

वार्षिक अनुसंधान प्रतिवेदन

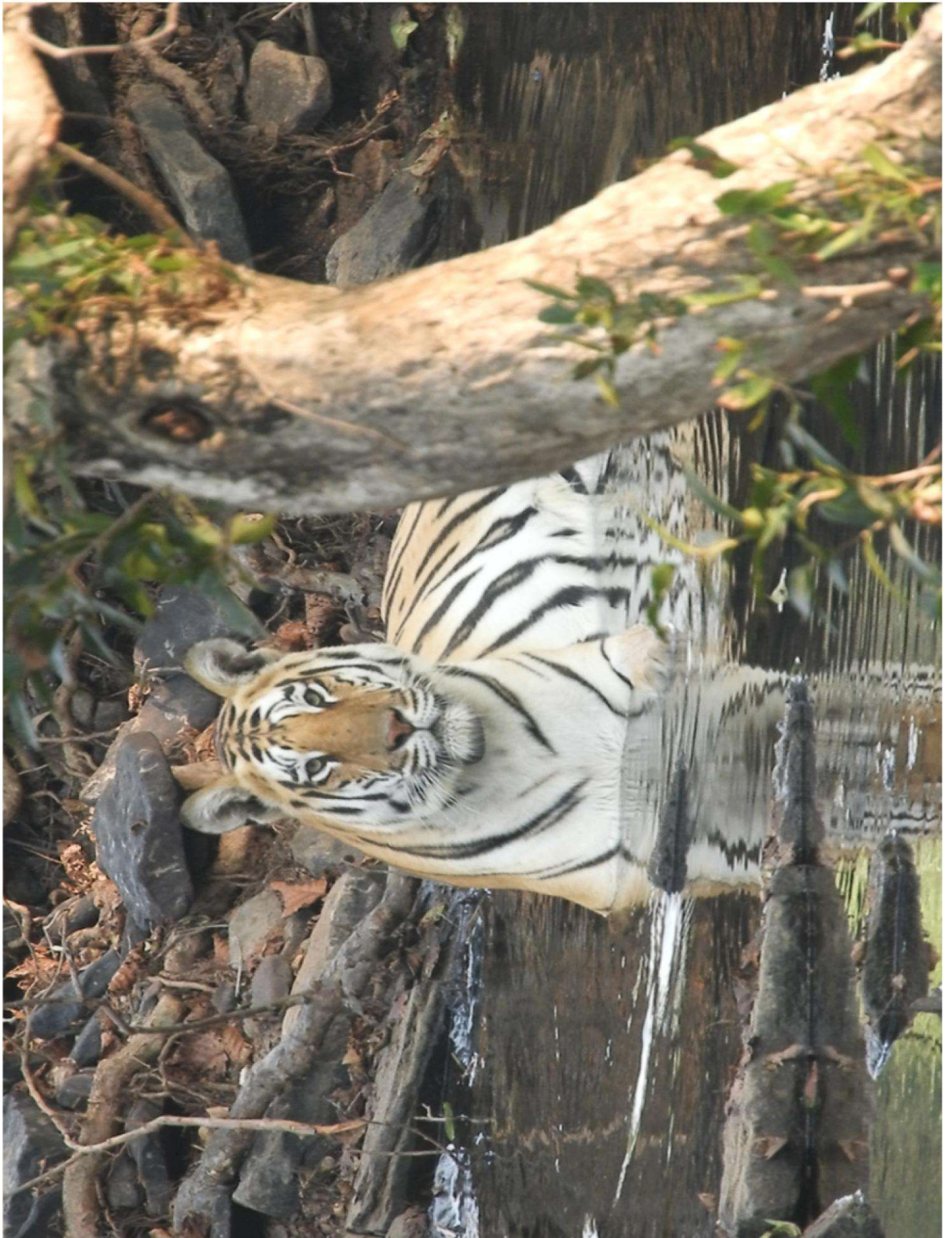
ANNUAL RESEARCH REPORT

2021-2022



State Forest Research Institute, Jabalpur (M.P.)

राज्य वन अनुसंधान संस्थान, जबलपुर (म.प्र.)



वार्षिक अनुसंधान प्रतिवेदन
ANNUAL RESEARCH REPORT
2021-2022

With best compliments from :

Director
SFRI, Jabalpur



State Forest Research Institute, Jabalpur (M.P)

राज्य वन अनुसंधान संस्थान, जबलपुर (म.प्र.)

FROM THE DIRECTOR'S DESK

Globalization and the rapid economic growth along with the ever increasing demand for forest land for agricultural industries and other infrastructure development projects have caused continuous shrinking of land resources. This has led to tremendous adverse impact on forest resources jeopardising the objectives of sustainable forest management.

Research oriented scientifically based knowledge application in managing forest is the need of the hour to deal with the emerging challenges of the current issues of forest and natural resource management.



M.P. State Forest Research Institute, Jabalpur was envisioned to assist in realizing the goals of the forest department by undertaking applied research and thereby providing solutions to the key problems of the forestry sector in the state of Madhya Pradesh. In this context SFRI has traversed 60 years of its glorious journey with steady growth in search of excellence, focusing its efforts on adaptive and applied forestry research programmes to provide scientific and technical interventions for the progress of the forestry sector of the state.

This is the centenary year of forestry research in the state of Madhya Pradesh. As we gear up to meet the emerging challenges of anthropogenic pressures on forest, climate change, loss of biodiversity, it is indeed an appropriate time for the institute to revisit, redefine and revise its research focus to plan its strategy to enable itself to the cause of the marginal section of the society and tribal community for livelihood issues, beside contemporary issue of forest management and other stakeholders.

The institute is committed to provide scientific solution by undertaking departmental as well as consultancy projects, predominantly which are of applied aspects deliverable in the field with a focus to augment the livelihood resources of the downtrodden community with meager sources of income from the forest.

The institute continued with its research programmes both in the forestry and wildlife sector with acute paucity of funds as in the past few years. The institute achieved the targets as per the Annual Action Plan of 2021-2022 with initiation of 03 new projects, execution of 24 ongoing projects, completion of 11 research projects and continuation of 09 regular activities. 05 project reports were submitted to the sponsoring agencies, 22 research papers were published in various national, international journals and newsletters of SFRI and 07 research papers and articles in souvenirs and symposiums.

The institute has developed many operational protocols regarding the conservation and enhancement of forest productivity efforts of the forest department. The institute is also now venturing upon broadening its horizon of research in the field of wildlife conservation and habitat improvement.

I am grateful to the Chairman and Vice Chairman of the Board of Governors and to the eminent members of the Research Advisory Committee of the institute for their guidance and constant support which helped us immensely to achieve our desired goals.

It's give me enough pleasure to present before you the Annual Research Report of the institute and it is hoped that the information about the research outcomes and activities documented in this report will be useful to the stakeholders and to those concerned with the forestry sector.

(Amitabh Agnihotri)
Director

1. THE INSTITUTE

1.1 INTRODUCTION

State Forest Research Institute, Jabalpur (SFRI) came into existence on 27th June, 1963 for the scientific development of forestry sector in the state of Madhya Pradesh following the recommendations of tenth Silvicultural Conference held at Dehradun in 1961. It was granted autonomy on 29th October, 1994 and was registered on 2nd August, 1995 as a society under M.P. Societies Registration Act 1973. Over the years the institute has developed as an educational, training, research and consultancy organization at the state and national level and is carrying out adaptive and applied research programmes. The research programmes are focused on tropical forestry, environment, wildlife, agro forestry, biotechnology and biodiversity conservation. The vision of SFRI is to function as nodal centre of research in forestry and to provide scientific support to the state and its people on matters related to forestry, wildlife and climate change with particular emphasis on conservation, sustainable utilization and scientific management of natural resources. The institute conducts multidisciplinary forestry research and provides technical advice to the practical problems that are encountered by the field foresters. It also disseminates research findings through training, education, seminars, workshops, participation in public fairs and consultancy services. Technical bulletins, series of pamphlets, brochures and two journals namely 'Vaniki Sandesh' and 'Van-Dhan Vyapar' are published quarterly. 'Vaniki Sandesh' contains papers and articles of practical importance and also on research findings of the projects of the institute which can be applied and adopted in the field. The Journal of Tropical Forestry is also published from the institute campus by the Society for Tropical Forestry Scientists comprising of senior forest officers and scientists from the state and all over the country. The journal carries technical research papers, articles and research recommendations of forestry projects undertaken by various organizations.

The institute is located at Jabalpur in a lush green campus spread over a sprawling area of about 102 ha. The region of Jabalpur has close proximity to two major forest types, namely; sal and teak forests of Madhya Pradesh and four protected areas (PA's) namely; Kanha, Bandhavgarh, Pench and Satpuda. This unique location rendered it suitable for the setting this institute here. It houses a rich infrastructure of various research and experimental plots, research nursery, ornamental nursery, clonal nursery, medicinal and aromatic plants nursery, rose garden, seasonal garden, gene-bank, glass-house, mist-chambers, shade-net houses, poly houses, botanical garden, bambusetum, tissue culture, fully renovated state of art EIA, soil and seed testing laboratories along with administrative block, conference halls, lecture room, museum, herbarium, auditorium, library and documentation centre, guest house, officers' rest house, etc. The institute is now equipped with a mobile soil testing laboratory. The institute also provides residential accommodation to its employees inside the campus.



1.2 VISION, MISSION AND GOALS

Vision

To serve as a nodal centre of research in order to provide scientific support to the state and its people on matters related to forestry, wildlife and climate change with particular emphasis on conservation, productivity, sustainable utilization and scientific management of natural resources while becoming a self sustaining center of prominence and repute in the region

Mission

To focus on various applied research programs, evaluation of implementation of various schemes, policies, and upgradation of skills of the personnel of the forest department in order to realize the vision of SFRI and Sustainable Development Goals (SDGs) of the sector.

Goals

To conduct study and research on:

- a. Conservation of forests, wildlife and ecosystem services
- b. Enhancement of productivity of natural forests, plantations, and trees outside forests to meet the requirement of local communities and industries
- c. Efficient and sustainable utilization of biodiversity and forest resources.
- d. Climate change mitigation and adaptation.

1.3 Thrust Areas

A. Forestry

1. Investigations into problems related to natural regeneration of various miscellaneous species and development of suitable silvicultural management techniques
2. Development of suitable package of practices for sustained rehabilitation of degraded forests.
3. Development of suitable nursery and planting practices for RET species.
4. Development of suitable models of inter-planting of NTFP species in commercial teak and bamboo plantations being raised by MPRVVN.
5. Development of suitable management models for forest areas under JFM.
6. Development of suitable agroforestry and farm forestry models for various agro-climatic zones of the state and studies on forest based livelihoods
7. Estimation of carbon sequestration potential in forests of different compositions and densities.
8. Development of models of adaptation to climate change for converting forest- fringe villages into climate-smart ones.
9. Assessment of carrying capacity of forests of different types and canopy densities for grazing.
10. Establishment of a network of sample plots representing different forest types, including coppice forests and plantations
11. Preparation of species-specific growth tables for volume, biomass and sequestered carbon and development of region-specific allometric equations for estimation of these parameters
12. Establishment of a network of preservation plots in different forest types and studies in ecological succession.
13. Assessment of region-specific potential of NTFP production in forests.
14. Development of suitable tools and techniques for sustainable and non-destructive harvesting of NTFPs and Germplasm collection, evaluation and preservation.
15. Development of suitable post-harvesting techniques for different NTFPs
16. Estimation of demand and supply and study of value-supply chains of commercially important medicinal plants and other NTFPs
17. Economic valuation of forest eco-system services and Forest certification.
18. Conversion of eligible existing 'candidate plus' trees into 'plus' trees after their genetic evaluation and also selection of new 'candidate plus' trees of economically important species having desired genetic traits
19. Conversion of existing seed stands into seed production areas and establishment of new quality seed stands.
20. Development of economically viable, eco-friendly and easy to handle alternatives of polythene bags for production of quality planting material in nurseries
21. Evolution of suitable micropropagation and macropropagation techniques for identified species
22. Seed certification
23. Environmental impact assessment and preparation of environmental management plans
24. Upgradation and modernization of institute laboratories and Dissemination of evolved technologies from lab to land

B. Wildlife

1. Estimation of wildlife populations.
2. Monitoring and evaluation of wildlife habitats
3. Re-introduction of species
4. Estimation of carrying capacity of PAs for ecotourism
5. Impact assessment of eco-tourism
6. Potential exploration of ecotourism in areas outside protected areas (PAs)
7. Determination of carrying capacity of visitors in tiger reserves and PAs.
8. Man-animal interactions
9. Habitat management
10. Landscape level planning and management
11. Corridor linkages and functionality assessment
12. Protected areas (PAs) management effectiveness evaluation.

1.4 MAJOR RESEARCH CONTRIBUTIONS

The institute undertakes need-based forestry research programmes of the state and plays a dynamic role to address various forestry management problems. Some of the important research contributions during the year are mentioned below:

1. Use of excavated soil for enhancing natural regeneration and plantation activities of Greenko Energy Pvt.Ltd., Rampura forest range, Neemuch district of M.P.
2. Selection of species specific root trainer sizes and potting mixes to be adopted by the Forest Department nurseries of Madhya Pradesh for ten selected tree species.
3. Capacity Building of Frontline Forest Staff of Madhya Pradesh for 5th cycle of All India Tiger Estimation Programme-2021-22
4. Study on leopard (*Panthera pardus L.*) presence, identification of conflict zones and developing suitable mitigation measures on human-leopard interactions in the urban areas of Jabalpur and Indore, Madhya Pradesh
5. Population Habitat Viability Analysis (PHVA) of Hard ground Barashingha (*Cervus duvauceli branderi*) for introduction in Bandhavgarh Tiger Reserve, M.P.
6. Impact Assessment of Proposed Sheopur Kalan & Badoda Towns A Group Water Supply Scheme- Parbati River Sub-project under MPUSIP on Aquatic Fauna, River Hydrology & Ecology and its Mitigation.
7. Assessment of impact of Doubling of Katni Singrauli Railline Project on flora, fauna and habitats of Sanjay-Dubri Tiger Reserve
8. Environmental Impact Assessment on Flora, Fauna & Socio economic status of local communities and action to be taken to mitigate impact of Kopra Medium Project at Nauradehi Wildlife Sanctuary, Sagar District (M.P)
9. Survey, population density and quantitative assessment of medicinal plants for the sustainable development of livelihood generation in Jabalpur Forest Circle (M.P.).
10. Development of high-tech nursery and preparation of quality planting material of RET species for their restoration in natural forest and rural/urban areas through plantations.
11. Monitoring and evaluation of wildlife and their habitats for sustainable management and development in the protected areas/ Territorial divisions of Madhya Pradesh.
12. Monitoring of re-introduced tigers (*Panthera tigris L.*) in Nauradehi Wildlife Sanctuary.
13. Study of the impact of proposed Morena Water supply sub project under MPUDP on Dolphin, Crocodile & Gharial and their habitat in National Chambal Gharial wildlife Sanctuary, Morena (MP).
14. Study on tiger presence and their dispersal movements in Ratapani-Kheoni landscape of Vindhyan Range.
15. Phytosociological study of river bank flora from Amarkantak to Mandla with special reference to impact on water quality in river Narmada.
16. 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.

17. Identification of potential pockets and selection of candidate plus trees of Bija and standardization of its clonal propagation technique.
18. Dissemination of knowledge through training programme for sustainable management and quality fruit collection of Chironji to Stakeholders.
19. Germplasm evaluation and standardization of propagation technology for production of quality planting stock of medicinally important species viz. *Anogeissus latifolia* & *Commiphora wightii*.
20. Conservation of lac insects genetic resources.
21. Production of quality planting stock of important RET and wild medicinal tree species through application of advanced technology.
22. Study based on growth of sample plots of Teak, Sal and other species laid out in different forest areas of Madhya Pradesh.
23. मध्यप्रदेश में प्रमुख गोंदों के संग्रहण के ऑकड़ों का संकलन एवं प्राथमिक संग्राहकों पर सामाजिक आर्थिक प्रभाव।
24. पश्चिमी मध्यप्रदेश के मालवा का पठार कृषि-जलवायु प्रक्षेत्र (क्षेत्रीय वन वृत्त, उज्जैन) के अंतर्गत कृषक समृद्धि योजना द्वारा कृषि वानिकी के तहत निजी भूमि के रोपण एवं वर्तमान कृषि वानिकी मॉडल का अध्ययन।
25. मध्यप्रदेश में महुआ फूल एवं अचार गुठली के उत्पादन एवं संग्रहण मात्रा का ऑकलन।
26. देवास जिले में लोकवानिकी प्रबन्ध योजना क्रियान्वयन का अनुश्रवण एवं मूल्यांकन।
27. उच्च गुणवत्ता वाले पौध तैयार करने हेतु बीज तथा नर्सरी तकनीकों का मानकीकरण।
28. क्षेत्रीय सह सुविधा केन्द्र, जबलपुर द्वारा मध्यप्रदेश एवं छत्तीसगढ़ में औषधीय पौधों के लिए डेटाबेस प्रबंधन प्रणाली की स्थापना एवं औषधीय पौधों की खेती का प्रचार-प्रसार।
29. गृह औषधीय वाटिका स्थापना हेतु आवश्यक तकनीकी सलाह व मार्गदर्शन एवं निःशुल्क औषधीय पौधों का वितरण।
30. संस्थान के बैम्बूसिडम में (बांस का पौधशाला) देश के विभिन्न क्षेत्रों से विभिन्न प्रजातियों के बांस का रोपण तथा उनका रखरखाव।

1.5 ADMINISTRATION

The administration of the State Forest Research Institute Society is governed by a Board of Governors, which is constituted by the following members:

1.	Honorable Minister of Forests, Forest Department, Govt. of M.P., Bhopal	Chairman
2.	PCCF & HoFF, Madhya Pradesh, Bhopal	Vice Chairman
3.	Addl. Chief Secretary / Principal Secretary, Dept. of Forests, Govt. of M.P., Bhopal	Member
4.	Addl. Chief Secretary / Principal Secretary, Dept. of Finance, Govt. of M.P., Bhopal	Member
5.	PCCF (Wildlife) M.P., Bhopal	Member
6.	Managing Director, M.P. Forest Development Corporation, Bhopal	Member
7.	Managing Director, M.P. Minor Forest Produce Federation (Trade and Development), Bhopal	Member
8.	Director General, Indian Council of Forestry Research & Education, Dehradun	Member
9.	Director, Wildlife Institute of India, Dehradun	Member
10.	PCCF (Working Plan), MP, Bhopal	Member
11.	PCCF (Research/Extension & Lok Vaniki) M.P., Bhopal	Member
12.	PCCF (Land Management), MP, Bhopal	Member
13.	PCCF (CAMP), MP, Bhopal	Member
14.	Chairman, State Expert Appraisal Committee (SEAC) M.P, Bhopal	Member
15.	Director General, MP Council of Science & Technology, Bhopal	Member
16.	Emeritus Scientist	Member (Nominated by Govt. of MP)

17.	Emeritus Scientist	Member (Nominated by Govt. of MP)
18.	Director, State Forest Research Institute, Jabalpur	Member Secretary & Treasurer

RESEARCH ADVISORY COMMITTEE

The Research Advisory Committee of the institute comprising of eminent forest officers and stakeholders examines and approves the project proposals of the institute, evaluates their progress and results and also monitors the quality of research. The committee comprises of the following members:

1.	Principal Chief Conservator of Forests & HoFF, M.P.	Chairman
2.	PCCF (Wildlife), M.P.	Member
3.	Managing Director, MP MFP Federation, Bhopal	Member
4.	Managing Director, MPRVVN, Bhopal	Member
5.	PCCF (Research and Training), M.P.	Member
6.	PCCF (Production), M.P.	Member
7.	PCCF (Research / Extension and Lokvaniki), M.P.	Member
8.	PCCF (Working Plan), M.P.	Member
9.	APCCF (JFM & FDA), M.P.	Member
10.	APCCF (Research / Extension and Lokvaniki), M.P.	Member
11.	APCCF (Development), M.P.	Member
12.	Director General, MP Council of Science & Technology, Bhopal	Member
13.	Director, TFRI, Jabalpur	Member
14.	Director (Research), Jawahar Lal Nehru Krishi Vishwavidalaya, Jabalpur	Member
15.	CCF (Territorial nominated by PCCF & HoFF), M.P.	Member
16.	Director, Horticulture, Govt.of M.P.	Member
17.	Director, Veterinary and Animal Husbandry, JNKVV, Jabalpur	Member
18.	Farmer's representative	Member
19.	Representative of NGO	Member
20.	Director, SFRI, Jabalpur.	Member Secretary

1.6 ORGANIZATION

S.No	Forestry Professionals	Sanctioned	Working
1	Director (PCCF/APCCF)	1	1
2	Addl. Director (APCCF/CCF)	1	0
3	Deputy Director (CF/Dy.CF)	2	2
4	Assistant Director (ACF)	2	1
5	Forest Ranger	3	1
6	Dy. Ranger	1	0
7	Forester	1	7
8	Forest Guard	15	11
	Total	26	23

S.No	Forestry Professionals	Sanctioned	Working
	Scientist		
1	Forest Ecologist	1	0
2	Forest Geneticist (Scientist-E)	1	1
3	Seed Specialist (Scientist-E)	1	1
4	Tree Improvement Specialist	1	0
5	Forest Botanist (Scientist-E)	1	0
6	Biodiversity Scientist	1	0
7	Marketing Specialist (Scientist-E)	1	0
8	Wildlife (Scientist - B)	5	1
	Total	12	3
	Technical		
1	Statistical Assistant (Sr. Research Officer)	1	1
2	Technical Assistant (Social–economics), (Sr. Research Officer)	3	0
	Technical Assistant (Contingency)		2
3	Technical Assistant (Forestry Research), (Sr. Research Officer)	9	7
	Technical Assistant		2
4	Technical Assistant (Consultancy/Extension), (Sr. Research Officer)	1	1
5	Technical Assistant (Library), (Sr. Research Officer)	1	1
6	Technical Assistant (Documentation) (Sr. Research Officer)	1	1
7	Technical Assistant (Computer) (Sr. Research Officer)	1	1
8	Lab Technician, (Sr. Research Officer)	6	1
	Lab Technician		2
9	Lab Incharge, (Sr. Research Officer)	3	1
10	Ledger Assistant (Research Officer)	3	1
	Ledger Assistant		0
11	Herbarium Assistant (Contingency)	1	1
12	Lab Assistant	3	1
13	Field Assistant	3	1
	Total	36	24
	Non-Technical		
1	Head Clerk	1	0
2	Accountant	2	2
3	Steno – II	2	0
4	Steno - III	2	0
5	Assistant Grade – II	2	1
6	Assistant Grade – III	4	1
7	Driver	6	2
8	Daftari	1	0
9	Peon/ Orderly	10	0
10	Khalashi	1	0
11	Chowkidar	4	0
12	Mali	4	0
13	Dak Runner	3	0
14	Sweeper	2	0
	Total	44	6

1.7 WORKING DEPARTMENTS, RESEARCH DIVISIONS AND FACILITATION CELLS OF THE INSTITUTE

Forestry research in the institute is categorized in six broad divisions and facilitations cells which are as follows:

A. Forestry Department

A1. Biotechnology Research Division

Research Disciplines

1. Forest Genetics & Tree Improvement
2. Biotechnology
3. Phytochemistry
4. Tissue culture

A2. Conservation Research Division

Research Disciplines

1. Biodiversity Conservation
2. Forest Botany
3. Ethnobotany
4. Forest Ecology & Ecosystem Services

A3. Forest Management Research Division

Research Disciplines

1. Silviculture
2. Soil Science
3. Forest Protection
4. Forest Mensuration
5. Statistics
6. Joint Forest Management

A4. Forest Utilization Research Division

Research Disciplines

1. Timber & Fuel-wood Utilization
2. Medicinal & Aromatic Plants
3. Bamboos
4. Other NWFPs
5. Forest-based Livelihoods
6. Market Information System

A5. Productivity Research Division

Research Disciplines

1. Plant Propagation
2. Seed Technology & Certification

A6. Social Economics Research Division

Research Disciplines

1. Sociological Studies
2. Forest Economics
3. Agroforestry
4. Policy Research

B. Wildlife Department

B1. Animal Ecology Research Division

Research Disciplines

5. Animal Ecology
1. Conservation Biology
2. PHVA studies
3. Re-introduction, Re-wilding and Translocation

B2. Habitat Ecology Research Division

Research Disciplines

1. Habitat Management
2. Ecosystem services valuation of PAs
3. Ecological studies of terrestrial and aquatic animals
4. Ecological studies post relocation of villages

B3. Wildlife Management Research Division

Research Disciplines

1. PA Network
2. Wildlife Management
3. Man-Animal Interactions
4. Landscape Level Planning and Management
5. Corridor Management

B4. Ecotourism and Conservation Education Research Division

Research Disciplines

1. Ecotourism
2. Attended Interpretation
3. Unattended Interpretation

C. Facilitation Cells

1. Environmental Impact Assessment
2. Climate Change, Climate Justice, REDD+
3. Extension, Training & Consultancies
4. Monitoring & Evaluation
5. GIS & Remote Sensing
6. Computer & IT
7. Library
8. Documentation
9. Procurement
10. Common Research Facility

1.8 TRANSFER OF TECHNOLOGY

1. Training and demonstration programme on establishment and best management of Seed Production Areas, Seed Technology and Nursery Management for Field Foresters.
2. Dissemination of knowledge through training programme for sustainable management and quality fruit collection of Chironji to stakeholders.
3. Scientific method of Lac cultivation.
4. Training on establishment, maintenance and periodic measurement of sample plots
5. Orientation programme on wildlife population monitoring tools and technologies
6. Training cum demonstration of cultivation techniques, processing and marketing of medicinal and aromatic plants.
7. Training cum awareness and orientation programmes regarding forestry research for the newly recruited trainee forest rangers and forest guards and students from universities.
8. रोपणी में रूट ट्रेनर में पौध तैयारी, पौधों में होने वाली बीमारियों का निदान एवं रोपणी प्रबंधन पर प्रशिक्षण एवं प्रदर्शन।
9. Participation in exhibitions and fairs.

2. RESEARCH ACTIVITIES

Abstract of Research Activities

2021-2022

S. N.	Name of the Research Division	No. of Completed Projects	No. of On-going Projects	Newly Initiated Projects	No. of Regular Activities	Total
1	2	3	4	5	6	7
Forestry Department						
1	Biotechnology	-	3	-	3	6
2	Conservation	2	-	2	2	6
3	Forest Management	2	2	-	2	6
4	Forest Utilization	3	2	-	-	5
5	Productivity	1	5	-	1	7
6	Social Economics	-	3	1	-	4
Wildlife Department						
7	Animal Ecology	1	4	-	-	5
8	Habitat Ecology	2	2	-	1	5
9	Wildlife Management	-	1	-	-	-
Facilitation Cells						
10	Environmental Impact Assessment (EIA)	-	2	-	-	2
11	Climate Change, Climate Justice, REDD+	-	-	-	-	-
12	Extension, Training & Consultancies	-	-	-	-	-
13	Monitoring & Evaluation	-	-	-	-	-
14	GIS & Remote Sensing	-	-	-	-	-
15	Computer & IT	-	-	-	-	-
16	Library	-	-	-	-	-
17	Documentation	-	-	-	-	-
18	Procurement	-	-	-	-	-
19	Common Research Facility	-	-	-	-	-
TOTAL		11	24	3	9	46

2.1 FORESTRY DEPARTMENT

2.1.1 BIOTECHNOLOGY RESEARCH DIVISION

Mandate

1. Investigations on genetic variation, inheritance pattern and reproductive biology.
2. Exploring correlation between intra-specific variability and habitat characteristics.
3. Selection, testing and development of clones/varieties of commercially important tree species for desired traits.
4. Allele mining for traits related to biotic and abiotic stresses.
5. Developing breeding and production populations through provenance, progeny and clonal trials.
6. Field verification of already identified 'candidate plus trees' and conservation of eligible ones to 'plus trees' after their genetic evaluation.
7. Selection of new candidate plus trees of economically important tree species having desired traits, such as faster growth, better form, drought resistance, disease resistance, insect resistance, NTFP production, etc on the basis of intra-specific genetic variability.
8. Development of microsatellite markers for important tree species.
9. Molecular marker based genetic diversity analysis of populations of important forestry species.
10. Full genome sequencing of native tree species.
11. Development of improved varieties with desired quantitative (growth) and qualitative (disease, insect, pest and drought resistance) traits through genetic engineering.
12. Wood forensic studies.
13. Development of bio-informatic tools and data base for priority species.
14. Germplasm evaluation of medicinal plants for active ingredients.
15. Study of seasonal variations in the content of secondary metabolites.
16. Determination of differences, if any, in the percentages of secondary metabolites present in medicinal plant produces of wild and cultivated origin.
17. Phytochemical analysis of forest foods-edible fruits, tubers, etc. for their nutritional values.
18. Phytochemical analysis of forestry plants for their potential utilization in preparation of bio-pesticides and bio-fertilizers.
19. Bio-prospecting for useful organic compounds in micro-organisms, plants and fungi that grow in extreme environments.
20. Evolution/standardization of cost effective micro-propagation (tissue culture) protocols for forestry species whose propagation from seeds or macropropagation is difficult due to scarce availability of mother plants.
21. Field testing of the performance of tissue culture raised planting material.

On-going Projects :- Three

1. 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.
Funding Agency: PCCF (Research, Extension & Lok Vaniki) M.P., Bhopal
2. Establishment of demonstration plot of *Bambusa tulda* at SFRI, Jabalpur.
Funding Agency: Director, M.P. State Bamboo Mission, Bhopal.
3. Use of excavated soil for enhancing natural regeneration and plantation activities of Greenko Energy Pvt.Ltd., Rampura forest range, Neemuch district of M.P.
Funding Agency: PCCF (Land Management), M.P., Bhopal

Regular Activities :- Three

1. Provenance trial of *Litsea (Litsea glutinosa)*.
2. Maintenance of clonal germplasm of *Madhuca latifolia* (Mahua).
3. Maintenance and enrichment of Bamboosetum.

Project Summary:-

On-going Projects

1. 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, there is 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.

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 :-

To complete the objectives of the project the following design has been adopted:-

1. Identification of potential pockets - For this, working plans of different forest division to be reviewed. Reconnaissance survey will also be taken for identification of potential pockets of designated species from different agro climatic zones of Madhya Pradesh.
2. 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 will be taken for their selection. For fruit bearing species, flowering and fruiting pattern will take under consideration.
 - b. Passport information of selected of CPTs – Complete passport information will be 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.
3. Standardization of clonal propagation technique – For this cloning technique will be standardized.

Objectives of Research:-

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

Activities Undertaken:-

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

Cost of the Project :- Rs. 25.97 lakhs

Expected Outcome of Research :-

1. The potentially rich areas of designated species will be identified from different forest divisions of M.P.
2. The Candidate Plus Trees will be identified from potentially rich areas.
3. Clonal technique will be standardized



Achar



Bija



Tinsa



Haldu



Dhaman



Shisham



Bija



Tinsa



Haldu



Dhaman

2. Title of the Project:- Establishment of demonstration plot of *Bambusa tulda* at SFRI, Jabalpur.

Why this Project: -

To observe the field performance of tissue culture raised plants of *B.tulda*.

Research Methodology:-

The planting material collected from Rain Forest Research Institute, Jorhat and planted in SFRI campus. The technical guidance provided by the technical staff of the project. The other project activity such as site preparation, fencing, stacking, planting, irrigation, protection, maintenance and watch & ward etc. being supervised by Research Range Officer, SFRI, Jabalpur.

Study Design:-

Spacemnt 4x4 meter

Objectives of Research :-

- To establish a demo plot of *Bambusa tulda*.

Activities Undertaken:-

Site preparation, communication to RFRI Jorhat and planting

Cost of the Project :- Rs.6.00 lakhs

Expected Outcome of Research:-

Field demonstration of *B.tulda* plants.



Bambusa tulda

3. Title of the Project:- Use of excavated soil for enhancing natural regeneration and plantation activities of Greenko Energy Pvt.Ltd., Rampura forest range, Neemuch district of M.P.

Why this Project:-

As per the letter no./F-4/2021/10-11/3375 Bhopal, dated 07/10/2021 from Principal Chief Conservator of Forest (Land Management), M.P., Satpura Bhawan Bhopal communication, Greenko Energy Pvt.Ltd. is establishing pump storage in 301.96 hectare for which Govt. of India has in-principle approved setting up pump storage in the proposed forest land. This proposed area is about 4 km away from Gandhi Sagar Sanctuary with 8 to 10 inch soil depth. The condition is also imposed by Govt. of India to take up a study regarding enhancement of natural regeneration and afforestation on excavated soil by a recognised research institute.

Keeping this in view and with the consent of office letter no./Gen./3128 dated 01/11/2021 the project proposal was formulated for compliance of the above proposed activities.

Research Methodology: -

a. Survey of the project area – It will cover following activities.

- i. Collection of meteorological data - climate, topography, rainfall, number of rainy days, temperature etc.
- ii. Soil samples will be collected for analysis of their physico-chemical properties viz pH, Electrical Conductivity, NPK, organic carbon, moisture content, water holding capacity etc.
- iii. Vegetational survey – includes present status of naturally occurring species and their regeneration status.

b. Site improvement activity - It will cover following suggestions/activities.

