PIED PIPERS IN NORTH-EAST INDIA

Bamboo-flowers, Rat-famine and the Politics of Philanthrophy (1881–2007)

SAJAL NAG

MANOHAR

This book is about an amazing ecological phenomenon known as *bamboo flowering.* The hill state of Mizoram (India) is covered by a thick growth of two particular species of bamboo which flower and fruit approximately every fifty and thirty years. The bamboo fruits which are a delicacy for the wild rats induce excessive breeding in them. Once these millions of hungry rats finish eating the fruits, they invade human habitat and devour their harvest causing extreme food scarcity leading to famine. In the recorded history of Mizo hills, this calamity is known to have occurred in 1737, 1767, 1827, 1861, 1881, 1911, 1931, 1959, 1977 and the predicted famine of 2007 is already ravaging the hills.

Earlier the British used this calamity to subdue the valiant Mizos, Christian Missionaries to engage in the politics of humanitarianism and the Mizos themselves to whip up nationalist sentiments. The 1959 famine is particularly remembered as it sparked off the 20-year long insurgency in Mizoram. The post-colonial government both at the state and centre are currently engaged in an interesting competition of philanthropy to mitigate the current famine. This book narrates the politics of colonial, evangelical, nationalist and post-colonial state around an environmental catastrophe.

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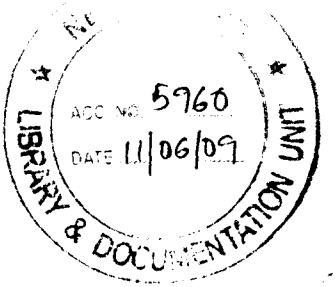

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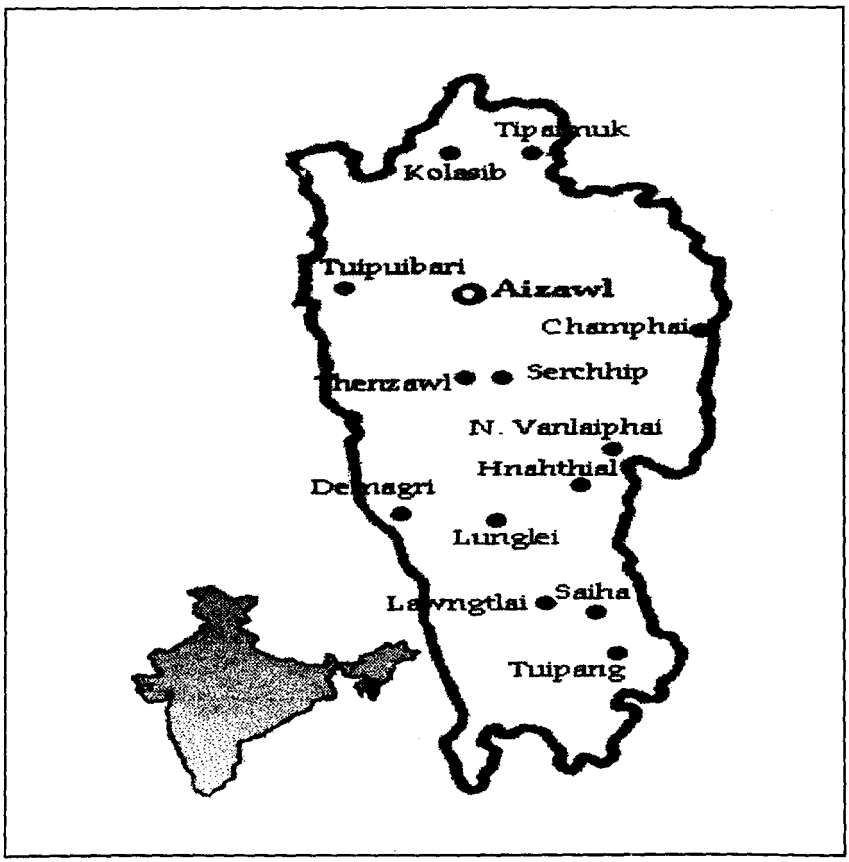

Map 2: Mizoram State of India.

CHAPTER 1

Introduction

The history of mankind is a story of man's ceaseless struggle against nature. This is because nature, which facilitated men's survival, often was the cause of his extinction as well. In this struggle only the fittest survived. Nature often helped the civilizations flourish but at other times it created adversities to its detriment. Natural hostility could be of two broad types: one, an environment unfavourable to human survival and two, sudden and unforeseen devastation by nature in the form of calamities. The calamities too could hit in myriad ways: earthquakes, floods, volcanic eruptions, tsunamis, landslides, avalanches, cyclones, hurricanes, twisters, epidemics, typhoons, storms, tornadoes, draught and famines.[1] Human history is therefore a story of challenge and responses to nature. Civilization flourished where mankind was able to respond to these challenges effectively and it perished wherever it failed.

History cannot exclude this aspect of man's struggle against nature from its purview. In fact, traditional historiography has always included calamities and its impact on man as a part of its study. The Bible has talked about the Great Flood; in the Middle Ages Europe witnessed the Black Death and the bubonic plague. Famines played a very important role in shaping the history of England and Ireland. It is only in recent times with the Rankean revolution in Germany which emphasized only political history, the study of calamity and man's day-to-day struggle for survival has been relegated into the background. But this historiographical neglect cannot minimize the importance of natural calamities in the making or breaking of civilizations.

Primitive man took shelter in the safety of caves and mountain cavities to escape the vagaries of nature. But since then men have

made tremendous progress in science and technology.[2] But he is still as helpless against natural calamities. Earthquakes in the seabed and the consequent eruption of sea water are part of the life of coastal regions. During the tsunami of December 2004 about 2,50,000 people perished. Frequent earthquakes and volcanic eruptions are an integral part of Japanese life. The Japanese have succeeded in minimizing the effects of these natural calamities on them as they developed early warning knowledge systems and survival tactics during such crises. In fact, it is believed that the devastation by natural calamities has increased manifold and intensified in recent times. There was a devastating earthquake in northern Iran, volcanic eruptions in Philippines and Alaska, a deluge in Texas and Bangladesh, cholera epidemic in Peru, widespread drought in California and East Africa, Hurricane Andrews, Katrina and Rita in the United States. Hurricane Erick had destroyed the island of Hawaii. India too has had its share, a ruinous typhoon in Orissa coast (1999), the earthquakes in Latur (1993), Bhuj, Gujarat (2002), and the two sides of Kashmir in India and Pakistan (2005), frequent floods in West Bengal, Bihar, Assam and Maharashtra in recent times. Research on the nature and causes of natural calamities have revealed that since the Second World War up to 1986 the intensity and frequency of natural calamities have actually increased over the last 50 years.[3] The report further stated that though the number of major natural calamities has not increased in number, the frequency of smaller calamities have increased manifold in recent times. Although even the most advanced countries were not found to be free from the vagaries of nature, what is alarming is that the developing world and formerly colonized countries were seen to be more vulnerable to such destructions. These regions also reported more devastation and casualties. The research conducted by the United Nations has also shown similar results. During 1987–9 the greatest number of natural calamities took place in countries other than North America. Out of these more than half took place in developing countries affecting a massive number of people.[4] Analysts feel one reason is the tremendous increase in global population since the First World War. The developing countries have experienced

population explosions. Livelihood requirements have compelled people to fan out and settle in hitherto uninhabited sites like the river basins, ports, sea shores, mountains and volcanic foothills. Such sites are dangerous as they are close to calamity sites with few escape routes rendering them most vulnerable. Since nature is unpredictable and warnings have often proved ineffective, loss of life and property have multiplied. Moreover due to the development of science and technology people have forgotten their traditional coping mechanisms and survival strategies *vis-à-vis* natural calamites and have increasingly become dependent on the state and its agencies for succour during these crises. The over-dependence on the state has actually rendered people more vulnerable as the state is bureaucratic in nature and slow and too cautious in acting. Moreover, a state has its own perceptions and theories of calamities and disasters. What is a calamity to the affected people may not be in the scheduled list of calamities of a particular state. All natural calamities are not 'natural' or 'calamities' at all as far as the state is concerned. Even if a natural calamity hits people in a terrible manner, the state may not come to the rescue of its people when it does not fit the listed description of a natural calamity. Again some calamities are defined as 'national' in character while others are 'regional' according to the policies of a state.[5] In such cases the nature of relief and rehabilitation could vary according to the scale befitting a national or regional event. It is obvious that the definition of 'natural', 'national' and 'regional' depends on the strength of the respective lobbies and the power of the political elite.

