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RESEARCH ARTICLE

MIZORAM FOREST AFTER INDIA'S INDEPENDENCE: BAMBOO, WILD-LIFE AND LAND USE

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Abstract

Mizoram has abundant natural bamboo resources and nearly one third of its geographical area is under bamboo cover. Bamboo is extensively used as material for construction of houses, cutlery, weaving, handicrafts, support for climbers, food, etc. Bamboo resource management and utilization has never been given a serious thought. Harvesting bamboo for local consumption had been negligible as compared to the huge stock available in the state. The introduction of Mahal system has generated income for the forest department. Gregarious bamboo flowering historically has significant ecological, socio-economic and political impact. Being an ecological hotspot, Mizoram is home to a great variety of wildlife species. Systematic survey on flora and fauna is yet to be undertaken. Wildlife conservation is an important mandate of the Forest department. Apart from awareness campaign, protected areas, National Parks and Wildlife Sanctuaries have been notified. The practice of jhuming has gradually deteriorated tree and bamboo forests. Forest plays an important role in protection and conservation of soil and water which are the two important resources on which growth and productivity depends. It also provides the needs of the local population who are depending on forests for fuel, fodder, building materials, fruits, vegetables, etc. As forest plays vital roles in environmental stability and ecological balance, the socio-economic life of the people of the state revolves around the forest.

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Introduction:-

Bamboo, one of the fastest growing woody plants, provides livelihood to more than two billion people living below the poverty line and represents one of the world's greatest natural and renewable resources (Lalnunmawia, Seminar Paper, 2017) Mizoram has abundant natural bamboo resources, and occurs throughout Mizoram where 31 per cent (about 6446 Sq.km) of its geographical area is under bamboo cover (Economic Survey of Mizoram 2008-2009). A total of 22 bamboo species have been reported, of which 14 per cent of the bamboo growing stock in the country is available in Mizoram forest (Economic Survey of Mizoram 2008-2009). The number of bamboo is about 3465 culms / ha, while the growing tree stock is only 34 cu m/ha. According to the record available, the total bamboo stock in Mizoram was estimated to be 12,950.75(000) metric tonnes while the annual yield was 3,237.689(000) metric tonnes (Lalnunmawia, Seminar Paper, 2017)

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Bamboo is extensively used for construction of houses, particularly in the rural areas. Before 1972, majority of the village population were living in houses made chiefly of bamboo. The people living in the southern and western parts of the state, such as Chakmas, Brus, Tlanglaus, Pangs etc. still live in houses made of bamboo (Lalnunmawia, Seminar Paper, 2017). The bamboo species extensively used in construction are *Melocanna.baccifera* (Mautak), *Bambus tulda* (Rawthing), *Dendrocalamus hamiltonii* (Phulrua), *D. longispathus* (Rawnal) and *Bambusa vulgaris* (Vairua). The floors and walls are chiefly made from *M.baccifera*, *D.hamiltonii* and *D.longispathus* and the roofs are covered with leaves of bamboo and thatch. Farmers conventionally used the cut culms of bamboo as a substitute for cup of tea. Some bamboos like *Bambusa khasiana* (Rawte/Chalte), *M.baccifera* etc are extensively used to support crops like betel vines, beans, peas and other climbers (Lalnunmawia, Seminar Paper, 2017). *Melocanna baccifera* (Mautak) are tall, strong and ideal for house building, weaving, handicrafts, paper pulp and production of toothpicks, chopsticks etc. The edible shoots are largely eaten during rainy season (Mizoram Forest 2006, Dept. of Environment & Forest, Govt. of Mizoram, 2008).

Bamboo grows as under storey plants in deciduous and evergreen forests, in pure stands along riverbanks, in and around villages and as dominant secondary vegetation on abandoned jhumlands. This is due to its vigorous, spreading, subterranean rhizome system from which it is able to regenerate rapidly after cutting and burning.