- i. Suitable species for afforestation scheme.
- ii. Spacing and different pit size for various suitable species.
- iii. Appropriate soil mixture in pits for better growth.
- iv. Enhancing natural regeneration through protection and various conservation practices.

Study Design:- For ecological studies, three main activities will be carried out in Greenko Energy Pvt.Ltd. site and adjoining area.

a. Crop composition - As per the guidelines of working plan, 5 plots of 0.1 ha will be laid out randomly to study crop composition in the area.

b. Regeneration status - In each plot of 0.1 ha, three sub plots of size 10m × 10m will be laid out for observing the natural regeneration of various species in the site.

c. Ground flora study - Similarly, 5 sub plots of size 1 sqm will be laid in each 0.1 ha plot to study ground flora of the area.

For edaphic soil study, three-three soil samples will be collected randomly along the road side and from the excavated dump. This will help to understand the physio-chemical properties of the soil as well as help to suggest afforestation by suitable species.

Objective of Research:-

- To improve impacted site through natural regeneration and plantation activities.

Activities Undertaken:-

Field tour will be conducted for site survey, vegetation survey and soil samples collections for their physico-chemical analysis

Cost of the Project: - Rs.8.45 Lakhs

Expected Outcome of Research:-

The impacted area of Greenko Energy Pvt.Ltd. at Rampura Forest Range, Neemuch Forest Division, Neemuch will be replenished and improved by appropriate use of excavated soil of the adjoining forest area through natural regeneration and afforestation to restore the ecological balance.



Study Site, Natural Vegetation and Land Pattern



Regular activity

1. Title of the Project:- Provenance trial of *Litsea (Litsea glutinosa)*.

Why this Project:-

Litsea glutinosa commonly known as maida chal belongs to family Lauraceae is an evergreen tree. Its bark contains active alkaloid known as laurotetanine which is a derivative of tannic acid and is very useful in several diseases and also used in cosmetic industries. Due to increased demand of bark by Agarbatti industry, the trees are completely stripped for the extraction of bark. The prevailing destructive practices have threatened the survival of this very precious species in the state of Madhya Pradesh and hence this species becomes under the threatened category. Today, its *ex-situ* conservation is one of the major challenging tasks because it is highly recalcitrant in nature. Keeping under above considerations a provenance trial has been taken up in SFRI campus for its *ex situ* conservation and observing best performing provenance.

Research Methodology:-

A provenance trial of *Litsea glutinosa* has been taken up in SFRI campus in the year 2010-11 with 8 provenances viz Jagdalpur-15, Pachmarhi-15, Baihar – 15, Lalbarra (Balaghat)-15, Patakot – 15, Rewa – 15, Betul – 15, Langhi (Balaghat)-15 Samnapur-7 alongwith 126 plants. The plants were raised through stem branch cuttings under mist chamber. The best performing provenance will be evaluated on the basis flowering and fruiting pattern, height and girth.

Study Design:-

Total plants 126

Number of provenances 8

Spacing 3x3 meter

1. Jagdalpur Total plants = 15 (3 lines of 5 plants each)	2. Jagdalpur Total plants = 15 (3 lines of 5 plants each)	3. Lanji Balaghat Total plants = 15 (3 lines of 5 plants each)	4. Lalbarra Balaghat Total plants = 10 (2 lines of 5 plants each)
5. Patakot Total plants = 15 (3 lines of 5 plants each)	6. Rewa Total plants = 15 (3 lines of 5 plants each)	7. Betul Total plants = 15 (3 lines of 5 plants each)	4. Lalbarra Balaghat Total plants = 10 (2 lines of 5 plants each)
8. Baihar Balaghat Total plants = 16 (2 rows of 8 plants each)			

Objective of Research:-

Maintenance and collection of growth data.

Activities Undertaken:-

Lopping of branches, removal of weeds, soil working, data collection of data on -height, girth, flowering and fruiting etc

Cost of the Project - Rs. 0.50 Lakhs

Expected Outcome of Research:-

As *Litsea glutinosa* is critically endangered tree species of forest of Madhya Pradesh. By provenance trial of this species the best performing provenance will be evaluated and will be further used for genetic and tree improvement programme.

2. Title of the Project:- Maintenance of clonal germplasm of *Madhuca latifolia* (Mahua).

Why this Project:-

Mahua is a versatile fruit bearing tree species which occurs in different forest divisions of M.P. It is considered as a valuable tree which yields fuel, edible flowers, oil yielding fruits, fuel and timber. The fermented flowers can be used to produce country liquor. The oil obtained from its fruits is used for cooking by tribal. It has been noticed that Mahua is not being planted and old trees are dying due to human interference and natural calamities. Deforestation and increasing population are mainly responsible. Loss of qualitative germplasm is another important factor. If tribal are supplemented with quality planting material such as the grafted plants of quality germplasm which will give early fruiting and tribal can enhance their economy substantially. The germplasm consisting of 36 grafted Mahua

plants were planted in 2010-11. At present 26 grafted Mahua plants are available. In this regular activity the flowering and fruiting behavior from grafted mahua plant will be observed.

Research Methodology:-

The germplasm consisting of 36 grafted Mahua plants from 6 plus trees (6 clonal plants from each plus tree) was raised in the SFRI campus during 2010-11.

Study Design:-

SFRI-5	SFRI-4	SFRI-3	SFRI-2	SFRI-1	Damoh
36	30	24	18	12	6
35	29	23	17	11	5
34	28	22	16	10	4
33	27	21	15	9	3
32	26	20	14	8	2
31	25	19	13	7	1

Objective of Research:-

Maintenance of clonal germplasm and recording of flowering and fruiting time.

Activities Undertaken:-

Pruning of branches, soil working, application of FYM, removal of weeds, data collection on - height, girth, flowering fruiting etc.

Cost of the Project - Rs.0.50 Lakhs

Expected Outcome of Research:-

The germplasm of Mahua can be utilized as genetic resource for further tree improvement programme.

3. Title of the Project:- - Maintenance and enrichment of Bamboosetum.

Why this Project:-

Bamboos are very important for making different kind of items and presently bamboo stands next to timber species. SFRI has about 1.0 hectare area covered with important 37 bamboo species belonging to 12 genera. The main objective of this regular activity is to maintain and to create awareness among various stakeholders such as farmers, bamboo growers, students etc. Bamboosetum plays an important role in *ex-situ* conservation of different species/varieties of bamboo. The another important objective of proposed regular activity is to enrich with new bamboo species for the enrichment of this Bamboosetum. Enrichment and maintenance of existing Bamboosetum will also help for multiplication of important bamboo species which will be useful to create awareness among the people for physical identification of different bamboo species.

Research Methodology:-

The existed bamboosetum of 1 hectare area including 37 species covering 9 genera will be maintained through soil working. The growth data of these species will be recorded in terms of number of culms per clump, height and collar dia. For enrichment of bamboosetum the new bamboo species will be introduced from North East, West Bengal, RFRI, KFRI etc.

Study Design:-

For introduction of new species a spacement 4x4 meter will be adopted in a pit size 45x45x45 cm.

Objective of Research:-

To maintain and enrich Bamboosetum of SFRI.

Activities Undertaken:-

Preparation of thalas, irrigation, removal of weeds, soil working, data collection on - height, collar girth, number of culms per clump etc

Cost of the Project - Rs.1.00 Lakhs

Expected Outcome of Research:-

Enrichment of bamboo species in Bamboosetum for further multiplication and conservation.

Deliverable technologies developed in each project for stakeholders, forest professionals, field foresters and other beneficiaries.

Other significant achievements :

Potential pockets & CPTs of Bija, Haldu, Tinsa, Dhaman, Achar & Shisham identified from different forest divisions of M.P.

2.1.2 CONSERVATION RESEARCH DIVISION

Mandate

1. Identification of biodiversity rich forest areas in the state and assessment of present biodiversity status in them.
2. Identification of locally rare, endangered and threatened species in wild and development of their *in-situ* and *ex-situ* conservation techniques.
3. Assessment of the biodiversity conservation status in the existing MPCAs/PPAs and suggesting need-based management of intervention for improvement.
4. Identification of suitable forest areas for the establishment of new MPCDAs and recording/documentation of base line data on biodiversity in them.
5. Assessment of the functioning of Biodiversity Management Committees (BMCs) and suggesting measures for improvement.
6. Assessment of the status of Access Benefit Sharing (ABS) and suggesting measures for improvement.
7. Assessment of region-specific potential of NTFP production in forests.
8. To investigate into the infestation of various insect pests in forest nurseries, plantations and forest areas; and suggest suitable preventive/control measures, preferably cultural and/or biological control measures.
9. To study the extent and frequency of occurrence of various diseases in forest nurseries, plantations and forest areas; identification of causative organisms and suggesting suitable prophylactic and control measures, preferably cultural and/or biological control measures.

Completed Projects : Two

1. Extension of developed nursery techniques of some NTFPs and medicinal plants species through Research and extension center of M.P. APCCF (R&E and Lok Vaniki), Bhopal.
Funding Agency : APCCF (Research Extension and Lok Vaniki), M.P. Bhopal.
2. Biodiversity Assessment of Encroachment removed area of Madan Mahal Hills of Jabalpur and its surrounding forest area ecological restoration through plantation and conservation of cleaned area.
Funding Agency : Smart City, Nagar Nigam, Jabalpur.

Newly Initiated Projects: Two

1. Development of quality planting material of medicinal plants. RCFC-CR.
Funding Agency: RCFC, Jabalpur
2. Preparation of quality planting material of RET and other important species.
Funding Agency: SFRI, Jabalpur

Regular Activities : Two

1. Maintenance and development of Medicinal and aromatic plants gene bank.
Funding agency : SFRI, Jabalpur
2. Maintenance of Forest Herbarium, SFRI Jabalpur
Funding agency : SFRI, Jabalpur

Project Summary:-

Completed Project

1. **Title of the Project:- Extension of developed nursery techniques of some NTFPs and medicinal plants species through Research and extension center of M.P.**

Why this Project:-

Nursery techniques of various RET species were already developed by this branch. This developed nursery technique will be helpful to our field staff of Social Forestry for preparation of RET plantlets in their nurseries. As discussed by Addl. PCCF, Research, Extension and Lok Vaniki Bhopal this project was redesign and submitted and sanctioned by the funding agency.

Research Methodology :- Following action were taken to fulfil the objectives of the project.

- a. **Selection of User group:** Training was provided to our field staff of research and extension nurseries. About 100 trainees were targeted to provide training from each Research and Extension circles (trainees were be identified by concerned Research and Extension circles). **(Due to covid numbers of trainees were minimized)**
- b. **Preparation of literature:** A literature of nursery techniques of 17 species was prepared.
- c. **Training schedule:** Trainees were selected as user group in each of Research and Extension circles. One day training was organized in each site for dissemination of the nursery techniques. Each trainee was provided a training kit having Pen, Writing pad and Literature (manual) on nursery techniques.

Objectives of Research:-

1. Providing training to nursery staff of Research and Extension nurseries of Madhya Pradesh regarding nursery techniques of selected species. (One training program in each R&E circle.)
2. Providing post training support to nursery field staff for helping them in plant preparation in their nursery.

Activities Undertaken:-

- Literature preparation and publication.
- Organization of trainings and preparation of final report.

Cost of the project: Rs.14.77 Lakhs

Outcome of the project:-

Technical bulletin on nursery technique printed. Training provided to forest field staff of social forestry. This project outcome helped them in preparation of RET species in nurseries of social forestry and to resolve their problems in RET plants preparation.

2. Title of the Project:- Biodiversity Assessment of Encroachment removed area of Madan Mahal Hills of Jabalpur and it's surrounding forest area for ecological restoration through plantation and conservation of cleaned area.

Why this Project:-

As per the direction of Hon'ble High Court of Jabalpur, Encroachments of Madan Mahal Hills were demolished and area was cleaned. This area is being restored ecologically through raising of plantation. For selection of suitable species for plantation this project was designed. There is a good forest type available nearby the encroachment free area. This forest area was taken for the survey.

Research Methodology :- Following action were taken to fulfil the objectives of the project.

- a. **Survey of forest cover (Floral study):** Forest cover survey was conducted in adjoining forest areas of encroachment areas. Inside the forest areas, 0.5 km to 1 km away from the boundary of encroachment area quadrates were laid.

Following types of quadrates were laid:

- 1: 0.1ha quadrates to assess the composition of trees.
- 2: 10 X10m to assess the composition of shrubs, established regeneration.
- 3: 1 X1m to assess the composition of herbs, unestablished regeneration and grasses.

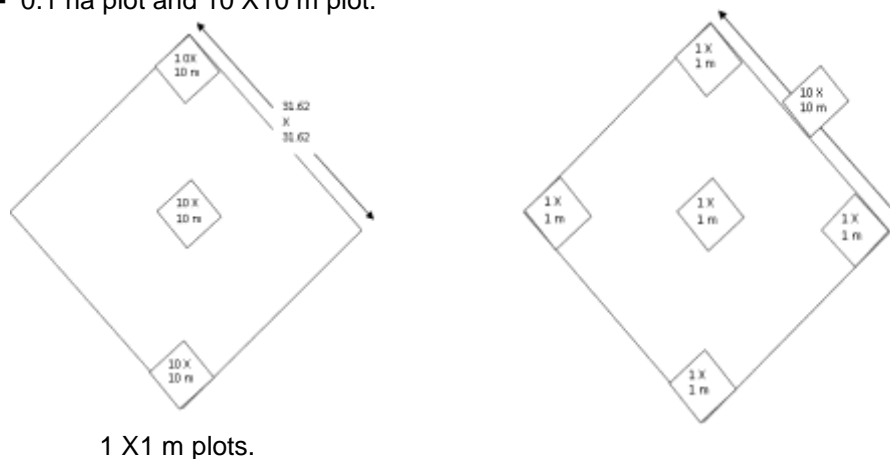
Size	0.1 ha	10X10m	1X1m
Total plots laid	101	303	1515

Besides these, other species which were not covered in the quadrate study were also observed and added in the list.

Vegetation composition evaluated by analyzing frequency, density, abundance and IVI (Important Value Index).

- b. **Survey of faunal diversity (Faunal study):** During the vegetation survey checklist of birds, butterfly etc. was also prepared by ocular observations.

Study Design:- 0.1 ha plot and 10 X10 m plot.



Objectives of Research:-

1. To assess the floral composition of the forest area of Madan Mahal Hills.
2. To assess the established plant varieties available in the encroached areas and develop appropriate techniques for their conservation.
3. To suggest the appropriate plantation technique to funding agency for plantation in encroachment cleaned area.

Activities Undertaken:-

- Field surveys for Sample and data collection for herbarium, collection of photographic evidence. Data analyzed for biodiversity assessment. Report prepared and submitted.

Cost of the project: Rs.13.00 Lakhs and GST

Outcome of the project:-

Technical bulletin on nursery technique printed. Training provided to forest field staff of social forestry.

- Total 57 tree species, 50 shrub and climber and 121 herbaceous species were recorded.
- Medicinal plant species –130
- Insectivores plants – 04
- Birds – 157 species
- Lepidoptera – 57
- Odonate – 28
- Spiders – 24
- Amphibians and reptiles – 18 species were observed in the study area.

This work will assist in biodiversity conservation of the hills of Madan Mahal. Selection of local plant species will help in the development of the area according to the surrounding ecosystem. Field guide will help the students, nature enthusiasts to study the diversity of the area.

Newly Initiated Projects

1. Title of the Project:- Development of quality planting material of medicinal plants.

Why this Project:-

This institute is engaged in medicinal plant conservation since last few decades. Preparation of quality planting material of medicinal plants is one of the mandates of RCFC project. This year under this mandate 50, 000 plants will be prepared in SFRI nursery.

Plantation Methodology:-

- a. **Preparation of QPM of the selected medicinal plant species.** Species were selected as per discussion with Regional Director and Co-ordinator of RCFC-CR. 19 species were

selected for multiplication. QPM for all the mentioned species were selected which will be prepared through seeds, stem cuttings or root cuttings.

- b. Maintenance of the existing earlier indisposed stock of medicinal plant species.** Planting materials which were not disposed during last season will also be maintained under this project.

Working Schedule:-

The work will be carried out as per the scheduled time table.

Objectives of Research:-

1. Preparation of QPM of the selected medicinal plant species.
2. Maintenance of the existing earlier indisposed stock of medicinal plant species.
3. Selling of plants in nominal rates or free distribution to cultivators and other individual households/ institutions for establishment of home/institutional herbal gardens and extension purpose

Activities Carried out-

- Procurement of material
- Filling of polybags
- Plant preparation through seeds and cuttings

Cost of the Project:- 5.00 Lakhs

Expected Outcome of the Project : -

- This work will help in preparation of 50000 medicinal plants.

2. Title of the Project:- Preparation of quality planting material of RET and other important species.

Why this Project:-

Earlier during 2016-17 one project was sanctioned by the Research, Extension and Lok Vaniki Wing of Forest department for RET plants preparation. During this project period all nursery management works were carried out under this project. This project was stopped by the funding agency. After that due to pandemic and unavailability of budget the nursery was not properly beng maintained.

The balance amounts of Rs. 22.32 lakhs were deposited in revolving fund and during 2018 to 2021 an amount of Rs. 9.2 lakh was received from sale of plants, which was also deposited in the revolving fund.

In the above project it was mentioned that the amount received from the sale of plants will be deposited in the revolving fund. The balance amount of the project and the amount received from the sale of plants will be utilised in preparation of more RET plants in the subsequent years.

Thus this project is designed to prepare more plants of RET and other important species for their restoration. Amount received from sale of plants will be further deposited in revolving fund which will be used in maintenance of nursery and preparation of more plants in future.

Research Methodology:-

Following works will be carried out under the project.

- a. Collection of planting material:** Survey will be made in different forest areas for collection of seeds of RET species. Seeds and planting material will be collected or procured from the known source for mass multiplication.
- b. Preparation of plantlets:** Plants will be prepared by using suitable nursery techniques.

Study Design:-

Based on availability of seeds of RET species survey will be conducted to collect the planting material. Nursery schedule will be followed to prepare quality planting material. Species having commercial importance will be selected for multiplication.

Objectives of Research:-

1. Preparation of planting material of RET and other important species.
2. To enrich the revolving fund for making self sustained nursery.

Activities Carried out-

- Procurement of material
- Filling of polybags
- Plant preparation through seeds and cuttings

Cost of the Project:- 9.04 Lakhs

Expected Outcome of the Project : -

- Preparation of plantlets of RET and other important species.
- This work will be helpful to provide plantlets of RET and other important species to user groups.
- Selling of plantlets will help in generating revenue for revolving fund which will help in running the nursery in future.

Regular Activities :

1. Title of the Project:- Maintenance and development of Medicinal and aromatic plants gene bank.

Why this Project:-

Medicinal plant conservation is one of the mandates of Biodiversity and Medicinal plant branch. This project will help us to enrich the existing medicinal plant gene bank of SFRI, Jabalpur

Research Methodology:-

Following works will be carried out under the project.

- a. Collection of new plants:** Survey will be made in different forest areas, institutions, farmer's field for collection of new species. Beside this seeds will also be procured from different sources to enrich the gene bank.

Maintenance of gene bank of medicinal plant and infrastructure:

- b. Plant utility display:** For each species labels will be prepared depicting information regarding its local name, scientific name, uses etc.
- c. Maintenance of gene bank of medicinal plant and infrastructure:** All infrastructure including live plants will be maintained under the project.

Study Design:-

Based on availability of medicinal plants survey will be conducted to collect the planting material. Plants will also be procured from other institutions to enrich the gene bank.

Objectives of Research:-

1. Collection and conservation of medicinal and aromatic plants in the Gene Bank of SFRI, Jabalpur.
2. Maintenance of gene bank of Medicinal plants.

Activities Carried out-

Procurement of Manpower, poly-pots, potting media, Mother plants, Irrigation and plant nutrients, Survey for collection of medicinal plants and conservation and maintenance of collected plants in the gene-bank

Expected Outcome of the Project : -

- Medicinal plants will be conserved inside the institute's premises. .

2. Title of the Project:- Maintenance of Forest Herbarium, SFRI Jabalpur.

Why this Project:-

Herbarium plays a central role in authentic identification of plant material, biodiversity conservation, habitat identification of rare, endangered, threatened and endemic plants, documentation of traditional knowledge, study of molecular taxonomy, to check bio-piracy of intellectual property, environmental management etc. It is the permanent preservation and management of collections of

plants/plant parts. The development of virtual and searchable herbarium database will provide taxonomic information for authentic identification and important data with regards to different species.

Research Methodology:-

1. Plant/plants parts were collected from the field probably at the time flowering and fruiting.
2. Collected samples were dried in blotting sheets for at least one week.
3. Samples were mounted on white mount board sheets with details like collection number, name of collector, locality, habit, habitat, distribution, flowering, fruiting, local name, scientific name, family, uses.
4. Specimens were disinfected and preserved by using mercuric chloride solution (0.1%) to make specimens unpalatable to insects.
5. Lamination of specimens were also done for disinfection and preservation from pathogens, insects and mites.
6. These specimens were digitized by developing herbsoft for easy identification for various stakeholders.

Study Design:-

1. SFRI-Herbarium is unique in terms of its scientific arrangement of plants/plant parts adopting Bentham and Hooker's classification system.
2. Database of taxonomic information of forestry species was designed to develop virtual and searchable herbarium through herbsoft.

Objectives of Research:-

- Maintenance of old specimens and herbarium software

Activities undertaken:-

- Cleaning and protection of herbarium sheets
- Maintenance of Herbarium software

Cost of the Project:- 0.20 Lakhs

Expected Outcome of the Project : -

- Preparation of plantlets of RET and other important species.
- SFRI has a rich forest herbarium since 1963. Presently all species which are present in herbarium was digitized and can be identified through software (Herbsoft).
- Total specimens – 20364 Total family – 198 Total Genus – 1231 Total Species – 3478

Deliverable technologies developed in each project for stakeholders, forest professionals, field foresters and other beneficiaries.

- Developed Nursery techniques of RET species.
- Identification of suitable species for plantation in Madan Mahal area.

Other significant achievements.

- Organized buyers-sellers meet.
- Participated and lecture given in workshop held at Bhopal of “ Root trainer nursery management”,

2.1.3 FOREST MANAGEMENT RESEARCH DIVISION

Mandate:

1. Contribution to the knowledge of silviculture of forestry species.
2. Development and standardization of nursery and planting techniques of different forestry species.
3. Evaluation of plantations raised by the state forest department and forest development corporation.
4. Evaluation of the quality and impact of various development activities of the state forest department.
5. Determination of sustainable harvesting practices of timber and bamboo species.

6. Provision of soil testing services to the SFD, FDC and other users.
7. Measurements of growth for computing volume and finding the development of crop stands, for different species, in different quality classes and in different climatic zones of the state.
8. Designing of experiment and analysis of data for all branches of the Institute.

Completed Project : Two

1. चलित मृदा परीक्षण प्रयोगशाला के माध्यम से म.प्र. के अनुसंधान एवं विस्तार केन्द्रों में मृदा परीक्षण कर मृदा में उपस्थित पोषक तत्वों की जानकारी प्रदान करना।

Funding Agency : PCCF (Research Extension & Lokvaniki) M.P. Bhopal

2. म.प्र. राज्य वन विकास अभिकरण द्वारा विभिन्न वन विकास अभिकरणों में वित्तीय वर्ष 2015–2016 (द्वितीय मूल्यांकन) एवं 2016–17 (प्रथम मूल्यांकन) के वर्षा ऋतु में हुए वृक्षारोपण कार्यों का अनुश्रवण मूल्यांकन एवं प्रोजेक्ट इम्पेक्ट असिसमेंट (पी.आई.ए.) के संबंध।

Funding Agency : PCCF (JFM/FDA) M.P. Bhopal

Ongoing Project : Two

1. वन विभाग म.प्र. द्वारा विभिन्न योजनाओं के अंतर्गत किये गये वृक्षारोपणों का अनुश्रवण एवं मूल्यांकन

Funding Agency : PCCF (JFM/FDA) M.P. Bhopal

2. Study based on growth of sample plots of Teak, Sal and other species laid out in different forest areas of Madhya Pradesh.

Funding Agency : SFRI, Jabalpur

Regular Activities : Two

1. मृदा नमूनों का परीक्षण।

Funding Agency: SFRI, Jabalpur

2. Periodic measurement of 13 sample plots due for measurement in the year 2021-2022.

Funding Agency : SFRI, Jabalpur

Project Summary:-

Completed Project

1. **Title of the Project:-** चलित मृदा परीक्षण प्रयोगशाला के माध्यम से म.प्र. के अनुसंधान एवं विस्तार केन्द्रों में मृदा परीक्षण कर मृदा में उपस्थित पोषक तत्वों की जानकारी प्रदान करना।

Why this Project:-

सभी जीवों का अस्तित्व किसी न किसी रूप में मृदा से जुड़ा हुआ है। धरती की ऊपरी सतह जिसे मृदा या मिट्टी कहा जाता है, जो इस दृष्टि से सबसे अधिक महत्वपूर्ण है, जहाँ से पौधे आवश्यक पोषक पदार्थों के रूप में पोषक तत्व को ग्रहण करते हैं। वैसे तो नीचे की परतों में चट्टानों तथा खनिज पदार्थों के रूप में पोषक तत्व काफी मात्रा में मौजूद होते हैं, परन्तु इनकी रचना बहुत जटिल होने के कारण पौधे इन्हें सीधे रूप में प्राप्त नहीं कर पाते। इसके विपरीत मृदा में सभी पोषक तत्व सरल रूप में पाए जाते हैं और पौधे इन्हें आवश्यकतानुसार आसानी से ग्रहण कर लेते हैं, चूँकि पौधों की जड़ें इसी भू-भाग में केन्द्रित रहती हैं, इसलिए मृदा का महत्व सभी पेड़ पौधों की वृद्धि एवं विकास के लिए बहुत अधिक बढ़ जाता है।

अतः सफल रोपणी के लिए इनका प्रबंधन अति आवश्यक हो जाता है। सभी प्रकार की मृदायें पौधों को पूर्ण पोषक तत्व देने में असमर्थ होती हैं। अलग-अलग प्रकार की मृदाओं में उपलब्ध पोषक तत्वों का स्तर अलग-अलग होता है, मृदा में प्रयुक्त पोषक तत्वों की जानकारी होना अति आवश्यक है, अतः मृदा में उपस्थित पोषक तत्व की जानकारी प्राप्त करना ही मृदा परीक्षण है।

राज्य वन अनुसंधान संस्थान, जबलपुर में मृदा विज्ञान प्रयोगशाला प्रदेश के द्वारा 11 अनुसंधान एवं विस्तार वृत्तों में एक परियोजना की गयी है, जिसमें चलित मृदा परीक्षण प्रयोगशाला के माध्यम से "मध्यप्रदेश के अनुसंधान एवं विस्तार केन्द्रों में मृदा परीक्षण कर मृदा में उपस्थित पोषक तत्वों की जानकारी प्रदान करना" विषय पर कार्य लिया गया। मृदा का रासायनिक विश्लेषण मृदा में उपलब्ध पौधे

के पोषक तत्वों को निर्धारित करना जैसे कार्बनिक तत्व, नत्रजन, फॉस्फोरस, पोटॉश, कैल्शियम और भौतिक विश्लेषण जैसे पी.एच., घुलनशील लवण (ई.सी.), जल धारण क्षमता इत्यादि का विश्लेषण करता है। वृक्षों को प्रारंभिक पोषक तत्व मिट्टी के माध्यम से प्राप्त होते हैं।

अतः पौधे के सफल उत्पादन एवं राज्य के अनुसंधान एवं विस्तार केन्द्र की रोपणियों में उच्च गुणवत्ता के पौधे तैयार करने के लिये मृदा नमूनों के परीक्षण की आवश्यकता है। इसको देखते हुए इस परियोजना के माध्यम से अनुसंधान एवं विस्तार वृत्त की विभिन्न रोपणियों के मृदा नमूनों का परीक्षण किया गया है।

Research Methodology :-

राज्य वन अनुसंधान संस्थान की चलित मृदा परीक्षण प्रयोगशाला के द्वारा विभिन्न अनुसंधान एवं विस्तार केन्द्रों में दौरा कार्यक्रम के दौरान मृदा परीक्षण किया गया। कार्यालय राज्य वन अनुसंधान संस्थान, जबलपुर से कार्यालय पत्र आदेश जारी किया गया। जिसके परिपालन में समस्त अनुसंधान विस्तार वृत्तों में डाक, ई-मेल एवं दूरभाष के द्वारा सूचना दी गई। चलित मृदा परीक्षण प्रयोगशाला द्वारा मध्य प्रदेश के समस्त 11 अनुसंधान विस्तार वृत्तों में मृदा परीक्षण के लिए प्रस्तावित दिनांक में दौरा किया गया।

तालिका क्रमांक : विभिन्न अनुसंधान विस्तार वृत्तों में प्रवास कार्यक्रम एवं प्राप्त मृदा नमूनें

क्र.	अनुसंधान एवं विस्तार वृत्त	प्रथम दौरा दिनांक	प्राप्त नमूनों की संख्या	द्वितीय दौरा दिनांक	प्राप्त नमूनों की संख्या
1.	जबलपुर	18-19/01/2019	12	11-12/11/2019	12
2.	रीवा	21-22/01/2019	32	14-15/11/2019	42
3.	ग्वालियर	24-25/01/2019	29	17-18/11/2019	16
4.	सागर	27-28/01/2019	35	20-21/11/2019	37
5.	भोपाल	30-31/01/2019	33	23-24/11/2019	30
6.	रतलाम	02-03/02/2019	20	26-27/11/2019	20
7.	झाबुआ	05-06/02/2019	50	29-30/11/2019	33
8.	इंदौर	08-09/02/2019	14	02-03/12/2019	13
9.	खण्डवा	11-12/02/2019	36	05-06/12/2019	43
10.	बैतूल	14-15/02/2019	22	08-09/12/2019	23
11.	सिवनी	17-18/02/2019	49	11-12/12/2019	45

राज्य वन अनुसंधान संस्थान, जबलपुर से चलित मृदा परीक्षण प्रयोगशाला द्वारा मृदा नमूनों के विश्लेषण के लिए 11 अनुसंधान एवं विस्तार वृत्तों में रवाना हुई। दो चरणों में दौरा कार्यक्रम किया गया।

इस तरह सभी अनुसंधान एवं विस्तार वृत्तों से प्राप्त मृदा नमूनों का परीक्षण किया गया। प्राप्त मृदा नमूनों का परीक्षण करने में जिन विधियों का प्रयोग किया गया है। वह निम्नानुसार है :-

1. पी.एच – पी.एच मीटर द्वारा
2. धुलनशील लवण – ई.सी. मीटर द्वारा
3. नाइट्रोजन – जेलडॉल विधि
4. फास्फोरस – स्पेक्ट्रोमीटर
5. पोटेशियम – फ्लेम फोटोमीटर
6. कार्बनिक कार्बन – वाकले एण्ड ब्लैक विधि
7. सूक्ष्म पोषक तत्व – एंटोमिक एब्जोर्षन स्पेक्ट्रोमीटर

Study design: पी.एच , धुलनशील लवण, नाइट्रोजन, फास्फोरस, पोटेशियम, कार्बनिक कार्बन एवं सूक्ष्म पोषक तत्व कापर, आयरन, मैंगनीज, जिंक का परीक्षण।

Objectives of Research:-

- मृदा परीक्षण सुविधाओं को रोपणी तक पहुँचाना एवं रोपणी मृदा में उपलब्ध पोषक तत्वों का परीक्षण करना।

- मृदा एवं केंचुआ खाद में उपस्थित तत्वों के बारे में जानकारी मृदा स्वास्थ्य कार्ड के माध्यम से उपलब्ध कराना।
- रोपणी की मृदा परीक्षण के उपरांत मृदा में उपलब्ध पोषक तत्वों के आधार पर खाद की मात्रा के बारे में सुझाव देना।

Activities Undertaken:-

- पी.एच मीटर, ई.सी. मीटर, ऑटो-जेलडॉल, नाइट्रोजन एनालाइजर, फ्लेम फोटोमीटर, स्पेक्ट्रोमीटर, एटोमिक एब्जोर्बशन स्पेक्ट्रोमीटर (ए.ए.एस), वाकले एण्ड ब्लैक विधि

Outcome of Research: -

रोपणी स्तर पर मृदा परीक्षण के आधार पर मृदा में उपलब्ध आवश्यक पोषक तत्वों की जानकारी दी गई। परीक्षण उपरांत मृदा में उपलब्ध पोषक तत्वों की कमी की पूर्ति हेतु परामर्श अथवा सिफारिश दी गई ताकि रोपणी में उच्च गुणवत्ता के पौधे तैयार किये जा सकें।

अनुसंधान एवं विस्तार वृत्तों के मृदा नमूनों का चलित मृदा परीक्षण प्रयोगशाला के द्वारा परीक्षण

क्र.	अनुसंधान एवं विस्तार वृत्त का नाम	प्रथम दौरा प्राप्त मृदा नमूने	द्वितीय दौरा प्राप्त मृदा नमूने	कुल मृदा नमूने
1	जबलपुर	12	12	24
2	रीवा	32	42	74
3	ग्वालियर	29	16	45
4	सागर	35	37	72
5	भोपाल	33	30	63
6	रतलाम	20	20	40
7	झाबुआ	50	33	83
8	इंदौर	14	13	27
9	खंडवा	36	43	79
10	बैतूल	22	23	45
11	सिवनी	49	45	94
कुल मृदा नमूने				646

उपरोक्त सारणी में दर्शाए गए 11 अनुसंधान विस्तार वृत्तों की विभिन्न रोपणियों से प्राप्त कुल 646 मृदा नमूनों का परीक्षण किया गया जिसके अंतर्गत मृदा में पी.एच, ई.सी., कार्बनिक कार्बन, कार्बनिक तत्व, नाइट्रोजन, फास्फोरस, पोटेशियम एवं सूक्ष्म पोषक तत्व (कॉपर, आयरन, मैंगनीज, एवं जिंक) का परीक्षण कर संबंधित अनुसंधान एवं विस्तार वृत्त में रिपोर्ट दी गई।

विभिन्न अनुसंधान एवं विस्तार वृत्तों की विभिन्न रोपणियों से प्राप्त मृदा नमूनों का परीक्षण तथा उपस्थित आवश्यक पोषक तत्वों की जानकारी संबंधित अनुसंधान एवं विस्तार वृत्तों को प्रदान की गई, पोषक तत्वों की कमी की पूर्ति हेतु सुझाव दिये गये। इन परिणामों के आधार पर भविष्य में पौधे तैयार करने हेतु रोपणियों में सही मात्रा में उर्वरक का प्रयोग तथा उच्च गुणवत्ता की पौध का उत्पादन किया जा सकेगा। उच्च गुणवत्ता के पौधों को जब वन क्षेत्र में रोपण किया जाएगा तो अधिक से अधिक पौधे जीवित रहेंगे एवं वृक्षारोपण सफल होंगे, इस प्रकार अच्छा वन तैयार हो सकेगा।



MSTL at R&E Jabalpur



Soil sample preparation at Rewa R&E



MSTL at Gwalior R&E

2. Title of the Project:- म.प्र. राज्य वन विकास अभिकरण द्वारा विभिन्न वन विकास अभिकरणों में वित्तीय वर्ष 2015–2016 (द्वितीय मूल्यांकन) एवं 2016–17 (प्रथम मूल्यांकन) के वर्षा ऋतु में हुए वृक्षारोपण कार्यों का अनुश्रवण मूल्यांकन एवं प्रोजेक्ट इम्पेक्ट असिसमेंट (पी.आई.ए.) के संबंध।

Why this Project:-

National Afforestation Programme (NAP), a flagship afforestation programme under the aegis of National Afforestation and Eco-development Board (NAEB), Ministry of Environment and Forests, Government of India, is currently under implementation on a massive scale plantation throughout the country by district level forest development agencies (FDAs), an institution carved on the lines of district rural development agency with a view to institutionalizing participatory principles in forest management practices. The programme aims at: regeneration and eco-development of degraded forests; increase in the availability of fuel wood, fodder and grasses; increasing production of NTFPs; and, rehabilitation and reclamation of problem sites like alkaline saline soils, deserts, coastal areas, etc. NAP envisages peoples' participation and generation of employment especially for forest dependent communities. The overall objective of the programme is ecological restoration and environmental conservation through peoples' participation in conformity with the objectives as laid down in the National Forest Policy of 1988. Capacity building and skill development of rural communities engaged in afforestation and forest protection activities are among the key components of the programme.

