

## **Traditional Methods of Pest Management in Shifting Cultivation after Bamboo Flowering in North-East India: Experience of Tamenglong District of Manipur**

Lunghim Rongmei

*Geography Department, Manipur University, Imphal, India -795003*

**ABSTRACT:** *North East India is a landlocked region where hill, mountain and plateau account for 72% which is cover by difference types of tropical and deciduous forests and bamboo. These forests are the main source for a large number of hill tribes of North East India where they can practise shifting cultivation for their subsistence. An estimated of 4, 43,336 families depend their livelihood on jhum cultivation and clear a forest area of 3,869 square kilometres every year. But the region has suffered from famine when the gregarious flowering of bamboo due to heavy damage to the crops in the jhum fields by the outbreak of rat population. Despite of employing a number of scientific methods to control the rat swam, Tamenglong district of Manipur has suffered from rat flood till today. Hence the present paper is attempted to reconstruct the traditional knowledge of pest management after bamboo flowering by using snow -balling method of sampling.*

**Keywords:** jhum, bamboo flowering, pest management, snow balling

### **I. INTRODUCTION**

Physiographically North East India is not a homogenous unit. The region has tertiary mountains, Achaean plateaus, and river valleys, intermontane and piedmont plains. This uneven distribution of landforms reflect in difference soil types, rainfall, humidity and temperature, which support an attitudinally variety of vegetation and forest cover which is the main sources for shifting cultivation. Shifting Cultivation is the oldest form of farming which is commonly practice by the hill tribes of North East India. It is known as jhum cultivation in Assam hills and other hilly region of the North East India (N.N Bhattacharyya). Under this cultivation all the vegetation of a land are clear and drying for 2-3 months, after which burning and sowing of seeds are follows. The land loses its fertility after 2-3 years of cropping and the farmers have shift to another piece of forested land for growing. The abandoned jhuming areas requires 3-15 year depending on the nature of land to recover its fertility and to cover with forest. But this farming usually fail to produce crops due to poor management and unable to control from the huge destruction given by outbreak of rat population during the time of bamboo flowering because bamboo is the dominant species of plant in North East India. Hence number of scientific techniques has been used to control the rat population and managed to save the standing crops and storing grains. But number of jhum villages in North East India has still unable to control their field from rat attack and suffering from lack of food products especially in Tamenglong district of Manipur. According to the interview of the elders who experience twice the bamboo flowering and rat outbreak, the destruction causes by rat swam in 2000s is much severe than the 1950s, because this generation do not follow the traditional system of shifting cultivation and denying the traditional methods of pest managements.

### **II. STUDY AREA**

North East India is located between latitudes 22° N and 29° N and longitude of 89°46'E and 97°30'E. It covers an area of 255,083 square kilometres and accounts 7.7 percent of the land surface o India. The region is border with China, Bangladesh, Myanmar and Bhutan. With its long border extending over 4800km,it is connected with the mainland by narrow corridor of foothill of North Bengal. North east India is land lock region diverse physiographical unit. The region has Tertiary Mountain, Achaean plateaus river valley intermontane and piedmont plain.

### **III. OBJECTIVES**

- To establish evidences of relationship between gregarious flowering of bamboo and rat outbreaks/rat floods.
- To reconstruct the traditional knowledge of pest management

#### **IV. METHODOLOGY**

The study is based on the primary data collected through field survey using snowball sampling technique especially in shifting cultivation villages of Tamenglong district of Manipur. Intensive interviewed were employed to understand the methods and techniques of pest management after bamboo flowering to the target group of elder people above 80 years of age who had experience twice the bamboo flowering and rat outbreak and secondary data are collected from recent research paper published in difference journals and news papers.