Economic implications of bamboo

Bamboo resource management and utilization has never been given a serious thought before (Mizoram Forest 2006, Dept. of Environment & Forest, Govt. of Mizoram, 2008). Harvesting bamboo for local consumption had been negligible as compared to the huge stock available in the state. The aggregate domestic consumption in 1988-89 was estimated at 28,315 tones, which left a surplus of 3.209 million tones (Lalnuntluanga et al, 2005). The Government receives up to a sum of Rs.66.00 lakhs per year from royalty in Bamboo, which is almost per cent of the forest department's income. The Mahal System is the main system of selling forest bamboos. Harvesting rights are sold annually to Mahalders from the Cachar and they have rights to exploit any quantity of bamboo from the forest. Although, bamboo culms mature within three years, existing Regulation limits cutting of four-year-old culms. These regulations are hardly enforced, which results in harvesting of immature culms and caused damage to rhizomes and young shoots and hence limiting the future yielding potential of the forest. The present study reveals that even the Mahal system of selling bamboo is facing problem due to public pressure in the form controversies over community forest area, allotment of land to individuals within the reserved forest by the Land Revenue Department.

Since most uses are non-market based, the economic value of bamboo to the communities is not easy to determine. It is mainly used for house construction. Bamboo is widely used in handicraft, as umbrella handles and traditional hats (Khumbeu). But there is neither record of income derived by local artisans nor their costs and returns. Normally the local prices obtained for bamboo products are low.

However, apart from feeding pulp and papers mills industries in the neighbouring state, some local cottage industrial enterprises have processes bamboo providing employment for the local people. Bamboo Ply-board industry have been established at Zuangtui, Aizawl and Lengpui village. A local NGO, Hnamchhantu, has actively investigating potentials in bamboo products such as hanger, broomsticks, and handles for wall and ceiling cleaners etc. Market interest for some products has already been established by TRIFED in New Delhi and NEZCC in Guwahati. Also MIFCO, a state government run corporation has successfully processes and preserves bamboo shoots that sell well both in the state as well as outside the state.

Problems Associated With Bamboo Resources

Management problems

The steep terrain of Mizoram makes managing many of the bamboo forests very difficult. However the main difficulty is the mahal system of harvesting. Because of this the local communities are unable to reap financial benefit from harvesting the resource. The price paid by the Mahalders for harvesting rights is very low and it may be expected that they are making large profit. Local people have no rights to harvest bamboo in a Mahalders forest and must pay the mahaldar if they wish to take any culms. Profits made by the Mahalders have not reached the local economy because these people are from outside the State. In its essence, the system plunders the natural resources of the state while giving no benefit what so ever to the local communities.

The study reveals that the Environment & Forest Department recently face pressure from the public and the Revenue Department, who claim the reserve forest as community land or village area. This may ultimately result in stoppage of mahal system of harvesting and selling bamboo.

Jhumming:

When the forest land is slashed and burnt for shifting cultivation, organic matter of the surface soil is decomposed. This caused a decrease in the level of soil fertility. Therefore, the reduction in jhum cycle not only hampers the biodiversity and ecosystem but also results in unfavourable economic consequences to the farmers. Thus, without proper soil and water conservation measures traditional jhum farming system fails to meet even the minimum food requirement of the farmers. The intensity increases with the gradual rise in population. Jhumming as well as other factors like local demands, forest fire, encroachments etc. affect the sustained yield of bamboo forest.

Co-occurrence of Bamboo Flowering and Famine

Some bamboo species have a life cycle of a fixed length after which they flowered and die and a new generation emerges from the seedlings. The periodic flowering and fruiting of *Melocanna baccifera* (Mautak), is recorded at the interval of 48-50 years, which causes panics among the tribal populations of Mizoram. It has been observed that bamboo loses its durability and strength after flowering due to certain changes in its biochemical contents and as such, it is not suitable for raw materials in bamboo industries. Processing industries and local weavers lose their source of raw material very rapidly and must find alternative sources to remain in business. The gregarious flowerings of this bamboo species have, in the past, had serious ecological and economical impacts. Environmental degradation and erosion increases due to loss of vegetative cover.