Different forest divisions were selected to run the scheme for the achievement of the above objectives and to devolve forest protection, management and development functions to decentralized

institutions of Joint Forest Management Committee (JFMC) at the village level, and Forest Development Agency (FDA).

As explained earlier, the object of this National project of India is about collection of information regarding Eco- development, degraded forests and other components as explained earlier, now this programme is taken in hand by Forest Development Authorities of different districts in India. Therefore to evaluate the different works, this project is being taken by State Forest Research Institute, Jabalpur. (M. P.)

Research Methodology:-

The evaluation work was carried out in 36FDAs for the year 2015-16 and 32 FDAs for the year 2016-17. The sites selected for evaluation under various FDAs were visited by various monitoring and evaluation teams from the State Forest Research Institute, Jabalpur during the month of June 2020 to July 2020.

Systematic random sampling method was adopted for monitoring and evaluation by selecting more than 30% of the total area treated under various FDAs in the year 2016-17, whereas in the year 2015-16 the 100% evaluation of all the given sites has been done. Grading of various afforestation activities and quality of works was done on a scale of 1-10. Parameters for the evaluation of plantation on site selected, percentage of survival, health of plantation, maintenance, protection measures including fire, grazing, watch & ward, encroachment, illicit felling, record keeping, verification/supervision, involvement of people , species selection.

The afforestation models included were Aided Natural Regeneration (ANR), Artificial Regeneration (AR), Silviculture Development (SPD), Medicinal plant (MP) and Bamboo Plantations (BP). The major activities included planting, soil moisture conservation works and entry point activities, as per project proposals of respective FDAs.

Study Design:-

To estimate the plantation under the scheme three sample plots were laid out in each plantation site. These three sample plot were ocularly selected in good, moderate and low survival condition of plantation. Inside the sample plot plant survival and growth were enumerated.

Objectives of Research:-

1. Monitoring and Evaluation of FDAs.
2. Project Impact Assessment.

Activities Undertaken:-

1. Preparation of field staff evaluation format of plantation sites.
2. Range level Proforma.
3. Proforma for EPA works.
4. PIA works to be filled by interview of committee members, villagers, field staff & ocular observations.
5. Proforma for "Evaluation format for first concurrent evaluation of forest development agency projects sanctioned under National Afforestation Programme (NAP) scheme" .

Cost of the Project:- Rs. 41.14 Lakhs

Expected Outcome of Research:-

1. Estimation of growth including height of tree species in different forest divisions.
2. Estimation of survival percentage of tree species in different forest divisions.
3. Socio economic information
4. Reports were prepared on the basis of the information received as per format as well as physical & other verification and discussion with staff and people.
5. Project Impact Assessment on Villagers awareness, employment during execution and implementing forestry works, income as wages, effect on agricultural crop production and fodder production, . soil & water conservation, regeneration status, presence of wild animals, water level, Documents verification, plantation journal, name of the nursery from where the seed and plants were received etc. (30 Final reports of the Year 2015-16 and

31 Final reports of the year 2016-17 were prepared and submitted to funding agency APCCF (GIM/ FDA) .

Grading of FDA project on scale of 1 to 10 (Plantation year 2015-16 and 2016-17)

S. No.	FDA 2015-16	Grade	FDA 2016-17	Grade
1	Badwaha	7.2, Very good	Badwani	7.2, Very good
2	Badwani	6.9, Very good	Burhanpur	5.07, Very good
3	Burhanpur	5.2, Very good	Damoh	6.7, Very good
4	Chhatarpur	5.5, Very good	Datiya	6.5, Very good
5	Datiya	6.8, Very good	Dewas	7.8, Very good
6	Dewas	7.3, Very good	East Chhindwara	6.0, Very good
7	East Chhindwara	4.7, Good	Hoshangabad	7.5, Very good
8	East Mandla	5.7, Very good	Khargone	7.6, Very good
9	Hoshangabad	5.8, Very good	Mandsaur	5.6, Very good
10	Indore	6.4, Very good	Narsinghpur	7.4, Very good
11	Jabalpur	6.8, Very good	North Balaghat	7.7, Very good
12	Khandwa	5.5, Very good	North Panna	5.0, Very good
13	Khargone	7.1, Very good	North Sagar	7.1, Very good
14	North Betul	6.2, Very good	North Seoni	6.8, Very good
15	North Sagar	6.9, Very good	North Shahdol	6.9, Very good
16	North Shahdol	7.4, Very good	Rajgarh	5.4, Very good
17	Satna	6.9, Very good	Rewa	7.5, Very good
18	Sehore	5.4, Very good	Satna	7.0, Very good
19	Sendhwa	7.5, Very good	Sheopur	6.8, Very good
20	Sidhi	7.2, Very good	Shivpuri	6.0, Very good
21	Singrauli	6.7, Very good	Singrauli	7.5, Very good
22	South Betul	6.0, Very good	South Betul	6.3, Very good
23	South Chhindwara	6.6, Very good	South Chhindwara	6.6, Very good
24	South Panna	6.2, Very good	South Panna	6.4, Very good
25	South Sagar	6.9, Very good	South Sagar	6.6, Very good
26	Umariya	7.5, Very good	South Seoni	6.9, Very good
27	Vidisha	6.3, Very good	South Shahdol	6.8, Very good
28	West Betul	6.4, Very good	Tikamgarh	4.5, good
29	West Chhindwara	5.7, Very good	Umariya	7.5, Very good
30	West Mandla	6.1, Very good	West Betul	7.7, Very good
31			West Chhindwara	5.6, Very good

6. Estimated plant growth, of the plantations in different divisions and photographs of plantation site also taken with Geo-coordinate to verify it.
7. Estimated survival percentage, in different divisions, and photographs of plantation site also taken with Geo-coordinate to verify it.
8. Socio economic information (microplanning, entry point activities, meeting register, cash book, pass book, audit , people participation, soil water conservation, male female in JFMc, fuel , fodder, grass etc) .
9. Quantitative analysis, Qualitative analysis, Project profile, Physical target, physical achievement, Financial target, financial achievement etc.
10. Project Impact Assessment on Villagers awareness, employment during execution and implementing forestry works, income as wages, effect on agricultural crop production and fodder production, . soil & water conservation, regeneration status, presence of wild

animals, water level, Documents verification, plantation journal, name of the nursery by which the seed and plants received etc.

The ultimate outcome of the monitoring and evaluation is to assess the availability of ground water by soil and water conservation measures, the extent to which the water bodies have got recharged and any qualitative and quantitative increase of fodder production thereby improving the livelihood opportunities of village communities of forest division area. Regeneration and eco-development of degraded forests, increase in the availability of fuel wood and grasses, increasing production of NTFPs. NAP encourages peoples' participation and generation of employment especially for forest dependent communities. Due to this programme the ecological restoration and environmental conservation through peoples' participation has been achieved. Capacity building and skill development also increased in rural areas.



FDA work of Umariya (plantation year 2015-16) ANR model



FDA work of Datiya (2016-17) - ANR model

Ongoing Projects :

1. Title of the Project:- वन विभाग म.प्र. द्वारा विभिन्न योजनाओं के अंतर्गत किये गये वृक्षारोपणों का अनुश्रवण एवं मूल्यांकन।

Why this Project :-

वन विभाग द्वारा प्रत्येक वर्ष विभिन्न योजनाओं के अंतर्गत विभिन्न उद्देश्यों की पूर्ति हेतु वृक्षारोपण किये जाते हैं।

सामान्यतः यह वृक्षारोपण परियोजनायें पांच वर्ष की होती हैं। परियोजना के समाप्त होने के उपरांत वृक्षारोपण कार्य का मूल्यांकन किया जाना अत्यंत आवश्यक है। यह मूल्यांकन वृक्षारोपण परियोजना का एक अत्यंत महत्वपूर्ण घटक है। यह मूल्यांकन भविष्य में की जाने वाली परियोजनाओं के सफल क्रियान्वयन में सहायक सिद्ध होगा।

Research Methodology:-

1. कार्य पूर्व प्रारंभिक कार्यशाला
2. क्षेत्रीय कार्य 3.प्रतिवेदन तैयार करने का कार्य
3. समापन कार्यशाला

Objective of Research:-

1. वृक्षारोपण की सफलता का आंकलन।
2. उन कारकों का विश्लेषण जिनके कारण वृक्षारोपण सफल/असफल हुआ।
3. वृक्षारोपण का सामाजिक-आर्थिक प्रभाव।
4. वृक्षारोपण का प्रभाव।

Activities Undertaken:-

1. क्षेत्र सर्वे
2. द्वितीयक आँकड़ों का एकत्रिकरण
3. प्राथमरी आँकड़ों (जीवित प्रतिशत, वृद्धि, ग्रीडिंग स्टॉक, बेसल एरिया, प्राकृतिक पुनुरुत्पादन, बायोडायवर्सिटी इन्डेक्स, कार्बन स्टॉक, ईको सिस्टम सर्विसेस, वाइल्ड लाइफ प्रजेन्स, कम्युनिटी पार्टिसिपेशन एवं प्रोजेक्ट इम्पेक्ट असिस्मेन्ट) का एकत्रिकरण

Expected Outcome of Research : -

यह मूल्यांकन भविष्य में की जाने वाली परियोजनाओं के सफल क्रियान्वयन में सहायक सिद्ध होगा। मूल्यांकन के परिणामों के आधार पर आगे होने वाले वृक्षारोपणों की रणनीति निर्धारण में सहायक होगा। उस रणनीति के अनुसार ही भविष्य में वृक्षारोपण किये जा सकेंगे।

Regular activity :

1. Title of the Project:- मृदा नमूनों का परीक्षण।

Why this Project :-

मध्यप्रदेश वन विभाग द्वारा प्रतिवर्ष विभिन्न वनमण्डलों में वृक्षारोपण का कार्य किया जाता है। वृक्षारोपण को सफल बनाने के लिये उस क्षेत्र की मृदा में उपस्थित पोषक तत्वों की मात्रा ज्ञात करने हेतु एवं वहां की मृदा लगाई जाने वाली प्रजाती के अनुकूल है अथवा नहीं इस हेतु वहां की मिट्टी का परीक्षण किया जाना आवश्यक है। इस कारण विभिन्न वनमण्डलों से वृक्षारोपण के पूर्व मृदा नमूने परीक्षण हेतु राज्य वन अनुसंधान संस्थान जबलपुर की मृदा परीक्षण प्रयोगशाला में भेजे जाते हैं। इस प्रयोगशाला में प्राप्त मृदा नमूनों का परीक्षण कर मृदा में उपस्थित पोषक तत्वों के बारे में जानकारी दी जाती है एवं पोषक तत्वों की कमी की पूर्ति हेतु सुझाव दी जाती है।

Research Methodology:-

मध्यप्रदेश वन विभाग के विभिन्न वन मण्डलों से प्राप्त मृदा नमूनों को सुखा कर, कूट कर, पीस कर तैयार किया जाता है। इसके पश्चात् मृदा परीक्षण कार्य हेतु मृदा में उपस्थित आवश्यक पोषक तत्वों नाइट्रोजन, फॉस्फोरस, पोटेशियम, पी.एच, ई.सी, कार्बनिक कार्बन, सूक्ष्म पोषक तत्व, (कॉपर, मैग्नीज, जिंक, आयरन) आदि का निम्नानुसार विधि से परीक्षण किया जाता है।

पी.एच.	पी.एच मीटर
ई.सी.	ई.सी. मीटर
कार्बनिक कार्बन	वाकले एण्ड ब्लैक विधि
नाइट्रोजन	ऑटो जेलडॉल नाइट्रोजन एनालाइजर
फॉस्फोरस	स्पेक्ट्रोमीटर
पोटेशियम	फ्लेम फोटोमीटर
सूक्ष्म पोषक तत्व (कॉपर, आयरन, मैग्नीज, एवं जिंक) –	एटोमिक एब्जोर्बशन स्पेक्ट्रोमीटर (ए.ए.एस)

Objective of Research:- मृदा परीक्षण कार्य

Activities Undertaken:-

पी.एच मीटर, ई.सी. मीटर, ऑटो-जेलडॉल, नाइट्रोजन एनालाइजर, फ्लेम फोटोमीटर, स्पेक्ट्रोमीटर, एटोमिक एब्जोर्बशन स्पेक्ट्रोमीटर (ए.ए.एस), वाकले एण्ड ब्लैक विधि

Expected Outcome of Research : - विभिन्न वनमण्डलों द्वारा किये गये वृक्षारोपणों को अधिक से अधिक संख्या में सफल बनाने।

राज्य वन अनुसंधान संस्थान जबलपुर में स्थित मृदा विज्ञान प्रयोगशाला के माध्यम से मध्यप्रदेश के विभिन्न वनमण्डलों से प्राप्त मृदा नमूनों का परीक्षण किया जाता है। मृदा में उपस्थित आवश्यक पोषक तत्वों की जानकारी संबंधित वनमण्डल को प्रदान की जाती है। इन परिणामों के आधार पर खाद की मात्रा की अनुशंसा दी जाती है ताकि जब वृक्षारोपण किया जाए तो उसमें अधिक से अधिक पौधे जीवित हो एवं वृक्षारोपण सफल हो।



Soil Lab

2. Title of the Project:- Study based on growth of sample plots of Teak, Sal and other species laid out in different forest areas of Madhya Pradesh

Why this Project:-

To compile all the crop parameters and volume of the felled trees to create an initial database for forecasting.

Research Methodology:-

- Collection of growth data of sample plots.
- Grouping into different site qualities, forest types and specieswise.
- Estimation of future productivity.
- Final compilation and report preparation.

Study Design:-

- Compilation of all the crop parameters and volume of the felled trees from all sample plot files.

Objectives of Research:-

- To study the yield for different site qualities, forest types and specieswise.
- To create an initial database for forecasting, reference.

Activities Undertaken:-

- Appointment of one project staff and procurement of stationary.

Expected Output of Research:-

- Compilation of all the crop parameters and volume of the felled trees to create an initial database for forecasting.

Cost of the project : Rs. 2.60 Lakhs

Expected Outcomes of Research:-

- To compile all the crop parameters and volume of the felled trees to create an initial database for forecasting.



Sample plot cleaning and numbering on trees in SP13 South Seoni Division

Other significant achievements:

1. New project submitted on :
 - 1 Training on soil moisture conservation and its importance in forestry.
 - 2 सूक्ष्म प्रबंध योजना निर्माण हेतु प्रशिक्षण कार्यक्रम।
 - 3 मध्यप्रदेश के विभिन्न वनमण्डलों में चलित मृदा परीक्षण प्रयोगशाला के द्वारा मृदा परीक्षण करना।
2. Provided necessary information regarding Soil lab and Mobile Soil Testing Van to Trainee Range forest officers from Utrakhand Forest Academy Haldwani Panna tiger reserve Balaghat south panna Betul circle, etc.
3. Compilation of Forest Statistics data for Seed Production Areas (SPA) and Seed Orchards (SO) in Madhya Pradesh for forest department.

1.4.1 FOREST UTILIZATION RESEARCH DIVISIION**Mandate**

1. Timber and Fuel-wood utilization
2. Medicinal and Aromatic plants
3. Market Information System
4. Bamboos
5. Gums, resins & other NWFP's
6. Forest-based Livelihoods

Completed Projects : Three

1. Survey, Population Density and Quantitative Assessment of Medicinal Plants for the Sustainable Development of Livelihood Generation in Jabalpur Forest Circle (M.P.)
Funding Agency: NMPB, New Delhi
2. Phenological studies and determination of sustainable harvesting limits of some important wild Medicinal Plants and other NTFPs with active participation of users forest dependent communities in Satna Forest Division of Madhya Pradesh.
Funding Agency: PCCF (Research Extension and Lok Vaniki), M.P.Bhopal.
3. Phytosociological Study of River Bank Flora From Amarkantak to Mandla with Special Reference to Impact on Water Quality in River Narmada

Funding Agency: PCCF (Research Extension and Lok Vaniki), M.P.Bhopal.

Ongoing Projects : Two

1. Regional-cum-Facilitation Centre, Central Region, Jabalpur
Funding Agency: NMPB, New Delhi
2. Strengthening of Market Analysis centre for technical support in Marketing of Minor Forest Produce in Madhya Pradesh.
Funding Agency: MP State Minor Forest Produce (Trade & Dev.) Federation, M.P., Bhopal

Project Summary:-

Completed Project

1. **Title of the Project:- Survey, Population Density and Quantitative Assessment of Medicinal Plants for the Sustainable Development of Livelihood Generation in Jabalpur Forest Circle (M.P.)**

Why this Project:-

This Project was funded by NMPB, New Delhi to estimate to population density, production potential and capable MAPs for livelihood generation in 5 Forest divisions namely Jabalpur, Katni, West Mandla, East Mandla and Dindori forest division of Jabalpur Forest Circle.

Research Methodology :-

The research methodology for this project has been followed as prescribed in training manual prepared and published during the training program by Verma, Dharmendra & S.K. Masih, 2017; Rai, C.P., R.K. Pandey & S.K. Masih, 2011.

Study Design : To complete the objective of the project following design has been adopted:-

- Preparation and publication of survey manual to disseminate survey methodology for front line forest field staff (Beat Guard)
- Training for front line forest field staff (Beat Guard)
- Resource Survey in identified potential area/ medicinal plant rich area.
- Focused group discussion program (FGDPs) in identified JFMCs
- Data collection, computation
- Drafting of project report and submission

Objective of Research:-

- Estimation of population density, production potential and livelihood generation capabilities of medicinal plants.

Activities Undertaken:-

- Data Computation, Data Analysis, Drafting of project report, finalization of project report, submission of project report

Cost of the project: Rs.51.58 Lakhs

Outcome of the project:-

- Training programs were organized in all 37 ranges of respective forest divisions of JFC. During 22 training programs, 1615 beneficiaries were trained. Out of which Jabalpur, Katni, West Mandla, East Mandla and Dindori forest divisions represented 316, 360, 283, 376 and 280 beneficiaries respectively.
- The analysis of population density has been carried out with reference to local name, botanical name, family name, habit, part used and uses of all the species and recorded.
- A total of 100 plant species of economically and commercially important MAPs and NTFPs having 46 trees, 15 shrubs, 10 climbers and 29 herbs from 7 ranges of Jabalpur forest division were analyzed.
- A total of 93 plant species of economically and commercially important MAPs and NTFPs having 41 trees, 16 shrubs, 11 climbers and 25 herbs from 6 ranges of Katni forest division were analyzed.

- A total of 88 plant species of economically and commercially important MAPs and NTFPs having 34 trees, 16 shrubs, 11 climbers and 27 herbs from 6 ranges of East Mandla forest division were analyzed.
- A total of 135 plant species of economically and commercially important MAPs and NTFPs having 73 trees, 17 shrubs, 12 climbers and 33 herbs from 8 ranges of West Mandla forest division were analyzed.
- A total of 67 plant species of economically and commercially important MAPs and NTFPs having 28 trees, 11 shrubs, 4 climbers and 24 herbs from 10 ranges of Dindori forest division were analyzed.
- A total of 143 plant species of economically and commercially important MAPs and NTFPs were analyzed from Jabalpur Forest Circle. Out of which tree, shrub, climber and herb category represents 81, 17, 12 and 33 species respectively.
- Total 48 (100%) economically and commercially important MAPs and NTFPs species has been recorded from all 5 forest divisions.
- 27 (80%) economically and commercially important MAPs and NTFPs species were distributed in 4 forest divisions.
- 20 (60%) economically and commercially important MAPs and NTFPs species, distributed in 3 forest divisions.
- 27 (40%) economically and commercially important MAPs and NTFPs species were distributed in 2 forest Divisions.
- 21 (20%) economically and commercially important MAPs and NTFPs species were distributed only in 1 forest division.
- The distribution of these species is mostly localized. Due to over exploitation, unsustainable harvesting practices, illicit felling, improper collection practices, etc., the density and quantity of these species is reducing day by day in the forest areas. To enhance the number, density and population of these species, especially an urgent attention is required for the species falling under 20% and 40% distribution class requires management practices such as their in-situ and ex-situ conservation, propagation, cultivation, plantation, etc.
- Estimated Production Potential (EPP) of each division has been analyzed and determined. The sum of EPP value of each plant species found in all the 05 forest divisions is projected as EPP of Jabalpur forest circle.
- Total 17 plant species of Tree category were found well distributed in all the 05 forest divisions of Jabalpur forest circle. These species are Achar (3228842.04 q), Amaltash (673202.23 q), Aonla (5092720.16 q), Bael (6754123.85 q), Baheda (1032703.96 q), Bhilwa (760173.37 q), Bija (775904.56 q), Dhawa (80072.41 q), Gunja (26635.49 q), Haldu (17244.98 q), Harra (2203058.14 q), Jamun (592023.92 q), Kumbhi (13725.16 q), Kusum (841773.47 q), Mahua (20242941.64 q), Palash (168557.34 q) and Tendu (1554124.77 q). The Estimated Production Potential (EPP) of above mentioned plant species of MAPs and NTFPs and their estimated production in 9720 ha. area of Jabalpur Forest Circle.
- Total 08 plant species of Shrub and Climber category were found well distributed in all the 05 forest divisions of Jabalpur forest circle. These species are Aak/Akua (20251231.2q), Arandi (273520.8q), Bela dudhi (1856.52q), Dhawai/Dhawda/Dhawal (2392675.2 q), Karonda (141800900.4 q), Mainhar/ Manhar (604778.4 q), Marorphali (35001817.2 q) and Nurgundi/Nagar (38912270.4 q). The Estimated Production Potential (EPP) of above mentioned plant species of MAPs and NTFPs and their estimated production in 9720 ha. area of Jabalpur Forest Circle.
- Total 14 plant species of Herb category were found well distributed in all the 05 forest divisions of Jabalpur forest circle. These species are Babchi (431891.97 q), Baramasi 2635869.6 q), Bhrangraj (688543.22 q), Bhui aonla (21953578.1 q), Chakoda (204150702.4 q), Gokharu (11695287.61 q), Jungli Pyaz (27767739.57q), Kalmegh (3639945.6 q), Nagarmotha (56951208.02 q), Naibuti (10729778.43 q), Punrnawa (10913597.53 q), Safed Musli (329468251.5 q), Tinpatiya (897058.8 q) and Van tulsi (53561074.2 q). The Estimated

Production Potential (EPP) of above mentioned plant species of MAPs and NTFPs and their estimated production in 9720 ha. area of Jabalpur Forest Circle.

- On the basis of analysis of FGDPs, total 58 commercially and economically important MAPs and NTFPs collected with their parts and products.
- During the analysis, a total of 192 plant species of economically and commercially important MAPs and NTFPs were scrutinized, out of which Jabalpur, Katni, West Mandla, East Mandla and Dindori Forest Divisions representing 40,34,39,39 and 40 plant species respectively.

Deliverable technologies developed in each project for stakeholders, forest professionals, field foresters and other beneficiaries.

- Survey and Assessment Manual

Trainings to frontline forest staff

S. No.	Program	Organized by	Venue	Date	Target Group	No. of Participants
1	Training	Project Team	Shahpura, Panagar, Jabalpur, Kundam, Bargi, Dheemarkheda, Barhi, Katni, Bahoriband, Niwas, Kalpi, Tatari, Mandla, Anjaniya, Bichhiya, Mohgaon, Mehandwani, Shapur, Shahpur, Dindori, East Karanjiya, Chanda	18.12.2017 to 28.04.2018	frontline forest staff, beat guards, rangers, SDOs, local traders and JFMC members	1615

Trainings to JFMC members

S. No.	Program	Organized by	Venue	Target Group	Number of Participants
1	FGDP	Project Team	Shahpura, Patan, Panagar, Sihora, Bargi, Kundam, Jabalpur, Deemarkheda, Badwara, Katni, Rithi, Vijayraghvarh, Bahoriband, Niwas, Kalpi, Barela, Bijadandi, Tikariya, Mandla, Maharajpur, Bamhni, Jagmandal, Bichhiya, Mawai, Mohgaon, Motinala, Ghughri, Shahpura, Mehndani, Shahpur, Dindori, Amarpur, North Samnapur, West Karanjiya, East Karanjiya, South Samnapur, Bajag	local traders and JFMC members	1020



Training Program - Katni Forest Division



Training Program – Shahpura Range, Jabalpur Forest Division



Field Demonstration of sample plot in West Mandla Forest Division



Field Demonstration of sample plot in Katni Forest Division



Training Program – North Samanapur Range, Dindori Forest Division



FGD at Gadghorakhpur Beat, Bargi Range, Jabalpur Forest Division



FGD at Aeri Beat, Ghughari Range, East Mandla Forest Division



FGD at Devgaon Beat, Mohgaon Range, East Mandla Forest Division

2. 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 Bacillariophyceae 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

3. 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 belliricain* Chitrakoot range

Ongoing Projects

1. Title of the Project:- Regional-cum-Facilitation Centre, Central Region, Jabalpur.

Why this Project:-

Establishment of Regional Cum Facilitation Centre - Central Region - under the Central Sector Scheme of NMPB.

To promote conservation, development and sustainable management of medicinal plants.

Objectives of Research:-

- Disseminate the programmes and policies of NMPB
- Establishment of linkages between different stakeholders

Activities Carried out-

- Collection of data
- Market rate collection
- Training, stakeholder meet, seminar, workshop, webinars
- Publications
- Subject matter expert
- QPM Distribution

Cost of the Project:- 119.59 Lakhs

Expected Outcome of the Project : -

- 275 beneficiaries were trained - 04 training programs
- 300 participants attended 06 webinar
- 178192 Planting material raised for distribution
- 114000 plants were distributed under Ayush Aapke Dwar and to farmers for cultivation
- 517 data regarding different stakeholders were collected
- 75 no. of fortnightly market rates were collected and reported

- 04 new brochures were published, 11 brochures reprinted
- M&E of 01 project- completed
- Participated in 02 fairs
- Participated in Global Ayush Investment and Innovation Summit – 2022, Gujarat



Participation in Fairs/ Melas

आजादी के अमृत महोत्सव उपलक्ष्य पर एनजीओ ने बांटे निःशुल्क औषधीय पौधे-

भारतीय सहारा।
सौधी। गत दिनों प्रगति संस्था और आरसोएफसी के संजंय से आजादी के अमृत महोत्सव उपलक्ष्य पर जिले के कई ग्राम पंचायतों में किसानों को निःशुल्क औषधीय पौधे वितरित किये गए। ग्राम पंचायत म्कोठी के चंडोहीदोह व सौधी जनपद में नेबुहा ग्राम पंचायत में सत्तार व अश्वगंधा के किसानों 5000 पौधे बांटे गए। कलक कार्यक्रम में प्रगति संस्था के निदेशक प्रमोद सह आरसोएफसी संस्था के सहायक प्रकज सैनी ग्राम पंचायत के सारपंचर सेक्रेटरी व आमजन उपस्थित रहे। वितरण में अश्वगंधा बीज सत्तार मठकविनि- मिश्रण के पौधे किसानों को निःशुल्क बांटे गए, और औषधीय पौधों के गुणों व उनकी महत्ता के साथ साथ बीज से बाजार तक की जानकारी से ग्रामीणों को अवगत कराया गया।

अश्वगंधा की फसल का निरीक्षण करने भरतरी पहुंचे सुविधा केंद्र के अधिकारी

क्षेत्रीय सह सुविधा केंद्र मध्य क्षेत्र के अधिकारियों की उपरिबद्धि में किसानों को बांटे गए औषधीय पौधे। ● **सौजन्य संकेत किसान**

पाटन (मध)। विन्मखंड पाटन के ग्राम भरतरी में एक किसान द्वारा ली ज रकी औषधीय अश्वगंधा की फसल जिले में चर्चा का विषय है। राष्ट्रीय पाष्य बोर्ड के उकीन न्यायत क्षेत्रीय सह सुविधा केंद्र मध्य क्षेत्र के अधिकारियों ने सुधरार को ग्राम भरतरी पहुंचकर किसान सुधीरा पटेल की मेरुत से तैयार की गई अश्वगंधा की फसल का निरीक्षण किया। भारत सरकार की योजना अक्षुपु आपके द्वार के अंतर्गत निरीक्षण अधिकारियों ने अश्वगंधा की फसल को टलकूट क्षेत्रीय फसल मना। क्षेत्रीय सह सुविधा केंद्र मध्य क्षेत्र के सहायक संचालक डा. एस्के उपाध्याय, सलाहकार डा. सवी दुग्गल, प्रोफेक्टर अश्विन्स पंकज सैनी ने किसान सुधीरा पटेल से कहा कि अश्वगंधा फसल के एक बाई एक मीटर का प्लांट बनाकर उसमें पौध संरंज व उनसे उध्पन उपज का विश्वाड बनाकर रखें। राष्ट्रीय औषधि बोर्ड फसल की गुणवत्ता का परीक्षण करेगा। इस क्षेत्र में और अन्य औषधीय फसल की उपज लेने की स्थितियों का अंकलन भी करेगा। इस दौरान भरतरी ग्राम के किसानों को औषधीय पौधों का भी वितरण किया गया। पौध वितरण कार्यक्रम में किसान सुलतम सिंह, वजू पटेल, प्रमेश पटेल, रामकुमार यादव, रवी शंकर पटेल, सुधराज पटेल, प्रदीप पटेल व वीर टाकू आदि उपस्थित रहे।

Media Coverage



Free plant Distribution under Ayush Aapke Dwaar & Ayush Aapka Cultivation



Trainings

2. Title of the Project:- Strengthening of Market Analysis Centre for technical support in Marketing of Minor Forest Produce in Madhya Pradesh.

