

## REVISED

### ACTION PLAN FOR MANAGEMENT OF PROSPECTIVE GREGARIOUS FLOWERING OF BAMBOOS IN THE NORTHEAST INDIA

#### Introduction

The 'bamboo' also called *poor man's timber*, is one of the most important forestry species having wide distribution throughout the country and has major contribution to the rural economy of India. Of the 1250 species under 75 genera distributed throughout the world, bamboo in India is represented by 145 species belonging to 23 genera under sub-family Bambusoideae of family Poaceae. Bamboo forests in India occupy an extent of approximately **10.03 million** hectares (mha), which constitutes almost 12.8% of the total forest area of the country (GOI, 2001). About 28% of the total bamboo area of the country is located in North-East India. The principal bamboo genera occurring in North-East India include *Arundinaria*, *Bambusa*, *Chimonobambusa*, *Dendrocalamus*, *Dinochloa*, *Gigantochloa*, *Melocanna*, *Indocalamus*, *Ochlandra*, *Drepanostachyum*, *Phyllostachys*, *Pleioblastus*, *Pseudoxytenanthera*, *Schizostachyum*, and *Thamnocalamus*. The distribution of species and the quantity of bamboos, however, is uneven and more than 50% of the bamboo species and 66% of growing stock out of about 80.42 million tonnes (GOI, 2001) occurs in North-East India. There are about 1500 documented applications of bamboos, of which major ones include use in building materials, agricultural implements, furniture, musical instruments, food items, handicrafts, large bamboo based industries (paper pulp, rayon etc.), packaging, to name a few.

#### Gregarious flowering

2. Most of the bamboo species flower at the end of a long number of years of vegetative growth. The flowering is synchronous over vast tracts of varying extent and this phenomenon is called "gregarious flowering". The gregarious flowering has been observed to occur at regular time intervals. Such a peculiar behaviour of bamboos often creates ecological, economic and social problems, particularly in the North-East India because of its poor infrastructure development. Gregarious flowering of muli bamboos (*Melocanna baccifera*) is expected during the years 2005-07 in the North-East. The states, expected to be affected by the gregarious flowering to varying extents include Assam, Manipur, Meghalaya, Mizoram, Nagaland and Tripura. Sporadic flowering in a few products has already been reported by the states.

Recently flowering of other species of bamboos has also been reported from East Kamang District Sappa of Arunachal Pradesh. Details are awaited from the state government.

#### Why does gregarious flowering occur?

3 Although a wide range of research is going on, the flowering of bamboo is still unexplained and mysterious. There are several theories on the causes of flowering and death of bamboos such as the ones relating the phenomenon to pathological, periodical, mutational, nutritional, human, resource matching, predator satiation reasons, and bamboo wildlife cycle hypothesis (Prasad et al, 2002). Physiologically, the bamboos differ significantly from other vegetation because of the mechanism of flowering. Generally, most of the bamboo species

flower gregariously at fixed intervals and all clumps including those of current year die after flowering. Majority of bamboos fall between the two physiological states of constant flowering (*Bambusa atra*) and constant sterility (*Bambusa vulgaris*). Some bamboos die within two years after flowering (*B. arundinacea*) while others do not die but then growth slows down during the flowering period as in *Phyllostachys* and *Arundinaria species*. The flowering is like setting on an alarm clock which is set to go off at a particular time when all populations of a given species raised from the same seed source, no matter where they are situated, would start flowering at the same time. For example, seeds of *Thyrsostachys oliveri* that flowered in Burma in 1891 were sown at Calcutta and Dehradun- two places separated by 1500 km from each other. The clumps raised from these seeds flowered simultaneously at Calcutta and Dehradun in 1940 and flowered again in 1987-88 indicating the flowering cycle of 48 years (Chaturvedi, 1988).