The fruits of bamboos are edible and the sudden enormous increase in their availability causes a rapid explosion of the rat populations, whose numbers are related to the availability of food. The rats not only devastate the naturally regenerating seeds and seedlings and thereby reduce the regeneration rate, but also destroy other crops and stored grains. Serious famines resulted. The famines caused by the flowering of *Melocanna baccifera* are known as the "Mautam" famine. These occurred in Mizoram in 1815, 1863, 1911, 1959 and 2007 (Lalnuntluanga et al, 2005) The flowering of *Bambusa tulda* causes the "Thingtam" famine, and these occurred in 1785, 1833, 1881, 1929 and 1977 (Lalnuntluanga et al, 2005) Mautam famines are more severe because the fruits of *M.baccifera* (Mautak) are much larger and can support larger populations of rats.

Mautam Famine 1959 and Its Political Impact on Mizoram

The political impact of Mautam famine of 1959 is so intense that it brought the State under military insurgency for more than a decade. The great famine broke out due to bamboo flowering which was followed by the resultant outbreak of violence by the Mizo National Front (MNF) in 1966. Initially, it brought forth in the relief front a number of voluntary social welfare organizations. One such organization called the Mizo National Famine Front (MNFF) came up in 1960 (Ray, 1982). It earned a good name by the devoted works of the young volunteers who collected house-to-house donations and helped the people in distress. On October 22, 1961 the MNFF dropped the word 'Famine' and became the Mizo National Front (MNF) and came up as a political party with the objective of the creation of an independent and sovereign State of Mizoram. The MNF gradually got in its fold, apart from zealous young men, some members of a political party the Eastern India Tribal Union (EITU) and, a secessionist group the United Mizo Freedom Organisation (UMFO) who were asking for a hill state. Former village chiefs who were disgruntled against the Mizo Union and a number of ex-servicemen also joined the MNF (Ray, 1993). The popularity between the first and foremost political party the Mizo Union and the MNF was getting sharper.

On the 28th February, 1966 armed MNF force simultaneously attacked different government installations at Aizawl and other places. Then the large scale disturbances and the decade long insurgency in the Mizo Hills started. The Government of Assam declared the district as a disturbed area on 2nd March, 1966. While insurgency was going on in the Mizo Hills, political process was continuing for finding a way to meet the aspiration of the hill people of Assam. The Mizo district becomes the Union Territory of Mizoram on 21st January, 1972. It comprises the territories which immediately before this date comprised the Mizo district of Assam and it ceased to be a part of Assam (Ray, 1993).

On 30th June 1986, the MNF and the Government of India signed Mizoram Peace Accord. The MNF volunteers returned as the Central Government lifted the ban on the MNF and other allied organizations, declaring them as unlawful were cancelled (Ray, 1993). The Union Territory of Mizoram was raised to a full-fledged state on February

20, 1987 as result of Peace Accord signed between the Mizo National Front (MNF) and the Government of India on June 30, 1986. It became the 23rd state of India with 40 elected Member of Legislative Assembly.

Wildlife Resources

Mizoram is home to a great variety of wildlife species which has a significant influence on the tradition and culture of Mizos. Till date, no systematic survey of the flora and fauna of Mizoram have been undertaken. Nevertheless, the region is quite rich in flora and fauna. Systematic studies on Insects including butterflies and other invertebrates are yet to be done. Zoological Survey of India has done some preliminary works in the late eighties and early nineties but these are inconclusive. Thus there is ample scope for research in this field.

-Wildlife Conservation in Mizoram

Wildlife conservation in Mizoram is an important mandate of the forests. Due to the typical food habit, life style and lack of conservation awareness and ignorance of laws; indiscriminate killing is still prevalent in the state. Initially, only one Wildlife Division used to function under the direct control of Northern Circle. However, since 1994, a separate post of Chief Wildlife Warden looking after matters pertaining to wildlife conservation in the state including implementation of the Wildlife (Protection) Act, 1972.

The department has taken up wildlife protection by constituting protected areas, and conducting awareness campaign for enlisting public support. There are 2 National Parks and 6 Wildlife Sanctuaries in the state. However, Preliminary notification for a new Sanctuary, viz., Pualreng Wildlife Sanctuary in Kolasib District has been recently issued and final notification is being expected from central government [This information was received through dialogue with Lalnunsanga K., DCF (ARCBR); as shown at “**Glimpses of Environment & Forest Department, Mizoram**”. A short profile and records of Environment & Forest Department, Govt. of Mizoram not published]. At this juncture, there are three separate wildlife offices under the department, namely; Wildlife Division, Aizawl (1986), Dampa Tiger Reserve W.Phaileng (1991), Chhimtuipui Forest Division (1982).