Why this Project:-

Madhya Pradesh is endowed with wide diversity of MFP. The collection of these MFP is an important source of self sustenance and of income. Earlier due to absence of any systematic marketing network in Central India, trade was unknown in both demand and price structure. There was lack of information on prices of MFP at different market levels. Collection of MFP does not give commensurate returns to tribals many times though several hours are put into collection; the earnings are much below minimum wages. They get low returns and are dependent on trader at the first point of sale. The market channel for MFP is long with a number of intermediaries. There is lack of awareness about the product and its market value. A state level market information project for non wood forest products was undertaken 2001 and a MIS Cell established at SFRI for market data collection, analysis and dissemination. The project has been on-going for past 16 years and useful data has been generated. In 2011, the MIS Cell was strengthened further with establishment of 5 Market Analysis Centres located in different agro climatic zones of the State viz., Chhindwara (Satpuda agro climatic zone), Bhopal (Vindyan Plateau), Katni (Kymore Plateau) Indore (Malwa Plateau) and Shivpuri (Gird Region). In the present proposal it has been proposed to make Van Dhan Vyapar quarterly News letter more informative by increasing and improving its content including information on Vindhyan herbal products.

Survey Methodology:-

Survey of NTFPs traders of 5 Market Analysis Centres located in different agro climatic zones of the State viz., Chhindwara (Satpuda agro climatic zone), Bhopal (Vindyan Plateau), Katni (Kymore Plateau) Indore (Malwa Plateau) and Shivpuri (Gird Region). Collect market price and purchase price data, from district level to National Market, New Delhi for publication of Van Dhan Vyapar News letter and monitoring of MSP.

Study Design:-

- Collect, analyze and report periodic market information for Van Dhan Vyapar.
- Survey in selected village markets in each zone for study of effect of MSP.
- Assist in compilation of information on availability of processed material.
- Survey for collection of selected NTFPs in M.P.

Objectives of Research:-

- To strengthen the current MIS to assist in collection of market information on prices and products in local, regional & national markets.
- To monitor MSP for selected MFPs in the state and suggest improvements to ensure good returns and increase efficiency in marketing.
- To undertake study for collection of selected NTFPs.

Activities Carried out-

- Compilation of market information and publication of Van Dhan Vyapar.
- Compilation of information on location of village markets, market days, MFP traded, etc.
- Electronic linking with M.P. MFP Federation, TRIFED, etc.

- Collection of data with regard to prices- procurement price at first point level in different village markets /Haats.
- Quarterly market survey in all markets for publication of Van Dhan Vyapar News letter.

Cost of the Project:- 10.00 Lakhs

Expected Outcome of the Project : -

- Survey of 75 NTFPs traders in Katni, Panna, Chhindwara, Betul, Gwalior, Shivpuri, Sheopur, Seoni, Mandla, Dindori, Satna, Umaria and Balaghat district of Madhya Pradesh State has been done.
- Survey of 11 NTFPs traders in Raipur, Dhamtari and Jagdalpur of C.G state has been done.
- Publication of Van Dhan Vol. 21 (1) Jan-March 2021 Vol. 21 (1) April-June 2021, Vol. 21 (1) July-Sept 2021 has been done and dispatched to stakeholders and Vol. 21(4) is under publication.
- Survey in 5 different agro climatic zones.
- Quarterly survey NTFPs traders of important NTFPs market of M.P, C.G., M.H and National market New Delhi.
- Publication of Vandhan Vyapar
- Survey will be done in 5 different agro climatic zones of the State 5 districts of Satpuda agro climatic zone (Chhindwara centre), 3 districts of Vindyan Plateau (Bhopal centre), 7 districts of Kymore Plateau (Katni centre), 4 district of Malwa Plateau (Indore centre) and 4 district Gird Region (Shivpuri centres) and 3 districts of Chhattisgarh state, 1 districts of Maharashtra and 1 National Market New Delhi. Quarterly survey NTFPs traders of 11 important NTFPs market of M.P, 3 Important NTFPs markets of C.G. and 1 of M.H and National market New Delhi.
- Compilation of Market prices data.
- Publication of Van Dhan Vyapar in 4 quarters
- Quarterly dispatch of Van Dhan to 455 different agencies, subscribers, Traders, Forest Department, Vandhan Vikash Kendra wildlife institutions, Universities and others

The collected and compiled data of selected NTFPs, Traders, important NTFPs Markets, market prices of MFPs, collection areas, important village markets of NTFPs, market days shall be very much useful for M.F.P. Federation, Bhopal. This information can be used by all MFP Cooperative Societies, Samities, progressive farmers, Vaidyas, all CCFs, DFOs for their use.



Collection of MFPs information from Prabandhak of Chareeon samiti district Balaghat



Collection of MFPs information from the trader of village Chicholi, district Betul



Collection of MFPS information from the trader of Pohri district, Shivpuri



Group discussion with traders of Karahal, district Sheopur



Collection of MFPS information from the trader of village Chiraidongri



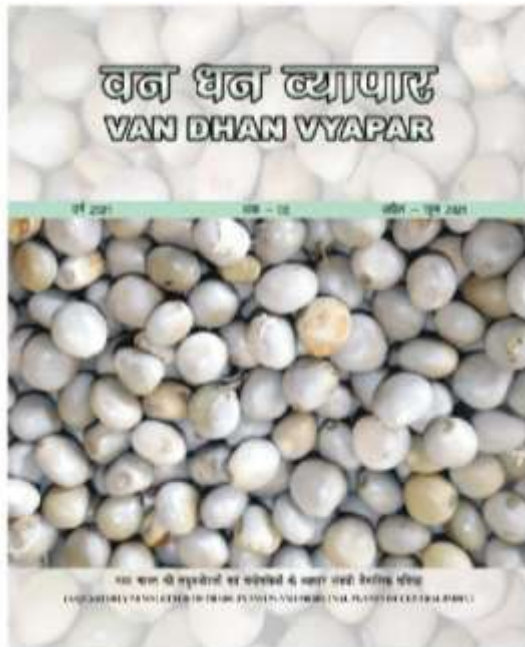
Visit weekly market Damua, district Chindwara



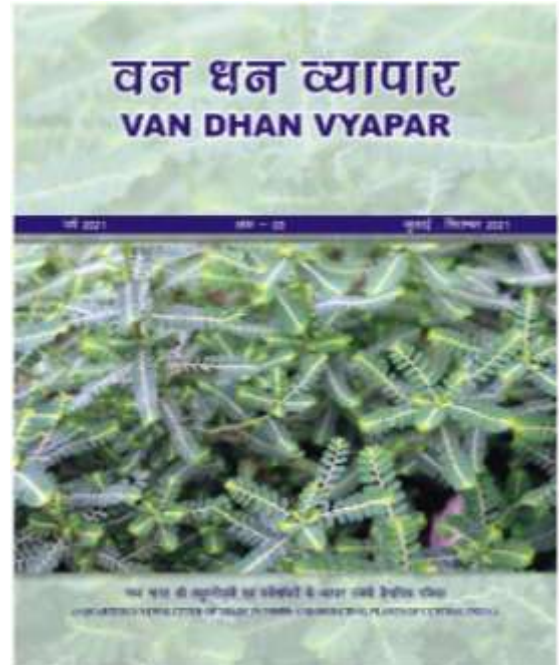
Collection of MFPS information from the trader of Chindwara



Collection of MFPS information from the traders of Chindwara



Van Dhan Vyapar Vol. 21(2)



Van Dhan Vyapar Vol. 21(3)

1.4.2 FOREST PRODUCTIVITY RESEARCH DIVISION

Mandate

1. Seed collection, testing and certification.
2. Seed storage and treatment.
3. Research on seed biology, seed biochemistry, seed physiology and seed technology with regards to seed pre treatments and storage of seeds to enhance germination and longevity of seeds.
4. Plant propagation and nursery management.

Completed Project : 01

1. रोपणी में रूट ट्रेनर में पौध तैयारी, पौधों में होने वाली बीमारियों का निदान एवं रोपणी प्रबंधन पर प्रशिक्षण एवं प्रदर्शन।

Funding Agency: PCCF (Research Extension & Lok Vaniki), M.P. Bhopal

Ongoing projects:- 05

1. Dissemination of knowledge through training programme for sustainable management and quality fruit collection of chironji to stakeholders.

Funding Agency: PCCF (Research Extension & Lok Vaniki), M.P. Bhopal

2. Germplasm evaluation and standardization of propagation technology for production of quality planting stock of medicinally important species viz. *Anogeissus latifolia* & *Commiphora wightii*

Funding Agency: PCCF (Research Extension & Lok Vaniki), M.P. Bhopal

3. Training and Demonstration Programme on Establishment and Best management of Seed Production Areas, Seed Technology and Nursery Management for Field Foresters

Funding Agency: PCCF (Research Extension & Lok Vaniki), M.P. Bhopal

4. अनुसंधान एवं विस्तार रोपणियों का श्रेणीकरण, मान्यता एवं लघु शोध कार्यों की अद्यतन स्थिति का आंकलन।

Funding Agency: PCCF (Research Extension & Lok Vaniki), M.P. Bhopal

5. Selection of species specific root trainer sizes and potting mixes to be adopted by the Forest Department nurseries of Madhya Pradesh for Ten selected tree species.

Funding Agency: PCCF (Research Extension & Lok Vaniki), M.P. Bhopal

Regular Activities:- One

1. **Seed, collection, testing & certification**

Funding Agency -SFRI, Jabalpur

Project Summary :-

Completed project

1. **Title of the Project:-** रोपणी में रूट ट्रेनर में पौध तैयारी, पौधों में होने वाली बीमारियों का निदान एवं रोपणी प्रबंधन पर प्रशिक्षण एवं प्रदर्शन।

Why this Project:- विभिन्न प्रजातियों के उच्च गुणवत्ता के पौधों को तैयार कर वन क्षेत्रों की उत्पादकता बढ़ाना।

Training Methodology:- प्रशिक्षण के माध्यम से क्षेत्रीय अमले को विभिन्न बिन्दुओं जैसे: रूट ट्रेनर में उच्च गुणवत्ता की पौध तैयारी करना, रोपणी में तैयार पौधों में कीट एवं फफूँद के प्रकोप की जानकारी एवं उससे बचाव के साथ-साथ नर्सरी प्रबंधन की जानकारी उपलब्ध कराकर वन क्षेत्रों की उत्पादकता बढ़ाना।

Study Design:- प्रशिक्षण

Objectives of Research:-

- रूट ट्रेनर में उच्च गुणवत्ता के पौध तैयारी करना।
- रोपणी में तैयार पौधों में होने वाली बीमारियों का निदान।
- नर्सरी प्रबंधन।

Activities Undertaken:-

- प्रशिक्षण हेतु साहित्य संग्रहण कर विवरणिका तैयार करना ।
- विभिन्न अनुसंधान विस्तार एवं लोकवानिकी वृत्त के क्षेत्रीय अमले से संपर्क कर प्रशिक्षण की रूपरेखा की जानकारी दी ।
- विभिन्न समय में अलग अलग दल बनाकर क्षेत्रीय अमले को प्रशिक्षण दिया, जिनमें विभिन्न बिन्दु जैसे: रूट ट्रेनर में उच्च गुणवत्ता की पौध तैयारी करना, रोपणी में तैयार पौधों में कीट एवं फफूँद के प्रकोप की जानकारी एवं उससे बचाव के साथ-साथ नर्सरी प्रबंधन आदि सम्मिलित थे ।

Cost of the Project:- 02.00 लाख

Expected Outcome of Research:-

11 अनुसंधान विस्तार एवं लोकवानिकी वृत्त के क्षेत्रीय अमले को विभिन्न बिन्दुओं जैसे: रूट ट्रेनर में उच्च गुणवत्ता की पौध तैयारी करना, रोपणी में तैयार पौधों में कीट एवं फफूँद के प्रकोप की जानकारी एवं उससे बचाव के साथ-साथ नर्सरी प्रबंधन पर प्रशिक्षण कार्यक्रम 05 चरणों में संपन्न किये गये, जिसमें जबलपुर अनुसंधान एवं विस्तार वृत्त में जबलपुर एवं रीवा अनुसंधान विस्तार वृत्त के क्षेत्रीय अमले को शामिल किया गया । इसी तरह इंदौर अनुसंधान विस्तार वृत्त में झाबुआ एवं रतलाम के अनुसंधान विस्तार वृत्त के क्षेत्रीय अमले को बुलाकर प्रशिक्षण दिया गया । भोपाल अनुसंधान विस्तार वृत्त में खण्डवा के क्षेत्रीय अमले को बुलाकर एक साथ प्रशिक्षण दिया गया । सागर अनुसंधान विस्तार वृत्त में ग्वालियर अनुसंधान विस्तार वृत्त के क्षेत्रीय अमले को बुलाकर प्रशिक्षण दिया गया । 11 अनुसंधान विस्तार एवं लोकवानिकी वृत्त के कुल 281 क्षेत्रीय अमले को उपरोक्त बिन्दुओं पर प्रशिक्षण दिया गया । प्रशिक्षण में प्रशिक्षणार्थियों से दिये जाने वाले प्रशिक्षण की उपयोगिता एवं क्षेत्र में उसके क्रियान्वयन पर अभिमत प्राप्त किया गया । प्रशिक्षणार्थियों द्वारा उक्त प्रशिक्षण को काफी उपयोगी एवं सार्थक बताया गया ।



अनुसंधान विस्तार वृत्तों के क्षेत्रीय अमले को रूट ट्रेनर में रूट तैयारी एवं रोपणी प्रबंधन पर प्रशिक्षण

Ongoing projects

1. Title of the Project:- Dissemination of knowledge through training programme for sustainable management and quality fruit collection of Chironji to stakeholders.

Why this Project:-

Unscientific harvesting practices, immature fruit/seed collection and overexploitation are commonly practiced by stakeholders and fruit collectors. Natural regeneration and distribution of this species in natural forest is also decreasing in past few years.

Training Methodology:-

- Literature will be reviewed to prepare brochures which include important information i.e, sustainable harvesting, collection procedure, primary processing storage and management of seeds after storage etc.
- Trainings will be scheduled after discussing with forest officials.
- Training will be conducted to provide important information to stakeholders and forest staff for sustainable management and quality fruit collection of Chironji.

Objective of Research:-

- To disseminate the knowledge of package of practices comprising of scientific harvesting of fruits of Chironji for quality fruit collection and sustainable management of the species.

Activities Undertaken:-

- Lecture were delivered to stakeholders for scientific harvesting of fruits of Chironji for quality fruit collection and sustainable management of the species
- Fruit collection procedure, method of sustainable harvesting, identification of diseases and their preventive measures were demonstrated through field visit

Cost of the Project:- 14.10 Lakhs

Expected Outcome of Research:-

800 participants (forest dependent communities with subordinate staff of the division) will be trained in 02 divisions viz. Chhindwara and Panna Forest Division for quality fruit / seed collection of chironji through proper scientific manner.

Achievement

- Training module and course material has been prepared.
- 20 trainings and demonstration programme were completed in East, West & South Chhindwara and North & South Panna Forest Division.
- About 40 to 50 seed collectors of various JFMC's were trained in each training, to promote quality fruit collection and sustainable harvesting and management of the species.
- 1013 no. of participants were trained against targeted 800 in East, West and South Chhindwara & North and South Panna Division.
- Project Report will be submitted in June 2022.



Training

2. Title of the Project:- Germplasm evaluation and standardization of propagation technology for production of quality planting stock of medicinally important tree species viz. *Anogeissus latifolia* & *Commiphora wightii*.

Why this Project:-

Natural regeneration and distribution of these species in natural forest is decreased in past few years, due to overexploitation and poor seed germination. Representation of these species in forest area are lacking so quality seed collection and nursery technique should be standardized for increasing their density in forest.

Research Methodology:-

1. Seeds of targeted species will be collected from different seed zones of Madhya Pradesh
2. Physiological and Morphological parameters will be tested to identified best germplasm
3. Purity, Moisture, viability, germination of seeds will be tested

4. Experiments on pre seed treatment, storage condition and cuttings will be laid.
5. Data collection, analysis and report writing will be done.

Study Design:- Randomize Block Design RBD

Objectives of Research:-

1. To identify the potential pockets of *Commiphora wightii* and *Anogeisus latifolia* in Madhya Pradesh and to evaluate germplasm with reference to morphological and physiological attributes. The second objective of the project is to develop seed and nursery techniques of targeted species.

Activities Undertaken:-

- Seeds of *Anogeisus latifolia* were collected from 07 seed zones with 21 sites.
- Analysis of seeds with various parameters were done of 03 seeds zones collected from previous year.
- Experiments were done on pre seed treatment, storage condition.
- Various potting mixture were applied on seedlings of 03 seed zones for production of quality seedlings.

Cost of the Project:- 34.02 lakhs

Expected Outcome of Research:-

- Identified potential pockets for collection of superior germplasm.
- Best germplasm evaluated on the basis of morphological and physiological attributes analysis.
- Standardized Seed techniques for enhancement of seed longevity and germination potential of targeted species.
- Standardized Nursery techniques for raising quality planting stock of selected species.
- Making available technical brochures based on the outcome of research to make it available for practical application in the field by the foresters of the forest department and by the general public.

Achievement:-

- Seeds of *Anogeisus latifolia* have been collected from 10 seed zone for evaluation of germplasm.
- Out of 10 seed zone the germplasm evaluation work were completed of 3 zones on morphological and physiological parameters.
- Seeds and Vegetative part of guggule has been procured from Morena District.
- Under physiological parameters various pre-treatments were applied for enhancing the germination of seeds.
- In *Commiphora wightii* the best treatment was found to be seed soaking with 0.5% KNO₃ for 10 minutes.
- In vegetative propagation the best treatment was found in 7mm dia of vegetative cutting with 500 ppm GA₃ for overnight soaking.
- The highest 66% rooting response was found with above treatment.
- Best collection period were find out in the 1st week of February month with respect to higher germination potential.
- 54% germination was recorded in the seeds collected in the month of February against 26% in the seeds collected in the month of November.
- Seeds were stored in various storage conditions to enhance the longevity of seeds.
- Seed longevity was recorded only for 07 days.
- In *Anogeissus latifolia*, preliminary observations of three seed zone, the highest germination 7% was found with seed soaking in 48 hrs. cold water followed by 5% with 200 ppm GA₃ against 1% in control.



Seed Germination and potting mixture standardization experiment of *A. latifolia*

3. Title of the Project:- Training and demonstration programme on establishment and best management of seed production areas, seed technology and nursery management for field foresters.

Why this Project:-

Lack of basic knowledge on the seed technology and management aspects of nursery of different tree species in the comprehensive manner of the field foresters and other user groups. Hence, an earnest efforts will be made to provide all scientific information with respect to best management of seed production areas, collection of quality seeds, maturity indices, seed collection and handling, sampling, method of processing, storage, pre-treatment, seed testing, viability, longevity, seed grading, seed dormancy, insect and pest problem before and after collection of seeds and basics of nursery management for production of quality planting material. In order to raise superior plantations, superior planting stock, the training programme is essential for field foresters.

Training Methodology :-

- 04 training programmes will be organized in one year. Each training programme will be organized for three days in each quarter at State Forest Research Institute, Jabalpur. In each training 50 field foresters/forest guards/foresters/Dy. Rangers/Samiti members (covering R & E, territorial divisions and adjoining buffer zone) will be selected to undertake the training on various aspects viz; Best management of production areas, selection of seed stand, Establishment of New Seed Production Area (SPA), Seed collection, Knowledge of seed maturity, Seed extraction and cleaning, Insect and disease problem, Seed storage, Method of seed lot sampling, Test for moisture, purity, weight, germination and vigor, Rapid seed viability estimate, Seed certification, Pre sowing treatments, Seed dormancy and Basics for nursery.
- Total 200 participants will be trained in a year.
- Approx 300 participants will be trained during the training period. During these trainings desired technology of testing and certification of seeds will be demonstrated. For selection of seed stands and establishment of seed production area, the field visit will be done during the period of training. During the training programme training course material will be provided to each

participant. This training programme will be continued till one and half year. Nomination of field foresters will be done by the concerning Territorial Divisions & R&E Centers.

Objectives of Research:-

- To provide basic knowledge for selection of Seeds stand, establishment and best management of seed production areas and to provide basic knowledge on Seed Technology and Nursery Management.

Activities Undertaken:-

- Bullentins were prepared containing important information i.e, selection of seed stand, establishment of seed production areas, management, seed collection , processing, storage , seed treatments, testing of seeds and management of nurseries.
- 11 Trainings were imparted and 281 field foresters were trained.
- These trainings were conducted at SFRI to provide important information to field foresters for Seed Production Areas, Seed Technology and Nursery Management.

Cost of the project:- 26.75 lakhs

Expected Outcome of Research:-

- The outcome of the training programme will help in the establishment and management of seed production areas for quality fruit/seed collection under tree improvement programme for field foresters.
- Raising of high quality planting material by adopting advanced nursery techniques and management system.

Achievement

- Training module and course material has been prepared and distributed to trainees.
- 11 Training and demonstration programme were organized during the project period.
- 281 field foresters of 52 forest division and 11 R&E circles were trained on selection of Seeds stand, establishment and best management of seed production areas, Seed Technology and Nursery Management.
- Project Report will be submitted June 2022.





Training and Demonstration programme to field foresters of various Forest Division and R&E Centers

4. Title of the Project:- अनुसंधान एवं विस्तार रोपणियों का श्रेणीकरण, मान्यता एवं लघु शोध कार्यो की अद्यतन स्थिति का आंकलन के तहत कार्य।

Why this Project:-

अनुसंधान एवं विस्तार द्वारा विभिन्न वन वृत्तों अंतर्गत स्थित रोपणियों में उच्च गुणवत्ता के पौधे तैयार करने तथा लघु शोध कार्य हेतु रोपणी में विभिन्न संरचनाओं को स्थापित करने बावत् राशि प्रदान की गयी। इन रोपणियों के विविध कार्यो के सतत मूल्यांकन, लघु शोध कार्यो एवं संरचनाओं की स्थिति, उपयोग एवं रोपणियों का श्रेणीकरण हेतु यह प्रस्ताव प्रस्तुत किया गया।

Research Methodology:-

- रोपणियो की अधोसंरचना का मूल्यांकन, श्रेणीकरण एवं मान्यता कार्य।
- अभिलेखों का परीक्षण, कर्मचारियों की कार्य कुशलता एवं पोष तैयारी हेतु स्थल पर प्रशिक्षण कार्य।

Study Design:- रोपणी भ्रमण

Objectives of Research:-

- विभागीय स्तर पर रोपणियों के विविध कार्यो का सतत मूल्यांकन।
- उच्च गुणवत्ता के पौधे तैयारी हेतु रोपणी में स्थित प्रमुख संरचनाओं की स्थिति एवं उपयोग।

Activities Undertaken:-

- लगभग 17 रोपणियों का उद्देश्य प्राप्ति हेतु भ्रमण किया गया।
- रोपणियों में चल रहे शोध कार्य हेतु आवश्यक सुझाव दिये गये।
- संरचना के रखरखाव एवं अधिकतम उपयोग हेतु आवश्यक सुझाव दिये गये।

Cost of the Project:- 04.50 Lakhs

Expected Outcome of Research:-

थर्ड पार्टी मूल्यांकन के आधार पर पाई जाने वाली उत्कृष्ट रोपणियों एवं उनसे प्राप्त होने वाले पौधे एवं आय से रोपणी में स्थित क्षेत्रीय अमले में प्रतिस्पर्धा की भावना जागृत करने से, एक नई ऊर्जा एवं उत्साह प्राप्त

होगी एवं सभी रोपणियाँ उत्कृष्ट स्थान पाने के लिए प्रयासरत रहेंगे जिससे रोपणी में गुणवत्ता वाले मानक पौध तैयारी एवं आधुनिक अधोसंरचना स्थापित होगी।

- अधोसंरचना में सुधार के फलस्वरूप रोपणियों को बहुआयामी स्वरूप देना।
- ईको पर्यटन का विकास करना।
- कर्मचारियों की कार्य कुशलता में दक्षता में वृद्धि।

Achievements:-

- ग्वालियर अनुसंधान विस्तार केन्द्र की तीन रोपणी भूता बैराज एवं गुना के कार्यों का श्रेणीकरण, मान्यता, मूल्यांकन कार्य के साथ-साथ रोपणी के अमले को प्रशिक्षण का कार्य।
- सागर अनुसंधान विस्तार एवं लोकवानिकी केन्द्र की 10 रोपणियों : चकरा, सिरोंजा, बहरोल, अंडेला, गंज, पण्डाझिर, देवरा, कुण्डेशर, पिपरोट, अमरमऊ का सतत् मूल्यांकन, श्रेणीकरण एवं प्रशिक्षण कार्य किया गया।
- बैतूल अनुसंधान विस्तार वृत्त की निमाड़, बोरगांव, नेपानगर की रोपणी सतत् का मूल्यांकन, श्रेणीकरण एवं प्रशिक्षण कार्य किया गया।



अनुसंधान विस्तार की रोपणियों का अवलोकन एवं प्रशिक्षण



अनुसंधान विस्तार वृत्तों की नर्सरियों का अवलोकन

5. Title of the Project:- Selection of species specific root trainer sizes and potting mixes to be adopted by the Forest Department nurseries of Madhya Pradesh for 10 selected tree species."

Why this Project:-

There is a ban on use of polythene bags in forest nurseries, therefore it is necessary to find alternatives of polythene bags. So, in place of polythene bags, root trainer may be an alternative of aforesaid material.

Training Methodology :-

Fresh seeds will be collected from identified superior trees by hand plucking and peak maturity of targeted species. After collection seeds will be dried in open air and will be tested for viability, moisture content and germination percentage for development of packages of nursery techniques in reference to standardization of root trainer cell size with various potting mixture for selected species, work will be done on following lines:

- Collection of seeds.
- Seed testing will be done for viability, moisture and germination percentage.
- Different seed sowing media will be tried for better germination percentage.
- Preparation of various potting mixture.
- Seed sowing in various root trainer cell size with various potting mixture.
- Seed sowing in nursery bed and germination tray.
- Experiment will be laid out in the greenhouse of the institute and Social Forestry Nursery, Jabalpur. Out of 10 targeted species, the work will be done in 05 species of SFRI greenhouse and rest 05 species of Social Forestry Nursery, Jabalpur.
- The experiment will be laid out in Complete Randomized Block Design (CRBD) with various treatments with three replicates in each treatment. 30 plants will be required for each treatment with three replicates in every experiment.
- After experiments produce plant will be provided free of cost to the Social Forestry Nursery / Forest Department.
- The potting mixtures will comprised with various fertilizers and chemicals. Three-month-old seedling will be used for experiments. Different size of root trainer will be used for standardization of root trainer cell size with potting mixture. The plants will be transplanted very carefully without disturbing the root ball and irrigated daily with fresh water. Fumigation with various insecticides and fungicides will also be done as per requirement of the disease in plants. Observation will be recorded on germination potential, seedling growth and survival percentage. Potting mixture will be analyzed for its physico-chemical properties prior applied into root trainer and after the completion of experiment. 05 experiments will be done to achieve the objectives.

Experiment No. 01:- 03 sowing conditions will be tried to study the effect on seed germination behaviour.

Experiment No. 02:- 36 potting mixtures will be used to study the effect on growth and survival of seedlings of targeted species.

Experiment No. 03:- Effect of various cell size of root trainer on seedling growth and survival percentage.

Experiment No. 04:- Thinning of seedlings in root trainer trays at 03 month intervals of every potting mixtures seedlings.

Experiment No. 05:- To standardize spacing of seedlings in root trainers for better growth and survival of plants.

Study Design: RBD

Objectives of Research:-

- To standardize the potting mixture of targeted species for better growth and survival of plants.
- To standardize the root trainer cell size for optimum growth of targeted species.
- To standardize the planting period of seedlings under root trainer cell size for plantation programme.
- To standardize spacing of seedlings in root trainers for better growth and survival of plants.

Activities Undertaken:-

- Project staff recruitment.
- Literature survey.
- Seed collection.
- Seed testing.
- Production of plants.

- Procurement of chemicals and fertilizers.
- Procurement of various sizes of root trainers.
- Seed collection of 10 targeted species for production of plants for experimental work.
- Preparation of potting media.
- Filling of root trainers with different potting mixture.
- Preparation of nursery bed.
- Seed sowing in nursery bed, preservation tray and root trainers. Observation will be recorded on germination potential.
- Testing of potting media before and after experiment.
- Shifting of seedlings from nursery bed to root trainer with various potting mixture.
- Watering and weeding.
- Fumigation with various insecticides and fungicides will also be done as per requirement of the disease in plants.
- Observation will be recorded on growth and survival of plants every two months interval.
- Measurement of seed ling growth.
- Wages (seed collection and experimental work).

Cost of the project:- 17.76 lakhs

Expected Outcome of Research:-

- Evaluation of potting mixture for raising quality seedlings of 10 targeted species.
- Species wise root trainer size with potting mixture will be standardized.
- Standardized seedling size and period with root trainer cell size and potting mixture for plantation activities.
- Growth performance of seedlings in root trainers with reference to with and without spacing (alternate cell and row).
- Effect of thinning on growth of seedlings.
- Production of quality planting stock in root trainer.

Achievement

- Review of literature has been completed.
- Purchasing of root trainer is in process.
- Procurement of chemicals and fertilizers was completed.
- Collection of seeds of 10 targeted species is in under progress.
- After purchasing of root trainer, the various experiments will be done.

Regular activity

1. Title of Project : Seed, collection, testing & certification.

Objectives of Research:

1. Seed Collection, testing and certification.
2. Provide quality seeds for future plantation programme.

Activities Undertaken:

- 08 seed samples of teak seeds were tested and certified.

Deliverable technologies developed in each project for stakeholders, forest professionals, field foresters and other beneficiaries:

- Deliverable technologies of standardization of seed and nursery techniques of *Commiphora wightii* and *Anogessus latifolia* is in under progress.
- On the basis of previous research work, technology disseminated through training and demonstration programme on sustainable harvesting and management practices of chironji.

Other Significant achievement :

- 1013 Chironji fruit collectors were trained for quality fruit collection and sustainable management of chironji.
- 200 field foresters of various forest divisions and R&E circles were trained for collection of quality seeds, Selection of seed stands, establishment and best management of SPA, seed technology and nursery management.
- 03 project proposals were formulated and submitted to Director for further approval.

1.4.3 SOCIO ECONOMIC RESEARCH DIVISION

Mandate

1. SOCIOLOGICAL STUDIES

Research Priorities

- (i) Studies of changes in the pattern of dependence of tribal and other forest dwelling communities on forests.
- (ii) Studies on the role of various tree species in the religio-cultural practices of tribal and other forest dwelling communities.
- (iii) Developing models of adaptation to climate change for villages located in the vicinity of forests in order to make them climate smart village.

2. FOREST ECONOMICS

Research Priorities

- (i) Estimation of the contribution of various goods and services provided by forests in the gross domestic product.
- (ii) Estimation of the quantities of various non-nationalized NTFPs, including medicinal plants, annually collected in the state and their economic valuation.
- (iii) Estimation of demand and supply and study of value supply chains of commercially important medicinal and aromatic plant species.
- (iv) Wood balance studies.
- (v) Assessment of the demand and potential availability of raw material resource for forest based industries.

3. AGROFORESTRY

Research Priorities

- (i) Survey and documentation of currently prevailing social forestry, farm forestry bund planting and agroforestry practices, along with their economics.
- (ii) Estimation of species-wise trees outside forests (ToFs) in the state.
- (iii) Development of suitable agroforestry models for various agroclimatic zones of the state.

4. POLICY RESEARCH

Research Priorities

- (i) Impact assessment of various policies, legislations, rules, regulations, government resolutions, schemes, programmes procedures, etc. related to forestry sector, identification of problems/bottlenecks in their implementation and suggesting amendments/modifications, if required.
- (ii) Exploring possibilities of Forest Certification and facilitating the forest department in obtaining FSC certification.