### Why gregarious flowering is so much cause of concern?

4 In the North-Eastern states, based on personal experiences, the local people have knowledge on the periodicity and problems associated with gregarious flowering in the region. It may also be stated that the factors responsible for flowering have not been understood fully. Nearly all bamboos have their own life history and all of them flower once in lifetime. There is general belief supported by some scientific perspective that the gregarious flowering of bamboos brings famine. The phenomenon can be explained as a chain of events occurring in the following sequence. The gregarious flowering of bamboos produces large quantities of seeds, which in turn causes sudden population explosion in rats. However, the quantity of seeds available for rats diminishes soon on the germination of seeds after the rains. The resultant short supply of bamboo seeds on the one hand and a large population of rats on the other, makes rats heading towards the farmlands in the adjoining areas and causing wide spread loss to the crops. Such a chain of events has the potential to cause famine (Nag, 2001).

### Past history of gregarious flowering

5 Although no scientific detailed study is available, there are reports that document the historical occurrence of bamboo flowering and famine in North-East India particularly in Mizoram. The recorded bamboo flowering in Mizoram suggests that the two earlier events of gregarious flowering had occurred in a time block of 1911-1912 and 1959-1960 respectively (Nag, 2001). The last gregarious flowering of muli bamboo in Mizoram, Tripura, Manipur and Barak Valley of Assam has been reported in 1958-59, which was followed by famine in those areas. Based on this, the projections have been made that the next flowering cycle is expected to occur during 2004-2007 (GOM, 2002).

### History of gregarious flowering in Mizoram:

6 *The past record of gregarious flowering in Mizoram is given in the Table below:*

*Table 1 Record of gregarious flowering of bamboos in Mizoram*

S.No	Species	Recorded Year of Flowering					Cycle (Years)
		I	II	III	IV	V	
1	Muli Bamboo ( <i>Melocanna baccifera</i> )	1815	1863	1911	1958-59	Expected in 2004-07	48
2	Pecca Bamboo ( <i>Bambusa tulda</i> )	1785	1833	1881	1929	1977/ next expected in 2025	48

7 The preparations by the Mizos for an anticipated famine due to bamboo flowering may sound intriguing and even over-enthusiastic for anyone who is not familiar with the history and society of Mizo people. The twenty years long history of insurgency in Mizoram led by the Mizo National Front (MNF) was triggered by one such famine that took place in 1959 following gregarious flowering. True to their tradition, the Mizos had anticipated the famine and during October 1958 requested the then Assam Government to sanction to the Mizo's District Council a sum of Rs. 15 lakhs for the whole district for expending on relief measures. The Assam Government rejected the request on the ground that such anticipation was not scientific and famines could not be predicted. This rejection by the state government led to formation of a voluntary organization called the 'Mizo National Famine Front' (MNFF) to organize and coordinate relief measures. Soon after the tragedy, the sense of alienation and marginalization of Mizos was complete and the idea of separatism and secessionism began to emerge. The MNFF was transformed into a political party called the 'Mizo National Front' (MNF). On March 1, 1966 the MNF declared the independence of the Mizo people from India and thus began a violent chapter of insurgency, which continued for 20 long years. It came to an end during 1986 through signing of an accord with the Government of India (Nag, 2001).

### **Immediate effects of gregarious flowering**

- 8 The gregarious flowering results in
- Sudden availability of huge stockpile of dry bamboos- a big fire hazard
  - Explosion in population of rodents due to availability of excess food in the shape of bamboo seeds
  - Sudden shortage of seeds due to germination and the rodents feeding on agricultural food crops
  - Shortage of food for the people
  - The people dependent on bamboo for livelihood purposes deprived of the source materials
  - Fear of outbreak of an epidemic