In a number of cases the state itself is responsible for causing 'natural' calamities. In North America a number of massive dams were constructed during the nineteenth century upsetting the geological formations of the region. In India the state has gone ahead with the construction massive dams on the Narmada and Tehri rivers despite the fact that they fall in a seismically vulnerable region and are submerging huge areas of human habitat, drowning peoples' life and property earned through the generations and also threatening the region with massive earthquakes. Natural calamities have not always been an event of fear. It is

found that only in modern times natural calamities and disasters have become a prospect of fear. But traditionally people's values were different and men had learnt to fight adversities of nature and evolved coping mechanisms to deal with such events. Thus, despite the devastation it caused, neither nature nor its adversities was feared. With mankinds increasing use of technology in securing mastery over nature, they became complacent and arrogant. But whenever nature proved more powerful than men thought it to be, fear developed in greater proportions. Calamities thus changed the values and perception of human beings. Natural disasters are also no more considered as solely natural.[6] It is intricately connected with the network of balance between nature, social, political, economic and technology. Hence natural disasters are not absolutely 'natural' in modern times. Experts felt that the vulnerability of a region that has suffered from a natural calamity cannot be studied without 'contextualizing' them from the larger issues of environment, social and political structure.[7] In fact modern-day political practices have appropriated natural calamities. Calamities have been used by men to acquire colonies, subdue people, annex territories, secure power, infuse ideologies, transform religion, induce culture and instigate rebellion. Calamities have thus had an all-pervading presence in modern history.

It is believed that the increased devastation wrought by nature on human beings has been a result of men's own interference with nature, thereby upsetting its delicate balance. Rivers have always inundated its basin. Therefore 'inundation' has traditionally been a geographical term. Nile, Hoang-ho, Amazon, Tigris, Euphrates, Indus and Ganges are rivers that have been the cradle of most advanced of civilizations. The water of these rivers often spilled over during the rainy season inundating its basins but seldom did they affect the human habitat adversely. This was because geography had evolved their own channel network through which the excess water flowed back to the rivers. Colonial regimes were the first to tinker and interfere with the rivers, constructing huge dams on it. They also exploited the forest resources denuding it to the extent that it was no longer able to absorb the

excess water. The extreme emphasis on urbanization as a form of modern civilization without any consideration to the sewage system let the excess water enter human habitat and cause displacement and devastation. The geographical term 'inundation' was given a new name by colonial regimes—floods. The indigenous people witnessed the transformation of life giving rivers into instruments of devastation. Thus the nationalist critics of colonialism for example preferred to call floods in colonial Assam as 'deluge'. In fact, the last decades of the last century could as well be described as the decades of natural calamities. Hence, 'it would be a great mistake, in our time, to ignore the existence and role of such events in Earth's history. . .'.[8]

Humankind have always had to cope with calamities. Such catastrophes have often made, unmade and greatly influenced the shaping of human civilization. Thus, one may say calamities have formed an integral part of human history. There have been many such communities, nations and civilizations who struggled against calamities for their survival. Some perished, others survived. In fact, calamities are inseparable from human history. At the same time human history is not a history of the destruction of human civilization by catastrophes but also mankind's ceaseless struggle to understand them and acquire a mastery over nature. As, with the passage of time, the emphasis of history has shifted from dynasties to the downtrodden, politics to people, events to environment; new historiographical schools have given shape to a new sub-discipline in history called Calamity Studies, wherein historians study the impact of calamities on human history.

The north-east of India has immense potential for Calamity Studies. The major calamities that are frequent in north-east India are diseases like kala-azar, malaria, small pox, natural disasters like floods and earthquakes, environmental catastrophes like landslides, famine and droughts. In Assam the popular proverb is that *jui, pani, yuin* (fire, water and white ants) are the three major agents of mass devastation in Assam. Floods of different intensity were almost an annual occurrence during the rainy season. There were recorded floods in 1240, 1570, 1642, 1786, 1781, 1825, 1842, 1862, 1867 and 1870 in Assam. Blights, floods and drought

adversely affected the harvest of the peasants quite regularly.[9] The districts of Lakhimpur and Kamrup were prone to floods. The district of Sibsagar experienced severe drought in 1857, 1870 and 1872. There were several cases of fire reported throughout the nineteenth century in Assam. Another menace in Assam was the white ant invasion. John McCosh reported that

> white ants occupy a prominent place in the annual economy of Assam. In no parts of India their ravages are more destructive, they devour the very house they stand, from main posts sunk seven feet underground, to the last bundles of thatch upon the ridge. . . . The furniture required to be constantly looked after, the feet of a table or a chair may be eaten up though no outwards signs be discernible.[10]

These calamities which devastated the region repeatedly were not all 'natural'. For example, famines in Manipur from 1930s onwards were artificial and resulting from man-made shortages of essential food items.

As a calamity, famines have played a very important role in the political developments in north-east India. It is now well known that the 1959 bamboo-famine had sparked off the twenty-year long insurgency in the Mizo Hills. But what is not yet known is that anti-India sentiment in Manipur and Nagaland also developed as a result of widespread famine. The Naga Hills were reeling under severe food crisis during 1946–7 which neither the colonial government nor the Indian leadership cared about.[11] In Manipur, it was the Marwari and Sikh merchants who entered Manipur along with the British and in no time monopolized the trade and commerce of the tiny princely state. With only one-third of its land arable, the state produced just enough for its subsistence. But during the Second World War, to satisfy wartime needs, these merchants bought up all the rice produced in the valley and supplied them to the Allied army. It often created severe food shortages for local consumption thereby resulting in an artificial famine situation in Manipur. The sheer severity of the situation prompted the womenfolk of Manipur to organize an all-women movement protesting against the export of local rice by outside traders (called *mayangs* by the Meiteis). The movement is

widely known as *Nupilan* (womens') movement, which broke out twice; once in 1904 and next in 1939–40. The breaking out of the *Nupilan* on the eve of Indian Independence had far-reaching implications as far as the shaping of anti-India attitude of the Meiteis was concerned. The artificial famine resulting from the hoarding of essential commodities by the Marwari and Sikh traders created the image of Indian traders as 'unscrupulous people'.[12] The continuation of such practice by these merchants despite protest movements and social ostracization only promoted the negative image of northern Indians in the Meitei mind. The success of the *Nupilan* movement only reinforced it.[13] In Mizo Hills the bamboo flowering and the consequent rat-famine (1957) sparked off the twenty years long bloody secessionist insurgency (1966–86). The tribal elders of Mizoram had warned the state government of Assam about an impending catastrophe in the form of bamboo flowering and consequent rat-famine. But Government of Assam dismissed the prediction as tribal superstition and ignored the warning. True to the prediction, the bamboo plants blossomed all over the hill ranges leading to an increase in the rat population who fed on human food. The state government was caught unawares and before they could take any ameliorative action, scores of lives were lost to starvation. The famine was over in time but the antipathy shown by the state to the Mizo tribals remained.[14] They demanded secession from India on the ground that they would not like to be part of a nation which did not come to their rescue in times of dire need. The movement graduated to organized insurgency, which the Indian state found difficult to tackle for a long time before the Mizos negotiated for an amicable settlement.

While political activity and social movements were organized around calamities like famine in colonial times, disasters like flood and landslides have been the pivot of politics in contemporary north-east India. Calamities have been used to highlight the neglect of the centre towards its north-eastern 'periphony'. Unfortunately there has not been much work on the impact these calamities have had on the people of the region. The objective of this monograph is to pioneer a study on the history and politics

around the bamboo famine in the Mizo Hills from the 1880s to the 1960s. This was in reality a rat-famine resulting from the reproductive flowering of the bamboo plants which is a rare occurrence.

The association of the Mizo with *mautam* or Mizoram as the land where the bamboo plant flowers is indeed historical. As the Irish were historically associated with potatoes and famines, the Mizos have been associated with bamboo flowering and rat-famines. Very few people knew that Mizoram is the theatre of such a rare environmental event. Of the first persons to publicize the state's association with this phenomenon, was J.D. Baveja, who in the tradition of the colonial bureaucrats wrote a monograph on the people he was administering titled *Mizoram: The Land Where Bamboo Flowers*. From the title itself it is evident that Baveja had no prior knowledge about the phenomenon. When he learnt about it he was equally amazed by the mysteriousness of the entire event and therefore used it profitably as the title of his monograph on the Mizo people. However, in the book there is hardly anything about bamboo flowering.[15] It is more an ethnographic narrative on the history and society of the Mizos. Although the book did not provide any new insight on the Mizo tribe, its title immortalized the association of the Mizo people with bamboo flowering.

Mizos are indeed inseparable from the phenomenon of bamboo flowering—*mautam* as the Mizos call it. Monographs, semi-historical and literary works on the Mizo Hills have marked Mizoram with bamboo flowering. Almost two decades after Baveja wrote his book, Vasanthi, a litterateur from another corner of the country (Tamil Nadu), wrote a popular novel depicting 'a human story written on the backdrop of the Mizo life' which was titled as *When Bamboo Blossoms*.[16] A similar novel was published in Hindi in 1997 with bamboo flowering as the backdrop. It was authored by Prakash Mishra and was titled *Jahan Baans Phulta Hai* (Where Bamboo Flowers). Subsequently another work by E.J. Thomas detailing the socio-economic transformation, taking place in the state of Mizoram was published with the title, *Mizoram: Bamboo Hill Murmers Change*. Sociologist Shiv

Vishwanathan has a chapter on bamboo flowering in his book *A Carnival of Science*. The title of the chapter interestingly is 'House of Bamboo'. The present work will be an addition to this list. As can be seen later, bamboo famine has really chased the Mizos along their migration up to the present habitat. Not only this calamity kept their population dwindling, they would have perhaps shifted from their present habitat where they migrated only in the eighteenth century, had the British not halted their movement by aggression as well as helping them mitigate the calamity. The missionaries too taught them to take control of these recurring calamity before they could convince them to convert to Christianity in large scale.