On-going Projects:- 03

1. "पश्चिमी मध्यप्रदेश के मालवा का पठार कृषि-जलवायु प्रक्षेत्र (क्षेत्रीय वन वृत्त, उज्जैन) के अंतर्गत कृषक समृद्धि योजना द्वारा कृषि वानिकी के तहत निजी भूमि के रोपण एवं वर्तमान कृषि वानिकी मॉडल का अध्ययन"।

Funding Agency: PCCF (Research Extension & Lokvaniki) M.P., Bhopal

2. "मध्यप्रदेश में महुआ फूल एवं अचार गुठली के उत्पादन/संग्रहण मात्रा का ऑकलन"।

Funding Agency: PCCF (Research Extension & Lokvaniki) M.P., Bhopal

3. "देवास जिले में लोकवानिकी प्रबन्ध योजना क्रियान्वयन का अनुश्रवण एवं मूल्यांकन"।

Funding Agency: PCCF (Research Extension & Lokvaniki) M.P., Bhopal

Newly initiated projects : 01

1. "मध्यप्रदेश के विभिन्न कृषि-जलवायु क्षेत्रों में कृषि-वानिकी मॉडल्स की सफलता एवं असफलता के कारणों का विश्लेषण"।

Funding Agency: PCCF (Research Extension & Lokvaniki) M.P., Bhopal

Project Summary:-

On-going Projects

1. Title of the Project:- पश्चिमी मध्यप्रदेश के मालवा का पठार कृषि-जलवायु प्रक्षेत्र (क्षेत्रीय वन वृत्त, उज्जैन) के अंतर्गत कृषक समृद्धि योजना द्वारा कृषि वानिकी के तहत निजी भूमि के रोपण एवं वर्तमान कृषि वानिकी मॉडल का अध्ययन।

Why this Project:-

कृषकों की खेती को लाभप्रद बनाने एवं आय में वृद्धि के उद्देश्य को ध्यान में रखकर कृषक समृद्धि योजना के अंतर्गत कृषि वानिकी के तहत कृषकों की निजी भूमि में शासन स्तर पर पौधा रोपण का जो अभियान प्रारम्भ किया गया था, उसके प्रति कृषकों का क्या रवैया है, क्या कमियां हैं, यह अभियान सफल रहा या असफल इसका कारण, कृषि वानिकी पद्धति अपनाकर खेती करने से कृषकों को होने वाली लाभ एवं हानि आदि तथ्यों को प्रकाश में लाने तथा भविष्य में ऐसी योजना के क्रियान्वयन से पूर्व गुण-दोष पर विचार कर उचित रणनीति तैयार करने हेतु अनुसंधान करने का दायित्व फंडिंग एजेंसी ने सौंपा था।

Research Methodology & Study Design:-

- अध्ययन क्षेत्र का चयन
- योजना में सम्मिलित कृषकों का सविचार दैव निदर्शन (Stratified Random Sample) विधि से चयन।
- सामाजिक-आर्थिक सर्वेक्षण द्वारा अनुसूची में कृषकों से आँकड़ों का संकलन।
- सर्वेक्षण हेतु समान आनुपातिक प्रतिनिधित्व के आधार पर कृषकों का चयन कर साक्षात्कार।
- सामाजिक वानिकी वृत्त द्वारा कृषि वानिकी पद्धति के अंतर्गत कृषकों की निजी भूमि में स्थापित प्रदर्शन प्रक्षेत्रों से प्रदर्शन प्रक्षेत्र का चयन तथा रोपण स्थल के पौधों की वृद्धि संबंधी आँकड़ों का संकलन।
- समूह रोपण एवं खेत के मेड़ों में किए गए रोपण से कृषि उत्पादन पर पड़ने वाले प्रभाव से संबंधित आँकड़ों का संकलन एवं विश्लेषण।
- लागत-लाभ अनुपात (Cost Benefit Ratio) का विश्लेषण।
- चयनित जिलों के ग्रामीणों एवं किसानों से उनके मॉडल, कृषि वानिकी पद्धति के आँकड़ों का संकलन एवं विश्लेषण कर नवीन मॉडल की रूपरेखा प्रस्तुत करना।

Objectives of Research:-

1. कृषक समृद्धि योजना के अंतर्गत कृषि वानिकी के तहत कृषकों की निजी भूमि में कृषि वानिकी के प्रति रुझान, सफलता एवं कृषकों की भावी आय में योगदान का आँकलन।
2. अनुसंधान विस्तार वृत्त द्वारा कृषकों की निजी भूमि में स्थापित प्रदर्शन प्रक्षेत्र का अध्ययन कर प्राप्त परिणामों के आधार पर कृषि वानिकी मॉडल के संबंध में सुझाव प्रस्तुत करना।

Activities Undertaken:-

Cost of the Project:- Rs.16.40 Lakhs

Expected Outcome of Research:-

- कृषक समृद्धि जैसी योजनाओं के माध्यम से वृक्षारोपण के प्रगति की समीक्षा हो सकेगी तथा ऐसी योजनाओं के प्रति कृषकों के रुझान का पता चल सकेगा।

- कृषि-वानिकी के प्रयोग से कृषकों की लाभ-हानि का आँकलन प्राप्त होने से कृषकों को मार्गदर्शन एवं प्रेरणा प्राप्त होगी।
- मालवा का पठार कृषि जलवायु प्रक्षेत्र में सफल पाए गये कृषि वानिकी मॉडल के परिणामों से कृषकों को कृषि वानिकी एवं वृक्षारोपण के प्रति निर्णय लेना सरल होगा।
- परियोजना क्षेत्र में कृषि-वानिकी मॉडल के प्रचार-प्रसार की रणनीति तैयार करने में मदद मिलेगी।



जिला-आगर मालवा: में कृषक समृद्धि योजना के तहत निजी भूमि में रोपित किये गए पौधों का अवलोकन एवं मापन



जिला-आगर, तहसील-बड़ोद, ग्राम-आम्बादेव में कृषक समृद्धि योजना के तहत निजी भूमि में स्थापित प्रदर्शन प्लाट के पौधों का अवलोकन एवं मापन

2. Title of the Project: मध्यप्रदेश में महुआ फूल एवं अचार गुठली के उत्पादन/संग्रहण मात्रा का आँकलन।

Why this Project:-

मध्यप्रदेश महुआ उत्पादन संग्रहण में एक महत्वपूर्ण स्थान रखता है। प्रदेश के गरीब एवं आदिवासी समुदाय के भोजन एवं आजीविका का प्रमुख स्रोत है। महुआ के व्यापार पर कई महत्वपूर्ण व्यापारिक उद्योग धंधे स्थापित हैं, जिनसे सरकार को आय प्राप्त होती है। इसी प्रकार चिरौंजी जो कि अचार के वृक्षों से निकलती है, जिसका देश विदेशों में निर्यात कर बहुमूल्य विदेशी मुद्रा प्राप्त की जाती है। प्रारम्भिक अध्ययन में पाया गया है कि महुआ के वृक्षों का नया रोपण नहीं हो रहा है, पुराने वृक्ष कमजोर होकर नष्ट हो रहे हैं, आदिवासियों की वनों में स्थित वृक्षों पर निर्भरता बढ़ती जा रही है। वनों से महुआ फूल संग्रहण के पूर्व संग्राहकों द्वारा संग्रहण स्थल में आग लगाकर सफाई की जाती है, इससे कई बार जंगल में भयानक आग लग जाती है, जिससे जैव विविधता एवं जंगली पेंड पौधों का नुकसान होता है। संग्राहक अचार गुठली संग्रहण करने के लिए अवसर पाकर अधिक आय की लालसा में वृक्ष

काटकर गुठली का संग्रहण करते हैं, जिससे वृक्ष धीरे-धीरे कम होते जा रहे हैं। वर्तमान समय में औपचारिक रूप से महुआ फूल एवं अचार गुठली के संग्रहण मात्रा के आँकड़े उपलब्ध नहीं हैं। जंगल के वृक्षों का आँकलन वन मंडलों की कार्य आयोजना से कर उत्पादन का आँकलन किया जा सकता है, लेकिन कृषकों की निजी एवं राजस्व भूमियों में महुआ एवं अचार के वृक्षों की संख्या अज्ञात होने के कारण ऐसा करना संभव नहीं था। इस अध्ययन से महुआ एवं अचार वृक्षों की संख्या का आँकलन प्राप्त होने पर उत्पादन मात्रा का आँकलन किया जाना संभव होगा। सरकार को प्राथमिक संग्राहकों की आय एवं रोजगार को बढ़ाने के लिए ठोस कदम उठाने में सहायक हो जाएगा।

Research Methodology & Study Design :-

- द्वितीयक आँकड़ों, साहित्य के द्वारा महुआ फूल एवं अचार गुठली के उत्पादन/संग्रहण क्षेत्रों की स्थिति, महत्वपूर्ण आँकड़े एकत्र करना।
- परियोजना स्टॉफ का चयन एवं सर्वेक्षण कार्य के लिए उन्हें प्रशिक्षण प्रदान करना।
- जिलेवार स्थानीय एवं थोक व्यापारियों से साक्षात्कार।
- मध्यप्रदेश राज्य लघु वनोपज सहकारी संघ, भोपाल एवं वनमंडल कार्यालय, स्थानीय फुटकर एवं थोक बाजार के व्यापारियों से महुआ फूल एवं अचार गुठली के उत्पादन/संग्रहण मात्रा की जानकारी एकत्र करना।
- महुआ फूल एवं अचार गुठली के उत्पादन/संग्रहण वाले जिलों का प्रारम्भिक सर्वेक्षण कर संग्रहण क्षेत्र वाले गाँवों का सामाजिक-आर्थिक सर्वेक्षण के लिए चयन, सर्वेक्षण की तैयारी, अनुसूची (प्राथमिक संग्राहक एवं व्यापारी के लिए) का निर्माण।
- परियोजना स्टॉफ का चयन एवं सर्वेक्षण कार्य के लिए उन्हें प्रशिक्षण प्रदान करना।
- मध्यप्रदेश के 52 जिलों में मौजूद 385 तहसीलों में कुल 54,903 गाँव विद्यमान है (मध्यप्रदेश शासन डायरी 2020)। अतः प्रत्येक तहसील से 02 गाँवों का सविचार निदर्शन पद्धति से चयन।
- प्रत्येक गाँव के 5 प्रतिशत (अधिकतम 15 न्यूनतम 5) अर्थात् अधिकतम 11,550 और न्यूनतम 3850 संग्राहक परिवारों के सामाजिक-आर्थिक सर्वेक्षण द्वारा साक्षात्कार लेकर संरचित अनुसूची के माध्यम से आँकड़े निर्धारित प्रपत्र में एकत्र किये जायेंगे।
- जिलेवार महुआ फूल एवं अचार गुठली का व्यापार करने वाले स्थानीय व्यापारी, साप्ताहिक बाजार एवं जिले के थोक व्यापारी से साक्षात्कार लेकर इन प्रजातियों के व्यापार, कीमत निर्धारण प्रक्रिया, मूल्य संवर्द्धन, भण्डारण विधि एवं उत्पादन/संग्रहण में होने वाली कमी व वृद्धि के बारे में आँकड़े एकत्र किया जाकर उनका अध्ययन एवं विश्लेषण किया जाएगा।
- एकत्र किए गये आँकड़ों के विश्लेषण द्वारा अनुकूल एवं प्रतिकूल दोनों परिस्थितियों की संग्रहण मात्रा को प्रतिबिम्बित कर सकेंगे।
- वरिष्ठ अधिकारियों एवं विषय विशेषज्ञों से चर्चा एवं उनके द्वारा प्राप्त महत्वपूर्ण सुझावों के आधार पर आवश्यकतानुसार महुआ फूल एवं अचार गुठली के संग्रहण उपरांत मूल्य, गुणवत्ता, भण्डारण एवं मूल्य संवर्द्धन के संबंध में आवश्यक वैज्ञानिक विधि एवं उपाय सुझाए जायेंगे।
- एकत्र किए गये आँकड़ों का अध्ययन एवं विश्लेषण।

Objectives of Research:-

- मध्यप्रदेश प्रदेश में जिलेवार महुआ फूल एवं अचार गुठली के उत्पादन/संग्रहण मात्रा का आँकलन।
- महुआ फूल एवं अचार गुठली के उत्पादन एवं संग्रहण में आने वाली समस्याओं का अध्ययन तथा उनके निदान के उपाय सुझाना।

Activities Undertaken:-

Cost of Project:- Rs.64.63 Lakhs

Expected Outcome Research:-

- जिलेवार महुआ एवं अचार गुठली की कुल उत्पादन/संग्रहण मात्रा का आँकलन।
- महुआ एवं अचार गुठली के उच्च, मध्यम एवं निम्न उत्पादन क्षेत्रों की पहचान।
- महुआ एवं अचार गुठली के उत्पादन/संग्रहण, प्रसंस्करण, मूल्य संवर्द्धन आदि में आने वाली समस्याओं की पहचान एवं निदान के उपाय।
- महुआ फूल एवं अचार गुठली की उत्पादन/संग्रहण मात्रा ज्ञात होने से माँग-पूर्ति के अनुसार कीमत निर्धारण द्वारा ग्रामीण आदिवासियों के हितों का संरक्षण संभव।
- वास्तविक उत्पादन/संग्रहण मात्रा के आँकलन द्वारा संबंधित उद्योग में निवेश की संभावना।
- महुआ एवं अचार गुठली की उत्पादन/संग्रहण मात्रा को बढ़ाने के लिए प्रभावी कदम उठाना आसान होगा।



जिला-जबलपुर, तहसील-कुण्डम,
ग्राम-बिसनपुरा में महुआ फूल के संग्रहण का कार्य



जिला-जबलपुर, तहसील-कुण्डम,
ग्राम-बिसनपुरा में महुआ फूल के संग्राहक का साक्षात्कार



जिला-जबलपुर, तहसील-पनागर, ग्राम-बड़ेरा कलौं में महुआ फूल के संग्राहक का साक्षात्कार



जिला-धार, तहसील-पीथमपुर ग्राम-नालछा में महुआ फूल के व्यापारी से साक्षात्कार



जिला-रायसेन, तहसील-देवरी, ग्राम-कोड़ा जमुनिया में अचार के वृक्ष का मापन कार्य



जिला-अशोकनगर, तहसील-पिपरई, ग्राम-सेमरी में महुआ वृक्ष का मापन कार्य

3. Title of the Project:- देवास जिले में लोकवानिकी प्रबन्ध योजना क्रियान्वयन का अनुश्रवण एवं मूल्यांकन।

Why this Project:-

निजी भू-स्वामियों तथा सामुदायिक भूमि में खड़े वनों का वैज्ञानिक प्रबन्धन करने, क्षेत्र में वनोंपज एवं वनोंषधियों का रोपण कर कृषकों को समृद्ध बनाने के लिए लोक वानिकी प्रबन्ध योजना का क्रियान्वयन मध्यप्रदेश शासन द्वारा किया गया। जिन कृषकों ने इस योजना को प्रारम्भ में अपनाया था, वे एक निश्चित समयावधि उपरांत भू-राजस्व संहिता की धारा 240-241 में शिप्ट हो गये। अतः यह अध्ययन आवश्यक हो गया था कि लोक वानिकी प्रबन्ध योजना के क्रियान्वयन में क्या कमियाँ रही, इसको अपनाने वाले कृषकों को क्या लाभ एवं हानि हुई। लोक वानिकी प्रबन्ध योजना एवं धारा 240-241 के कारण पुनरुत्पादन एवं पर्यावरण पर क्या प्रभाव पड़ा आदि कारणों को ज्ञात करना ताकि कमियों को दूर कर अन्य जिलों में बेहतर तरीके से लागू किया जा सके। यह परियोजना फंडिंग एजेन्सी के निर्देशानुसार तैयार की गयी है।

Research Methodology & Study Design:-

- देवास जिले से लोक वानिकी प्रबन्ध योजना एवं मध्यप्रदेश भू-राजस्व संहिता की धारा 240-241 से संबंधित द्वितीयक आँकड़ों का संग्रहण एवं अध्ययन।
- सामाजिक-आर्थिक सर्वेक्षण द्वारा अनुसूची में कृषकों से जानकारी एवं पौधों के वृद्धि संबंधी आँकड़ों का संकलन।
- चयनित कृषकों के पक्ष में समय-समय पर जारी आदेशों का संकलन एवं स्थलीय परीक्षण में उपयोग।
- देवास जिले में लोक वानिकी प्रबन्ध योजना के अंतर्गत सर्वेक्षण के लिए योजना में सम्मिलित कुल ग्रामों एवं कृषकों में से 10 प्रतिशत नमूनों (सेम्पल) का सविचार दैव निदर्शन पद्धति से चयन।
- लोक वानिकी प्रबन्ध योजना एवं भू-राजस्व संहिता की धारा 240-241 के प्रबन्ध योजना की शर्तों का क्रियान्वयन संबंधी अध्ययन, कृषक के योजना क्षेत्र का अवलोकन, चर्चा एवं फोटोग्राफ तथा संरचित अनुसूची द्वारा आँकड़ों का संकलन।
- प्रबन्ध योजना में किसान संघ की भूमिका का अध्ययन के लिए संघ के सदस्यों का साक्षात्कार।
- प्रबन्ध योजना एवं धारा 240-241 के अंतर्गत पालन में कमियाँ, समस्याएँ एवं सुझाव से आँकड़ों का संकलन।
- स्थलीय कृषकों के क्षेत्र से एकत्रित आँकड़ों के प्रथम दृष्टया परिणामों एवं तकनीकी बिन्दुओं पर वन विभाग के वरिष्ठ अधिकारियों से चर्चा कर अनौपचारिक अभिमत प्राप्त किया जाएगा, जिन्हें आवश्यकतानुसार प्रतिवेदन में सम्मिलित किया जाएगा।
- एकत्र किए गये आँकड़ों का विश्लेषण कर अंतिम प्रतिवेदन प्रस्तुत किया जाएगा।
- आँकड़ों को कम्प्यूटर में फीडकर उनका वर्गीकरण, श्रेणीकरण एवं विश्लेषण कर परियोजना प्रतिवेदन तैयार करना।

Objective of Research:-

- लोक वानिकी प्रबन्ध योजना एवं भू-राजस्व संहिता की धारा 240-241 के क्रियान्वयन का अनुश्रवण एवं मूल्यांकन।

Activities Undertaken:-

Cost of the Project:- Rs. 10.60 Lakhs

Expected Outcome of Research:-

- लोक वानिकी प्रबन्ध योजना एवं भू-राजस्व संहिता की धारा 240-241 के क्रियान्वयन एवं पालन में आने वाली बाधाओं की जानकारी हो जाने पर उनको सरलीकृत करना आसान होगा।
- योजना के सरलीकरण स्वरूप का आवलोकन एवं अध्ययन कर कृषकों को मनचाही योजना के अंतर्गत अपने वनों का वैज्ञानिक प्रबन्धन करना सरल हो जायेगा।



जिला-देवास, तहसील-कन्नौद, ग्राम-बुरुट: कृषक का लोकवानिकी प्रबंध योजना के अंतर्गत साक्षात्कार।



जिला-देवास, तहसील-कन्नौद, ग्राम-भिलाई: कृषक के प्राकृतिक वन में सागौन के वृक्ष का मापन कार्य करते हुए



जिला-देवास, तहसील-कन्नौद, ग्राम-ननासा के कृषक की भूमि में 40X40 का सेम्पल प्लॉट डालकर वृक्षों का मापन कार्य करते हुए।

Newly Initiated Project : 01

1. Title of the Project:- मध्यप्रदेश के विभिन्न कृषि-जलवायु क्षेत्रों में कृषि-वानिकी मॉडल्स की सफलता एवं असफलता के कारकों का विश्लेषण।

Why this Project:-

प्रदेश में समय-समय पर विभिन्न कृषि वानिकी मॉडल्स का अध्ययन कर खेती से औसत आय बढ़ाने के लिए कृषकों को सलाह देकर अपनाने पर बल दिया गया है। इन समस्त प्रयासों को अपेक्षाकृत सफलता नहीं प्राप्त हो सकी है, जिसका उत्तरदायित्व समय-समय पर बदलती प्राकृतिक, मानवीय एवं सामाजिक घटनाओं को जाता है। इन समस्त घटनाओं का अध्ययन कर प्रदेश के विभिन्न कृषि जलवायु क्षेत्रों में अपनाए जाने वाले कृषि वानिकी मॉडलों का अध्ययन कर उनकी सफलता एवं असफलता के कारकों को प्रकाश में लाने की आवश्यकता है, जिस पर गहन विचार विमर्श कर असफलता के कारकों को दूर कर सर्वग्राही तकनीक प्रस्तुत करना तथा सफल कृषि वानिकी मॉडल्स के अवधारणाओं को लागू करने के लिए कृषकों को मार्गदर्शन की आवश्यकता है।

परियोजना में इन्ही उपरोक्त अवधारणाओं को मूर्त रूप देने के लिए राज्य वन अनुसंधान संस्थान, जबलपुर एवं प्रदेश के अन्य शोध संस्थानों द्वारा कृषि वानिकी मॉडल्स पर किए गये अध्ययन के आधार पर प्रदेश में प्रचलित पूर्व के कृषि वानिकी मॉडल्स की वर्तमान स्थिति का अध्ययन कर उनकी सफलता एवं असफलता के कारकों को प्रकाश में लाने का प्रयास किया जाएगा।

Research Methodology & Study Design:-

- वर्ष 2000, 2010 एवं 2014 में राज्य वन अनुसंधान संस्थान, जबलपुर द्वारा प्रदेश के विभिन्न कृषि जलवायु क्षेत्रों में कृषि वानिकी मॉडल्स का अध्ययन किया था। प्रस्तुत परियोजना के माध्यम से पूर्व में कृषि वानिकी मॉडल्स का अध्ययन किया जाकर वर्तमान स्थिति में लाभ-हानि का आँकलन करते हुए, लाभप्रद मॉडल्स के बारे में प्रतिवेदन प्रस्तुत किया जाएगा। साथ ही उपयुक्त कृषि वानिकी पद्धति का सुझाव प्रस्तुत किया जायेगा।

- अध्ययन क्षेत्र का चयन।
- चयनित जिलों के प्रत्येक कृषि वानिकी मॉडल्स के कृषकों का साक्षात्कार एवं स्थल अवलोकन द्वारा संरचित अनुसूची में साक्षात्कार (structured interview) लेकर निम्न बिंदुओं पर जानकारी एकत्र की जाएगी।
- परियोजना से संबंधित पूर्व में स्थापित अन्य कृषि वानिकी पद्धति अपनाने वाले कृषकों का पता चलने पर मौके पर उनको भी अध्ययन में सम्मिलित किया जाना प्रस्तावित है।
- लागत-लाभ अनुपात (Cost Benefit Ratio) हेतु विभिन्न गतिविधियों में कृषकों द्वारा किए गए सभी व्ययों एवं उसके स्वयं के श्रम दिवसों तथा समस्त प्राप्तियों एवं उनके बाजार मूल्यों का पूरा लेखा जोखा परियोजना दल द्वारा रखा जायेगा। जिसे प्रतिवेदन लेखन में उपयोग किया जाएगा।
- प्राप्त आँकड़ों का विश्लेषण कर अन्तिम परियोजना प्रतिवेदन तैयार कर वित्त पोषक विभाग को प्रस्तुत किया जायेगा।
- आँकड़ों को कम्प्यूटर में फीडकर उनका वर्गीकरण, श्रेणीकरण एवं विश्लेषण।

Objective of Research:-

- मध्यप्रदेश के विभिन्न कृषि जलवायु क्षेत्र में पूर्व में प्रचलित कृषि-वानिकी मॉडल्स की वर्तमान स्थिति का अध्ययन।
- पूर्व प्रचलित कृषि-वानिकी मॉडल्स की सफलता एवं असफलता के कारणों की पहचान।
- सफल कृषि वानिकी मॉडल्स की रूपरेखा प्रचार-प्रसार हेतु प्रस्तुत करना।

Activities Undertaken:-

Cost of the Project:- Rs. 39-964Lakhs

Expected Outcome of Research:-

- उपयुक्त कृषि वानिकी मॉडल्स से कृषकों के लिए लाभ-हानि का लेखा-जोखा उपलब्ध रहने से सुविधानुसार क्षेत्र में वृद्धि या कमी पर्याप्त अवसर उपलब्ध होगा।
- कृषि जलवायु क्षेत्रवार सफल कृषि वानिकी पद्धतियों का प्रलेख।
- उपयुक्त कृषि वानिकी पद्धति का सुझाव अन्य कृषकों एवं शासन के लिए मार्गदर्शी अभिलेख।



जिला सिवनी में क्लोनल यूकेलिप्टस के साथ सोयाबीन



जिला उज्जैन में आँवला रोपण के साथ चने की खेती



जिला देवास में आँवला रोपण के साथ गेहूँ की खेती



जिला धार में आँवला रोपण के साथ प्याज की खेती

2.2 WILDLIFE DEPARTMENT

2.2.1 ANIMAL ECOLOGY RESEARCH DIVISION

Mandate

1. Predator and prey population monitoring *in-situ* condition
2. PHVA of locally extinct or newly introduced species in various protected areas of Madhya Pradesh
3. Re-introduction/re-wildling/translocations of carnivores and herbivores
4. Capacity building of frontline forest staff on predator and prey monitoring
5. Conservation of lac insects in central India

Completed Project: - 01

1. Capacity Building of Frontline Forest Staff of Madhya Pradesh for 5th cycle of All India Tiger Estimation Programme-2021-22
Funding Agency: PCCF (Wildlife) M.P., Bhopal,

Ongoing Projects:- 04

1. Study on leopard (*Panthera pardus L.*) presence, identification of conflict zones and developing suitable mitigation measures on human-leopard interactions in the urban areas of Jabalpur and Indore, Madhya Pradesh
Funding agency : PCCF (Wildlife) M.P., Bhopal,
2. Network project on conservation of lac insect genetic resources.
Funding agency-ICAR Indian Institute of Natural Resins and Gums, Ranchi, Jharkhand
3. Identification of best performing bamboo species for enhancement of income of farmers in Madhya Pradesh
Funding Agency : State Bamboo Mission, Bhopal
4. Population Habitat Viability Analysis (PHVA) of Hard ground Barashingha (*Cervus duvauceli branderi*) for introduction in Bandhavgarh Tiger Reserve, M.P.
Funding agency : PCCF (Wildlife) M.P. Bhopal through Bandhavgarh Tiger Reserve, M.P.

Project Summary

Completed Project

1. Title of the Project:- **Capacity Building of Frontline Forest Staff of Madhya Pradesh for 5th cycle of All India Tiger Estimation Programme-2021-22**

Why this Project:-

- With an aim to collect accurate field data and also to fill the previous gaps on data collection process, a comprehensive plan had been undertaken by the wildlife wing of Madhya Pradesh Forest during 4th cycle of All India Tiger Estimation programme on 2017-2018. It resulted very well for this state and comprehensive gap was fulfilled due to the series of capacity building programmes for frontline forest staff of all forest units (Territorial/Protected Areas/FDCs)
- Madhya Pradesh State Forest Research Institute is considered once again the knowledge partner of Madhya Pradesh Forest Department and series of field based capacity building trainings have been proposed to upgrade the skill of frontline forest staff for 5th cycle of AITE-2022 to create master trainers for Phase I and Phase III data collection.

Objectives of Research:-

1. To create a cadre of master trainers on advanced wildlife population monitoring techniques who can further transfer their knowledge to frontline forest staff of their respective forest divisions/PAs
2. To train all frontline forest staff of tiger bearing beats of this state

Activities Undertaken:-

- Phase I training have been conducted in 11 different training venues i.e. 1) Gandhi Sagar Wildlife Sanctuary, 2) Kheoni Wildlife Sanctuary, 3) Madhav National Park, 4) Ratapani Wildlife Sanctuary, 5) Satpura Tiger Reserve, 6) Pench Tiger Reserve, 7) Kanha Tiger Reserve, 8) Noradehi Wildlife Sanctuary, 9) Bandhavgarh Tiger Reserve, 10) Panna Tiger Reserve, 11) Sanjay Dubri Tiger Reserve. In total 308 frontline forest staff have been trained by Officials and Scientific team of SFRI, Scientific team of Wildlife Institute of India-Dehradun, Programme Officers from World Wildlife Fund-India and Senior Officials from Madhya Pradesh Forest Department.
- In addition to Phase I training, capacity building workshops on Camera Trap based Phase III data collection protocol have been organised in SFRI between 21-22 and 23-24 October 2021.
- One day workshop have been organised at e-daksh center at Collectorate on 29-11-2021 for computer operators of 83 forest divisions. Training on Phase I data entry process have been taught during this workshop.



Cost of the Project:- Rs.18.65 lakh (15.25 lakh+3.40 lakh)

Outcome of Research:-

- Total 302 Master trainers have been created from 83 forest divisions for Phase I data collection protocol from 17th August to 3rd September 2021
- Total 59 master trainers have been created from 22 divisions for Phase III data collection protocol from 21st October to 24th October 2021

On-going project

1. Title of the Project:- Study on leopard (*Panthera pardus L.*) presence, identification of conflict zones and developing suitable mitigation measures on human-leopard interactions in the urban areas of Jabalpur and Indore, Madhya Pradesh

Why this Project:-

The increasing human population, changes in land use practices, soaring demands from our urban population and more recently fast expanding economic activity have started straining the delicate balance at which leopards survive. Leopard being a large territorial animal requires spaces and in small

and isolated protected areas, they frequently venture out and come in direct conflict with local people and experience high mortality.

Leopard venturing have been observed regularly in the housing complexes, residential colonies, university complexes in Jabalpur and Indore which has put tremendous pressure on the Forest Department of both cities.

It is important to have a detailed study on their source sites, identification of main interaction zones in the urban areas of Jabalpur & Indore to reduce man-leopard interaction amicably.

Research Methodology:-

Identification of source sites of stray leopards and their causal factors of straying in and around the urban areas of Jabalpur & Indore:

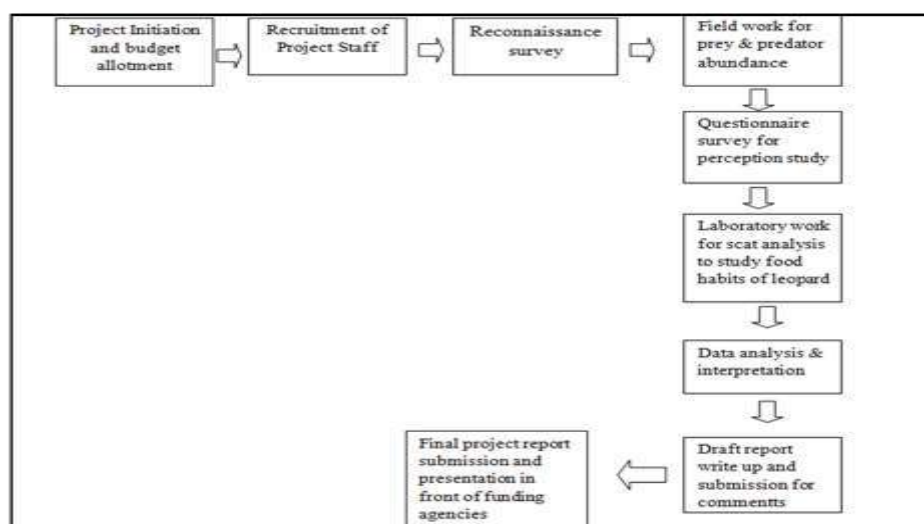
- Reconnaissance surveys and sign surveys for occupancy estimation
- Camera trapping for leopard abundance estimation
- Kill monitoring and Scat Analysis for food habits study

Developing suitable strategy to reduce man-leopard interaction amicably in the urban landscape:

- Identification of leopard-human interaction zones using secondary data collected which will be analyzed using Arc GIS 10.3.
- Perception of people towards human-leopard interaction
- Developing Habitat Suitability Model Map for leopard land-use pattern

Study Design:-

- Project Initiation and budget allotment
- Recruitment of Project Staff
- Reconnaissance Survey
- Field work for prey & predator abundance
- Questionnaire survey for perception study
- Laboratory work for scat analysis to study food habits of leopard
- Data analysis & Interpretation
- Draft report write up and submission for comments
- Final project report submission and presentation in front of funding agencies



Objectives of Research:-

- To identify source sites of stray leopards and their causal factors of straying in and around the urban areas of Jabalpur and Indore.