### **Magnitude of the problem likely to arise**

9 The Rain Forest Research Institute (RFRI), Jorhat, one of the institutes under the Indian Council of Forestry Research and Education (ICFRE), Dehradun organized expert consultations from 24-25 April 2002 on strategies for sustainable utilization of bamboo resources subsequent to gregarious flowering in the North-East. It has estimated that gregarious flowering of *Melocanna baccifera* will occur in an area of about 18,000 sq km in the States of Mizoram, Tripura, Manipur and parts of Assam, Nagaland and Meghalaya (RFRI, 2002). During the year 1959, there was gregarious flowering of this species followed by severe famine in 1960 in Mizoram. Again when there was large-scale flowering of *B. tulda* in Mizoram in the latter half of 1970s, there was a phenomenal increase in the rat population. About 2.5 million rats were reportedly killed in just one year in 1978. It could be an indicator to the magnitude of the problem that is likely to arise during 2004-07. RFRI has estimated that out of a total 26 Million Tonnes (MT) of bamboos available, about 10 MT occur in accessible areas and can be harvested before flowering between the years 2004 and 2006 (RFRI, 2002). In order to mitigate the problem, a contingency plan needs to be put in place. Learning from the past experience the GOI took pre-emptive action and constituted a Steering Committee with representatives from the state governments, industries and the concerned ministries and departments of the Govt. of India during the month of November 2002, to chalk out a detailed strategy and action plan to address this natural ecological phenomenon with high

social, economic and political implications. The Steering Committee held four meetings and further constituted three different task forces, i.e., 'Task Force on Regeneration', 'Task Force on Harvesting and Marketing' and 'Task Force on Rodent Control'. Based on the detailed discussions in the meetings, recommendations of the task forces and the preparedness reports of the states, the Committee finalised the Action Plan during May, 2004. As per the estimates provided by the state forest departments, an approximate extent of 11980 sq km is expected to be under gregarious flowering of which only less than two percent is proposed to be regenerated artificially over a period of five years. The amount required for the purpose as per the projections of the states is estimated to be of the order of Rs **327.90 crores**. Possibilities of obtaining funds for implementation of the activities under the 'Action Plan' by the state governments were explored through various sources. The state governments also moved Ministry of DONER, Ministry of Agriculture and the Planning Commission for Additional Central Assistance (ACA). The Planning Commission has agreed 'in-principle' to provide assistance of Rs. 85 crores as a new Centrally Sponsored Scheme to be operated by the Ministry of Environment & Forests in addition to providing ACA, to the state governments concerned. A Memorandum for the Expenditure Finance Committee (EFC) was accordingly prepared and placed for approval before the EFC on 6<sup>th</sup> June 2005. After detailed discussions, it was decided to revise the Action Plan mentioning activity-wise cost norms, indications regarding funding of various activities by the GOI and the state governments and strategy for constant monitoring of progress of implementation of the Action Plan. Subsequently, a meeting was also held on 10<sup>th</sup> June 2005 under the chairmanship of Member, Planning Commission, North-East, to review the progress made in dealing with this problem. **During the month of June 2005, the state of Arunachal Pradesh has also reported flowering of other species of bamboos (*Bambusa spp.*, *Dendrocalamus hamiltonii*, *Phyllostachys spp.*, *Schizostachyum fusinarum*) in East Kameng district. As gregarious flowering of any species of bamboo would create same type of ecological, social and economic problems, it has been decided to include gregarious flowering of any species of bamboo under this action plan. Details are awaited from other state govt.**

#### **Efforts made by the states so far:**

10 The preparedness of the states in dealing with this problem has been reviewed in a number of meetings of the Steering Committee, special review by DGF&SS (February 2004) and MOS (E&F) (November 2004) and the Planning Commission. The status of preparedness of states on various action points as per latest reports received, is given at Annexure - I

#### **Proposed mitigation strategy**

11 The major points in the revised action plan where action is required by the various stakeholders are given below:

##### **(1) Resource survey and mapping**

- i. There is an urgent need for a detailed resource survey and mapping of the bamboo resources of the North-Eastern states. Immediate action has to be initiated for developing a 'Bamboo-GIS' for North-East India in collaboration with the International Network for Bamboos and Rattan (INBAR), New Delhi; Forest Survey of India (FSI), Dehradun; Indian Institute of Remote Sensing

(IIRS) Dehradun; Forest Departments (FDs) and RFRI. The work is slated to be completed by end of March, 2006.