Table 1:- National Park and Sanctuaries (Statistical Handbook Mizoram, 2008 and records found in Environment & Forest Dept.).

Sl.No	Protected Areas	Area (in Sq. Km)	District	Year of Notification	
				Prelim	Final
1.	Murlen National Park	100	Champhai	1991	2003
2.	Phawngpui National Park	50	Lawngtlai	1991	1997
3.	Ngengpui Wildlife Sanctuary	110	Lawngtlai	1991	1997
4.	Khawnglung Wildlife Sanctuary	35	Lunglei	1991	2000
5.	Lengteng Wildlife Sanctuary	60	Champhai	1998	2002
6.	Pualreng Wildlife Sanctuary	50	Kolasib	2005	Due
7.	Tawi Wildlife Sanctuary	35.75	Aizawl	1978	2001
8.	Thorang Wildlife Sanctuary	50	Lunglei		2002
9.	Dampa Tiger Reserve	500	Mamit	1989	1994
	Total	990.75			

Source: Environment & Forest Department - Statistical Handbook 2008

As can be seen from above, only about 4.7 per cent of the State's geographical area is under protected areas network as against the national goal of 10 per cent (Lalnunsanga K., DCF). An abstract of protected areas animal census recorded during the last five years from 2000-2001 to 2004-2005 shown at Table 3. indicates that there has been an increase in the number of three selected animals such as tiger, leopards, and clouded leopards:

Table 2:- Protected Areas' Animal Census: 2000-01 and 2004-05 (Compiled by the author from “**Glimpses of Environment & Forest Department, Mizoram**”. A Short profile and records of Environment & Forest Department, Govt. of Mizoram unpublished).

Sl No	Name of animal	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005
1	2	3	4	5	6	7
1	Tiger	Nil	4	10	10	12

2	Leopard	Nil	12	21	8	32
3	Clouded leopard	Nil	Nil	4	6	7

Animal census conducted for the last five years 2000-2001 to 2004-2005 at Dampa Tiger Reserve at Mamit district, Mizoram also depicts that number of tiger and leopards, has been increased from 4 to 8, and 12 to 20 respectively as shown below:

Table 3:- Dampa Tiger Reserve Animal Census: 2000 to 2005 (Compiled by the author from “**Glimpses of Environment & Forest Department, Mizoram**”. A Short profile and records of Environment & Forest Department, Govt. of Mizoram unpublished).

Sl No	Name of animal	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005
1	2	3	4	5	6	7
1	Tiger	-	4	6	-	8
2	Leopard	-	12	3	-	20

Man - Animal Conflict

The Government of Mizoram has, by notification on 19th September 2002 classified the different categories of ex-gratia compensation to victims of wildlife on death, injury and loss of livestock and crop damage. A number of claims have been received by the department, and spent Rs. 17.705 lakhs for wildlife damage compensation during 2006-07, and Rs. 11.89 lakhs during the year 2007-2008 (Statistical Handbook of Mizoram, 2008). However, owing to financial crisis, the state government has not been able to earmark any funds from the State Plan and funds from central government against the protected areas have been the only source till date.

Assistance for improvement of the livelihood of villagers living in and around various protected areas to minimize the level of dependency of the people on forest and forest produces have been an important issue. Under these components, the people living in these areas have been given support in the form of free distribution of cooking gas and solar lamp; and financial assistance for development of poultry, piggery, cash crops cultivation, wet rice cultivation, terracing, pisciculture, insulation of water tank and bee keeping.

Allotment of Land for Shifting Cultivation

The formation of the Mizo District Council and Pawi-Lakher Regional Council, and abolition of the posts of village chief and his officials necessitated the framing of new norms. The first step in this direction was the constitution of democratically elected village councils which were authorized to regulate jhumming. Along with this move, a few customs were dispensed with, some were specifically upheld through legislative and executive measures, and the rest continued to operate undisturbed.

