jhum cultivation :

- i) Leads to deforestation & loss of fertility of a particular land.
    - ii) leads to soil erosion
    - iii) Burning of trees causes air pollution
    - iv) Insufficient cultivation of crops for a large population.
  - ii) The major disadvantages of shifting cultivation is that many trees in the forest are cut and this increases soil infertility and leads to soil erosion.
  - iii) In India, shifting cultivation is locally known as Jhum and has been blamed for environmental degradation.
  - iv) Nowadays farmers come back in just - 5 years, when it should be 10 years of gap, since then it is not enough time for the forest to regenerate.
  - v) Tons of biomass gets lost due to burning of trees.
  - vi) Tree burning lead to :
    1. Higher  $CO_2$ ,  $NO_2$  and other greenhouse gases (GHGs)
    2. Higher run off of rainwater.  
(Hence drought, drinking water shortage).
  - vii) Soil erosion, siltation in dams.
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## Terrace Cultivation :

Terraces are small plots on waters used for farming, closely relating to the New World. People dig into a hillside or other sloping surface and build it up so it is level in places, like steps.

Terraces can be in rectangle or they can follow the natural shape of the land. Terracing prevents the rain from washing the soil away. In agriculture, a terrace is a piece of sloped plane that has been cut into a series of successively ascending flat surface or platforms, which resembles steps, for the purposes of more effective farming. This type of landscaping is therefore called terracing.

Also it is the method of growing crops on sides of hills or mountains by planting on graduated terraces built into the slope. Though labour intensive, the method has been employed effectively to maximize available land area in variable terrains and to reduce soil erosion and water loss.

Terrace farming is of two types: namely bench and ridge type terrace.

1. Bench terrace - Reduce the land slope.
2. Ridge terrace - remove or retain water on slopes and this has two types - namely narrow based and broad-based.



Fig 2: Terrace cultivation (Zhadima Village)

\* This method of farming uses "Steps" that are built into the side of a mountain or hill. On each level, various crops are planted. When it rains, instead of washing away all of the nutrients in the soil, the nutrients are carried down to the next level. These steps prevent water from washing away the soil and plants.

This system also allowed them to build aqueducts, which carried water to each level.

The idea was also independently developed by the Inca people. The Incas built their aqueduct system so well that it is still used today.

People dig into a hillside on other sloping surface and build it up according to level.

# Importance on Terrace Cultivation.

## ① Origin :-

Terraced farming was developed by the Meso American and other peoples of the South-Central Andes before 1000 AD, centuries before they were used by the Inka, who adopted them.

## ② Effectiveness :-

In particular, terrace agriculture: Increase farmability and land productivity of sloped fields. Contributes to water conservation:

Slows down and reduces water runoff, improves rainwater harvesting, prevents soil erosion by decreasing rill formations.

## ③ Techniques :-

Terrace farming is a method of farming whereby "steps" known as terraces are built onto the slopes of hills and mountains. When it rains, instead of rain carrying away the soil nutrients and plants down the slope, they flow to the next terrace.

Every step has an outlet, which channels water to the next step.

As usually, rice is grown in shallow water, using paddy fields.

## Paddy field :

When growing semi-aquatic plants, such as rice and taro, paddy fields are used.

These fields are filled with shallow water at least part of the year.

Cultivating these plants is very labor-intensive. A lot of water is needed. Paddy-fields started next to which are built and are ready for the terrace cultivation on a hillside.

Deepwater rice is not grown using paddy fields. It needs water over some 35-40 centimetres (15 in) deep for least a week to plant the rice to it.

Some Deepwater practices are done in Asia including Northeastern India as well.

The production of paddy in Nagaland, mostly grown for self-consumptions as well, one of the main methods of cultivation practised by the Nagas is wet terrace paddy cultivation.

Carried out on hillsides by hand without the use of any modern tools or vehicles.

Nagaland with geographical area of about 16,579 Sq. km. lies between  $25^{\circ}60''$  and  $27^{\circ}40''$

hence paddy is the major crop in Nagaland.

Also during this seasons in the months of March and May, snails, frogs are easily available in Nagaland.

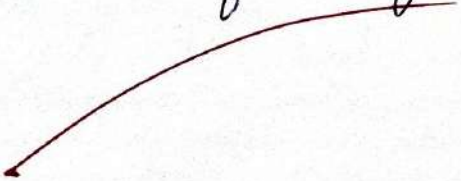
## Benefits of Terrace farming :

- Increases farmability and land productivity of sloped fields.
- Contributes to water conservation: slows down and reduces water run-offs, improves rainwater harvesting.
- Prevents soil erosion by decreasing soil formations.
- Boosts soil conservations.
- Reduces sedimentation and water pollution. Water stays long enough for heavy particles to settle down and prevent downstream sedimentation and pollution of water bodies, but short enough not to harm crops.
- Increase food production by adjusting hilly land for farming.

Nonetheless, terrace farming crops are rather diverse as well.

These are grains, legumes, medicinal and culinary herbs, berries, nuts, fruits, vegetables, etc.

## Relative disadvantages of terrace farming :-

- Specific machinery to push and level the soil;
  - High labor and cost inputs;
  - Land disturbance that often requires additional treatment;
  - Hiring trained staff to arrange terraces;
  - Preliminary soil testing;  
(Slipping soils are not suitable).
  - Terrace farming can be dangerous at some point because it can lead to rainwater saturation in some hilly areas.
  - On the contrary, the consequences of overflowing water is that it causes more dangerous water runoffs.
  - Terraces, in addition, may result in mudslides if not well managed.
  - Major disadvantage of terracing is rainwater saturation of the ground.
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## Terrace cultivation (Gardening) tools ÷

Agriculture is a labour-intensive process which cannot be done by hands, Therefore, It is necessary to use tools and machines to carry out agricultural processes.

These are also known as agricultural implements or agricultural tools.

Tools make the farming work easier and more efficient.

Some important farming tools are as follows ÷

- ) Sickle
  - ) Rake
  - ) Shovel
  - ) Scythe
  - ) Grape hoe
  - ) Spade
  - ) AXE
  - ) Mattock
  - ) Plough
  - ) Hoe
  - ) Harvesting knife
  - ) Dao's
- etc...
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## Conclusion ÷

The agricultural sector is of vital importance for the region. It is undergoing a process of transition to a market economy, with substantial changes in the social, legal, structural, productive and supply set-ups, as is the case with all other sectors of the economy.

It has become a part of the custom all their festivals and ceremonies revolve around it in agricultural practice and water conservation in case of elderly based farming. Due to non-availability of well organised irrigation system, vast areas of land which if brought under permanent irrigation, the food grain production in the state could be raised.

Technological advancement in many parts of the world have enable people to indulge in the double cropping and become self sufficient.

Incorporation of such advanced technologies to manage water would help the naga farming carry out double or winter cropping as well.

Nagaland is blessed with rich in cultures and natural resources, facility agriculture practise have resulted in serious environmental depletion.

Even today traditional organic products and thus face low income and productivity to the farmer and marketer.



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