- To study perception of people towards human-leopard interaction.
- To develop suitable strategy to reduce man leopard interaction amicably in the urban landscapes

Activities Undertaken:-

- Recruitment of two JRFs and Two Field Assistants done in October and November 2021
- Collected urban area Shap file data from Smart city Office Jabalpur
- Collected 95 villages name list from Municipal Corporation Jabalpur and 119 villages name list from Collector Office Jabalpur. in urban areas of Jabalpur district.
- Collected list of statistical study, social and economical information located in urban areas of Jabalpur district from Collector Office Jabalpur.
- Collected information of 24660 street dogs and 4,25,699 other domestic of animal list from Animal Husbandry department, Veterinary Hospital, in urban areas of Jabalpur district.
- Secondary data of Animal/Human Loss by leopard and Animal/Human Injured by leopard from 2018 to 2021 collected from DFO Jabalpur,
- Appointed psychologist for perception study on human-leopard interactions in the urban areas of Jabalpur and Indore, Madhya Pradesh

Cost of the Project:- Rs. 43.07 Lakhs

Expected Outcome of Research:-

- Source sites and causal factors of straying of leopard in and around Jabalpur and Indore.
- Leopard-human interaction zone and available suitable habitat areas for leopard in Jabalpur and Indore.
- Perception of local people towards human-leopard interaction amicably in the urban areas of Jabalpur and Indore

Deliverable technologies developed in each project for stakeholders, forest professionals, field foresters and other beneficiaries-

- This study will be a great help to Forest Department in effectively mitigating the issue of negative interaction between humans and leopards.
- Development of suitable strategies to reduce man-leopard interactions along with organizing awareness programs for different stakeholders.
- Psychological study for the understanding willingness of the people for sharing their space with leopards



Director SFRI on a field visit with Forest Department inside Ordinance Factory



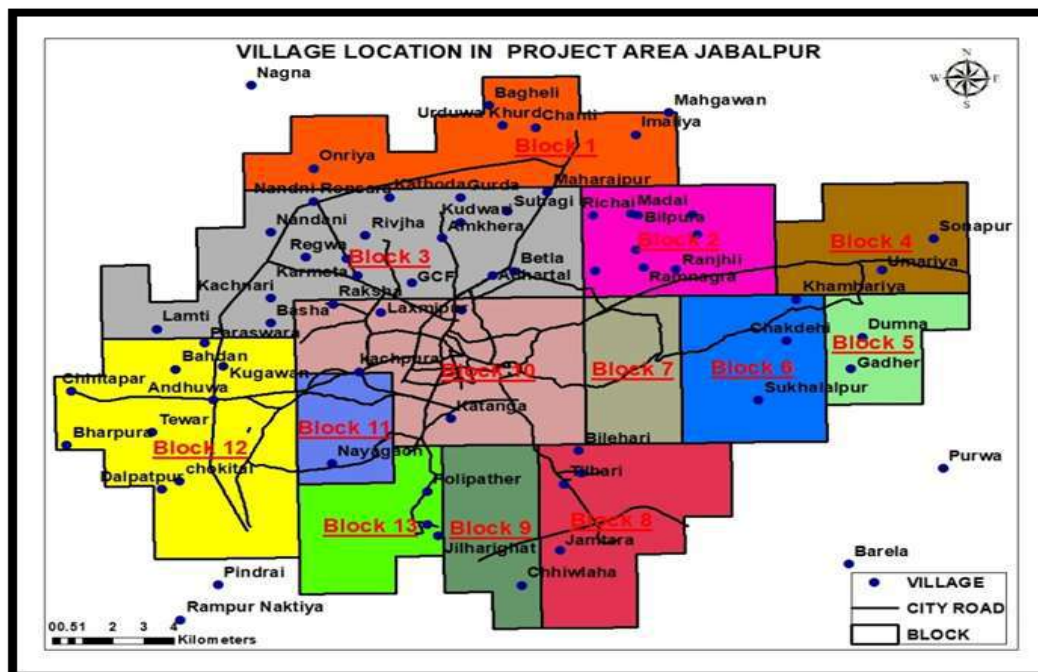
Interaction with Water Plant workers during field survey in the GCF area



Seminar was organized with SGNP officials for Forest Department & Media personnel



Recording leopard pugmark image with GPS reading



2. Title of the Project:- Network Project on Conservation of Lac Insect Genetic Resources.

Why this Project:-

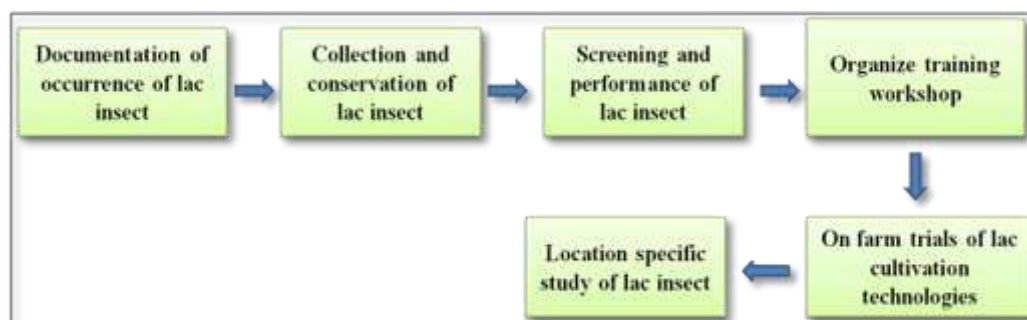
Fast depleting forest cover of the country is a serious threat to the bio-diversity of lac-insects as well as their host-plants. In the absence of human intervention, the unattended species of lac-insects and their host-plants might be lost. To overcome the situation the project was started to documentation the occurrence of lac insect/host plant, conserving the biodiversity of local lac insect species/races and breed which is decline due to anthropogenic activities and climate change. In this way, lac insect/host plants are needed for *in-situ* and *ex-situ* conservation. The Network project on conservation of lac insect genetic resources has a crucial role. Training on scientific method of lac cultivation can increase capacity and knowledge level of farmers on lac cultivation. It can lead to improve productivity of lac and can provide stability in their income.

In this project, there were 8 network Co-operating centers and 3 voluntary centers throughout in India with one lead centre IINRG, Ranchi, under network project on conservation of lac insect genetic resources. Madhya Pradesh, Maharashtra and Goa, and one union territory Daman & Diu is under the jurisdiction of State Forest Research Institute, Jabalpur, Madhya Pradesh as study area.

Research Methodology:-

- Collection and conservation of lac insect- Brood lac samples were collected from different districts of Madhya Pradesh/Maharashtra and conserved on different host plants under *ex-situ* condition. Screening and performance of collected lac samples also doing in gene bank by selected parameter.
- On farm trials of lac cultivation technologies- On farm trials of lac cultivation were made in selected sites of Madhya Pradesh. Farmers will be selected randomly on the basis availability of host plants.
- Training of farmers / resource persons: cultivation, training workshops were organized in selected sites of Madhya Pradesh to create awareness and promotion of lac cultivation on different host plants.
- Study of socio economic status of lac growers- Random sampling techniques were employed to select lac growers. All the relevant information was collected from the lac producers by personal interview through a pre-tested questionnaire

Study Design:-



Objectives of Research:-

- Conduct survey of the area for lac insects and host plants
- Collect and conserve lac-insect under ex-situ condition
- Carry out on-farm trials on lac cultivation technologies
- Training of adopted/selected farmers in collaboration with IINRG for *in-situ* conservation
- Conduct need based and location specific studies on lac-insects and/ or host plants

Activities Undertaken:-

- Collection and multiplication of collected local lac insect population host plant species in *ex-situ* condition
- Survey of lac insect and host plants was done 23 blocks of 11 districts and Lac occurrence were found in only 12 blocks of 11 districts in Madhya Pradesh on Palas, Kusum, Ber, Peela Gulmohar and Kala Siris
- Lac insects samples were collected from the 21 sites of 12 districts of Madhya Pradesh and inoculated on *Flemingia macrophylla*, *Flemingia semialata*, Kusum, Ber, Palas and Gular in SFRI campus during the month of June-July 2021.
- Nine sites of seven districts of MP were evaluated for screening and performance of lac insect in gene bank-Latori (Vidisha) and Shivpuri found best performing in gene bank
- Collected lac insect samples of 15 districts of Madhya Pradesh and two districts of Maharashtra were conserved in gene bank.
- Lac host Park has been established in SFRI campus in ornamental nursery. Eighty four plants of twelve species of lac host plants are maintained in lac host park.
- Fifteen *Zizyphus mauritiana* plants were pruned in SFRI Campus for Kusmi and Rangeeni lac cultivation trials.
- Capacity building cum hand holding training workshop was held on 21 June, 2021 on lac cultivation by scientific method at village Sasaipura, Karahal block, Sheopur district of Madhya Pradesh in which 61 progressive farmers, Van samiti members and local forest staff participated.
- One day meeting between SFRI team and DFO Sheopur and DFO Kuno-Palpur Wildlife Division was held on 22 June 2021 in Forest Division office Sheopur. Possibility of lac cultivation has been discussed and SFRI Team visited possible area where Lac can be cultivated by Samiti member on Palash.
- One day traders, farmers and van samiti member's interaction meeting were organized on 26 November 2021 in lac processing unit Jairamtola, Balaghat. In this meeting SFRI team interacted with 2 traders, 12 lac farmers and 8 van samiti members and obtained information about lac cultivation scenario in Balaghat district and adjoining areas.
- Socio economic status of 31 lac collecting farmers of Surkudi, Dhobitola, Dhanegaon, Daratola villages of Aamgaon and Salekesa blocks of Gondia districts has been studied. All the farmers of Gondia district are cultivating lac on Palash, Ber, Kusum lac in forest areas and farmers field. Amongst the different sources of income, agriculture cropping (Rice production) ranked first (56.83%) followed by Lac (22.12%), salary business/shop (7.4%) Labor activity (6.58%), forest produce (2.41%), Animal husbandry (2.14%), vegetables (0.58%) and other sources 3.95%.
- Socio economic status of 26 lac collecting farmers of Chargaon village of Katni district has been studied. All the farmers of Chargaon village collect only Ghont (*Zizyphus xylopyra*) and

Palas lac from forest areas. Amongst the different source of income, Agriculture (44.03%) ranked first followed by labour work (38.09%), Lac collection (17.88%).

- Socio economic status of 20 lac collecting farmers of Simardha, Nogori, Umardha, Ajwar, Bichhiya, Kuimall villages of Amarpur and Dindori blocks of Dindori districts have been studied during this period. All the farmers of Dindori district village collect/cultivated lac only Kusum lac from forest areas and farmers field. Amongst the different sources of income, agriculture cropping ranked first (38.02%) followed by Labor activity (29.40%), lac collection (27.92%) and forest produce (Mahua, Harra) (4.66%).
- Socio economic status of 20 lac growing farmers of Bhondwa, Dhimrutola, Sakri, Lavera, Pachpedi villages of Lamta and Balaghat blocks of Balaghat districts have been studied during this period. All the farmers of Lamta and Balaghat blocks have cultivated lac crop only Palas lac from farmer field. Amongst the different sources of income, agriculture cropping (Rice production) ranked first (54.53%) followed by lac cultivation (37.75%), labour work (6.59%) and vegetable (1.13%) in this area.
- Traders' survey was conducted in Katni and Panna district of Madhya Pradesh to estimate the lac production. Seven lac purchasing traders of Katni were contacted and interviewed. On the basis of survey it was resulted that in Katni district lac is produced on Palash and Ghont trees. In which 215 quintal lac were produced on Palash tree and 8 quintal on Ghont tree annually. In case of Panna district, 130 quintal lac was produced on Palash and Ber tree.
- Identified the main reason for reduction on kusmi lac production in Hoshangabad, Narsinghpur, Mandla, Chhindwara, Dindori, Balaghat and Betul districts of Madhya Pradesh and their unavailability of broodlac, lac of awareness about lac cultivation techniques, problem of marketing and theft, climatic factor and unavailability of host plants in farmers field.

Cost of the Project:-16.13 Lakhs



Director SFRI visited lac insect gene bank



Lac insect conserved on *Flemingia macrophylla* plants in gene bank



Lac cultivation training at village Sasaipura, Karahal block, Sheopur



Traders, farmers and van samiti members' meeting in Jairam tola, Balaghat

Expected Outcome of Research:-

- Occurrence of lac host plant in 135 blocks of 47 districts of Madhya Pradesh and 62 blocks of 28 districts of Maharashtra obtained from field survey.
- Broodlac samples of all districts of MP and Maharashtra shall be preserved in gene bank of SFRI. This broodlac will be distributed to farmers to promote the cultivation of lac on Palash, Kusum and Ber trees.
- *In-situ* and *ex-situ* conservation of lac insect genetic resources.
- A cadre of master trainers shall be generated for promoting, knowledge sharing and capacity building of the adopted/ selected farmers of lac cultivation.

Deliverable technologies developed in each project for stakeholders, forest professionals, field foresters and other beneficiaries-

- Best performing lac insect samples multiplied in gene bank which will be distributed to interested farmers and van samiti members of Madhya Pradesh and Maharashtra state to get more profit through lac cultivation.

3. Title of the Project:- Identification of best performing bamboo species for enhancement of income of farmers in Madhya Pradesh

Why this Project:-

Bamboo is an important source of income. According to an estimate, 20,000 NT (Notional tones; 1 N.T. is equivalent to 2400 m length of bamboo culms) of bamboo is being obtained from farmers. For many farmers, bamboo is the main source of income. In some states like Tamilnadu, many farmers have switched over from traditional agriculture to bamboo farming. There are 22 districts in the state of M.P. which have abundance of bamboo. To enhance income of farmers and bamboo dependant population from bamboo cultivation and to identify species which are more profitable to farmers, the present study is proposed to be carried in the state. Bamboo setums demo plots have been established in different agro-climatic zones of the state. This project envisages identifying best performing bamboo species for enhancement of income of farmers.

Research Methodology:-

Bamboo plantations, bamboo setums and demo-plots of various species in different agro-climatic zones will be surveyed and sample plantations of each bamboo species will be assessed to compare their performance in terms of survival, yield and profitability for their suitability for plantations in various agro-climatic regions of the state. In each district, sample of bamboo dependent population, like Basods and farmers, was surveyed in randomly selected blocks and villages. A structured schedule have been used to find the bamboo species utilized and resource availability, source and area of cultivation, systems of harvesting, annual income from sale, and interest of rural people/farmers in planting high yielding bamboo species, other than the traditional *Dendrocalamus strictus* species, besides studying the current system of marketing of bamboo, rates obtained, traders involved and identifying the locations species need for developing market linkage.

Study Design:-

- Appointment of staff
- Collection of secondary literature
- Identification of major bamboo plantations, bamboo setums demo-plots in different agro-climatic zones.
- Sample survey and performance assessment of plantations of various bamboo species by private farmer.
- Identification of suitable bamboo species for planting and resource augmentation.
- Design of schedules for farmers, craftsmen and traders.
- Sample survey of bamboo farmers, craftsmen and traders in selected district

Objectives of Research:-

- To identify best performing bamboo species in all the agro-climatic zones of the state based on the study of bamboo setums demo-plots and other bamboo plantations.
- To identify species suitable for strengthening the socio-economic conditions of farmers and other dependent communities – basods and pan barejas.

Activities Undertaken:-

- Surveyed 14 bamboo setums of 12 districts in 11 agro-climatic zones of Madhya Pradesh
- 37 bamboo species growth data collected from 14 bamboo setums of 12 districts of Madhya Pradesh
- Surveyed 45 demo plots of 13 districts of 9 Agroclimatic zones of Madhya Pradesh
- Surveyed 257 bamboo farmers of 12 districts of Madhya Pradesh
- Surveyed socio economic status of 1372 Basod households of 13 districts of Madhya Pradesh
- Surveyed socio economic status of 73 pan Barejas households of 3 districts of Madhya Pradesh
- To achieve this target, survey work is ongoing to collect data from bamboo setums demo-plots and other bamboo plantations. Work progress is given below

S.No.	Division	Surveyed demo plots	Surveyed bamboo farmers	Bamboo setum	Surveyed basod H.H	Pan Barejas
1	Satna Division	7	40	02	249	*
2	Tikamgarh Division	1	5	01	81	*
3	Bhind Division	3	02	01	*	*
4	Seoni Division	9	43	01	248	*
5	Alirajpur Division	2	19	01	49	*
6	Jabalpur Division	1	16	01	100	10
7	Khandwa Division	4	29	01	176	*
8	Raisen Division	4	24	02	111	*
9	Ujjain Division	4	12	01	10	*
10	Indore Division	2	19	01	15	*
11	Badwani Division	3	11	*	64	*
12	North Betul Division	*	37	01	154	*
13	Neemuch Division	03	*	*	*	*
14	Balaghat Division	02	*	*	*	*
15	Anuppur Division	*	*	01	104	*
16	Bhopal Division	*	*	*	11	*
17.	Hoshangabad	*	*	*	*	25
18.	Katni	*	*	*	*	38
	Total	45	257	14	1372	73



Measuring bamboo demo plot of Indore division



Survey of Basod HH in Ujjain District



Survey of Pan Bajera in Jabalpur District



Survey of bamboo plantation of farmers field in Alirajpur division

Cost of the Project:- Rs.10.17 lakhs

Expected Outcome of Research:-

- Best performing bamboo species in all the agro-climatic zones of the state based on the study of bamboo setums demo-plots and other bamboo plantations will be identified.
- Socio-economic conditions of farmers and other dependent communities – basods and pan barejas will be strengthened.

4. Title of the Project:- Population Habitat Viability Analysis (PHVA) of Hard ground Barasingha (*Cervus duvauceli branderi*) for introduction in Bandhavgarh Tiger Reserve, M.P.

Why this Project:-

The proposed site for introduction in Bandhavgarh Tiger Reserve is found suitable for Barasingha during an in house survey by the department.

The introduction sites supports all ecological requirements of this deer species as all the causes of local extinction of this cervid have been removed, the introduction programme stands justified as far as the IUCN guidelines are concerned.

A detail Population Habitat Viability Assessment is the need of the hour before carrying the introduction programme

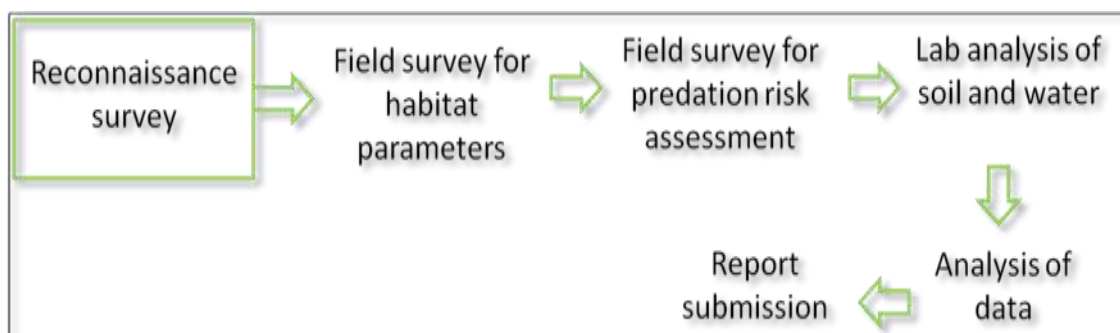
Research Methodology:-

- Reconnaissance survey for the proposed release site.
- Detail vegetation sampling based on working plan protocol shall be done.
- Other habitat parameters shall be also collected.

- Data shall be analysed and draft report shall be prepared
- Final report shall be submitted within 3 months.

Study Design:-

- Project staff recruitment shall be done for field data collection
- Field data collection shall be done in Kanha as well as in proposed releasing site at Bandhavgarh to compare both source sites and releasing sites.
- Data analysis shall be done and PHVA shall be done
- Report writing work shall be done.
- Submission of final report



Objectives of Research:-

- To compare various habitat parameters of the barasingha *in-situ* enclosure of Kanha and the proposed Magdhi *in-situ* enclosure in the Magdhi Range.
- To compare basic habitat parameters of the barasingha in Sonph meadow of KTR, with proposed reintroduction site Magdhi of BTR and adjacent meadows for the establishment of barasingha population.
- To explore the possibility of expansion of the free-ranging barasingha population and suggest measures for habitat and connectivity improvement in proposed introduction site.
- To prepare monitoring protocol for successful reintroduction.

Activities Undertaken:-

- Fund received during end of February
- Reconnaissance survey have been completed
- Vegetation sampling is done for ground cover and resting cover inside the proposed release site and it's adjoining patches

Cost of the Project:- 3.91 lakhs

Expected Outcome of Research:-

- Viable habitat for Barasingha in Bandhavgarh shall be identified which can be used for long term conservation of this species.

2.2.2 HABITAT ECOLOGY RESEARCH DIVISION

Mandate

1. Monitoring and evaluation of wildlife and their habitats.
2. Study on ecology and conservation of wildlife including herbivores, carnivores and avifauna of the state.
3. Impact of wildlife on human habitation and vice versa.
4. To prepare the wildlife management plan.
5. Serve as nodal agency to compliment management authorities for scientific inputs.
6. To develop wildlife forensic laboratory.

7. Documentation and dissemination of information on wildlife conservation

Completed Projects: - 02

1. Monitoring and evaluation of wildlife and their habitats for sustainable management and development in the protected areas/ territorial divisions of Madhya Pradesh)
Funding Agency: PCCF (Wildlife) M.P., Bhopal,
2. To Study the impact of proposed Morena Water Supply under sub project MPUDP on the Dolphin, Crocodile & Gharial and their habitat in National Chambal Gharial Wildlife Sanctuary, Morena (M.P.).
Funding Agency: MP Urban Development Company Ltd., Department of Urban Development & Housing Government of Madhya Pradesh

Ongoing Projects:- 02

1. Monitoring of re-introduced tigers (*Panthera tigris L.*) in Nauradehi Wildlife Sanctuary.
Funding agency : PCCF (Wildlife) M.P., Bhopal,
2. Impact Assessment of Proposed Sheopur Kalan & Badoda Towns A Group Water Supply Scheme- Parbati River Sub-project under MPUSIP on Aquatic Fauna, River Hydrology & Ecology and its Mitigation.
Funding agency : Madhya Pradesh Urban Services Improvement Project, Bhopal (M.P.)

Regular Activity:- 01

1. Maintenance of Monitoring and Evaluation Facilities and Database of Predators Prey in Madhya Pradesh
Funding Agency : SFRI & PCCF (Wildlife) M.P., Bhopal,

Project Summary

Completed Projects:

1. **Title of the Project: Monitoring and evaluation of Wildlife and their habitats for sustainable management and development in the protected areas/ Territorial divisions of Madhya Pradesh.**

Why this Project:-

To estimate the population of wild animal species of Madhya Pradesh, to find out the population density, the spatial occupancy of different species and to utilize the findings for its management purposes. Wildlife-population is not always static. Its number increases/decreases at different places and at different times, means the number of the same species varies from place to place and year to year. These data supports the park managers while taking any interventions for wildlife management.

Research Methodology:-

- Procurement of the primary data from all 83 units of Madhya Pradesh on Monitoring Tigers, Co-predators, prey and their habitats which is already being generated annually for PAs and at every 4 year interval in whole state by the staff of MP Forest Department at beat level on prescribed formats following the protocol developed by WII and NTCA in the form of Field guide: "Monitoring Tigers, Co-predators, prey and their habitats" which includes the following points:
 - Sampling for Tiger, Leopard and other carnivore sign encounter rate.
 - Sampling for ungulate encounter rates.
 - Sampling of vegetation, human disturbance and ungulate pellets.
 - Camera trapping for tiger identification
- Double sampling method is used for tiger population estimation. It is based on determining spatial occupancy of tigers throughout the potential tiger forests and sampling such forests using camera traps in a statistical framework (one pair in each 2 sq km grid).
- Hard and soft copy of data received and checked

- Rectified the data mainly for GPS location errors
- Analysis for population estimation of Tigers, other carnivore and herbivore species using various software (Arc GIS, Distance 6.2 software).
- Tiger identification was done with the help of capture histories (X matrix) and analyzed using the program Density 7.2.
- Preparation of various maps in ArcGIS software including habitat mask.
- Preparation of tiger data base with minimum movement area of individual for 2018, 2019-20 and 2020-21
- Data tabulation and report preparation

Study Design:-

- Followed the protocol developed by WII and NTCA in the form of Field guide: "Monitoring Tigers, Co-predators, prey and their habitats-2017"

Objectives of Research :

- To monitor the Tigers, co-predators, prey and their habitats in protected areas and territorial divisions of the state.
- To strengthen/improve the facilities and services for monitoring and data interpretation
- To create a database based on individual stripe pattern and movement area of tiger which will support monitoring the individual tiger and to deal with wildlife crime

Activities Undertaken :-

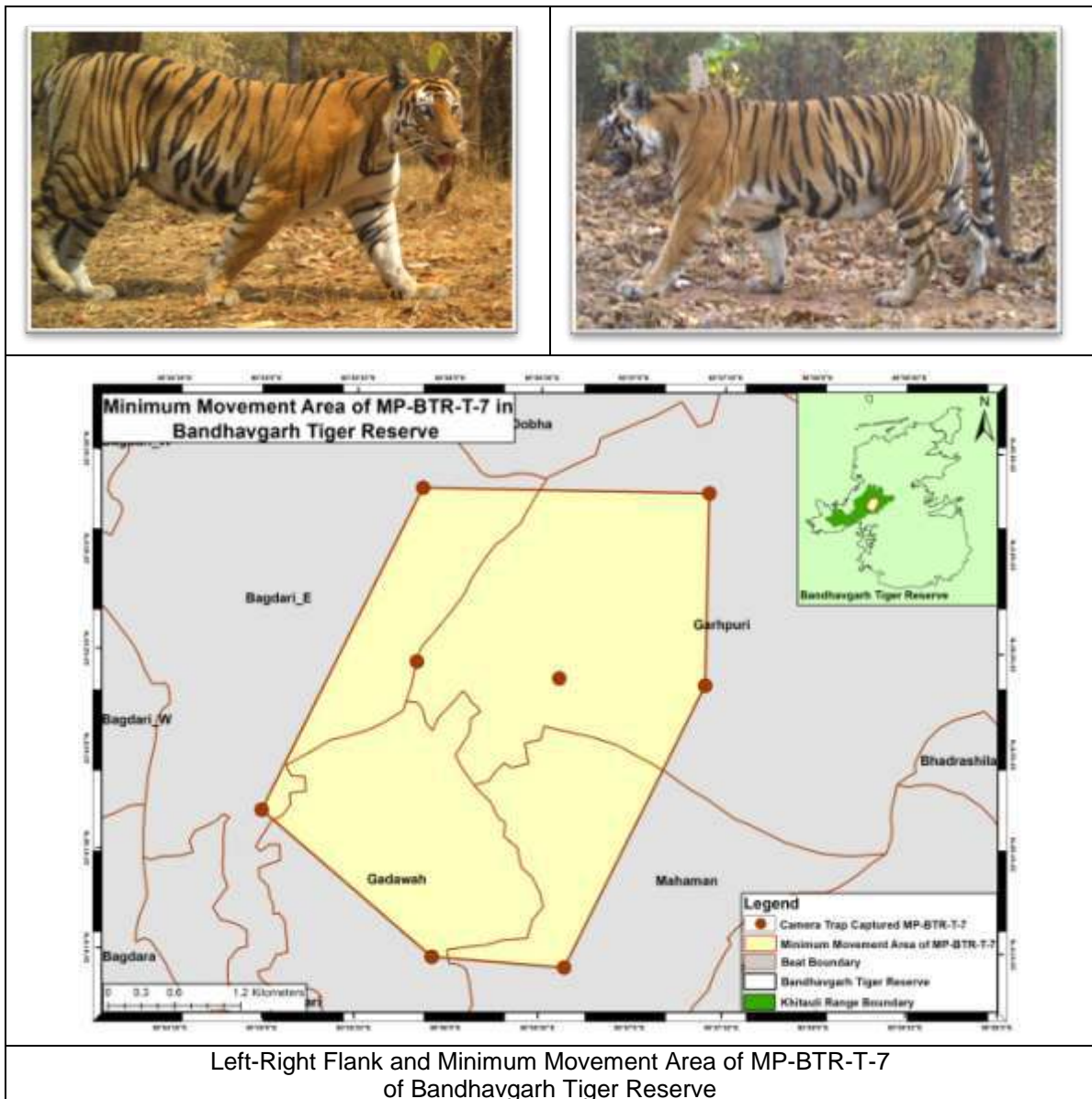
- Procurement of hard and soft copies of wildlife census data from all 83 units of Madhya Pradesh Forests Department.
- Data checking and Rectification of huge amount of data for -Wrong GPS entries, Double entry errors through cleaning tool and Manual corrections for wrong entry
- Segregation of Tiger and Leopard bearing beats and Map preparation in Arc GIS
- Analysis of encounter rate/km for carnivore species,
- Analysis of herbivore densities/sq km in Distance 6.2 software,
- Segregation of Tiger images
- Collate each and individual image with other images and with existing old database to find out individual tiger numbers
- Tiger Identification with their IDs
- Preparation of MMA of each individual tiger based on their capture location
- Preparation of camera matrix and trap matrix
- Preparation of MCP for each unit based on camera trap locations
- Preparation of habitat mask for each unit using Arc GIS
- Analysis of camera trap data with capture –recapture matrix for tiger density analysis and, Tiger density analyzed using Density 7.2 software.
- Create updated data base of individual tiger with left-right flanks and its minimum movement area.

Cost of the project- Rs. 154.28 Lakhs

Outcome of research:-

Information on population of tiger, other carnivores and prey species for year 2018, 2019-20 and 2020-21 would be applicable for Park Managers while performing various kinds of interventions regarding wildlife management on spatial and temporal basis.

Created data base would be supportive for wildlife management and for investigating the wildlife crime.



2. Title of the Project:- To Study the impact of proposed Morena Water Supply sub project under MPUDP on the Dolphin, Crocodile & Gharial and their habitat in National Chambal Gharial Wildlife Sanctuary, Morena (M.P.).

Why this Project:-

This project of Madhya Pradesh Urban Development Company Limited is supported by the World Bank and Madhya Pradesh Government. The task has been assigned to examine the impact of ecological flow on critically endangered species and their habitat which may be influenced due to construction of proposed intake well on Chambal Gharial Wildlife Sanctuary for water supply to Morena district.

Research Methodology:-

The study was performed by adopting nationally and internationally accepted scientific methods in rainy, winter and summer all round the year as under:-

Selection of reference sites - Reference sites were selected in upstream with zero value of hydrological stress.

Selection of observation sites – 30 observation sites were selected for following observations –

- Observation on population distribution, movement pattern, habitat, nesting and breeding sites of crocodile (Mugger) Ganges river dolphin and Gharial in upstream and downstream during all three seasons.

- Observation on various hydrological parameters i.e. rate of discharge, water velocity, river depth from reference site and sampling site of 30 Km river stretch.
- Observation on physico-chemical properties of water (pH, DO, EC, COD, BOD, Temperature, salinity, Nitrate, phosphate, Magnesium, chloride etc) from reference site as well as from 30 sampling sites.
- Sampling of macro-invertebrates done from 30 sites in all the three seasons.
- Working on methods of Maximum Allowable Environmental Difference (MAED) for similarity measure related to reference site.
- Other abiotic attributes of the study area i.e. landuse-landcover, catchment area, drainage etc. analysed in ArcGIS software as influencing variables.

Study Design:-

- The study area covers 30 km stretch of the Chambal River 15 km either sides from the proposed intake well along the side of National Highway (Old NH-3- Agra-Mumbai road) including reference site to compare the hydrological and ecological data from the project site.
- The study area of 30 km is divided into 30 segments at the interval of 1 km to observe hydrological, ecological and population data of Gharial, Dolphin and Mugger, details as given in the methodology.

Objectives of Research:-

- Study the population distribution, movement pattern, nesting and breeding sites of Gharial (*Gavalia gangeticus*), Ganges Rivers Dolphin (*Platanista gangetica*) and Crocodile (*Mugger*) affected by the proposed project of Chambal River.
- Asses the Ecological flow including ambient water flow, water discharge, Physico-chemical properties and water requirements in reference to Gharial, Dolphin and Crocodile.
- Predict and identify the impact of proposed project on the river ecology, existing flora and fauna and their habitat at the stage of operation, execution and maintenance phases.
- Recommend the mitigation measure and monitoring plan, based on finding of the study.

Activities Undertaken:-

- A reconnaissance survey of the proposed project site where intake well is to be constructed on Chambal River and 15 km upstream and 15 km downstream was done and collected relevant secondary data.
- Work permission from PCCF Wildlife to work in National Chambal Gharial Sanctuary, Morena.
- Prescribed proforma with details of the individual team member sent to Chief Wildlife Warden Madhya Pradesh Bhopal to grant work permission.
- Collection of primary data on – population, movement and behavior pattern, location of breeding & nesting sites of Crocodile, Gharial and Dolphin in different months (including lean season, pre and post monsoon).
- Observed the population of animal, through boat survey using binocular and camera.
- Movement and behavior pattern through focal sampling method and record the physical conditions of that area.
- Find out the breeding and nesting sites and their locations recorded through GPS.
- Assessment of water velocity, river depth, width in 30 km stretch in each segment of 1 km interval including reference site in different months (including lean season, pre and post monsoon)..
- Workout the way points of each segment for observation with the help of Arc GIS on study area map.
- Observation recorded on water velocity (Water flow Probe), river depth (Depth finder), width (Range finder and Rope) in each 30 segment of 30 km stretch including reference site.
- Assessment of Physico-chemical characteristics of water.

- Observations were taken with the help of portable instruments – DO meter and multi parameter.
- Collected river water sample for laboratory analysis from 30 sampling sites and reference site.
- Macro-invertebrates sampling for bio monitoring of river health.
- Collected samples with dip-net from river, from rock substratum and from shallow river bank. Identified and collected their photographs.

Cost of the project : Rs. 64.51 Lakhs

Outcome of Research:-

The impact prediction of water abstraction from National Chambal Sanctuary for the drinking water supply to Morena district is based on last 36 years data. Demand for the drinking water supply in this dry locality is the prime focus along with the maintenance of environmental and ecological flow for the continued existence of endangered fauna of the National Chambal Sanctuary because environmental flows are the balance between water resource development and the maintenance of a river along with ecologically acceptable conditions.

The quantity of raw water abstraction is almost equal to the water availability at minimum level of 36 years which are maintaining the sustainable survival of the Gharial and Dolphin. Looking to the demand for drinking water supply, an optional arrangement of the additional release of water quantity from Kota Barrage which can maintain the required ecological flow during peak summer months i.e. May and June or it may be May, June and July (depending on the rainfall of that year) is suggested.

The present observation on available population of Gharial, Dolphin & Mugger and the assemblage of other communities of large vertebrates, fishes, macro-invertebrates, benthos etc. indicates the congenial environment for the survival of the critically endangered species with other supporting elements such as channel form, water depth, deep pool areas and the existing river flow in the summer season. The only major requirement is to check on illegal anthropogenic activities, especially the extensive sand mining which is prevailing all around the study area.