The Phenomenon

Does bamboo flower too? This was the question my friends asked me when I told them about my present research. *Yes it does.* I replied with the confidence of the editor of an encyclopaedia. The barrage of questions that followed, I replied with equal élan. Little did they know that till I started my research I hardly knew anything about bamboo flowers and the connected rat-famine. I pored through volumes of encyclopaedia for study material to uncover these ecological mysteries. Botany is a strange subject. They do not address anything by their common names. They have their own names for them. Thus, Bamboo is called *Bambusoideae.* They also have their own mysteries about the world of plants, grass and trees. For example, I did not know that bamboo was not a tree; it is in fact a grass. It is strange because who would think that the grass in your lawn and the tall bamboo are of the same category? These bamboos also flower and bear fruits. Equally intriguing was the discovery that the reproductive flowering and fruition cycle takes place once in thirty, fifty and even hundred and twenty years. But there are also species which flower every year. These plants do not die but the variety which flower in longer spells begins to rot and then die after blooming. The subsequent generations of the plant are born out of these seeds but it takes three to four years. The jungle rats love the bamboo fruit containing

seed to the extent that the entire rat population comes overground ignoring the risk of being killed by serpents, animals and human beings. It is also believed that the food actually enhances the reproductive health of the rodents to such an extent that they become prolific breeders thereby adding enormously to the rodent population. All these are basic knowledge to botanists and zoologists but a great enigma to the students of social sciences and humanities under the present curriculum in Indian universities. Thus a simple reproductive function of the bamboo plant is shrouded with so much mystery around it. But beyond the centres of power, knowledge was gathered through generations of experience and transmitted through oral traditions by people who live far beyond the boundaries of these knowledge metropolis. It is these tribal elders in the Indian state of Mizoram, who for generations, through their transmitted knowledge about bamboo-flowering and the organic rat–bamboo connection has correctly predicted the exact time and sequence of the next occurrence of this amazing ecological phenomenon. Sometimes the amazing mysteries of the earth are good to read about but no one actually sees it happening. It happens in distant lands, on the fringes of the mainstream. For instance, very few Indians, outside the state of Mizoram knew that such a mysterious occurrence actually takes place in one of the states of their own country. Even the populace in the neighbouring states in north-east India knew precious little about this unique environmental event. Within Mizoram itself, my interviews with Mizo youth, who were born after the last bamboo-flowering spell in 1977, showed that even they were no better informed. Yet amidst them, in the Mission Veng of the capital town of Aizawl, there is an 88-year-old octogenarian, D. Rokhuma,[17] who has been working consistenly for the past several decades to understand the phenomena and sensitize people about the event and its implications.

The flowering of bamboo is an unique phenomenon. Unlike most other living organisms, it flowers only once in its lifetime after which it dies. The other peculiarity of such flowering is the entire forest of bamboo plants flower at the same time, which is the reason that such an event is called 'gregarious flowering'.

Incidently, they die at the same time too. Records of bamboo flowering stretch back as far as ninth century AD when a particular variety of bamboo (*Phyllostachys bambusoides*) flowered in Japan.[18] In fact, it was the plantologist, Dai Kai Zhi who used the words *bamboo flowering* for the first time in his Manual of Bamboo.[19] Bamboos are arborescent grasses belonging to the family of *poaceae* and are grouped under the subfamily *bambusoideae.*[20] Out of the 110 general varieties and 1110–40 species of bamboo in the world, India, according to the latest reports accounts for 18 general and 128 species of bamboos. North-east India has extensive bamboo vegetation covering an area of 3.05 million ha. Out of this the state of Mizoram accounts for highest forest cover with bamboo. It has 9 general and 20 species. The reproductive cycle of bamboo vary from species to species. Based on the flowering cycle they are classified into three types:[21] (1) annual or continuous flowering (species which flower every year and do not die). (2) Gregarious or periodic flowering when the whole clump flower in an extensive area and die after seed setting. The flowering may continue for two or three years in an area or in the same clump. (3) Sporadic or irregular flowering which occurs in isolated clumps in one or to two in an area or in parts of one clump. Thus flowering periodicity of bamboos varies from three to one hundred and twenty years as may be seen from Table 1.1.

Scientifically the bamboo flowering phenomenon is called 'synchronic masting'.[22] This term is used by scientists to describe the 'synchronized production of seeds at long intervals by a population of plants'. Masting is the accurate term but flowering was the word coined by the colonial authorities, which gained acceptance in common vocabulary. For the colonials the flowering of bamboo was an incredible event which they recorded again and again but they never seemed to have looked for an explanation.[23] Among them were E.C.S. Baker,[24] H.R. Blanford,[25] E. Blatter,[26] J.W. Bradley,[27] D. Brandis[28] and I.F. Bourdillon[29] and in later times Father H. Santapu[30] and D. Chatterjee.[31] It was only in 1967 that the first synoptic survey was conducted by Daniel Janzen.[33] Janzen regretted that although natural flowering of bamboo was being seen as a unique event, the natural bamboo

TABLE 1.1: FLOWERING HABITS—PRIORITY SPECIES[32]

Species	Period between flowerings in years
1. *Bambusa balcooa*	35–45
2. *B. bamboo*	45–8
3. *B. blumeana*	45–100
4. *B. polymorpha*	35–60
5. *B. texilis*	Regularly found to flower, does not die after flowering
6. *B. tulda*	30–60
7. *B. vulgaris*	Rarely found to flower
8. *Cepha pstacjuum pergracile*	Sporadic
9. *Dendrocalamys asper*	Not known
10. *D. giganteus*	40–65
11. *D. latiflorus*	Sporadic
12. *D. strictus*	40–65
13. *Gigantochloa apus*	50–60
14. *G. Levis*	Sporadic, not fatal
15. *G. pseudoarundinacea*	50–60
16. *Guadua angustifolia*	Not known
17. *Melacanna baccifera*	35–6, 48, 60
18. *Ochlandra travancorica*	7 (and 23)
19. *Phyllostachys pubescens*	67 and sporadic
20. *P. bamusoides*	60 (and 120)
21. *Thyrsostachys siamensis*	35–50

forests were being denuded across the world.[34] During flowering, individual aerial stems sometimes live for much less time than their species cycles and flower only at the end of the cycle when an inborn signal initiates the formation of inflorescences. Fruit development in a few species has also been reported. The size and shape of bamboo fruits vary according to the species. The morphology of fruit was dependent on its character for identification of bamboos. Researches have furnished an account of bamboo fruits belonging to 17 general and 22 species. Although bamboo fruit are generally known as *Caryopsis*, based on morphology, researchers classified them into three types:

1. *Caryopsis*: The *pericarp* is membranous, thin, soft and adheres to the seed coat. The fruit has an apparent ventral suture, which is nearly as long as the whole fruit. An articulate navel is located at the fruit base.
2. *Glans* have hard, smooth, *crustacous pericarp*, separated from the seed coat. The fruit has no ventral sutra and navel.
3. *Bacca* has thick fleshy pericarp separated from the seed coat. It indicated that the morphology of starch grains can also be used as a distinguishing character for identification.

In certain parts of China, contiguous parts of Myanmar with India, Japan and South Africa, this phenomenon was known to occur. In Japan the *moso* species of bamboo bloomed, after 67 years in 1997.[35] The bloom of *moso* for the second time was actually checked in the Kamigamo Experimental Forest Station in July 1997. In Japan, there was a reported outbreak of Smith's red-backed mole (a small burrowing insect eating mammal of the family of *talpidae*) subsequent to the flowering of *sasa ishizichiana* at Mount Tsurngi-shikoku in 1954–5.[36] In southern China there was mass flowering of thorny bamboos in 1994, which coincided with severe floods, bringing immense suffering to the people.[37] In fact, the instance of bamboo flowering in China was brought to notice of the plant scientists in the 1980s by zoologists who were attracted by the plight of the Giant Pandas during the flowering of bamboo plants. It was then observed that there had been many instances of mass flowering of bamboos causing a complete loss of livelihood to local growers.[38] Their trust in the reliability of the resource base was shattered and in many instances the people moved away permanently from bamboo as their source of income. The Blue Mountain of Jamaica has one of the best-recorded instances of periodic flowering.[39] Around the same time such flowering was reported from Trinidad and Tobago as well. In South America too there was a reference of a bamboo bloom with corresponding increase in rodents in the second half of the 1800s.[40] In this case, a peak in rainfall accompanied bamboo flowering. Similarly, research done by Taylor Green of the Pest Infestation Control Laboratory, United Kingdom indicated that

in East Africa, there was an excessive rodent population which followed heavy rainfall late in the season the next year.[41] The explanation given was that the late rainfall helped weed and grass to grow and survive longer than usual thereby providing protection to the rodents from predators, mainly birds and partly because these also provided additional food to the rodents. In Mizoram too, the 1977 bamboo flowering was accompanied by heavy rainfall.[42] In Thailand in the 1980s due to 'gregarious blooming' even the newly planted bamboos flowered and died. It is called 'gregarious bamboo flowering' because the bamboo clumps flower all at the same time in complete synchrony but only once in its lifetime. In the Balaghat district of the Central Provinces in 1869, the Kattang bamboo (*Bambusa arundinacae*) flowered and coincidentally there was a famine but no suggestion was made that there was any interrelation between the two occurrences.[43] The Indian states of Maharashtra and Uttarakhand also reported the flowering of bamboo but no famine or rat proliferation had been reported. There are other areas of India's north-east where these species of bamboo plants exists and the phenomenon also occurs. The famine did not take place since the affected area was not a human habitat. But, it is said that 'nowhere does the outbreak reach the proportion that it does in Mizoram'.[44]