- ii. Identification and grading of all muli bamboo-bearing areas for development interventions need to be done on priority basis. This has to be done both for the forest and non-forest areas
- iii. The FDs to initiate work on 'cohort mapping' of *M. baccifera* once flowering is reported from different areas in the region
- iv. For the areas already surveyed like North Cachar Hills and Barak Valley in Assam, cohorts need to be identified and incorporated in the 'Bamboo-GIS'
- v. Past flowering records need to be pooled together as soon as possible which can ultimately be incorporated into the 'Bamboo-GIS'. RFRI can take up this job through its web-site and all concerned may post their bamboo flowering records at this web-site

## (2) Resource extraction and management

- i. The states need to be provided with financial assistance for improvement of the roads network to facilitate large scale extraction of bamboos from affected areas
- ii. Introduction of improved tools both mechanized and hand tools, for economic extraction of bamboos.
- iii. Development of low cost improvised ropeways in hills for easy extraction of bamboos, wherever feasible.
- iv. The feasibility of transporting bamboos by waterways to be explored for making bamboo resources available at competitive rates for the users in other parts of the country.
- v. Possibility of transportation of bamboos by rail at preferential rates.
- vi. The states need to modify the present 'Mahal' system for extraction of bamboos so as to involve local communities directly in all activities.
- vii. The state governments may establish state level '**Bamboo Cells**' and the district level 'Task Forces' for efficiently discharging various activities right from felling, extraction, marketing to different parts of the country and export to neighbouring countries, upto the final regeneration and restocking of the areas. The states should identify/establish marketing centres at various places for effective marketing of bamboo poles, semi-finished and finished products.
- viii. The state governments need to give highest priority to maintenance of the law and order situation in the respective states to facilitate effective implementation of Action Plan to mitigate effects of gregarious flowering.

## (3) Resource utilization

- i. The Hindustan Paper Corporation Limited and paper mills located in other parts of the country may be persuaded to first consume the stocks of Muli bamboo of the North-Eastern region by suspending consumption of other species during the period of flowering
- ii. **Bio-Energy**  
Bamboo based gasification affords a unique opportunity to a) demonstrate its commitment to clean, renewable and cheap energy, b) utilise the waste generated by its operations, c) substitute the use of fossil fuels, and d) lower operating costs. Necessary technical help in

establishment of bio-energy units can be sought from the National Mission on Bamboo Applications, TIFAC, Ministry of Science & Technology.

- iii. The GOI has already relaxed restrictions on export of muli bamboos to other countries till March, 2007. GOI may consider relaxation of restrictions further **till 2008**.
- iv. The feasibility of establishing mini mechanical pulping, chipping and compressing mills at strategic locations may be explored for long-term storage and economic transportation. **The use of bamboos can also be considered for production of activated carbon.**
- v. The export potential for semi-processed bamboo items like high-density pulp, mats, chips etc., to other parts of country needs to be explored
- vi. The various cottage industries requiring minimum investment like units manufacturing 'agarbati' sticks, tooth picks, bamboo mats etc., need to be promoted by forming clusters comprising 5-10 closely placed villages and providing them with know-how, hand tools, machine tools and the marketing avenues.
- vii. The possibility of using *M. baccifera* fruit/seed that is rich in protein content for animal feed and oil extraction needs to be explored.
- viii. The technology for high value products needs to be tested and improvised for its suitability in respect of raw material coming from *M. baccifera*
- ix. The state governments may identify prospective buyers of muli bamboos for various uses. **The state govts may also explore possibility of reviving the plywood units lying closed for utilising these bamboos to convert into high value construction material**

#### (4)

#### Regeneration plan

- i. At the time of resource survey, the concerned FD should pay adequate attention to mark the accessible areas, which will be taken up for composite regeneration involving regulated natural regeneration (about 80%), planting with other economically more important species of naturally occurring bamboos in the region (say 15%) and tree plantation of naturally occurring species (say 5%) in a phased manner
- ii. Since there are no scientific studies to know whether the muli bamboo areas planted with other species would not be replaced later by muli Bamboo, the artificial regeneration needs to be restricted to the minimum
- iii. The 'Bamboo Cell' of the concerned state would draw up a detailed 'Master Plan' for regeneration and also prepare detailed estimates for requirement of funds for various activities
- iv. To meet the massive requirement of planting material for regeneration activity, the FD of concerned state should collect seeds from flowered areas. The state FD should gradually shift to clonal propagation and use of elite planting stock
- v. FD should draw time bound action plan to raise the required quantity of nursery stock in central nurseries, which are strategically located and manned by trained personnel
- vi. The production of quality planting stock may be outsourced through FD certified private nurseries of farmers and NGOs under the Joint Forest Management (JFM).