The new legal instruments relating to jhumming were the Jhumming Regulations and the Forest Acts. In addition, there were rules for the preventions and control of fire. The Mizo District (Forest) Act, 1955, prohibited jhumming in reserved areas, but the right to jhum in unclassified forests was permitted subject to regulation by the village council; an issue that was separately tackled in the Lushai Hills District (Jhumming) Regulation, 1954. The most important provision in this regulation related to the process of assigning plots to individual families. Two methods of plots allocation were outlined: draw of lots for previously demarcated plots, or draw of lots to determine the order in which the households would take their pick. The new lottery system prescribed by the jhumming regulation ensured absolute fairness to all families in the village.

Disputes in the matter of jhumming were to be referred to the executive committee (later the Local Administration Department), which could assign land to a neighbouring village if village or inter-village paths were not maintained, or on any other reasonable ground. Also, it could set aside land as protected forest or diminution of water supply was likely or if the land was likely to be required for irrigation.

The Mizoram (Prevention and Control of Fire in the village Ram) Rules, 1983, basically expressed certain traditional customs that had been till then implicit. By spelling them out, these norms were given due importance, and accountability was placed with the village council. The rules directed the village council to fix the period for cutting the jhums, as well as the date for burning jhums, which was required to organize voluntary labour (hnatlang) to construct firelines (meikawng). If a site was close to the village, it was to take utmost care to negligent manner which might cause destruction of undergrowth, bushes, thatches, trees, and bamboo, thus depriving the soil of its fertility and suitability for jhumming and other cultivation, was made punishable under these rules.

Land Utilization

Out of the total geographical area of 21,08,700 hectares, as much as 92813 hectares constituting 4.4 per cent of the total land is under the net sown area during 2007-08. The moderate slope areas are suitable for horticultural crops which covers about 21 per cent of the total geographical area. Further, out of the total net sown area 58.8 per cent is considered as available area for paddy, and 1.47 per cent is put under orchards and horticultural crops. This study also reveals that the total cropped area during the year 2007 – 08 figured at 1,02,903 hectares out of which about 43.7 per cent of total cropped area is under the primitive and detrimental jhum method of cultivation (Economic Survey Mizoram, 2008-2009). The land utilization statistic is shown in the following table.

Table 4:- Land Utilization 2007-08.

Sl. No	Land category	Area in '000 Hectares	
		2006 – 07	2007 – 08
1	Forest	1593.7	1593.7
2	Not available for cultivation	134.0	134.0
3	Other uncultivated land	79.2	77.2
4	Fallow Land	207.5	210.9
5	Net sown area	94.2	92.8
6	Total cropped area	105.6	102.9

Source: Economic Survey Mizoram 2008-2009

Conclusion:-

Even after more than 60 years of the Indian Independence, agriculture still occupies a very prominent place in the economy of Mizoram. According to Economic Classification of Workers, 2001 Census, 60.6 per cent of the total workers are engaged in agriculture practicing Jhum cultivation (Economic Survey Mizoram, 2008-2009). Agriculture in Mizoram mainly depends on rainfall which comes under the direct influence of the South West Monsoon; as such the state generally received an adequate amount of rainfall. Owing to the practice of jhumming for centuries in this land, tree and bamboo forests have gradually deteriorated. The state government has, however taken steps to generate the forest area either naturally or artificially through plantation.

Forest in turn plays an important role in protection and conservation of soil and water which are the two important resources on which growth and productivity depends. It also provides needs of the local population who are depending directly on forests for fuel, fodder, building materials, fruits, vegetables and other non-wood forest produces. As it plays vital roles in environmental stability and ecological balance, the socio- economic life of the people of the state revolves around the forest.

The forest department has issued fund for the improvement of the livelihood of villagers living in and around various protected areas to minimize the level of dependency of the people on forest and forest produces. Under these developmental components, the people living in these areas have been given assistance in the form of free distribution of cooking gas and solar lamp and financial assistance for poultry, piggery, cash crops cultivation, wet rice cultivation, terracing, pisciculture, insulation of water tank and bee keeping.

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