Observation on water velocity and water depth at National Chambal Sanctuary, Morena



Measurement of various parameters across the river width at every 10 m distance, marked by red ribbon on synthetic rope



Observation on nesting site of Gharial at National Chambal Sanctuary, Morena

Ongoing Projects

1. Title of the Project:- Monitoring of Re-introduced tigers (*Panthera tigris L.*) in Nauradehi Wildlife Sanctuary.

Why this Project:-

The tiger (*Panthera tigris*) is the top-order predator in the Indian subcontinent, with high flagship and conservation value. The latest tiger census conducted in India during the year 2014 shows that it harbours 57% of the global tiger population in 7% of their historic global range. Given that the tiger populations have undergone drastic declines and the recovery efforts including reintroduction are being promoted across the range countries. Nevertheless, such recovery efforts are limited by inadequate understanding of the behaviour of reintroduced animals. Translocation, reintroduction, restocking and rehabilitation are recognized as the central challenges for conservationist to re-establish wild population. Subsequently, the characteristics of home range, movement patterns and inter-specific interaction of released animals are indicative of the post-release response of each animal and the overall success of the release efforts.

Research Methodology: –

- **Studying ranging pattern of reintroduced tigers-** As per IUCN guidelines, all founder population has been radio-collared before hard release. All the collared animals need to be monitored intensively on 24 x 7 basis. Data has been analysed using Arc GIS 10.3.1. Minimum Convex Polygon (MCP) method and Kernal method were used to study the ranging pattern of reintroduced tigers.
- **Food habits and prey choice study-** Food habits and prey choice of reintroduced tigers have been studied from scat and kill data.
- **Studying prey availability for reintroduced tigers-** Line transects have been laid in the overall MCP areas of tigers to assess available prey base for re-introduced tigers. Distance software used for data analysis.
- **Recruitment pattern and population dynamics study -** Reproductive success is a key to the survival of a species, and understanding the reproductive parameters of free ranging large carnivores is crucial for assessing the reproductive output. Continuous monitoring of first litter (three cubs) of reintroduced tigress N1 was done.
- **Collection of vegetation data :-** Study on vegetation composition, forest density and cover in each grid of the area has been carried out as per the working plan norms of Madhya Pradesh.
- Survey of habitat components including waterholes, unique habitats, special habitats, sensitive sites etc done at the time of field survey.

- Human disturbances indices like Number of tree cutting, no of human/livestock trail, people seen, livestock seen, grass/bamboo cutting has been recorded in each 10 m X 10 m plot.
- Topography of the area and forest types have been recorded
- Studying habitat selection of reintroduced tigers- Based on the habitat characteristic of the area and movement pattern of reintroduce tigers, season-wise tiger locations have been analysed and plotted on the classified Landsat ETM+ imagery of Nauradehi Wildlife Sanctuary.

Study design:- NTCA guidelines and SOP has been followed for taking observations of reintroduced tigers.

Objectives of Research:-

- To study ranging & movement pattern of re- introduce tiger in Nauradehi Wildlife Division.
- To study food habit and prey choice of re-introduced tiger.
- To study habitat selection by re-introduced tigers.
- To develop suitable management strategies on long term sustenance and growth of tiger in Nauradehi and its adjoining forest patches.
- Tiger Radio collaring - Radio collaring of male and female tigers.
- Continuous monitoring through Satellite and VHF radio collar tracking
- Monitoring of tiger through camera trap - Camera trap installation based on direct and indirect evidences.
- Preparation of tigers profiles and their individual identification through stripe patterns.
- Pugmark monitoring - Regular PIP checking
- Analysis of tiger movement area - Based on tiger locations point in a certain duration (monthly and seasonal)
- Observation on animal behavior through direct sighting - Through vehicle and elephant back. Based on focal sampling method of each individual tigers
- Kill observation - Recording of kill data through approachable vehicle and elephant back.
- Scat analysis - Collection of scat sample for microscopic analysis of hairs of prey species.
- Vegetation analysis of the area which is using by tigers in different seasons.
- Receiving VHF signals and satellite locations.
- Captured individual images of tigers in different locations of camera trap.
- POP and PIP formation.
- Preparation of MCP in a Arc-GIS software.
- Observed different behavior and interaction with others.
- Filled information in kill data sheet and observed hair samples under the microscope.
- Location of tiger found in different vegetation types in different seasons.
- Tiger with radio collar
- Preparation of MCP and home range map.
- Camera trap images of each session
- Measurement of tiger's pugmark size and differentiation.
- Estimated home range area and prepared map.
- Filled formats of animal behaviors and activities
- Recorded the name of prey species.
- Slides and pictures of hair samples.
- Quadrat data of vegetation

Cost of the Project:- Rs 69.58 Lacs (Received Rs – 53.81 Lakhs)

Outcome of Research:-

- Findings will be very useful for tiger population revival in the area and will support park Managers for proper monitoring and protection of the introduced tiger and their recruits.



Scat sample collection from field



Tiger pugmark measurement



Tracking of Tiger location through antenna and receiver



Female cub N111 (first litter of N-1)



Female N-1 with second litter seen on 26 March 2022



Female cub N111 with N-2 tiger

2. Title of the Project:- Impact Assessment of Proposed Sheopurkalan & Badoda towns a Group Water Supply Scheme-Parbati River Sub-Project under MPUSIP on Aquatic Fauna, River Hydrology & ecology and its mitigation.

Why this Project:-

This proposed project funded by Madhya Pradesh Urban Development Company Limited intends to carry out a specific study to assess the impact of Weir & intake well constructed across Parbati River on aquatic fauna, river hydrology & ecology. The requirement and extraction of raw water for Sheopur Kalan & Badoda group water supply scheme from Parbati river is proposed to be 14.70 MLD in the year 2018, 25 MLD in year 2033 and 24.85 MLD in year 2048 and the impacts of this long term project are to be predicted in reference to the river ecology, existing flora and fauna and their habitat.

Research Methodology:-

The study will be performed by adopting nationally and internationally accepted scientific methods for field surveys in all three seasons i.e. rainy, winter and summer, round the year as under:

- 1. Selection of reference site** - Reference sites will be considered to be streams with values of hydrological stress = 0. Reference sites will not necessarily pristine and could be affected by other human influences; the only criterion for this classification will be that there should be an absence of hydrological stress
- 2. Collection of secondary data** - Pre-existing data will be collected through various secondary sources. Review of previous studies of this area.
- 3. Collection of primary data from study area -**
 - Data will be collected from reference site and 30 sampling sites of the upstream and downstream
 - Inventory of aquatic and terrestrial flora-fauna and their critical habitats
 - Identification of breeding/nesting sites and their mapping.
 - Movement pattern of major critical endangered species
 - Observation on various hydrological & ecological (rate of discharge, water velocity, river depth) parameters affecting the major faunal species in the river system.
 - Observation on Physico-chemical properties of river water.
 - Assess the water availability after water abstraction from the intake well in Parbati River for 50% dependable year, 75% dependable Year and Average Year and its impact.
 - Environmental flow (Rate of discharge, Velocity and Depth) and ambient water flow requirements for various species observed in Parbati River with special reference endangered fauna.

- Study the anthropogenic activities within study area.
- Recommendation and mitigation measures for the identified impacts.

Study Design:-

The study area is proposed to cover about 30 km stretch of Parbati River, 15 km on either sides, upstream and downstream from the proposed Weir & intake well located at upstream side of the near Mandi village including 10 km buffer area of the stretch. Field observation will be carried out as per the points mentioned in methodology.

Objectives of Research:-

- Preparation of Initial Environment Examination (IEE), Indigenous people (IP), Involuntary resettlement (IR)/ Resettlement Plan (RP).
- To study the present status of biological resources, including species distribution their conservation status, migratory bird species and their habitat conditions, breeding/spawning grounds
- To study the river hydrology, morphology, seasonal variations and data collection on historical flow of the study area
- To assess the impact of water extraction on river ecology, and predict the minimum environmental flow required for the survival of major aquatic fauna
- To suggest mitigation measures and prepare management plan to minimize the adverse impacts

Activities Undertaken:-

- Reconnaissance survey and selection of reference site.
- Meeting with MPUDCL team and officials of Municipal Corporation Office, Sheopur Kalan and Badoda
- Study design and preparation of formats
- Selection of Project staff as per requirements.
- Procurement of material / tools/ instruments/ accessories required for study.
- Preparation of Initial Environment Examination (IEE), Indigenous people (IP), Involuntary resettlement (IR)/ Resettlement Plan (RP) reports
- Collection of primary data on existing biological resources – Faunal – Floral species distribution, migratory bird species, and their habitat conditions, breeding/spawning grounds.
- Collection of primary and secondary data on river hydrology, morphology and its seasonal variations
- Water quality analysis for pH, DO, EC, COD, BOD etc.
- Study human activities like riparian agriculture, fishing, sand mining, raw water abstraction, cattle trampling and other human activity of the water supply project to parbati River.
- Review of water supply project DPR for year wise water requirement.
- Procurement of last 10 years classified hydrological data from CWC, New Delhi of study site falling in river Parvati.
- Predict the minimum environmental flow required for the survival of the major aquatic fauna
- Mitigation measures to minimize the adverse impacts of water extraction
- Delineation of the observation sites and layout of study area and collection of secondary data.
- Data on existing environment of the area, indigenous people of the area and if any resettlement happened or proposed in the area due to water supply project.
- Number of aquatic animal species found in the study area.
- List of macrophytes and terrestrial plant species and their distribution in the study area.
- List of migratory bird species and location of their breeding sites.
- Way points on study area map will be found.
- Data on water velocity (Water flow Probe), river depth (Depth finder), width (Range finder and Rope) in each 30 segment of 30 km stretch including reference site in different seasons will obtain.
- Water quality data on pH, DO, EC, COD, BOD, Temperature etc. for each segment in different seasons.

- Estimation of required water volume in MLD for particular area
- Receiving of last 10 years classified hydrological data.
- Limit of water abstraction will be estimated looking to the minimum safer requirement aquatic animals.
- Suggestions measures to minimize the adverse impacts will be based on the finding of the study.
- Detailed project layout and finalization of study area and observation points and prescribed formats
- Output in the Preparation of Initial Environment Examination (IEE), Indigenous people (IP), Involuntary resettlement (IR)/ Resettlement Plan (RP) reports.
- Physical features of the river and status of water discharge and Physic-chemical characteristics in different seasons.
- Estimation of total water requirement upto 2048.
- Prediction of the minimum environmental flow required for the survival of the major aquatic fauna
- Suggested mitigation measures.
- Project report with output data of river, water health, anthropogenic activity, assemblage of macro invertebrate, population of critical endangered species create data base of study area.
- Hardcopy and softcopy of the prescribed format and location map of fall the observations sites.

Cost of the Project:- Rs. 67.57 Lakhs

Expected Outcome of Research:-

- Impact prediction of for Sheopur Kalan & Badoda group water supply scheme from Parvati River and construction of weir and intake well on survival of the major aquatic fauna and the estimation of minimum required environmental flow for endangered fauna
- Output data and project findings will be useful for long term water management and habitat management plan for critical endangered species and other sensitive aquatic animals.



Reconnaissance survey of Parvati river project site, Sheopur



View of data collection from Parvati river, Sheopur



Mugger (*Crocodylus palustris*)



Sarus crane (*Grus antigone*)

Regular activities:

1 Title of the Project:- Maintenance of Monitoring and Evaluation Facilities and Database of Predators Prey in Madhya Pradesh.

Objectives of Research:-

- Organization of training / workshop programme for different forest division.
- Visit of conflict areas of the state.
- Data analysis of predators and prey as desired by department time to time.
- Maintenance of data base.
- Renewal of Radio Collar activation etc.

Activities Undertaken:-

- Maintenance of Tiger database, herbivore and carnivore database of the year 2016, 2017 and 2018 and add on the new data.
- Maintenance of iridium data of radio collars and their charges.
- Demonstration and checking of Radio telemetry equipments i.e. Radio Collar, Multichannel Receiver and Antenna at the time of distribution to various PAs.
- Renewal of Radio Collar Licence charges form Department of Telecommunications, New Delhi, Ministry of Communications, Government of India.
- Data for herbivore density and carnivore encounter rate has been analysed and sent to the following offices for inclusion in working plan –
 - Chief Conservator of Forests, Sagar
 - Chief Conservator of Forests, Balaghat
 - Chief Conservator of Forests, Chhatarpur – information for 2018
 - Divisional Forests Office, Obaidullahganj – information for 2018
 - Divisional Forests Office, South Panna
- Radio telemetry equipments i.e. Radio Collar, Multichannel Receiver and Yagi Antenna distributed and demonstrated to Nauradehi Wildlife Sanctuary, Panna Tiger Reserve, Satpura Tiger Reserve.

Cost of the Project:- 25.00 Lakhs

Deliverable technologies developed in each project for stakeholders, forest professionals, field foresters and other beneficiaries.

1. Monitoring and evaluation of wildlife and their habitats for sustainable management and development in the protected areas/ territorial divisions of Madhya Pradesh.

Population status of tiger co-predators and prey species is the main output of this project including all the details of individual tigers and prey biomass of particular Protected Areas, Territorial Divisions and M.P. Forest Development Corporation Projects. The range-wise results are applicable for the management interventions carrying out by management authorities.

2. Monitoring Re-introduced tigers (*Panthera tigris* L.) in Nauradehi Wildlife Sanctuary.

Regular monitoring of the reintroduced tigers result in their home range, movement patterns, habitat preference and inter-specific interaction of released animals are indicative of the post-release response of each animal that information is very applicable for park management and animal protections.

3. To Study the impact of proposed Morena Water Supply under sub project MPUDP on the Dolphin, Crocodile & Gharial and their habitat in National Chambal Gharial Wildlife Sanctuary, Morena (M.P.).

Findings of the study will assess the maximum quantity of water to be abstracted from Chambal River leaving the sufficient water for the safe guard of major aquatic endangered species i.e. Gharial, Mugger and Dolphin. Assessment of water quality will give information on various kind of water pollution which may be controlled by the concerned authorities.

2.2.3 WILDLIFE MANAGEMENT RESEARCH DIVISION

Mandate

1. PA Network
2. Wildlife Management
3. Man - Animal interactions
4. Landscape-level planning and management
5. Corridor management

Ongoing Project:- 01

1. Study on Tiger Presence and their dispersal movements in Ratapani- Kheoni landscape of Vindhyan Range
Funding agency : PCCF (Wildlife) M.P., Bhopal,

Project Summary

1. Title of the Project:- “Study on tiger presence and their dispersal movements in Ratapani-Kheoni landscape of Vindhyan range.”

Why this Project:-

The need for the project originated due to roaming of dispersal tigers near Bhopal city, the capital of Madhya Pradesh. Scientific investigation was required to make a strategic plan for sustainable wildlife management, in decision supporting system (DSS) for demarcation of critical tiger habitats based on prevailing functional attributes and GIS mapping of pinch point barriers by calculating geospatial resistance for tiger movements at connecting linkages. The landscape-level functionality assessment through genetic relatedness and gene flow between the adjoining source populations of the landscape, for the presence of tigers within the urban matrix was critical in managing the human/animal interaction. Study will be helpful in the strategic green development of Bhopal capital in future, with particular reference to tiger conservation in the Ratapani-Kheoni landscape.

The study demonstrates the feasibility of using non-invasive genetics as one of the methods for monitoring land occupancy. The data of opportunistic camera trap method being used for the past five years' will help to identify the land use pattern of dispersal of tigers in the study area. The present knowledge of tiger presence outside protected areas is inadequate, and there is a need to address this issue to enable better management of the potential alternative tiger habitat in Madhya Pradesh. This project addresses this issue by providing reliable information through monitoring tigers in the Ratapani-Kheoni landscape.

Research Methodology:-

- **For Occupancy analysis:** The present study was initiated with the goal of occupancy modeling and long-term conservation of tigers in the landscape. Analysis of single-species, single-season model using program PRESENCE 2.13.6 (Hines, 2006), to show the tiger occupancy & framework of a tiger in the landscape. The total study area was around 4620.84 sq. km.
- **For MaxEnt analysis:** The survey was conducted in 234 of 337 beats in the study area of the Ratapani-Kheoni landscape. In the figure, the track line represents the trails over the beat surveyed for Tiger, leopard, sloth bear, jackal, etc. the number of the track is 234 along with the same number of the beat surveyed and the analysis of presence data. The grid length and width are 3.14 X 3.14 km and a total of 10 km² of area grid. The analysis requires independent environment variable layers. The steps required to modify environmental layers in ArcMap. The same pixel size

were used for all layers as the elevation raster layer (pixel size: 0.0026). MaxEnt analyses are run by using only the present location of the species under species distribution modeling (SDM). A Bias layer background was created in the present location of the tiger. The MaxEnt (Javascript) software needs to be set before running some settings in the environment. Random test percentage was kept at 25, replicates were fixed 15, replicate run type was "subsample" and Maximum iteration was kept 5000 all these manual standards were kept before running the software.

- **For BMLR analysis:** Field survey data was collected in the predesigned and functionality survey forms.

Data collection: The functionality survey was done for tigers in the Ratapani-Kheoni landscape to determine tiger presence and habitat-related variables from Dec 2018 to June 2019.

Presence Data: Tiger's sign marks were recorded as encounter rate during the field survey. The location of the tiger signs was recorded in GPS and the details were filled in the predesigned format.

Multi-collinearity test: A method to detect any multi-collinearity is with checking of VIF (Variance Inflation Factor) and tolerance values in the regression model (Pratisto, 2010). Feasibility test of logistic regression model: Hosmer-Lemeshow test was used to test the model feasibility (Hosmer&Lemeshow, 2000).

Binomial Multiple Logistic Regression analysis: BMLR is a form of regression where the dependent variable is dichotomous (binomial) and multiple independent variables are continuous or categorical or both. It measures the relationship between a categorical dependent variable and continuous independent variables by converting the dependent variable to probability scores. (Equation 1): where P is the probability of the dependent variable, B (b₀, b₁,...b_k) are the coefficients of independent variable X (x₁, x₂,.... x_k).

$$P = \frac{\exp(\sum BX)}{1 + \exp(\sum BX)}$$

Data preparation for model: Extrapolation of the model was conducted within all areas of Ratapani-Kheoni Landscape to give the picture of parts of the landscape that suits tiger habitat.

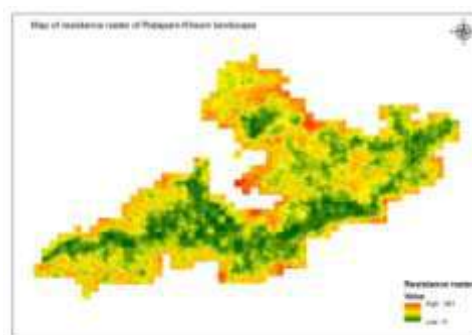
- **corridor designing in ArcGIS 10.3.1 by using Linkage mapper tools:**

Preparation of resistance raster to linkage mapper: Generally landscape utility tools use to generate the cumulative raster on the value of resistance of feature on the ground. One of the most important factor is Resistance value based on the negative impact of feature in respect of suitable focal patches.

Preparation of resistance raster to linkage mapper: Generally landscape utility tools are used to generate the cumulative raster on the value of resistance of feature on the ground.

Resistance habitat calculator: The Resistance and Habitat Calculator tool used to create a resistance map using the values in column F of the Excel spreadsheet. Resistance values can be calculated as the maximum or the sum across all input layers.

Linkage Mapper tool: We used Linkage mapper GIS tools to support regional wildlife habitat connectivity analysis. It consists of several Python scripts, packaged as an ArcGIS 10.1 toolbox, that automate the mapping of wildlife habitat corridors.



- **Population genetics through DNA analysis:**

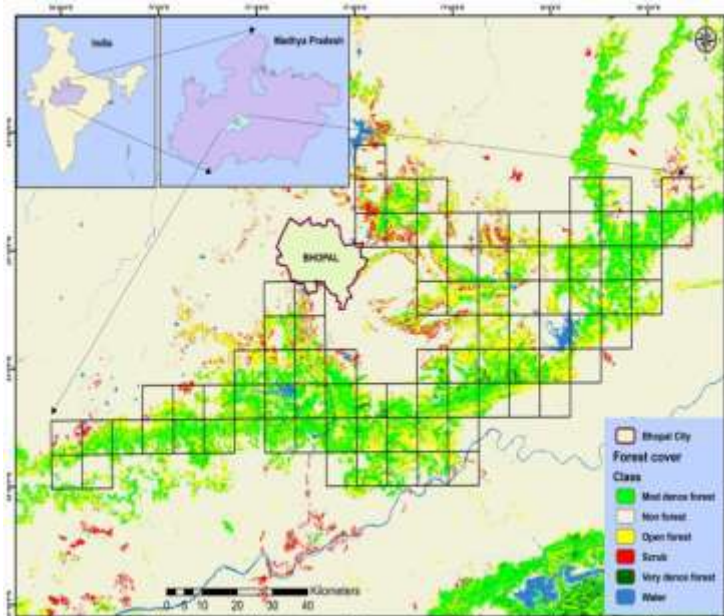
Sampling: Sampling: Samples were collected between December 2017 to June 2019 in the Ratapani-Kheoni landscape and Satpura Tiger Reserve in central India. 359 scat samples were collected from the Ratapani-Kheoni landscape and 267 scat samples from Satpura Tiger Reserve, which were presumed to be from tigers (*Panthera tigris tigris*). The DNA analysis for population

genetics was performed in Uma Ramakrishnan (Associate Professor) Lab. NCBS, Bengaluru, in the following steps:

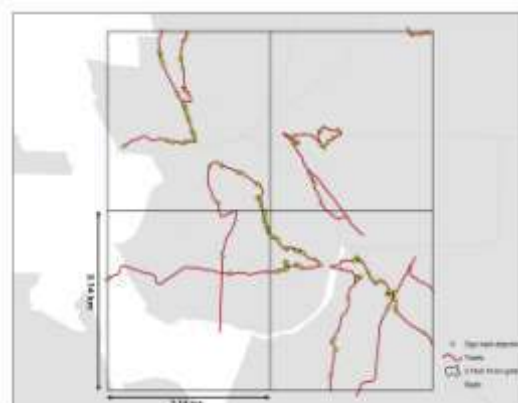
- Sample processing
- DNA extraction
- Species identification
- Genotyping using mPCR
- Individual identification
- Population genetic analysis

Study Design:- The tiger sign mark survey was conducted for tigers in the Ratapani-Kheoni landscape

to determine the tiger-bearing area in the landscape from December 2018 to April 2019. For the tiger in south-western India, the cell size was set based on the expected maximum home range size of ~200 (Karanth and Sunquist, 2000) and tiger in Panna tiger reserve in central India, the home range of male and female tigers were 132.7 and 73.6 (Sarkar et al., 2016). Initially, 8*8 grids were superimposed on the landscape geo-referenced map of the study area. A total of 5312 (sq.km), was initially surveyed. The area was surveyed for prey presence species occupancy survey method was used that explicitly accounted for spatial correlation recently designed to assess large-scale occupancy of tigers (Hines et al., 2010).



- **Field protocol:** The tiger occupancy sign survey was performed from December 2018 to April 2019. The survey was conducted in the winter and autumn season. The tiger moves along forest trails to hunt or to locate, avoid, or deter conspecifics (Karanth and Sunquist, 2000). Their passage is marked by tracks and occasional scat deposits (Smith et al., 1989). Fresh signs of tigers and major ungulate prey species in the Ratapani-Kheoni landscape were identified and recorded. We recorded the presence sign of tigers, Nilgai, cattle, sambar, chital, and sloth bear, along with habitat-related variables. Sign detection was assigned only once to each 100m. Trail segment thus yielding the standard (detection) "1" or "0" (non-detection) histories required for occupancy analysis. The sign detection data were aggregated at 1 km length from spatial replications (Mackenzie et al., 2006; Hines et al., 2010). We used the referent of the single species occupancy model (MacKenzie et al., 2002) developed by (Hines et al., 2010) to analyze the data that were preferred using program presence (Hines, 2006). We first compared the model of (MacKenzie et al., 2002) and (Hines et al., 2010) without additional covariates to choose the appropriate model type for conducting further analysis (Karanth et al., 2011) all model comparisons were based on the Akaike information criterion (AIC) values (Beier, Burnham and Anderson, 2002). We estimate the overall occupancy rate, Ψ , with the result of preparing the whole Ratapani-Kheoni landscape enclosed



Objectives of Research:-

Monitoring of tigers through non-invasive DNA sampling;

Non-invasive genetic analysis to establish tiger presence, minimum tiger numbers, sex, and their distribution.

Short term sub-objectives:-

- Spatial distribution of Tigers.
- Minimum numbers of Tigers along with sex ratio.
- Habitat improvement strategy for fragmented forest areas.
- Make certain wildlife conservation and its continuity.
- Identification of priority areas for tiger conservation.
- Identification of linking corridor with minimum resistance for Tiger movement.
- Identification of pinch point barrier (bottleneck) within the connecting linkage.
- Identification of landscape area facing human-animal conflict along with the prescription of mitigation strategy.

Long term objectives:-

- Tiger population stability in the sanctuary.
- Degrees of genetic relatedness exists between the intra and inter-adjointing sub metapopulation of the landscape.
- Identification of areas of the landscape can support the residential and transient population.
- Tiger occupancy in the landscape.
- The pattern of movement during dispersal in the landscape.

Activities Undertaken:-

Data sorting, Geo-tagging and GIS mapping, Occupancy in Presence, Analysis of habitat suitability modelling including MaxEnt, Binomial multiple logistic regression (BMLR) etc. were performed. Linkage mapper was performed for corridor designing. Habitat suitability prediction was performed of different models viz. Generalized linear model (glm), Random Forest (RF), Support Vector Machine (SVM), MaxEnt (SDM), Boosted Regression Trees (brt) in R language

Cost of the Project:- 37.44 lakhs

Expected Outcome of Research:-

- 1) Minimal tiger population, tiger spatial distribution map, tiger habitat suitability map by Binomial Multiple Logistic Regression (BMLR) analysis, molecular characterization of every captured tiger database will be used as forensic evidence, established DNA bank of tigers will be used in further tiger genomic studies, the importance of corridors as connected stepping stones in maintaining genetic exchange for genetic vigor of wildlife, the utility of the wildland block (stepping stone) concept will find out, the importance of weak linkages for tiger dispersal and movements between tiger conservation prioritization units in the Ratapani-Kheoni landscape of Madhya Pradesh.
- 2) The project findings will help to prepare a landscape management plan for the scientific conservation of wildlife, habitat, and human-wildlife interaction management.
- 3) Information regarding land use and occupancy of individual tigers will prove very precious as it provides baseline data in EIA studies.

Outcome of Research

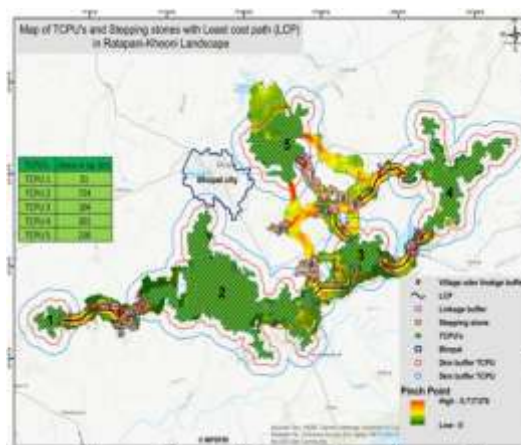
- The minimal unique tiger population is 19 in 2018-19 based on DNA genotyping (NGS)
- Ratapani individuals form their own cluster (STRUCTURE analysis)
- Ratapani has very little shared ancestry with Satpura, Kanha –Pench and Bandhavgarh populations, Not closely related or connected to any within the landscape
- The occupancy survey across the study area of a total 5312 (sq.km), segment distribution 83 grid cells (size 64 sq.km).
- The detected tiger sign in 49 of 83 grid cells was confirmed, which yielded a naïve occupancy of 0.5904.

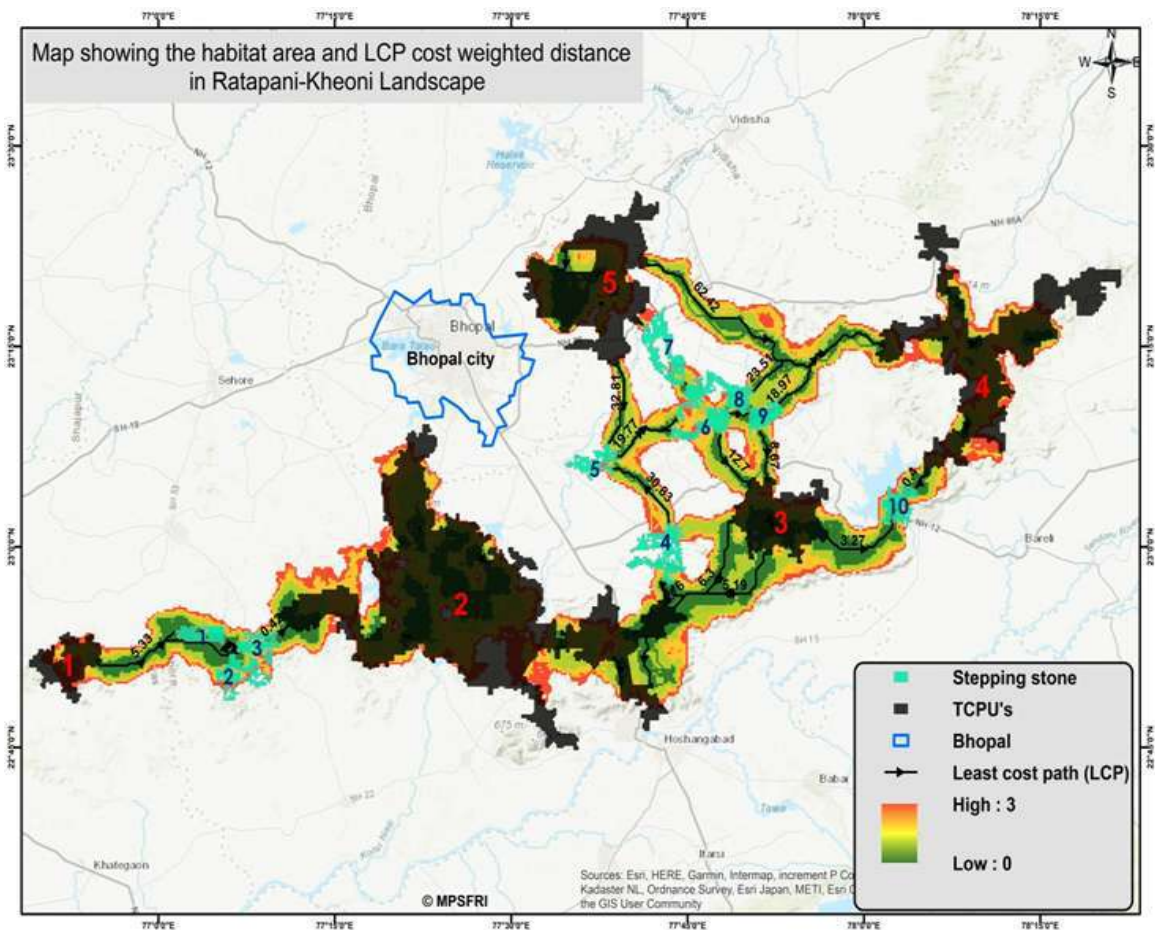
- The tiger occupied estimated potential **tiger habitat is 70.83%, or an area of 3762.48 (SE=482.34) out of 5312(km²)**
- In contrast, the traditional '**presence-versus-absence**' approach is only **3136.20 km² and underestimated true occupancy by 59.04%**
- The best-fitted model identified by inference of occupancy analysis is Hines model under which $\psi(\text{Cattle}+\text{Ruggedness})$, $\theta(\cdot)$, $\theta'(\cdot)$, $\text{pt}(\text{Nilgai}+\text{Water})$ model has shown the lowest AIC (value-1144.59) among 44 models. The model-specific $\beta(\text{beta})$ Coefficient estimate for covariates determining the Tiger occupancy in Ratapani-Kheoni landscape (RKL) is tiger $\beta_0(\text{SE}[\beta_0])$ -0.52(0.61).
- The historical tiger population persists near the city in the Vindhyan landscape due to the ruggedness of the terrain, abundant water availability and prey (mainly Bluebull/Cattle) presence.