- vii. The possibility of obtaining planting stock from TIFAC may be explored.
- viii. The planting activity is to be taken up in a phased manner as per the master plan drawn up to ensure success of the young plantations

**(5) Development of necessary infrastructure**

The state FD should draw a detailed plan for building up of necessary infrastructure required for addressing this problem like improvement of roads and buildings, procuring of vehicles for the departments dealing with the issue, setting up of health centres, godowns for storage of materials, medicines, small research stations for carrying out research on the related aspects of flowering for future guidance and documentation of all the sequence leading to gregarious flowering and its handling.

**(6) Rodent control and precautionary measures to control spread of epidemic**

- i. In order to control the increase in population of rodents, the concerned departments in the state governments need to draw detailed contingency plans for procurement, storage and distribution of rodenticides, and for creating awareness among the people about the need of drastically reducing the rat population. For this, the state governments may institute some kind of incentive at the district level involving the local administration to reward people actively engaged in controlling the population of rodents. The health departments also need to have plans for health safety of the people to avoid any chances of outbreak of an epidemic due to population explosion of rodents.
- ii. The state governments may also get some studies conducted to determine the precise nature of linkages between bamboo flowering and rodent outbreaks.
- iii. The states may undertake monitoring of rodent dispersal activity/migration between bamboo forest and Jhum areas in combination with population monitoring.
- iv) The farmers may be encouraged to grow early maturing varieties of rice and her crops.

**(7) Control of fire hazard**

The state governments should take all necessary measures for prevention and control of fire hazard, through employment of watchers, involvement of local people, procurement of fire fighting equipment and by creating general awareness about fire damage and control.

**(8) Famine control**

The Food and Civil Supplies Departments of the states should also chalk out detailed plans for making arrangements for procurement, storage and quick distribution of food items in the event of a famine. They need to have safe storage godowns and necessary infrastructure for timely and efficient distribution of food supply. If the famine does not occur, the plans for utilization of the extra food stock and saving them from rodent damage should also be kept ready.

**(9) Dealing with felling & transit restrictions**

The State Governments should take immediate steps for compliance of guidelines issued by MoEF to simplify the felling and transit restrictions to facilitate easy and timely utilisation of bamboos affected /going to be affected by gregarious flowering and removal of bottlenecks in its harvesting **The MoEF would facilitate in removal of bottlenecks. Wherever necessary, the Central Empowered Committee (CEC) of the Supreme Court will be approached for blanket permission for use of bamboos till the gregarious flowering is over.**

**(10) Royalty rates and entry tax**

State Governments should take appropriate steps to review the royalty rates for bamboo as the opportunity cost involved is small and it will bring in overall increase in revenue due to higher off-take. **The landed cost of harvested bamboos from gregarious flowering areas should match the price at which the paper mills are now buying the raw materials.** Similarly removal of entry tax (as imposed by Govt. of Assam) is also to be considered by Government of Assam so as to facilitate easy disposal of produce by the adjoining states.

**(11) Research projects**

There is need to identify variations within the species with respect to timing of flowering so that the flowering can be staggered in a particular area. The ICFRE would prepare specific research proposals which would mainly include survey for identifying genetic variance in different species and their utilization for value addition. The research proposals would also include as to what all valuable species can be planted in different states in the areas which will be under gregarious flowering.

**(12) Awareness campaign**

The states should finalize plans for creation of awareness among the people about this impending problem and issue a set of *dos and don'ts* for the people.

**Requirement of funds**

12 The projected revised requirement of funds by the state governments, the funding proposed to be met by the state governments from their own sources, proposed allocation by the MoEF, Government of India and the funds yet to be obtained by the states from other sources are given at **Annexure II**. The abstract of requirement of funds for implementation of Action Plan by the various states and ICFRE is given at **Annexure III**.

