

Title of the Project : Identification of potential pockets and selection of candidate plus trees of Achar, Beeja, Tinsa, Haldu, Dhaman and Shisham and standardization of their clonal propagation technique.

Why this Project :-

The proposed forestry species were naturally occurred in different agroclimatic zones of Madhya Pradesh but since last few decades due to over exploitation and unscientific harvesting practices designated species are comes under threat category and found only few pockets. Today, it was an urgent need to identify potential pockets and identification of CPTs of proposed species from different agroclimatic zones of M.P. as well as their multiplication through cloning was very essential.

Research Methodology :-

- Identification potential pockets – various agroclimatic zones of M.P.
- Selection of CPTs.
- Standardization of clonal propagation technique.
- Preparation of technical bulletin.

Study Design :-

- Identification of potential pockets - For this, working plans of different forest division were reviewed. Reconnaissance survey was made for identification of potential pockets of designated species from different agro climatic zones of Madhya Pradesh.
- Identification & Selection of candidate plus trees –
 - a. Selection criteria for wood producing tree species - On the basis of their phenotypic/morphological traits for wood producing species such as their height, girth at GBH clear bole, fluting and buttress less, epicormic branches, disease free and well establish crown etc were taken for their selection. For fruit bearing species, flowering and fruiting pattern were taken under consideration.
 - b. Passport information of selected of CPTs – Complete passport information was prepared for selected CPTs which includes forest division name, range, compartment number, associated species, GIS Mapping of selected CPTs, Land Mark, soil type, topography etc.
- Standardization of clonal propagation technique – For this an attempt was taken for standardizing clonal technique.

Objectives of Research:-

- To identify potentially rich areas of designated species from different agro climate zones of Madhya Pradesh.
- To select the candidate plus trees of designated species on the basis of their phenotypic traits.
- To standardize their clonal propagation technique.
- To prepare technical bulletin as an extension series of evolved technologies.

Activities Undertaken:-

Field tour was conducted in different forest divisions. Stem branches were collected and clonal propagation technique were standardized. Preparation of publication.

Cost of the Project :- Rs. 25.97 Lakhs

Outcome of Research :-

1. In this project 6 commercially important tree species of different categories (critically endangered, endangered and rare) have been selected. The broader objectives of this project were identification of their potential pockets from different agroclimatic zones of Madhya Pradesh, Identification and selection of morphologically and phenotypically superior genotypes as a Candidate Plus Trees (CPTs) and standardization of their clonal propagation technique. For achieving these objectives, reconnaissance survey were made in different agro climatic zones and in different forest divisions of Madhya Pradesh.
2. Under this project for *Buchanania lanzan* 102 trees were surveyed from 9 forest divisions covering 12 ranges and 20 compartments from 9 agroclimatic zones. Out of 102 trees total 36

phenotypically and morphologically healthy trees were selected and marked along with their geotagging. Potentially rich areas were found from West Chhindwara, South Panna, South Seoni, Chhatarpur, Sehore, Anoopur, Ashok Nagar, Dewas and Sidhi forest divisions. As for its clonal propagation was found very difficult due to its recalcitrant nature. During the study it was also observed that the wild genetic resource of this species is declining rapidly due to unsustainable harvesting practices of their fruits before ripening.

3. Six agroclimatic zones were found potentially rich for Bija covering 9 divisions and 9 ranges. It was observed that Dindori, South Balaghat, North Balaghat and North Betul areas were richly endowed with *Pterocarpus marsupium* however South Seoni, Shepur, Mandla, Sehore and Raisen were also potentially rich areas of this species. The outstanding trees phenotypically candidate plus trees were identified from these areas. The clonal propagation was also found very difficult for Bija however NAA 200 ppm concentration was induced 5% rooting response from juvenile cuttings. During the study it was observed that the natural population of this species is declining day by day due to huge biotic pressure and poor natural regeneration.
4. During reconnaissance survey it was observed that *Ougeinia ojeinensis* (Tinsa) was limited only in 7 agroclimatic zones of Madhya Pradesh which were restricted only in 8 forest divisions covering 8 ranges. The potentially rich areas were found from North Balaghat, South Seoni and Anuppur forest divisions. The 32 healthy phenotypically superior candidate plus trees have been identified from these areas along with their geotagging. From the study it was clearly indicated that this species comes under critically endangered category. Therefore, today it is an urgent need to protect and conserve this valuable timber tree species by increasing its population in the forests. An attempt has also been made for standardizing its clonal propagation protocol but due to its recalcitrant nature root promoting hormone IBA at 500 ppm concentration showed only 3% rooting response.
5. *Adina cordifolia* was reported from 9 forest divisions representing 9 agroclimatic zones. Total 14 ranges and 18 compartments were surveyed during the study. From these areas 150 trees of this species were surveyed for the identification of CPTs. Total 43 genetically superior and sound healthy candidate plus trees have been identified so far from these areas. It was also noticed that Anuppur, West Chhindwara, Sidhi, North Balaghat were richly endowed with this species. Due to huge biotic pressure on forests the natural population of this valuable timber tree species is declining rapidly. The other reason was also noticed its poor natural regeneration due to very poor seed germination. An attempt has also been made for standardizing its clonal propagation technique. Root promoting hormone NAA at 500 ppm concentration showed > 5% rooting response when the juvenile cuttings were treated for 30 minutes.
6. During reconnaissance survey it was observed that *Grewia tiliifolia* (Dhaman) was found only in 5 forest divisions covering 5 ranges which represents 4 agroclimatic zones. More than 32 trees of Dhaman were visited from these forest areas but most of the trees selected for CPTs only 5 phenotypically superior candidate plus trees identified from Obedullaganj, Raisen, Anuppur, West Chhindwara and South Seoni forest divisions. From the study it was concluded that Dhaman is coming under critically endangered tree species. There are reasons have been observed for declining the natural population of this species one of them is irregular flowering habit. Clonal propagation of this species was found very difficult due to its recalcitrant nature and both the root promoting hormones NAA and IBA were failed to induce roots from juvenile cuttings.
7. *Dalbergia latifolia* (Shisham) was also found only in 3 agroclimatic zones of Madhya Pradesh including 4 forest divisions having 6 ranges with 3 compartments. During the survey 38 trees of this species were visited so far out of which only 10 healthy and morphological superior candidate plus trees have been identified from South Seoni, W.Chhindwara, S.Chhindwara and Sehore forest divisions. So these areas were found potentially rich areas of this species. The declining of natural population of this species may be due to very slow growth and very poor natural regeneration. The vegetative propagation of this species was found very difficult hence difficult to propagate it by clonal propagation. Only new and healthy green shoot were developed from the cuttings.



Achar



Bija



Tinsa



Haldu



Dhaman



Shisham



Bija



Tinsa



Haldu



Dhaman