The correlation of bamboo flowering with famine is interesting. Famines are simply food shortage. The shortage could be due to natural or artificial causes.[45] Among the natural causes, shortage caused by infestation of vermin has been listed as one.[46] But such famines were 'minor and localised'. Rats have been also listed as one of the vermin who through depredation cause food shortage. Rats eat almost anything that humans eat. They cause the most serious damage to the seeds of grain both before and after harvesting. Grain stored on farms is often not only eaten by rats but also rendered unsuitable for human consumption when mixed with rat dropping. With population explosion among the rats the destruction of foodstuff also increases. Therefore as far as foodstuff of human beings are concerned the rats have been identified as a major destroyer.[47]

The gregarious flowering of bamboo increases the food supply of the rodents. Shiv Vishwanathan described the situation as a carnival for the animals:

When the bamboo flowers it is the signal for a feast. Everyone loves the bamboo. Its fruits look like a yellowish-green pear with a tender, white kernel inside. Sometimes the flowering is in clumps, some time the masting takes place over 95000 square miles. . . . Animals love it. Birds migrate en masse. Janzen reports of a guinea fowl he found which had over 400 seeds in his stomach. Rats, Pigs and chicken ravage the area and eat till hunger pangs become a distant fantasy. It is gluttony on an enormous scale. Rabelais would have the right word for it not botanists. No Pied Piper could play a carnival song such as this. There have been reports of as many as 40–60 million rats migrating to a masting. All they do is eat and eat and reproduce. Nothing grows at this time for these rat populations remain in the area for two years. Rice and even root crops like yams and arum growing in the area are devastated. Often villagers have to abandon their homes. As the rats, pigs and birds eat their reproductive cycles shorten. It is a factory-farmer's dream as litter follows litter. For chickens—the pigs of the bird world—increased food consumption can lower the time of sexual maturation by fifty days. What is feast to nature, becomes a famine to man as rats, birds and pigs multiply.[48]

The 1977 *Thingtam* famine in Mizoram was a living testimony to this occurrence.

Subsequent to the flowering of bamboos rats multiplied in thousands. They moved from village to village from *jhum* plot to *jhum*, in groups of thousands. Often in a matter of hours whole acres of standing crop, mainly rice would be destroyed. Though efforts were made at baiting and fumigation, traps were laid and pits dug around the *jhums* the effect was marginal. The number of rats was so overwhelming that often pits would get filled in by the bodies of the front-line rats while those following behind would walk over the bodies and enter the fields.[49]

This phenomenon however seriously affects the normal balance of nature. Animals dependent on bamboo vegetative growth such as the Giant Panda and Mountain Gorilla loses a favoured food source entirely after a flowering episode.[50] A glut of bamboo

fruit may also incite an explosion of population of rodents that eat the fruits. For example the flowering of *muli* or *terak* bamboo (*me locanna bambusoides*) in its native habitat around the Bay of Bengal in cycles of mostly 30–5 years leads to disaster. The accumulation of avocado-sized fruits promotes a rapid increase in rodent population, which lead to the loss of human food supplies and epidemic of rodent carrying disease.[51] A research at the Dehradun Institute of Forest Research on the connection between bamboo and rats found that the fruit contained:

1. Starch (on zero moisture basis)	50.240 %
2. Protein	11.556 %
3. Fat	0.231 %
4. Ash	3.030 %
5. Moisture	9.400 %
6. Others	26.493 %

It states that the rats feed on bamboo seeds which are rich in enzymes like *deamidase*, *amylase* and *amygdalins*. These trigger an overdose of oestrogen, enhancing fertility of the rodents enabling them to multiply at very rapid scale. According to a research of Dr. A.K. Ghose, a zoologist based in North Eastern Hill University, Shillong,[52] the fruit has high protein of nearly 12 per cent and very high starch content of about 50 per cent besides Vitamin A which helps augment the fertility of rodents.[53] No clear causal link between the flowering bamboos and the increase in rats has been established, though various theories exist. According to one theory[54] as bamboo seed contain a high concentration of Protein—nearly 11 per cent—perhaps by eating them the cannibalistic urges of the male rats toward the young is deadened. Also high intake of protein might strengthen the rats thus lowering the rate of infant mortality. It is also conjectured that some hormonal change took place in the rats due to the excessive protein that the bamboo fruit contained enabling the female rats to produce a litter much earlier than in normal circumstances. Even in normal circumstances however the rats are prolific breeders.[55] Although larger types reproduce once a year others produce several litters

during a single season. Some have only one to two young at a time while others have large numbers. Most rodents are polygamous and mate for the duration of a single breeding season and some such as beavers have permanent mates. The rather high rate of breeding is intensified by the fact that in many of the smaller rodents, sexual maturity is reached at an early age, within a month of its birth normally, earlier in the females than in the males. The females breed when less than a year old. The house mouse reproduce throughout the year with an average of 5.5 litters and 31 young per female per year in building houses and 10.2 and 57 young per year on farms in the United States. Wild Norway rats are able to breed at three to four months and can produce up to seven litters a year containing 6 to 22 young. Of the species commonly found in Mizoram (*Rarrusnitider* or the Himalyan rat and *Rattus Miviventer Mentosu* being two of the main ones), the gestation period is said to be of 20 to 22 days. Considering one female rat can give a litter of 6–12 young ones and that the mother can attain immediate *post-partum* pregnancy, the rate of reproduction can be high. Further, rats can breed throughout the year and the maturity period of a young one is about 60–70 days. If one combines all this, then one family of rats—producing an average litter of eight every month and half of its litter (the female) each again producing eight from their date of maturity—can produce thousands of rats in one year. Obviously, therefore if reproduction was allowed to go unchecked and if there were no other balancing factors rats would soon rule the eco-system.[56] Therefore the reports that rodents produce prolifically after consuming the bamboo fruits were not untrue. However the answer to the riddle lies not in any one factor but in a complicated combination of factors which until discovered will remain an enigma.[57] The tribal elders from ancient times had understood the connection between the increase in rat population and the consumption of bamboo fruits and the resultant famines, which have been subsequently confirmed by the findings of modern science. But, until recently most scientists discounted even the tribal belief that famine follows the flowering of bamboo.

The Flower of Evil

The flowering of bamboo plants has traditionally been associated with impending calamities and misfortunes. In southern China, the periodic bamboo bloom was accompanied most of the time by severe floods which the people of the region felt were connected. In Abra Province in northern Philippines mass flowering of the *schizostachyum lumampao* in the late 1980s was associated with the severe earthquake that struck the area later. In August 1996 tens of thousands of floating dead rodents were reported to be floating in the lower Subansiri and Ranganadi rivers of Arunachal Pradesh in India, carrying them with the floodwater to north Lakhimpur of Assam state spreading panic and posing a serious health hazard to the people living along the course of the river.[58] An expert team, which visited the site attributed this to the flowering of *kako* species of bamboo which caused an enormous increase in the rodents in the bamboo jungles of the area. The floodwater reportedly killed and washed away portion of these population during the river course.[59] It has also been found that bamboo flowering and the phenomenon of consequent increase in rat population is perfectly known to the tribes of Arunachal Pradesh. The bamboo flowering is known in colloquial languages of the tribe as *Talamlamnam*, the increase in rat population as *buli jugnam* and the resultant famine as *duna manam*.[60] Such events in the area had taken place earlier in 1947 and before the earthquake and great flood of 1950 in Assam. Bamboo flowering is considered a bad omen not only in the Mizo Hills, but also in Assam, Arunachal Pradesh and Uttarakhand. It is often believed that great catastrophes could either precede or follow a bamboo flowering event. The 1881–2 bamboo flowering preceded the great earthquake of 1897. Similarly the earthquake of 1950 almost destroyed the entire north-east was followed by the bamboo flowering of 1955–7. While for the Mizos and Arunachali tribes, bamboo flowering is a sign of impending famine, in Assamese folk belief, the flowering of *mokal* or *kotoha* or *kotah* (a thorny species of bamboo) is a bad omen.[61] There are a number of Assamese Bihu

songs which refer to the association of disasters with bamboo flowering. Similar is the belief of the Bengalis of Tripura in India, Sylhet, and Chittagong in Bangladesh which borders Mizoram and for whom this particular flowering species is known as *muli* bamboo. As early as 1836, Sir V.B. Jones connected the bamboo seeds with an impending famine. He wrote, 'For, says the Brahmins, when bamboo produce sustenance, we must look to heaven for food.'[62] *Dymock Pharma* the medical journal in their third issue in 1893 substantiated the prevalence of such beliefs in connection to the bamboo blooming. 'In India, bamboo flowering (is) an event of rare occurrence (which) has been supposed to bring in its train all sorts of evil accompanied by dire distress and famine.'[63]