**13** The total requirement of funds projected by the State Governments is Rs. **36650.40 lakhs**. The MoEF, GOI would be able to provide funds to the tune of Rs. 85 crores over a period of four years. Additional financial resources will have to be found out by the states, from their own budget and other sources such as Additional Central Assistance from the Planning Commission, 12<sup>th</sup> Finance commission and, if necessary, also from the Calamity Relief Fund under the Ministry of Home Affairs. The state governments will have to make requests to these bodies/organizations with full justification. The states governments may also approach NABARD for loans for regeneration activities. The proposed allocation of funds by MoEF is given below.

#### **Year-wise allocation of funds by MoEF, GOI**

<b>Years</b>	<b>Arunanchal *</b>	<b>Mizoram</b>	<b>Assam</b>	<b>Tripura</b>	<b>Manipur</b>	<b>Nagaland</b>	<b>Meghalaya</b>	<b>ICFRE **</b>	<b>Total</b>
2005-06*	0.25	08.60	09.30	15.00	06.90	06.00	04.90	0.50	51.45
2006-07	0.50	05.00	01.50	02.00	01.00	01.00	00.90	0.20	12.10
2007-08	0.50	05.00	01.00	02.00	01.00	00.50	00.60	0.20	10.80
2008-09	0.25	05.00	01.20	02.20	01.00	00.50	00.40	0.10	10.65
<b>Total</b>	<b>1.50</b>	<b>23.60</b>	<b>13.00</b>	<b>21.20</b>	<b>09.90</b>	<b>08.00</b>	<b>06.80</b>	<b>01.00</b>	<b>85.00</b>

*\* Since the problem of gregarious flowering of bamboos has been reported by the state of Arunanchal Pradesh only during June 2005, and extent and magnitude of the problem is yet to be assessed by the state, only a token provision has been provided for each year. Exact allocations of resources will be decided once assessment is completed by the state government.*

*\*\* The ICFRE has submitted a proposal for genetic improvement and conservation of genetic resources of some economically more important bamboo species of North-Eastern India as was discussed during the meeting held on 10<sup>th</sup> June 2005 in Planning Commission. An amount of Rs one crore is proposed to be allocated for the project. Based on the progress of research activities, requirement of further resources will be assessed and funds will be obtained from other sources.*

**14** The funds will be released to state governments after obtaining detailed annual action plan mentioning activity-wise proposed expenditure.

**15.** The distribution of bamboos in the North-Eastern States, including the area expected to flower and area accessible is given at **Annexure IV**. The availability of bamboos on account of gregarious flowering as estimated by the states in the next four years is given at **Annexure V**.

**16.** In order to fully comprehend and manage the situation arising out of gregarious flowering of *Melocanna baccifera* and in consideration to the above recommendations, the following actions are suggested:

### **Action points for various agencies**

<b>S.No.</b>	<b>Activity</b>	<b>Complete action by</b>	<b>Responsibility</b>
1.	Complete constitution of (a) Monitoring Committee/Task Force at State level under the Chairmanship of Chief Secretary.  b. Distt. level monitoring committee (forward copies of orders to MoEF)	10.08.2005	All North-eastern states (except Sikkim)
2.	Identification of muli bamboo areas/other bamboo areas (expected to flowering)	31.8.2005	State Forest Departments
3.	Survey and mapping of bamboo areas (species - wise)	31.10.2005	State Forest Departments
4.	Develop bamboo GIS, updating of Website( <a href="http://www.rfri.org">www.rfri.org</a> ) Provide content information to RFRI, Jorhat	Continuous process	RFRI with the co-operation of INBAR, FSI, IIRS and State Forest Departments.
5.	Prepare marketing plan, target the paper mills in the country, advertise, and contact meetings.	31.08.2005	State Forest Departments
6	Relaxation of restrictions on export of muli bamboos to other countries till 2008.	31.12. 2005 (Relaxation already provided till 31.03.2007)	MoEF/ Director General of Foreign Trade
7.	Relaxation of Entry Tax	31.12.2005	Government of Assam
8.	Revision of royalty rates	31.12.2005	Concerned state governments
9.	Prepare 'Harvesting Plan' keeping in view the marketing potential	31.08.2005	State Forest Departments and State Forest Departments Corporations.
10	Prepare deviation statement, if needed from the prescriptions of the working plans.	30.6.2005	State Forest Departments'
11	Apply for and get advance sanction for deviations, as necessary, from RCCF	31.08.2005	State Forest Departments/ regional CCFs
12	Prepare plan for improvement of road transport network	31 <sup>st</sup> July, 2005	State Public Works Department as indicated by Forest Departments.
13	Prepare plan for transportation of bamboo by road/rail/water/ropeways as feasible	31.08. 2005	State Forest Departments and State Forest Development Corporations in consultation with the High Power Committee of the Supreme Court for the NE Region.
14	Harvesting of bamboo areas and their marketing	August 2005 to 2007-2008, as necessary	State Forest Departments and State Forest Development Corporations

15	Explore other possibilities of utilization of muli bamboos	Continuous process	State Forest Departments with co-operation from Forest Development Corporations, ICFRE, IPIRTI, INBAR etc.
16	Prepare regeneration plan, natural & artificial with mix of bamboo species. Artificial with tree species. (success of plantations should be ensured)	31.10.2005	State Forest Departments
17	Implement regeneration plan	2005-2008	State Forest Departments
18	Plan for control of pests (rats)	31 <sup>st</sup> August, 2005	State Agriculture Departments/Forest Departments
19	Preparation of plan for control of fires	31 <sup>st</sup> August, 2005 and continuous process	State Agricultural Departments
20	Plan for health and epidemic problems	31 <sup>st</sup> August, 2005 and continuous	State Medical & Health Departments
21	Plan for awareness building & implementation	31 <sup>st</sup> August, 2005 and continuous process.	State and District level Committees, NGOs, Panchayati Raj Institutions.

### **Review of progress of implementation of the activities under the 'Action Plan'**

17 The revised composition of the Central Monitoring Committee (CMC) with following composition will be constituted:

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|-----|---|------------------|
| 1.  | Director General of Forests & Special Secretary   | Chairman         |
| 2.  | Addl. Director General of Forests, MoEF   | Vice-Chairman    |
| 3.  | Forest Secretaries of the state concerned   | Member           |
| 4.  | Principal Chief Conservator of Forests of the states                                      | Member           |
| 5.  | Inspector General, NAEB   | Member           |
| 6.  | Chief Conservator of Forests (Central) North East Regional Office, MoEF, Shillong         | Member           |
| 7.  | Director, RFRI Jorhat   | Member           |
| 8.  | A representative of DONER, New Delhi  | Member           |
| 9.  | Mission Director, National Mission of Bamboo Application Ministry of Science & Technology | Member           |
| 10. | Deputy Commissioner (SWC-E) Ministry of Agriculture, New Delhi                            | Member           |
| 11. | Representative of North Eastern Council, Shillong.  | Member           |
| 12. | Representative of E&F Division of Planning Commission                                     | Member           |
| 13. | Representative of North East Division Of Planning Commission                              | Member           |
| 14. | Deputy Inspector General of Forests (RT) Ministry of Environment and Forests              | Member Secretary |

**Terms of Reference (TOR)** of the Committee are –

- To review the progress of implementation of the action points by each state and the GOI agencies every two months
- Review the progress of funding and release of funds to the State Governments by the various sources identified.
- Review progress in utilisation of funds action by the state governments.
- Strategies adopted for value addition of the bamboo products.

## **Monitoring Committee of the States**

**18** The monitoring Committee of the states will be headed by the concerned Chief Secretaries who would review the progress of implementations of Action Plan every month. One 'nodal officer' will be designated by the state for maintaining liaison with the Govt. of India. The Chief Secretaries may approach Ministry of Environment & Forests or the Planning Commission whenever required in connection with the flowering.

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