#### **V. BAMBOO FLOWERING AND OUTBREAK OF RAT POPULATION**

Bamboo is a type of flowering perennial evergreen plants in the grass family. It is one of the fastest-growing plants on Earth, with reported growth rates of 100 cm (39 in) in 24 hours. There are about 29 species of bamboo are found in North East India. Most of the bamboo species in North East India are flowering and dying in every 50 year which causes an outbreak of rat population and great impact on shifting cultivation. There is casual relation among the bamboo flowering, rat flood and failing of crop in shifting cultivation. The gregarious bamboo flowering and consequent falling of bamboo seeds provided super abundance food for the rats which led to faster body growth, high breeding, build up of high rat population, migration to the nearby jhum field crops and heavy damages.( Nazira Q. Kamal,2011) Usually rats give birth twice a year but when the bamboo is flowering they can give birth dozen times in a year as the bamboo flowering give them good nutrition to support their reproduction. Rats eat anything they can find and they eat every kind of crop. They attack not only crops, also have been found to eat bamboo matted floors inside houses and have even destroyed home materials. The destruction of crops has resulted in severe food shortages. As a result, this situation affects the people through starvation bringing along with it death, destruction and suffering. The bamboo flowering and rat infestation cycle has in the past lasted for about three years, until the rats run out of food and their populations return to normal. But this time the cycle is much longer than before especially in Tamenglong district of Manipur. In Tamenglong district ,bamboo flowering was started from 2005 and lasted up to 2007 and rat flood and infestation on jhuming field started from 2006 and lasted till 2012 which is double time than before. This proved that something is change in the mechanism of shifting cultivation or bamboo constituent in the region or lack of management etc. According to the respond of the elders people of the district, there is decreasing in bamboo area and declining of fertility and increasing of pest attack in the field, this is due to the application of scientific techniques and denying of traditional knowledge by this younger generation.

#### **Traditional Methods of Pest Management after Bamboo Flowering**

According to the interview of the elder people above the age of 80 years from difference villages in Tamenglong district of Manipur, they total opposed the present application of scientific techniques in jhuming field like using pesticide, herbicide, habitat trapping , continuous trapping in bamboo habitats, rat flood trap barriers,etc and suggested to follow the traditional knowledge of pest management. Although they did not understand the exact mechanism of bamboo flowering and rat outbreak, but they know that famine will follow after the bamboo flowering due to huge damaged of crop by flood of rat population. Hence they adopted difference techniques to prevent from this disaster and frequently use the proverb: "prevention is better than cure". Most of their methods for the management of pest in shifting cultivation is related with the preventive measures. The methods which are used to control rat after bamboo flowering is difference from village to village and they can discuss as under:

##### **1. Cutting down the Bamboo of Area:**

Traditionally they use to cut down the bamboo areas for cultivation when they saw the symptom of flowering, because they understand that if they did cut down the bamboo also naturally this bamboo will mass dying after flowering. So during the flowering of bamboo they targeted for jhum in bamboo areas only and left the other place for regain fertility and to recover forest. Traditionally they follow this system to save from wasting their land and they are much conscious of their land. This method will prevent the bamboo from flowering and reduced the rat reproductive system which will enhance the higher chance to produced crop from their field. Usually they follow this technique during the time of bamboo flowering although they did not understand that this method will prevent the bamboo from flowering and reduced the rat population.

##### **2. Selection of Field:**

Usually selection of field site is an individual concern during the normal time, they select the place base on slope condition, soil, forest cover and accessibility, and as a result jhum fields are scatter in difference region base on individual choice. But during the time of bamboo flowering, this individual choice is prohibited by the village's elder because this scatter field is more prone to the rat attack and other animals and they select the field site for the whole village or the nearby villages in one particular place as a compact form for the betterment of the whole region. Under this system the whole region or village will protect the field especially in the night time on rotation basis without considering the individual interest and they use traditional trap as well

as sounding instrument made from bamboo to scare the animal. Even though they cannot protect the periphery of the field from the rat infestation and other animal, they can produce good yield from the central part of the field for their subsistence by this method.