The situation is being repeated prior to the impending flowering in the year 2007. Despite the modernity people still act according to these beliefs. When the Government of Mizoram declared in 2003 that 34 vegetation sites had been sighted where bamboo was found to be flowering, the tribal Christians were flocking to churches to offer special prayers to ward off famine which they feared could strike the region anytime.[64] Despite their change of faith the Mizos go by their traditional belief that when bamboo flowers, death and destruction will follow. The Chief Minister of Mizoram, Zoramthanga himself supported the act saying, 'It is not a myth or superstitious belief to think that bamboo flowering signals famine [*sic*]. It is a stark reality and we have experienced and witnessed an outbreak of famine in the past under similar circumstances.'[65] Following the flowering of these plants in parts of Tripura state contiguous to Mizoram, there has seen large-scale evacuation in 2005 as the environment created panic among the people there. It is a common belief among the poverty-stricken tribal population in the interior region of the state that bamboo flowering brings with it famine, epidemic and starvation. This fear coupled with superstition has resulted in hundreds of tribal families leaving their hamlets. The beginning of flowering has coincided with the advent of viral fever and an outbreak of gastroenteritis spreading panic. Similar panic and desertion has been reported from the Naga, Kuki and Zo tribes of

Ukhrul, Tamenglong and Churachandpur districts of Manipur state where the bamboo plants flowered with corresponding increase in rat population in mid-2004. Manipur last witnessed the phenomenon in 1954–5, around the same time as the great rat-famine in Mizoram. Confirming the fear of the people, experts stated that besides a fair chance of famine, plague and leptospirosis might also be a major threat to the people in this region.[66] According to this report what makes the situation worse is the fact that besides eating up agricultural produce the rodents also carry almost 200 types of *pathogens*, which pose a grave threat to human beings.[67] The governments in the respective areas, therefore, activated their machinery to tackle the menace.

Bamboo flowering as seen above is a recurring theme of fictions, colonial monographs and a serious topic of research for botanists. But the concurrent rat-famine has been a serious concern for the administration. Bamboo flowering indeed is an environmental activity. But the famine that results has serious social and economic repurcussions and also influenced politics in the north-eastern region. The bamboo flowering can be said to be a grand event since it ensures the survival of the species. It can be said to be celebration time for the rodents since the abundant food supply gives their population a boost. But for other species that depend on bamboos it is a calamity. The Panda which feeds on bamboo leaves has to starve or migrate, as with blossoming, bamboos begin to rot and die. The Mountain Gorillas of Rwanda, which feeds on *arundinaria alpina* bamboo leaves, also become a sorry victim of the phenomenon. It is a calamity for human beings too as most of the rural and tribal people depend on bamboo, which can be said to be the 'poor men's wood', for the construction of houses. For the tribal groups such as the Mizos, their kitchen utensils, hunting bows and arrows, spinning gadgets for textiles, pots for carrying water baskets, beds and smoking pipes too are made of bamboo. In fact, there is hardly any item, which is not made of bamboo. Hence they were hit hard. They have to construct or repair their houses, carve out their utensils and make their tools before the plants start to rot and die. The rat-famine was a huge additional hardship. Modern science has testified that

the death of the bamboo plant results in soil erosion. The soil, previously bound together by the bamboo roots, erodes away affecting agricultural productivity.

Mizo oral history testified that the previous occupants of their land had migrated out of this land due to this scourge. The Mizo tribes too were forced to migrate to the hills of Manipur and Assam plain. Every famine would carry away a large number of lives with it. For a tribe poor in its demographic resources, it was a horrifying experience. Even when they survived the famine, the depopulated tribe would be vulnerable to head-hunting attacks or to subjugation and enslavement by the neighbouring tribes. But then calamities have always had such profound impact on human civilization. The number of people killed by natural calamities would be higher than the lives lost in all the battles and wars put together. Earthquakes have destroyed cities. Civilizations disappeared due to volcanic eruptions. Floods have washed away ancient cultures. Landslides have permanently buried habitats. Massive deaths and migrations resulted from famines. Diseases have eradicated habitations. Calamities might have had little space in historical research, but it has always made a tremendous impact on the making or unmaking of human history—acknowledged or un-acknowledged by historians.

The People

Keeping a wider audience in mind it is important to provide some reference to the people and region, mentioned in this book. Mizos are an Indo–Mongoloid tribal people who mostly live in the Indian province of Mizoram. The twenty-sixth state of the Indian federation, Mizoram is situated in the north-eastern corner of India. Mizoram is the land of the highlanders [Mizo: highlanders; ram: land]. It has an area of 33.9289 sq. km, of mostly hilly terrain. It is bound in the north by Cachar and Hailakandi districts of Assam, on the east and south by the Chin Hills of Myanmar (Burma) and on its western frontier lies the Indian state of Tripura and the sovereign state of Bangladesh. Mizoram is located between the 22.20′ and 24.27′ (N) latitude and 92.20′

and 94.29′ (E) longitude. It has a long international boundary touching both Myanmar and Bangladesh. The present international boundary was the creation of the colonial state during its withdrawal from the subcontinent. What is now foreign land lying across the border was hitherto the undivided ancestral lands of the scores of sub-tribes who now constitute the generic Mizo tribe. Indeed, the Partition of India in 1947 had a devastating impact on the Mizos. The Mizo tribes were distributed over a huge area in India as well as Myanmar and Bangladesh. They were a conglomeration of sovereign tribes living under the rule of their respective chiefs before the British conquest. It was British subjugation, which divided them between two diverse areas: Myanmar and India. As long as India was under British rule, their socio-economic life was not disturbed as Myanmar formed a part of the British Empire. But the separation of Myanmar from British India in 1937 and the Partition of India distributed the Mizos between three sovereign countries—India, Pakistan (East Pakistan, later Bangladesh) and Myanmar thereby rupturing the emotional, social and economic ties with each other. The boundary with Myanmar extends 434.43 km and with Bangladesh over 254.22 km. Such a long international boundary makes Mizoram strategically important. The hill ranges in Mizoram have an average height of 900 m and run in the southern direction interspersed with deep gorges in which rivers and streams flow from the high hills. There are a number of rivers, streams, brooks and waterfalls which flow to the brim in the monsoon. The most important rivers are the Tlawng (Dhaleswari) which runs 200 km, the Tuirial (Sonai) running for 150 km and Tuival running about 60 km which flow along the northern Mizoram and eventually fall into the Barak River. The southern hills drained by Chimtuipui (Kolodyne) has a course of 150 km on the east with its tributaries like Mat, Tuichang, Tiau and Tuipui while the Karnaphuli runs for 80 km with its tributaries—Tuichawng, Kap, Deh, Phairuang and Tuilianpui inundates the western Mizo Hills. The river courses are somewhat compli-cated. The Tlawng River runs for 64 km northwards while parallel to it runs the Matriver and Deh to the

south. In the same way the Tuivawl, Tuichang, Tuilianpui and Tut run parallel to each other but in opposite directions.

The entire Mizoram state is constituted of hill ranges except for a small portion in the extreme north and south, which is flat. The hill ranges are generally very steep. The average height of the hills varies from 900 to 2,165 m. The Phawngpui or the Blue Mountain is the highest peak in Mizoram rising about 2,165 m situated in south Mizoram. The rest of the peaks are Lengteng (2,149 m), Naunuarzo (2,140 m), Surtlang (2,016 m), Zopuitlang (1,963 m), Lurhlang (1,935 m), Tan (1,926 m), Muifang (1,922 m), Ngurtlang (1,895 m), Tawi (1,890 m) and Rangturzo (1,855 m).

Heavy rainfall and the humid climate has turned Mizoram into a thickly forested area, but over the years the practice of *jhum* (slash and burn type of cultivation), has reduced forest cover drastically. Most commonly found trees are the different species of *chams*. The hills are covered by major varieties of bamboos (*Melanocana bambusieides*), wild banana also cover many hill slopes.

The total population of Mizoram according to the 1991 Census is 6,89,756 in which the number of males were 3,58,978 and females 3,30,778. Thus the male-female ratio is 921 females for every 1,000 males. The density of population is 32.77 per sq km. Mizoram is one of the most literate states of India. The literacy rate is 82.27 per cent according to 1991 Census, one of the highest in India. The male literacy percentage was 85.61 while the female was 78.60.

The British knew the Mizos as Lushai. It was a term used by the Bengalis in the bordering plains to describe one of the major tribes of the hills. There are a number of tribes inhabiting these hill ranges who all belong to the Kuki–Chin ethnic group. On the eve of British withdrawal these conglomeration of tribes inhabiting the hills decided to call themselves the Mizos. The word Mizo is generic term applied to a conglomeration of Chin–Lushai tribes and sub-tribes spread over Mizoram, Tripura, Manipur and sovereign states of Bangladesh and Myanmar. The names of these tribes and sub-tribes are Lushai, Pawi, Lakher, Paite, Ralte, Hmar, Vaiphei and so on. Among them the Lushais

were the dominant whose dialect called *duhlian* emerged to be the *lingua franca* of all the Mizo tribes.

