

## Forest Utilization Research Division

**Title of the Project:- Phytosociological study of river bank flora from Amarkantak to Mandla with special reference to impact on water quality in river Narmada.**

### **Why this Project:-**

The present work “Phytosociological study of river bank flora from Amarkantak to Mandla with special reference to impact on water quality in river Narmada” has been done to assess the phytosociological status, water quality, phytoplankton population, along the length of river Narmada at an interval of 05 km from Amarkantak to Dindori, Mandla and North Seoni Forest Division.

### **Research Methodology :-**

Phyto-sociological studies of riparian biodiversity has been done at an interval of 05 km from Amarkantak to Dindori and Mandla Forest Division along the river Narmada. The water samples, and phytoplanktons was collected from the river Narmada from the selected stations. Systematic ecological methods was followed for assessment of the status of riparian floral diversity within the study area. Physico-chemical studies were conducted by as per “Standard Methods for Examination of Water and Waste Water.” Water samples collected in sampling bottles as per the standard method (APHA, 2002; Trivedy and Goel 1986). Samples for plankton analysis were done by collecting using standard methods. The phytoplankton has been identified with the help of keys given by Prescott (1982), Agarkar (1975) and Desikachary (1959).

### **Study Design:-**

- Experimental plots were laid out to study tree cover, shrub and ground vegetation, regeneration study of forest.
- Diversity of phytoplankton community of river and its correlation with the physico-chemical parameters of the water body has been assessed
- Physico-chemical characterization of river water has been assessed.

### **Objectives of Research:-**

- To assess the phytosociological structure of river bank flora
- To assess the spatial diversity of phytoplankton community of river and its correlation with the physico-chemical parameters of the water body.
- To study the physico-chemical characterization of river water to assess pollution level.

### **Activities Undertaken:-**

- Phytosociological study of river bank flora
- Physico-Chemical Studies
- Study on Plankton Diversity

**Cost of the project:** Rs.25.56 Lakhs

### **Outcome of the project:-**

The overall population structure of tree species in the study site reveals that contribution of seedlings to the total population was highest followed by saplings and adult trees. Correlation between phytoplanktons and physico-chemical parameters have computed in which physico-chemical parameters with Cyanophyceae family shows high positive significant correlation; physico-chemical parameters with Chlorophyceae shows higher positive significance correlation; physico-chemical parameters with Bacellariophyceae shows moderate positive association in fresh water body Narmada River. This study has been provide structure of riparian biodiversity and quantitative and qualitative information on physico-chemical characteristics of the river water responsible for the degradation of river water and also provide informative data on the phytosociological status of riparian flora, diversity of phytoplanktons and terrestrial plants.



Field Survey in Amarkantak Range



Field Survey in Tikariya Range

## Forest Utilization Research Division

**1. Title of the Project:- Phenological studies and determination of sustainable harvesting limits of some important wild medicinal plants and NTFPs with active participation of users forest dependent communities in Satna Forest Division of Madhya Pradesh.**

### **Why this Project:-**

In the present study, efforts have been made to develop a technology for conservation and sustainable management of commercially important overexploited/threatened NTFPs from natural forests through community participation. As per the experimental design, six commercially important NTFP species were selected for the study on priority basis after detailed inventory of forest resources in two selected study sites, inhabited by aboriginal tribes, these sites are Nayagaon, Bhatiyachua and Surangi in Chitrakoot Range of Satna Forest Division and Maihar/ Udaipur VFCs in Maihar Range of Satna Forest Division. To develop a technology for conservation determination of sustainable harvesting limits of selected species, a systematic approach has been adopted. In the first stage, inventory study of the current status of commercially important forest was undertaken by adopting standard ecological method with direct involvement of local users communities.

### **Research Methodology :-**

**Ecological studies and inventory of wild medicinal plants:** On the basis of current status and growth pattern of selected NTFPs, various treatments were applied for determination of sustainable harvesting limit. Moreover, growth pattern of each selected species in relation to regeneration potential was studied. Regeneration and harvesting rates of each species were assessed to get Regeneration Index for various treatments based on different harvesting intensities i.e. Control (No harvesting), T1 (20%), T2 (40%), T3 (60%) and T4(80%), where whole and underground plant parts of herb species (roots/rhizome/tubers/leaves) are harvested. in case of tree species, in which fruits and seeds are the utilizable part, treatment starts with control, T1(60%), T2(70%), T3(80%) and goes upto the T4 (90%). All the treatments were taken in 4 (four) replications. Regeneration capacity of the method (Murleedharan et.al,1997). New recruits were enumerated in each treatment plot and mean regeneration indices were calculated.

### **Study Design:- Layout of experimental plots:**

After an inventory of forest resources in the selected VFC's/FPC experimental plots were demarcated on the basis of the growing potential of species selected for experimentation in each study site. The experimental plots were divided into 20 equal plots of 10mx10m size for herb species and 25mx25m for tree species. Number of plants in each plot were enumerated and marked in each plot.

**Demarcation of plot:** For determination of species specific sustainable limits experimental plot of laid out in two ranges of Satna Forest Division

### **Objectives of Research:-**

- Ecological study and preparation of inventory of commercially important wild Medicinal plants potentially rich in forest ecosystem.
- Status assessment of commercially important wild medicinal plants in the study site
- Determination of sustainable harvesting limit (SHL) of commercially important MAPs and NTFPs with active community participation.
- Organize training programme for user communities for sustainable harvesting/management of wild medicinal plants and other NTFPs in JFMCs areas.

### **Activities Undertaken:-**

- Ecological studies and inventory of wild medicinal plants
- Sustainable harvesting limit (SHL) of commercially important MAPs and NTFPs with active community participation.

**Cost of the project:** Rs.32.32 Lakhs

### Outcome of the project:-

Observation recorded during the study period were found quite alarming particularly for *Aegle marmelos*, *Vitex negundo* and *Alectra parasitica* var. *chitrakutensis* which allowed harvesting only to the extent of 60%, 65% and 35%, respectively to maintain sustainability in natural forest. However, other species i.e. *Gymnema sylvestre* (52%), *Terminalia bellirica* (70%) and *Woodfordia fruticosa* (65%) showed comparatively higher sustainable harvesting limit. It has been observed through this experiment that every NTFP species has a site specific permissible level of harvest (sustainable limit) which is directly related to its regeneration potential. When extraction level is exceeded from this optimum level, the plant population is adversely impacted.



*Alectra parasitica* var *chitrakutensis* showing flowering and fruiting



*Woodfordia fruticosa* at Chitrakoot range



Harvesting of fruits of *Aegle marmelos* in study area



Harvesting fruits of *Terminalia bellirica* in Chitrakoot range