**3. Pruning System:**

Pruning Shifting Cultivation is the oldest form of farming. Under this system big tree are prohibited to cut down and put standing in the midst of the field but they usually pruned away only the branches and clear the small plants and herbs. They practiced this system not to protect from the pest infestation but in order recover the forest as well as the soil fertility within a short span of time which will possible to reduce the jhum cycle with good yield. But when we study minutely about this farming system it has lot of contribution in pest management. The pruning tree which are standing in the midst of the crop is the good place for the carnivorous birds like eagle, kite, owl etc. because they love to sit in the naked tree for the better searching of the prey on the ground than they sit in the well groom tree. Hence these birds will scattered a lot of rats and disturbed the usual movement and function of pest infestation on the field and reduced the chance of damaging the crops.

**4. Fixation of Sowing Date:**

In the normal time they sow the seed in difference date and various varieties of seeds according to the convenience of the individual house and this will enhance the better chance for the maintenance. Because of difference date in sowing seed, the crops as well as the weeds are mature in difference day as a result the farmer has more days to work in the field and produced higher amount of crop. But during the time of bamboo flowering, longer days in maturing the crops have much vulnerable from the pest infestation. As a result, elders of the village will fixed the date for sowing seed for the whole village or the region. Sowing seed in one day in large area will reduced the pest attack on seeds as well as the maturing crops.

**5. One Variety of Seed:**

Difference varieties of seeds were used in shifting cultivation which resulted in difference in maturing time which is much prone to the rat infestation. Hence the elder of the village will select the best seed which has most productive as well as shortest in maturing time. This method will reduced the lag time of crop prone to the pest.

## **VI. CONCLUSION**

In this globalisation and scientific age we are trying to solve every phenomenon base on scientific knowledge and research, but this idea is opposed by the elder people who have strong believed in traditional knowledge which are inherit and passed from generation to generation. According to the elder people of the Tamenglong district of Manipur, bamboo flowering and rat outbreak are natural phenomenon which occurred every 50 year which is uncontrollable by human knowledge and effort and they guarantee that scientific knowledge cannot control the crop damage by rat during bamboo flowering. They suggest that instead of fighting against the natural phenomenon, it is better to go together with the nature, in case of bamboo flowering and rat flood, this generation tried to control the rat population by using difference scientific knowledge but so far it is unable to stop the rat attack on field and thousand of villages in North East India as well as South East Asia are suffered from famine which is much worse than the past time, this proved that scientific knowledge has fail even to fight against the small rat. Hence instead of using any form of scientific methods to control bamboo flowering and rat population, it is better to follow the traditional ways of farming and pest management which will save 80% of the crops same as the past time as well as to renewing the environment from science related pollution.

## **REFERENCES**

- [1]. Bhattacharyya.N.N (2005): North East India: A Systematic Geography, Rajesh Publication, New Delhi pp 1-88
- [2]. Gupta A. K.(2000): Shifting Cultivation and Conservation of Biological Diversity in Tripura, Northeast India, Springer
- [3]. Janzen Daniel. H, (1976): Why Bamboos Wait so Long to Flower, Annual Reviews
- [4]. Kama Nazira Q. I.(2011): Ecological Determinants of Bamboo Flowering and Rodent Population Outbreaks in Chittagong Hill Tract, Raghupur, pp 1-5
- [5]. Keller Helen,(2008): Needs Assessment Report on Bamboo Flowering, Rat Infestation and Food Scarcity in the Chittagong Hills Tracts, Bangladesh
- [6]. Nag Sajal.(1999): Bamboo, Rats and Famines: Famine Relief and Perceptions of British Paternalism in the Mizo Hills (India)
- [7]. Ninan. K. N.(1992): Economics of Shifting Cultivation in India, Economic and Political Weekly
- [8]. Yadav Mulayam Singh.(2005): Bamboo Flowering: Reviewed Work, Economic and Political Weekly