The origin of the word 'mizo' is shrouded in mystery. Generally these group of tribes would describe them as Zo. The word 'mizo' has been constructed recently by the Mizo intelligentsia. It has been borrowed from their own language, from the word 'mi', meaning 'people' and 'zo' meaning 'highland'; in other words 'highlander'. Lt. Col. Shakespear, who wrote the first ethnographic monograph on the tribe observed that Lushai was actually the name of single tribe—though the most powerful amongst the many tribes that inhabited the Lushai Hills. The British following the plainsmen described all the other tribes of the region as Lushai as a generic appellation which was incorrect:

> The term Lushai as we now understand it covers a great many clans: it is the result of incorrect transliterations of the word Lushai which is the name of a Clan, which under various Chiefs of the Thangur family, came into prominence in the eighteenth century. . . . In this monograph Lushai is used in the wider sense. Lushai being used for the clan of that name . . . and the general population of the hills is spoken of as Mizo.[68]

Lushai was therefore a later colonial coinage. Accordingly, the British described their habitat as Lushai Hills. Even under this name, however the tribals always called themselves Zo. It was reinvented in the 1940s to settle the identity and unity related issue of the Mizos. The word 'mizo' simply means hill-dwellers and 'Mizoram', the land of the Mizos. In 1946, during the formation of the first political party in Mizoram, the appellation Mizo was used for the first time in lieu of Lushai to cover all the tribes and sub-tribes living in the region.[69] By the end of the Second World War it was apparent that the British were going to withdraw from India in the very near future. The assumption of the Labour Party to power in Britain made it almost certain. As expected, the formal announcement of the British to leave the Indian subcontinent by June 1948 came on 20 February 1947. It prompted hectic political activity all over the subcontinent. The whirlpool of developments caught the tribals of the north-east unaware. They were generally leading a complacent life under British rule. After years of mutual warfare and bloody head-hunting raids on

the plains, they had settled to a peaceful life. Their migratory movements ceased. The British kept them 'excluded' from participating in the political life of the subcontinent. Hence they not only did not participate in organized nationalist politics of India but even the nationalist leaders did not initiate them into the political process.

Now, in 1947 there was talk of British withdrawal, Indian Independence and even the British last-ditch effort to retain the control of tribal areas through the Crown Colony Plan by which the British wanted that while the rest of India became independent, the tribal areas remain under the direct administration of the British who would rule them from London. Although the tribals were resigned to the idea of 'exclusion' from all political activity, they were compelled to rethink their strategy. If the British were going to withdraw who was going to govern the tribals? What kind of Indians would fill the space vacated by the British? And then, why should India govern them? Were they Indians? These questions they confronted were political in nature and it required political processes to settle them. But the foremost issue was to settle the question of identity. Ethnically, the Mizos are closer to the people of Myanmar. In fact, half of their own tribe continued to be on the other side of the frontier. On the other hand, they had been governed as part of the British Indian Empire for at least 50 years during which they had developed an intimate association with India, which would be difficult to severe outright. They could strive to have an independent political existence. Now, to decide all these options they required a political platform too. The Lushais had organized the Young Lushai Organization (YLA) in 1930, an organization affiliated to the Christian church on a socio-religious platform. The party had to be born out of this structure though it had to be divorced from religious affiliations. YLA was formed on the line of Young Mens' Christian Association (YMCA). Organized by the Christian church of a particular denomination. But a political party had to be secular as well as the representative of people irrespective of religion, denominations sub-tribe and such affiliations. The intelligentsia also realized that the nomenclature Lushai included only one of the Zo tribes and it was

politically imperative that all the tribes were unified under one political organization. Thus the name Young Lushai Association was replaced by Young Mizo Association (YMA) using Mizo as a generic term to include all the Zo tribes like Lushai, Pawi, Lakher, Paite, Ralte, Hmar, Vaiphei and others. R. Vanlawma, the first matriculate among the Mizos and the General Secretary of the YMA took the initiative. After consultation with the other Mizo intellectuals like Dahrawka, he drafted a constitution for a political party to meet the needs of the people, which were not fulfilled by the religious YMA. But a major problem that they faced was the issue of inclusion of the Mizo chiefs in the political party. The Mizo chiefs had ruled the Mizo tribes for a long time. Over the years, it had become an oppressive institution, which common Mizos wanted to be rid of. But the British perpetuated it. The inclusion of the chiefs in the party meant they would continue their tyrannical rule even after the British withdrawal. To avoid that, the party was confined to the commoners and named as Lushai Common Peoples Union with R. Vanlawma as its first general secretary. Vanlawma, on assumption, insisted on substitution of the word 'lushai' by the generic Mizo so that the party represented all the Mizo tribes not just the Lushais. Vanlawma also felt that the words 'Common Peoples' depicted the division within Mizo society, which should be done away with. Hence, it was decided that the party be renamed and formally launched as Mizo Union on 9 April 1946. This permanently settled the question of identity as well as the organization of a platform to deal with critical political concern.[70]

After Independence, on the demand of the tribe the name of the district was also changed from Lushai Hills District to Mizo Hills District by an Act of Parliament in 1954. It was then made into a union territory in January 1972. Mizoram became a full-fledged state of the Indian union on 20 February 1987.

The Event: A Prospective Famine in 2007

In 2002 there was a sudden spurt of interest in the bamboo-flowering phenomenon in Mizoram. The reason for such an all round 'interest' was the prediction by the Mizo elders that the

next *mautam* was likely to strike soon. According to the Mizo predictions based on the 50-year cycle of bamboo flowering, the next famine was likely to break out in 2007. True to the predictions, as early as 2000 the 6-ft high bamboo plants started to bloom into mauve, yellow and crimson coloured flowers in the southern areas of the state conveying an ominous omen of impending doom. The alarm had started ringing among all sections of the Mizos as they were reminded of the grim days of the late 1950s when scores of people perished in hunger as the hungry rats devoured their staple crops.

The print-media was quick to pick up the issue. *The Telegraph* (Calcutta) reported, 'Mizoram Apprehends Rat-Triggered Famine' (18 March 2001). In July it had a headline 'Mizoram Devises Two-Pronged Strategy to Combat Famine' (6 July 2001). *The Shillong Times* reported 'Mizoram Government to Purchase Rat-Tails: A Unique Measure to Check Famine' (15 June 2001). *The North East Sun* had a cover story entitled 'Catastrophic Famine to Strike North-East' (1–14 July 2002). *The Eastern Panorama* (March 2002) as well as *North East Frontier Magazine* ran similar cover stories. The predicted bamboo flowering, consequent rat-famine and Mizoram as the land where this unique phenomenon would occur in 2007, brought it worldwide attention. According to *The National Geographic News* the phenomenon was intriguing as it was interesting:

> Some species of bamboo flower only every 40–50 years. In an intriguing chain of events, these periods of flowering sometimes lead to the destruction of the basic crops and widespread famine in areas of India where bamboo grows heavily. The last famine of this nature occurred in 1961 through 1965 in the hilly state of Mizoram in eastern India, an area of 21,000 square kilometres with a population of more than 7,00,000. There are hundreds of species of bamboo in the world. Some flower every year, some at regular intervals. But a small percentage flowers in synchrony, over hundreds of square kilometres every few decades. Researchers are not sure how it happens. Science has not been able to explain how the same message is passed among bamboo clumps separated by hundreds of kilometres to flower at the same time . . . [Perhaps] the rhizomes of the bamboo have some kind of memory trait that make the plants grow in synchronisation, then burst into bloom all at the same time.

After the massive flowering, the bamboo clumps die in a kind of suicide by over production . . . when bamboo plants flower, they produce a large volume of seeds, which are source of food many predators, especially rats. As masses of flowering bamboo produce this natural bounty, rats are attracted to the area. Fortified by the protein rich seeds, they multiply rapidly. But the supply of bamboo seeds is limited. When it is exhausted, armies of the marauding rodents turn their attention to standing crops, devouring acres of rice, potatoes and sweet potatoes within a few days. As a result, local peasant, who are fully dependent on agriculture for their subsistence are subjected to famine.

The phenomenon mainly occurs in Mizoram (India), which is heavily covered with two species of bamboo. The impact can be so devastating that local folklore is full of tales of this natural cyclical event.[71]

The British Broadcasting Corporation (BBC), in its online world news edition reported,

The Indian state of Mizoram is preparing itself for a mass flowering of bamboo—which has the potential to devastate the area. The bamboo only flowers once every fifty years. When it last did so, in the 1950s the abundance of seeds led to plague of rats—which in turn led to widespread famine and thousands of deaths in the region. The bamboo is produced from an underground stem. Shortly after flowering—which it does in waves—it dies. Indian bamboo expert Professor M.P. Ranjan told BBC World Service's Outlook programme that the wave of flowering is expected again in the next two years and potential disaster looms. . . . Dr. Ranjan's fellow expert Dr. Eric Bo said 'this is going to happen, it is an act of God or whatever your belief. They are going to flower and they are going to die and we know approximately when that is going to happen.'[72]

The International Forest Conservation Portal recorded, 'The bamboo forests in India's north-east flower every few decades and folklore is rife with tales of devastating impact of this natural cyclical event.' It quoted an agricultural scientist who says,

Why bamboo clumps flower remains a mystery but it is believed to be caused by a characteristic that makes them grow in unison, then bloom. The flowering of bamboo produces huge seeds that attract predators, mostly rats. Strengthened by protein rich seeds the rodents multiply quickly. When the seeds are exhausted armies of rats chomp their way through rice and potato crops and granaries causing famine.[73]

The International Electronic Magazine on Environment, Energy and Sustainable Development, *Terra Green* also reported,

The north-eastern part of India is gearing up to protect itself from the possible famine triggered by a huge surge in rat population, the result of the flowering of bamboo plantations that began this month and is expected to peak in 2007. . . . Science has no explanation till date about the manner in which the message to flower at the same time is passed among bamboo clumps that are separated hundred of kilometres apart. It is speculated that the rhizomes of bamboo have some kind of 'memory' trait that makes them grow in synchronization and then burst into bloom at the same time. After massive flowering the bamboo clumps die, a sort of suicide due to over production. In previous years the simultaneous production of seeds by millions of bamboo plants caused a surge in the number of seed-eating rodents, fortified by the protein rich seeds multiplying rapidly. But the supply of bamboo seed is limited. When exhausted, armies of these marauding rodents turn their attention to nearby paddy and potato fields in search of food with devastating effects on these crops.[74]

The website of the International Human Flower Project posted a report for the surfers saying:

When Charles Baudelaire imagined Flowers of Evil, he likely never heard of Mautak bamboo. People in North eastern India's state of Mizoram refer to Melocanna baccifera as mautam or famine. The Indian peasants and officials are struggling to prevent the next flower fed disaster by harvesting the plant now and distributing poison and rattraps in the region. The flowers produce millions of protein rich seeds that are devoured by rats causing an explosion in the rodent population. When the bamboo seed supply is exhausted, the rats move on to the next available food source—the Mizoram peasents' meagre stores of rice and cereals.[75]

A similar report prepared by Peter Foster, was published in *The Daily Telegraph* of London which described it as a 'Strange Story'.[76] Another website published a rare photograph of the bamboo fruit describing it as 'Disaster Fruit'. It reported:

Most of the bamboo species flower after the end of a long number of years of vegetative growth. The flowering is synchronous over vast tracks of landscape and this phenomenon is called gregarious flowering, which is followed by death of bamboo clumps. But such peculiar behaviour of the

bamboo sometimes create problems for ecology besides human beings. The gregarious flowering of bamboo results in production of large quantities of seeds which in turn, supports population explosion in rats. However quantity of seeds available for rat diminishes soon after the germination of seeds following rains. The resultant short supply of bamboo seeds on the one hand and a large population of rats on the other lead to a phase when the rodents head towards farmlands in adjoining areas, causing widespread loss to crops. Such a chain of events has the potential to cause a famine. The last gregarious famine with a cycle of 48 years, of *muli* bamboo occurred in 1959 and the next is expected to start next year and reaching its peak in 2007.[77]

The mass of material available in the internet on the subject was indicative of the growing curiosity regarding the subject. A search of internet resources brings to notice that there is hardly any reading material from the Indian science fraternity on the issue.[78] Amusingly, and unfortunately much of the material on the phenomenon related to Mizoram, as available in the internet are unacknowledged borrowing from my paper published in the *Economic and Political Weekly* (24–31 March 2001) including its printing errors. For the Department of Science and Technology, Government of India, Centre for Science and Environment, New Delhi, and Centre for Environmental Education, the phenomenon is still 'mysterious'. Prof. B. Hari Gopal of the Department of Science and Technology, Government of India and Prof. H.Y. Mohan Rao of the University of Delhi were among the firsts to initiate scientific enquiry into it. All these indicated the governmental agencies, NGOs and botanists were equally in the dark about the phenomenon leading to a lot of speculation and unneccessary panic.

The invasion of rats and the consequent devastation from the famine was inscribed for posterity by S. Barkakaty, the first Indian Superintendent and also the Deputy Commissioner of the then Mizo Hills district of Assam (1949–53) who had occasion to experience one of the famines (1952–9):

They come in thousands and spread themselves to cover so wide an area that they eat up the entire paddy of a *jhum* overnight. When mautam year approaches, the cultivators take every possible preventive measure in their

simple way by setting up traps around the *jhum* and keeping watch day and night to frighten away or kill rats. But these efforts are not sufficient for saving the crop. During such a famine (therefore) people have to depend for their sustenance and survival on wild roots, jungle fruit and anything that is edible. As a result of under nourishment various epidemics break out causing heavy loss of life.[80]

In early 2003, the Mizoram state government evolved its own contingency plan to avert a famine. It set-up a high level 'Mizoram State Rodent Control Committee' with the Chief Minister, Zoramthanga as its chairman. The seriousness with which he saw the issue can he inferred from the 2004 newspapers report. Zoramthanga, allaying the fear of the repetition of the devastation of the 1957 famine stated,

The biggest difference between then and now is that we are no longer under Assam. We are free to follow our policies. To tackle the phenomenon we have chalked out a multi-pronged strategy that focuses on utilisation and generation of more species [of bamboo] . . . the government will not only prevent a repeat of the tragedy four decades back but actually pave the way for a bamboo revolution in the State.[81]

The committee initiated a mass campaign for killing rats in fields and houses to pre-empt their proliferation. It even offered Re. 1 for the tail of every dead rat. In the first 18 months nearly 80,000 rats were killed in the state. Two expert 'rodent killers', John Bourne and Valerie Grassmen—bio-scientists from Canada who have successfully eliminated rodents and pests in their country had also visited Mizoram in November 2002, on the invitation of the government.[82] They held extended consultations with local experts and submitted a report recommending the annihilation of rats using poison, traps and holes dug in the ground. They suggested the use of zinc phosphide and bromadiolone as a poison and said that the chemicals should be scattered in areas away from human habitation before tilling for *jhum* started.

The central government did not lag behind. It sent plant physiologist Professor H.Y. Mohan Rao of the University of Delhi to help control the situation in 2003 who recommended the farmers to plant crops that the rats did not eat such as banana,

ginger and turmeric instead of the traditional items during the period when vast fields of bamboo were expected to flower. The Government of India financed a number of seminars and workshops. The recommendations of which were placed before the Planning Commission.

The Union Ministry of Environment and Forests had roped in experts including International Bamboo and Rattan Network and the United Nations Industrial Development Organization (UNIDO) for hectic consultation on how to handle the natural growth cycle of the bamboo plant which would have a direct bearing on the socio-economic well-being of the popular and a long-term ecological impact. The fact that after flowering, the entire bamboo forest die and rot was a more serious concern. Having an area of about 18,000 ha of the region covered with about 25 million tonnes of rotting bamboo was a ghastly prospect. More so, since a thriving economy revolves around bamboo. The pulp and paper industry, construction, cottage industry, handloom, food, fuel, fodder and medicine annually consume about 22 million bamboos. If left unharvested this would amount to a loss of around Rs.12,000 million. This will seriously undermine the production of paper industries of the region, as bamboo constitutes their major raw material. Bamboo rotting over hundreds of acres and growth of rat population would have a devastating effect on the *jhum* cultivation which is mainstay of the rural people of the region. Women who make the majority of the rural work-force and contribute more to holding up the rural economy would particularly be vulnerable. Their major source of cash-generating income—such as *jhum* field produce, the vegetable from the wild and the bamboo shoots which they gather and sell in town markets would disappear at least for a crucial period of time seriously affecting family budget. Again, water, which is already a scarce resource in most of the hill regions of north-east India would become scarcer. This was the experience of past years. Thus, women and children would be forced to spend longer hours to fetch water.[83] Experts testified that during the bamboo flowering in Mizoram there was a sharp increase in temperature followed

by a spell of dry arid weather, which had direct fallout on the health of the people.

The impending event provided the scientific community an opportunity to study the phenomenon and evolve a strategy to pre-empt the catastrophe. The Jorhat Rain Forest Research Institute organized a workshop in April 2002 which was attended by the officials of various north-eastern states, organizations like International Network for Bamboos and Rattan (INBAR, Beizing), Gramland and Fodder Research Institute (Jhansi), Forest Survey of India (Dehradun), Institute of Wood Science and Technology (Bangalore), Himalayan Forest Research Institute, State Forest Research Institute (Itanagar), Kerala Forest Research Institute (Peechi), United Nations Industrial Development Organization (UNIDO) and so on. The workshop recommended that Mizoram should go for early harvesting of bamboos before they flowered and attracted rodents.

The idea of harvesting the entire bamboo population has appealed to the Chief Minister of Mizoram, Zoramthanga. Mizoram harvested about 40 per cent of India's 81 million tonnes of bamboo. Now with a one time harvesting the minister wanted to 'reverse the flowering phenomenon into an economic opportunity'. He felt it could bring Mizoram a 'green gold revolution through bamboo'. He proposed setting up an incense factory with machines imported from China or Thailand besides making paper and other handicraft items from bamboos. Prof. M.P. Ranjan, head of the Centre for Bamboo Initiatives at the National Institute of Design at Ahmedabad who was part of group of botanists, engineers, architects and civil servants trying to counter the catastrophe commented that it was of the 'same magnitude as a flood or an earthquake' was also equally enthusiastic about the prospect of harvesting this 'wonder grass' for an industrial purpose.

The Ministry of Environment and Forests put a dampner on the proposal stating that about 26 million tonnes of bamboo spread over more than 10 million ha was going to be affected by the imminent flowering. Only 10 per cent of these bamboos grow in

accessible areas and can be retrieved for industrial use. Another major problem is the requirement of a massive storage facility to cope with the glut of such harvested bamboos. Without proper storage the bamboo is likely to quickly rot. India's Ministry of Environment and Forests set-up two committees to recommend ways to limit crop losses. One suggested that bamboo was extracted before it flowers and that mixed vegetation was planted immediately after flowering to stop soil erosion. The second recommended improving harvesting and storage facilities for extracted bamboo and removing export restrictions to find additional outlets for harvested bamboo.

In a separate proposal the Centre for Indian Bamboo Resource and Technology (CIBART) forwarded a pilot project with the Ministry of Rural Development and the Manipur state government, which involved creating a 'buffer zone' in which bamboo would be completely removed to deter rats from around bamboo growing villages. Plant Scientist Indira Khurana of the CIBART recommended that bamboo seed could be collected from the areas in which it has already flowered and immediately planted in the buffer zone. This would limit the number of seeds available to rats and would also reduce the time during which bamboo would not be available to local communities.

Some non-governmental organizations and individual environmental activists were horrified with the idea of *en masse* harvesting of bamboo plants to prevent it from flowering and resulting in famine conditions. Manorama Savur, an expert on bamboo stated,

> the first cause for alarm is not the threat of gregarious flowering which is a normal phenomenon but that a United Nations organization is ringing alarm bells while the central government is again getting caught in the UN's hysteria. The Government of India seems to have forgotten that the United Nations Food and Agriculture Organization (UNFAO) was basically responsible for both the death of the bamboo forests and the destruction of the forest ecosystem in the entire bamboo region of the southern and central India from 1960 onwards. The north-eastern region was mercifully spared, as UNFAO had not entered that region. . . . The second alarming fact is the central government's threat to harvest the bam-

boos before they flower. If an important species is clear-felled before it flowers and its rhizomes having reached the end of the physiological is exhausted, it would mean a death, a criminal murder of a species.[84]

The basic point of the activist was that flowering of bamboo is a normal reproductive activity like any other organic body. The function of a flower is to produce seed to perpetuate its species. This is true of bamboo too except that each species of the bamboo tends to flower gregariously over vast stretches of areas, but only at the end of its vegetative growth which varies from one to hundred and twenty years for different species. It implies that while any one species is flowering gregariously all other species is bamboo in that region would continue to live and vegetatively reproduce their clump. Mizoram has other species that will not flower in 2007. Thus while one species flowers and dies, others would continue to live nullifying the fear of the people about the shortage of bamboos. Again, though the fear of invasion of rodents is real there is no reason it could not be effectively tackled. Like bamboo seeds, rats also devour, wheat and rice seeds profusely. If rodents could be prevented from entering the ripe grain fields and storehouses, they could be from the ripening seeds of the bamboo too. The activist also refuted the idea that bamboo flowering portends famine. On the contrary it is the famine—which often is the result of a serial drought—that results in gregarious flowering of bamboo across the species. It is a defence mechanism—a simple survival strategy of the species to survive, reproduce and perpetuate itself. Bamboo is a grass, rigid and woody with lignin but is essentially a cellulose, carbohydrate with a large water component. Good rainfall or running water is essential for its growth. Water is both an agent of nutrient distribution in nature and a significant medium of biological acitivity in plants. Repeated failure of monsoon rings the death knell for bamboo.[85]

A retired professional forester A. Maslekar from the Indian Forest Service reported that a bamboo species (*Dendrocalamus structus*) flowered gregariously in Maharashtra in the year 1983–4 and also in Madhya Pradesh and Andhra Pradesh in the following years. He asserted that misconceptions about a natural phenomenon

like bamboo flowering are perpetuated by vested interests. 'Bamboo flowering is a natural phenomenon. It is preceded by increase in rodent population—a nature's way of controlling profuse seeding. Bamboo seeds are eaten by rats, cattle as well as people. It is quite nutritious and even some believe that bamboo seed is also invigorating and has aphrodisiac qualities.'[86] He felt that under such a situation to consider the harvest of bamboo prior to flowering is neither silviculturally sound nor ecologically desirable nor is it economically welcome. It will entail wiping out of a precious natural resource altogether from the site as there will be no seeding and regeneration . . . the idea to harvest bamboos prior to flowering needs to be nipped in the bud. Everything has its time and nature has its own time-table. We have already interfered in nature's way too much.[87] The same sentiment was echoed by environmentalist P.K. Gautam 'More pressing that the US walking out of Kyoto Protocol and Russia following suit is the need to take stock of the impending anthropogenic mess that we are about to create on the subject of bamboo.'[88]

Confirming the medicinal and aphrodisiac qualities of bamboo seeds another retired civil servant from north-east J.A. Dunn, who find actually experienced the phenomenon called for scientific research on bamboo flowing:

> When the (last flowering of *muli* bamboo took place, the villagers collected the seeds which are pear-shaped just like William pear—about the same size. They cooked and fried the seed and consumed with rice. After some time it was noticed that the incidence of pregnancy increased among many of the married women. Assuming that consuming the seed had somehow increased the fertility of these womenfolk, I collected a fair quantity of seeds and sent to the company along with my observations and requested them to have the seeds analysed but it appeared nothing had been done. The company however requested me to send more seeds but as it was practically the end of flowering I could collect a few kilograms only. It has been said that the rat population increased due to abundance of food, it may however be the other way round as in man. Therefore if proper research/analysis is conducted the properties of the seed would be discovered which could then be a boon for childless couples.

The flowering of *muli* bamboo occurs once in every fifty years. One opportunity had been lost during the last flowering but it has now again presented itself and time should not be wasted for (starting) research/analysis of the seed by medical professionals and pharmaceutical firms.[89]

As can be seen the imminent bamboo flowering has activated a huge range of people, NGOs and governments. While the to-be-affected people are petrified by the prospect and are praying to survive the impending horror, the state machinery and scientists are gearing up to tackle the calamity and mitigate the imagined hardships. This is to be compared against the pre-colonial situation when the Mizo tribe tackled this calamity, which was a part of their life and history, on their own. It would be interesting to dwell on how and why they became dependent on external agencies to fight their battle or for that matter, was it the project of these agencies to create such dependence. It is intriguing because while the rest of the world is taking extreme interest in mitigating this calamity hardly any one in India is keen to gather the tribal knowledge about the phenomenon and their history of coping with it which could be recorded to provide a meaningful insight in tackling the problem. Interestingly such interest in a famine that was to come six or seven years later was truly unprecedented if one considers the usual slow or no reaction of the Indian state towards the sufferings of the people. The reasons were not far to seek. The 1959 famine in Mizoram and the apathy of the Indian state towards the misery of the Mizo people had given rise to the Mizo National Front which organized and led a 20-year long violent secessionist movement which the Government of India had a difficult time to counter. Now that the insurgency is over, the Government of India does not want to take another chance with this imminent famine. In other words, it seems that the entire 'interest' shown in pre-empting a famine was tactical, politically motivated—not really a genuine concern of a state for its citizens. If this is the politics of the post-colonial state in 2002, what was the state of politics *vis-à-vis* the famine during colonial times? How did the other NGOs that were active in the region in those

days react to the calamity? There is much talk about the Mizo insurgency having been sparked off by the bamboo flowering of 1957; was it really true and how? In other words, how did the knowledge and inherent defence mechanism of a small tribal community against natural calamities change with the onset of organized state structures of the colonial state and post-colonial state? This is the subject matter of this book.

NOTES

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3. T.S. Glickmen, D. Golding and E.D. Silverman, 'Acts of God and Acts of Man: Recent Trends in Natural Disasters and Major Industrial Accidents', Washington D.C.: Centre for Risk Management, Discussion Paper, CRM, 1992–2000; cited in Susan L. Cutter, ed., *Environmental Risk and Hazards*, New Jersey, 1994.
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17. D. Rokhuma is the Grand Old Man in this state and has been the recipient of the high civilian award of Padmashree by the Indian government. He advises students, researchers, academics, policy-makers and the administration alike on the issue of bamboo flowering. He is an authority on the subject though he was a school dropout. He has seen quite a few occurrences of this reproductive cycle of the bamboo as well as the devastation it brings to the vegetation of the area and the misery to the popular. He has been a keen observer and with a curious mind. He has been able to test the peoples beliefs associated with the phenomenon against real happenings. It has tried to understand the organic correlation, if any, between bamboo blossoms and growth of rat population. As a result of his intrinsic interest in the subject, he has developed a laboratory in the backyard of his massive house where he has preserved a rare bamboo fruit, massive numbers of rat-tails and associated animate and inanimate objects as evidence from past events of bamboo flowering. Not only this, he has been a veteran crusader against the famine that results from this environmental event. He had organized a NGO called Anti-Famine Campaign Organization to raise peoples' awareness about the phenomenon and initiate action long ahead of the predicted event. He has rallied youth groups, students, ex-army men and bureaucrats around the organization. No wonder, the state administration relies more

on him to tackle the problem than its own pool of scientists and policy makers.

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34. Vishwanathan, op. cit., p. 206.

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