S. No.	Variable	Variable code	Percent contribution
1	<i>Boselaphustragocamelus</i> probability of occurrence	Nilgai_avg	28.1
2	<i>Rusaunicolor</i> probability of occurrence	Sambar_avg	8.8
3	Topographic ruggedness Index	Ruggedness TRI	7.2
4	Village density	Village_Density	5.9
5	Annual mean temperature	AM_Temp	5
6	Minimum temperature of coldest month	Min_Temp_CM	4
7	<i>Muntiacus muntjak</i> probability of occurrence	Barking_Deer_avg	3.6
8	Maximum temperature of warmest month	Max_Temp_WM	3.5
9	Melursusurcinus	Sloth_bear_presence	3.3
10	Slope	slope	3.2
11	Bamboo regeneration	Bamboo_Regeneration	3.2
12	DEM elevation	Elevation	3
13	<i>Axis axis</i> probability of occurrence	Chital_avg	3
14	Bamboo forest	Bamboo_forest	2.9
15	Water availability upto March	Water_Availability_Upto_March	2.8
16	Human footprint	Human_footprint	2.7
17	Forest cover	Forest cover	2.4
18	Distance of village from forest compt.	DST_From_Village	2.3
19	Annual precipitation	Ann_Precipitation	1.9
20	Cattle count	Cattle_Presence	1.7
21	Human population density	Population_Density	0.8
22	Precipitation of Driest month	Precipitation_DM	0.7

Percent Contribution for each variable of the model

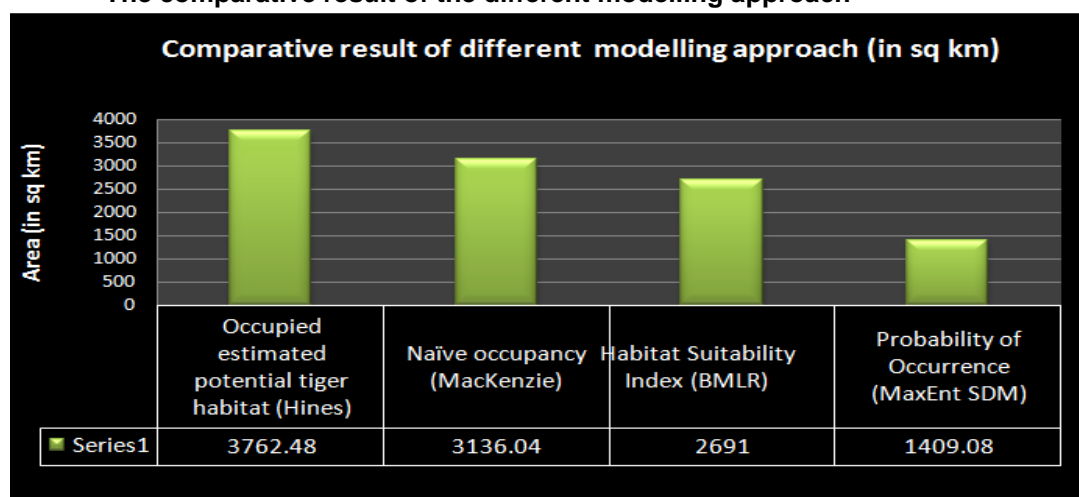
The total 7210 km² area was mapped on the GIS platform by using ArcGIS 10.1 software to find out the tiger conservation prioritization areas (TCPUs). TCPU_1, TCPU_2, TCPU_3, TCPU_4 and TCPU_5 were identified using MaxEnt software within a studied landscape area. The probability of occurrence was predicted at 1409.08 km² in the study area of the landscape. The identified TCPUs area was spatially distributed in five conservation units, namely TCPU_1 (50.99 km²), TCPU_2 (724.20 km²), TCPU_3 (104.43 km²), TCPU_4 (301.48 km²) and TCPU_5 (227.98 km²). Map of TCPUs, Stepping stones and Cost weighted distance is shown below





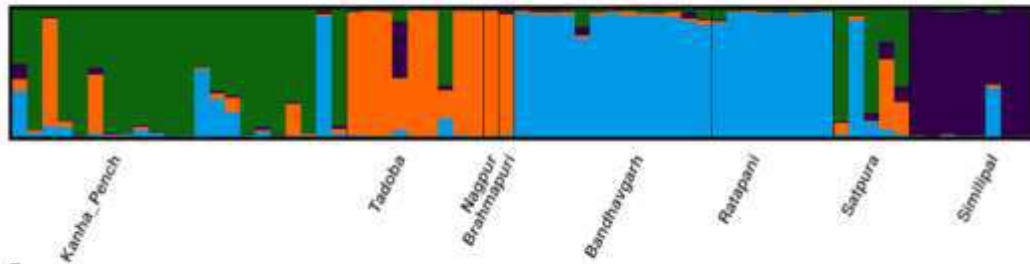
Linkage	Cost Weighted Distance (CWD)	Linkage length (in km.)	Village falling under 0-3 km swath	Village falling under 3-5 km swath	Total Villages
1	0.06	26.278	0	5	5
2	0.42	2.137	0	1	1
3	5.19	18.406	0	3	3
4	3.27	12.669	0	2	2
5	0.40	2.847	0	0	0
6	18.97	21.263	4	4	8
7	12.70	9.149	1	3	4
8	3.74	1.066	2	2	4

The comparative result of the different modelling approach

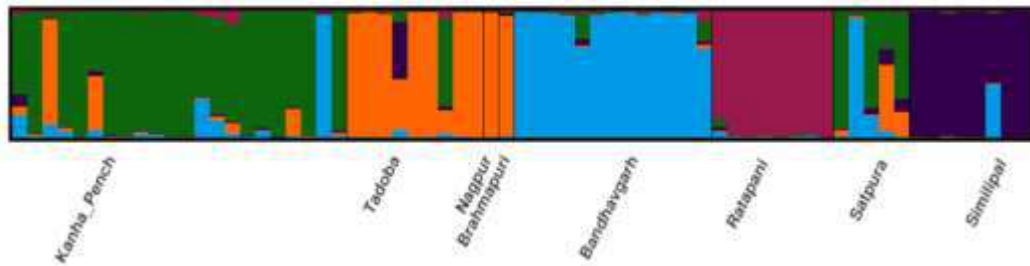


- Analysis of the four focal populations using structure indicates K=4 best explains the genetic clustering of these populations.
- Ratapani individuals form their own cluster and do not show this pattern of shared variation.

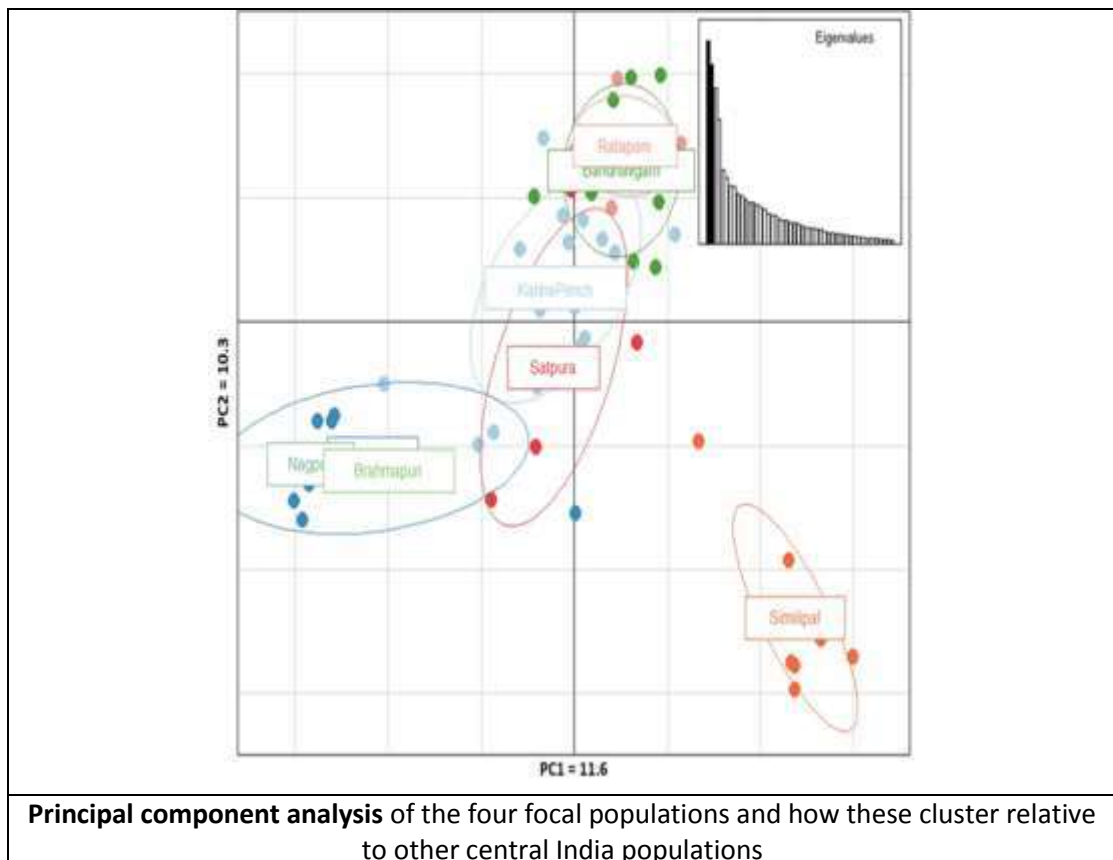
K=4

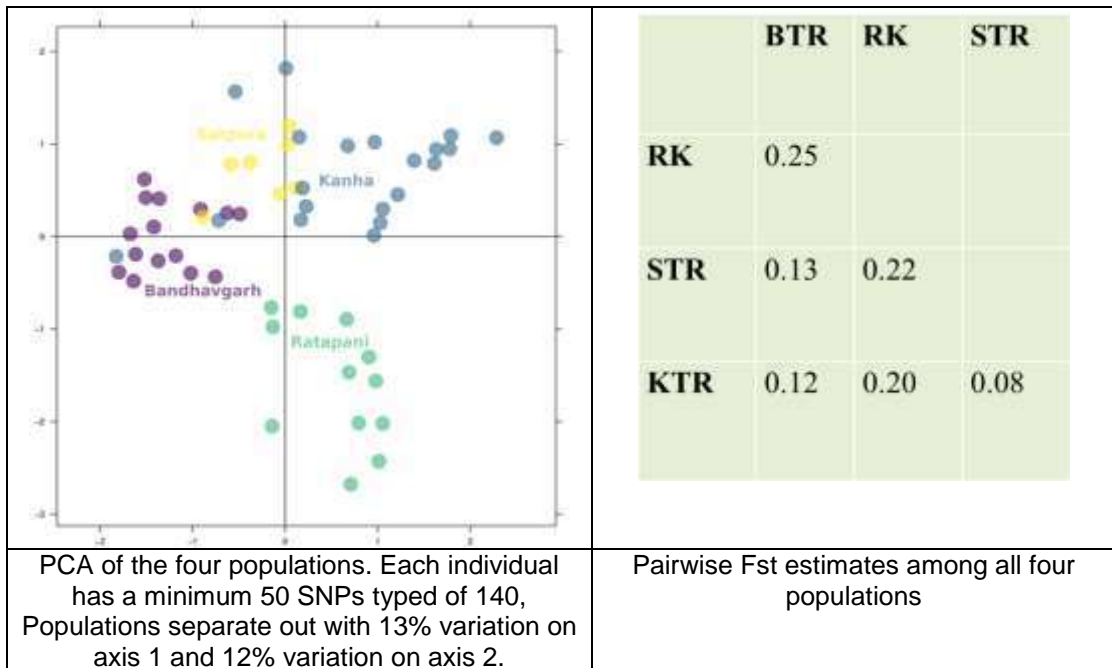


K=5



Population genetic STRUCTURE analysis of central India highland





- Analysis of clustering of these populations and assignment based on STRUCTURE indicate that there is some clustering of Kanha and Satpura populations, and these have the lowest Fst estimate.
- There is some shared ancestry between Satpura, Kanha, and Bandhavgarh, with some individuals sharing high proportions of ancestry based on the STRUCTURE plot.
- In addition, estimates of Fst between Bandhavgarh and Kanha and Satpura are relatively low. This suggests that there may be some movement of individuals among these populations.
- Ratapani has moderate Fst with all of the three other populations in the landscape (0.2-0.25). Based on STRUCTURE analysis, Ratapani has very little shared ancestry with any of the populations.
- Overall it does not appear that Ratapani is more closely related or connected to any of these three populations within the landscape.

Further landscape-level analysis that assesses the impact of landscape features and distance across the landscape could help in explaining the apparent isolation or low connectivity of Ratapani with other populations within this landscape.

In most cases, the Tiger dispersal movement overlaps the territorial forest of three divisions: Bhopal, Obbadlahganj and



Sehore. Tigress showing remarkably long-range behaviour is unique behaviour in thin and fragmented suitable habitat in Ratapani landscape.

Deliverable technologies developed in each project for stakeholders, forest professionals, field foresters and other beneficiaries:

The methodology will be helpful for decision support in the prioritization of tiger conservation patches and also provide baseline information for a strategic conflict mitigation plan.

2.3 FACILITATION CELL

2.3.1 ENVIRONMENTAL IMPACT ASSESSMENT (EIA) CELL

Mandate

1. Environmental Impact Assessment Study

On-going Projects :- Two

1. Assessment of impact of Doubling of Katni Singrauli Railline Project on flora, fauna and habitats of Sanjay-Dubri Tiger Reserve

Funding Agency: IRCON Pvt. Ltd.,

2. Environmental Impact Assessment on Flora, Fauna & Socio economic status of local communities and action to be taken to mitigate impact of Kopra Medium Project at Nauradehi Wildlife Sanctuary, Sagar District (M.P)

Funding Agency: Water Resource Department, M.P.

Project summary

1. Title of the Project:- **Assessment of impact of Doubling of Katni Singrauli Railline Project on flora, fauna and habitats of Sanjay-Dubri Tiger Reserve.**

Objectives of Research :-

- To collect the baseline data on existing flora and fauna and socio economic status of the area for Biodiversity report.
- To assess the probable impacts of the proposed activities on flora and fauna of the area & their habitat within the 10 km impact zone
- To assess the impact of noise, air and water quality due to proposed activities
- To suggest mitigation measures and animal passage plan for conservation/protection and improvement of flora, fauna, habitats and social status of local communities.
- To create a cadre of master trainers on advanced wildlife population monitoring techniques who can further transfer their knowledge to frontline forest staff of their respective forest divisiobs/PAs
- To train all frontline forest staff of tiger bearing beats of this state.

Activities Undertaken:-

- Recruitment of project staff
- Collection of baseline data on existing flora of the area is in progress
- Collection of Air, noise and water samples is in progress
- Scanning 28.65 km foot patrolling of Beohari Buffer, Bastua Core and Dubari Core with the help of forest rangers and beat guards
- Monitored all sensitive under and overpasses and recorded newly proposed under and overpasses and fencing locations at animal sensitive areas of Katni-singrauli railway line

Structures-Summary

Structures	Beohari	Bastua	Dubari	Overall
Underpasses (Existing)	4	6	16	26
Underpasses (Proposed)	1	0	9	10
Overpasses (Existing)	1	0	1	2
Overpasses (Proposed)	0	0	3	3
Fencing (Proposed)	03	04	13	20

Cost of the Project : Rs. 40.78 Lakhs

Expected Outcome of Research:-

Baseline data and mitigation measures with reference to following details

- Bio-diversity Impact Assessment Report
- Animal Passage Plan



2. Title of the Project:- Environmental Impact Assessment on Flora, Fauna & Socio economic status of local communities and action to be taken to mitigate impact of Kopra Medium Project at Nauradehi Wildlife Sanctuary, Sagar District (M.P)

Why this Project:-

- The Kopra river is the tributary of the Sonar river (a tributary of Ken river, Yamuna basin).
- Kopra Medium Project would help in maximum utilization of water in Sagar District, Madhya Pradesh.
- The proposed Dam and its submergence area falls under Nauradehi WLS, this is why it is important to study the impact of dam on the wildlife habitat and local communities.
- The proposed study would create a base line information on flora, fauna and socio economic status of local communities. This study may help to develop long term suitable strategy by Nauradehi WLS and also by Water Resource Dept., M.P.

Research Methodology:-

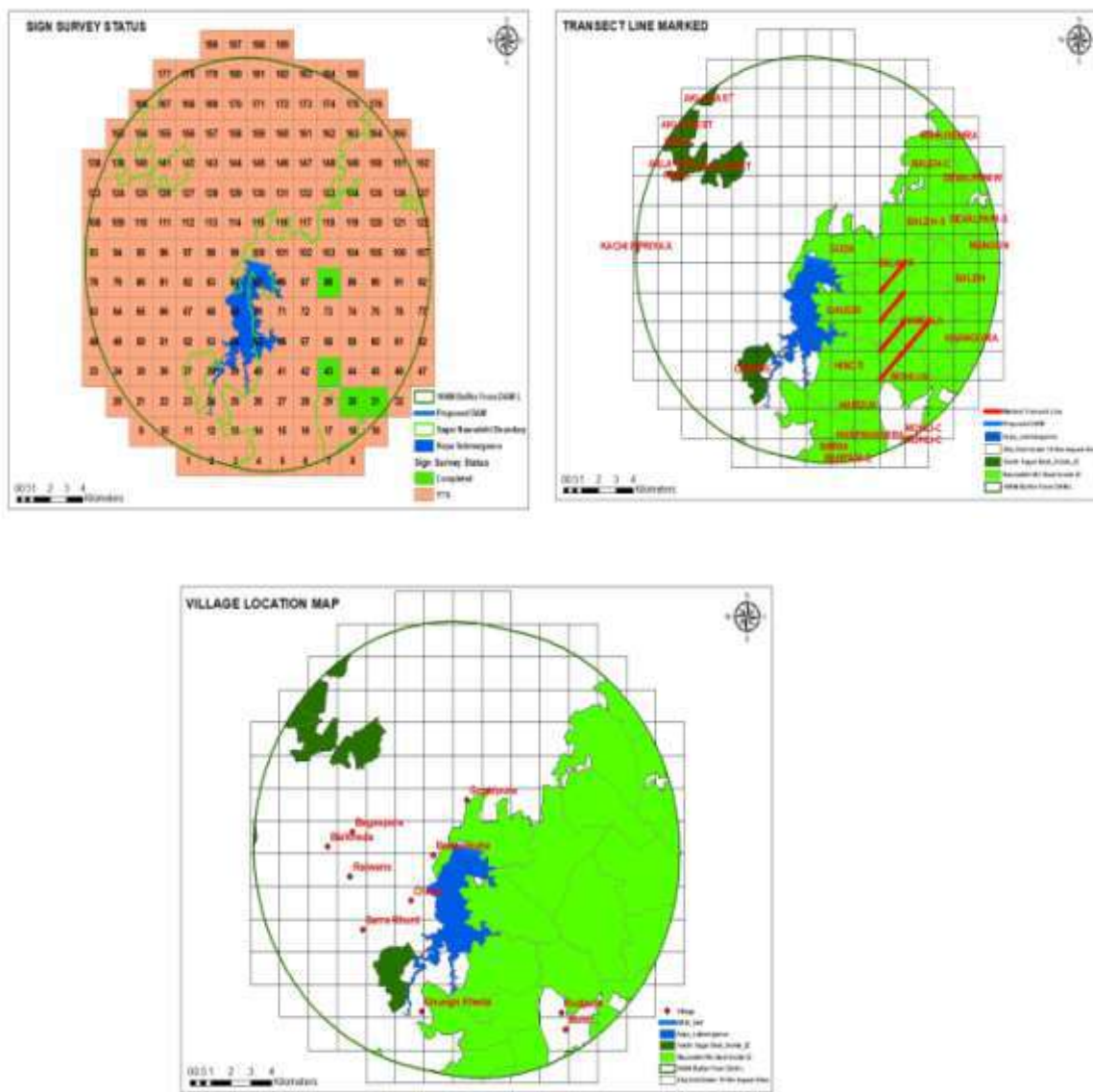
- Reconnaissance survey has been done.
- All respective maps have been prepared for detailed survey under impact zone.
- All secondary data has been collected.
- Project staff has been recruited.
- Field data sheets are prepared for wildlife, vegetation and socio-economic surveys

Objectives of Research :-

- To collect baseline data on existing flora, fauna and socio economic status of the area.
- To assess the probable impacts of the proposed activities on flora, fauna of the area and their habitat within the 10 km impact zone.
- To assess the impact of noise, air and water quality due to proposed activities.
- To suggest mitigation measures for conservation/protection and improvement of flora, fauna, habitats and social status of local communities.

Activities Undertaken:-

- Recruitment of project staff
- Collection of baseline data on existing flora is in progress
- Collection of Air, noise and water samples is in progress
- Sign survey- Surveyed 4 grids out of 189 grids
- Line transect- Marked 5 transects out of 48 transects
- Socio economic status of local communities- Visited and collected village level information from 15 out of 40 villages.



Cost of the Project : 47.14 Lakhs

Expected Outcome of Research:-

Identification of all potential environmental impacts due to proposed dam construction is an essential step of Environmental Impact Assessment. In case of dam construction projects, impacts on biodiversity, air pollution, water pollution and social issues are significant. Both direct and indirect environmental impacts will be created on various environmental attributes due to proposed activity in the surrounding environment, during the operational phase. This study will reveal how the activities being carried out will affect the flora, fauna, wildlife and socioeconomic attribute and mitigation measures will be suggested.

2.3.2 EXTENSION, TRAINING AND CONSULTANCY

Mandate

1. Dissemination of forestry research technologies evolved by the institute.
2. To act as a nodal agency for co-ordination of research extension activities.

Activities

- Publication of Annual Research Report, Annual Action Plan of the institute and training modules.
- Organization of trainings, workshops, meetings, seminars and conferences and preparation of proceedings and action taken report.
- Participation in 'Kissan Mela', 'Herbal Fairs' and public awareness events.
- Providing logistic support of xeroxing audio visual equipments, public address system, binding of research documents.
- Co-ordination with different research divisions and facilitation cells of the institute.
- Providing desired information about research services to the stakeholders.
- Preparation of information related to Madhya Pradesh Vananchal Sandesh, Annual Administrative Report, Annual Statistical Report and informations pertaining to extension of activities of the institute for the M.P. Forest Department.
- Providing I.D. nos. to all research projects, compilation of information of research projects of the institute
- Co-P.I. in the Network project on "Conservation of Lac insect genetic resources of IINRG, Ranchi."
- Training co-ordinator of the training programme "Preparation of plants in the root trainers and its transplantation in the field" organized by the institute.
- Member Secretary of the drafting committee of the Vision Document 2030 of the institute.

Dissemination of information

a. Annual Action Plan

Monitoring and evaluation of progress of the works as per the Annual Action Plan 2022-23 by conducting quarterly review meetings of each division periodically.

b. Annual Research Report

The Annual Research Report for 2020-21 was prepared, published, and disseminated to all the stakeholders.

c. Dissemination of research technologies and strengthening of extension linkages



Exposure visit of trainee forest rangers, forest guards and students

d. Online and physical exposure to research activities of the the institute to the trainee forest rangers, trainee forest guards and students

Probationary Trainee Forest Range Officers posted in various forest divisions of M.P., Uttarakhand Forest Training Academy Haldwani, Telangana State Forest Academy, Hyderabad, Karnataka State Forest Academy, Gungaragatti, Under graduate students from Kerala Agriculture University, Trainee

ACF's from Central Academy of State Forest Service, Coimbatore, Trainee Forest Rangers & Forest Guards from Shivpuri, Betul and Balaghat visited the institute physically as well as online during the year as a part of their course curriculum. They were acquainted with the research activities of the institute by class room lectures and visit to various laboratories, wildlife, mist chambers, shade net houses, gene bank, botanical garden, nurseries, museum and herbarium, located in the campus.



Exposure visit of trainee State Forest Service officers & Forest Rangers from KSFA & CASFOS

e. Organization of National Campaign Azadi Ka Amrit Mahotsav 'AYUSH Aapke Dwar' programme at SFRI.

Under the the national campaign Azadi Ka Amrit Mahotsav 'AYUSH Aapke Dwar' Medicinal Plant Farmers Conference was organized on September 05, 2021 in K.P. Sagaria Auditorium in SFRI. On this occasion, a sapling of Sita Ashoka was planted in the premises of State Forest Research Institute by the Hon'ble Forest Minister of Madhya Pradesh, Dr. Kunwar Vijay Shah, the chief guest of the program.

Hon'ble Forest Minister informed all the participants present in the conference that inclination of many young farmers has moved towards the cultivation of medicinal plants and other farmers are also involved in medicinal plant farming

On this occasion, saplings of Sita Ashok were also distributed to the participants. In the program 60 farmers, officers of pharmaceutical companies, Forest Department, AYUSH Department, Horticulture Department, Principal of Ayurvedic College and farmers from many states of the country were connected online. On this occasion, brochure of 10 major medicinal plants published by the Regional cum Facilitation Center of the institute were released.



Plantation of Sita Ashoka by Hon'ble Forest Minister, Govt. of MP in SFRI



Release of Technical Bulletins published by RCFC



Address by Hon'ble Forest Minister, Govt. of MP to the participants



Distribution of Sita Ashoka Plants to the participants

f. Distribution of medicinal plants in various districts of M.P. & C.G. by RCFC

Regional cum Facilitation Center distributed 34889 medicinal plants to 1675 farmers in the districts of Morena, Shahdol, Jabalpur, Balaghat, Sehore, Sidhi and Bilaspur in the state of M.P. & C.G.



g. Training program regarding plant preparation in polyhouse, greenhouse and mist chamber & on planting techniques of rare and threatened species.

A one-day training program was organized regarding plant preparation in polyhouse, greenhouse and mist chamber in Sagar and Jabalpur circles of social forestry and one-day training program has been organized by the State Forest Research Institute on the techniques of planting rare and endangered species in all circles of social forestry.



Training programme in Social Forestry Circle, Gwalior

h. Organization of training programme on “Selection of Seed Farms, Establishment of Seed Production Areas, Management, Training and Demonstration Program on Seed Technology and Nursery Management”.

Seed Division of State Forest Research Institute Jabalpur organized three days 02 training programs in the month of September, 2021 for the Social Forestry Circle of Indore and Bhopal. The training was also participated by regional level officers and employees from Territorial Forest Division, Sendhwa, Barwani, Khargone, Barwaha, Indore, Obaidullaganj, Raisen, Sehore, and Bhopal. Topics on project formulation, selection of seed farm, establishment and management of seed production area, seed quality, maturity, storage, treatment and plant preparation, planting techniques and management, training and demonstration on vermicompost preparation were included in the training module. 44 field level officers and field foresters were trained.



Participants of the training programme with faculty members



Classroom session of training programme



Field visit and demonstration in the seed production areas



Distribution of certificate of participation to the trainees by Director, SFRI

i. Organization of workshops for the training of master trainers of various forest divisions for All India Tiger Estimation-2022

State Forest Research Institute, Jabalpur is providing technical assistance to Madhya Pradesh Forest Department for Tiger Estimation. For All India Tiger Assessment Year 2022, the data collection under Phase-1 protocol has been done by this institute by more than 300 field staff at the following 11 places in the state. Training has been provided for Gandhi Sagar Wildlife Sanctuary, Mandsaur Madhav National Park, Shivpuri, Khowani Wildlife Sanctuary, Dewas Ratapani Wildlife Sanctuary, Obaidullaganj, Sapatuda Tiger Reserve, Hoshangabad Nauradehi, Wildlife Forest Division, Sagar, Pench Tiger Reserve, Seoni Bandhavgarh Tiger Reserve, Umaria, Kanha Tiger Reserve, Mandla Panna Tiger Reserve, Panna, Sanjay Dubri Tiger Reserve, Sidhi. The training teams of the IDPAP were also involved as trainers in all the training venues



Training programme at Kanha Tiger Reserve



पन्ना टाईगर रिजर्व प्रशिक्षण स्थल Training programme at Panna Tiger Reserve

j. Participation in the 8th International Herbal Fair, Bhopal by SFRI & RCFC, Central Region, Jabalpur

The 8th International Herbal Fair, was organized by the Madhya Pradesh Minor Forest Produce Co-operative Federation (Trade and Development), from 22 to 26 December 2021, in Bhopal, in which the State Forest Research Institute, Jabalpur and Regional-cum-facilitation Center, Central Region, Jabalpur. also participated in this. A stall was set up displaying its activities and achievements of the institute and centre in the fair, in which **under the Azadi Ka Amrit Mahotsav program distribution of free medicinal plants were done where in aout 1000 different medicinal plants were distributed to the visitors of the fair.** Posters and live display of medicinal plants, publications and distribution of brochures was done.



k. Principal Secretary Forest, M.P. Government visit to State Forest Research Institute

Shri Ashok Barnwal, Principal Secretary, Forest, Government of MP visited the institute on 22/01/2022. He visited various research laboratories, archives, documentation branch, library, auditorium, museum, herbarium, bambusetum and medicinal plant gene bank and suggested topics and other issues for future forestry research activities so that forestry research be of more practical and useful in the field particularly for the supplementing the livelihood of forest dependent communities. He also planted Sita Ashoka sapling in the medicinal plant garden of the Institute.



Visit to Archive of the institute



Plantation of Sita Ashoka sapling

Organization of Meetings

S. N.	Meeting	Organised by	Place	Date of organization	Participants
1.	Organization of 37 th meeting of the Board of Governors of the Institute.	Extension and Training Branch, SFRI, Jabalpur	Bhopal	11/01/2022	Chairman and Members of the BOG
2.	Region wise meeting of Regional cum Facilitation Centers (RCFCs) and State Medicinal Plants Board (SMPBs)	National Medicinal Plant Board	Virtual mode	02/06/2021	Officials of RCFCs and SMPBs
3.	Review of the ongoing intramural project in the RCFC-CR.	RCFC-CR	SFRI, Jabalpur (Virtual & Physical)	07/06/2021	RCFC-CR Executives
4.	Meeting of the Coordination committee of Regional-Cum-Facilitation Center (RCFC) Central Region Jabalpur	NMPB	SFRI, Jabalpur (Virtual & Physical)	29/07/2021	RCFC-CR
5.	Online Follow-up meeting of "Devaranya Yojna"	M.P. State Policy and Planning Commission	Sushasan Bhavan, Bhopal	19/08/2021	Director SFRI
6.	First meeting of the advisory committee for assessing the progress/ progress of Regional-Cum-Facilitation Center (RCFCs)	SFRI, Jabalpur	SFRI, Jabalpur	15/09/2021	RCFC-CR
7.	Stakeholders meeting and Launch of Book "Reclaiming Sustainability in Medicinal plants and Herbal Medicine Sector"	Solidaridad Regional Expertise Center	Virtual mode	29/09/2021	Stakeholders

S. N.	Meeting	Organised by	Place	Date of organization	Participants
8.	Webinar on World Environment Day “Forest and Environment”	Department of Zoology, TD PG College, Jaunpur, UP	Online Class (Webinar)	05/06/2021	Post Graduation Students of TD PG College, Jaunpur, UP
9.	Traders, farmers and van samiti members interaction meeting on lac cultivation	Animal Ecology Division, SFRI Jabalpur	Lac processing unit Jairamtola, Balaghat	26/11/2021	Traders, farmers and van samiti members

Participation in Fairs :

S.No.	Event	Date	Place
1.	8th Internation Herbal Fair 2021 (Van Mela)	22/12/2021 to 26/12/2021	Police Lal Parade Ground, Bhopal
2.	One Day Kisan Mela 2022	11/03/2022	KVK, Mandla

Organization of Seminars/Symposiums/Workshops

S. N.	Topic	Organized by	Venue	Date	Target Group	No. of participants
1.	Workshop under the scheme “Azadi ka Amrit Mahostav”	RCFC Jabalpur and Balaghat Forest Division(M.P)	Van Vidhyalaya, Balaghat,	03/09/2021	Farmers, JFMC, Forest officials and staff	250
2.	Workshop under the scheme “Azadi ka Amrit Mahostav”	RCFC and Pragati Foundation, Jabalpur	Village-Neuha District-Sidhi	04/09/2021	Farmers, JFMC, Forest officials and staff	300
3.	Living with Leopard	Jabalpur Territorial Forest Division & SFRI, Jabalpur	SFRI Jabalpur	21/12/2021	Govt Department Jabalpur, Media personnel, Conservation communities	60

Organization of trainings

S. N.	Topic	Organized by	Venue	Date	Target Group	No. of participants
1.	Study tour of FRO's trainees, West Central India tour from TSFA, Dullapalli, Telangana (virtual)	SFRI	SFRI	24/06/2021	Trainees FRO	40
2.	Study tour of BSc (Hons) Forestry students of Kerala Agricultural University	SFRI	SFRI	01/07/2021	UG students	30
3.	Study tour of Trainee Forest Guards from Balaghat rangers College & Shivpuri	SFRI	SFRI	12/01/2022 02/07/2021 13/07/2021	Forest Guards	100

S. N.	Topic	Organized by	Venue	Date	Target Group	No. of participants
4.	Nursery techniques of RET species.	Bio-diversity Division	Betul, Seoni, Badgonda nursery, Indore, Ujjain, Jhabua, Sagar, Jabalpur, Rewa, Khandwa, Ahemadpur Nursery, Bhopal, Tapovan Nursery, Gwalior.	23/01/2020, 28/01/2020, 08/12/2020, 09/12/2020, 11/12/2020, 23/12/2020, 08/01/2021, 12/01/2021, 19/01/2021, 09/03/2021, 24/08/2021	Nursery staff of Social forestry circles.	703
5.	Training Program cum- workshop on Cultivation, Primary processing, Storage, Market linkage and Non destructive harvesting technique of medicinal plants	RCFC-CR	Village Silwani, District Raisen (M.P.), Krishi Vigyan Kendra, District Raisen(M.P.), Krishi Vigyan Kendra, Village Icchhawar, District Sihor(M.P.), Ecocenter MP forest department, Neemach(M.P.)	08/02/2022 09/02/2022 11/02/2022 24/03/2022	Farmers, JFMC, Forest officials and staff	131 55 85 120
6.	Selection of seed stands, establishment and best management of SPA, seed technology and nursery management	SFRI, Jabalpur	SFRI, Jabalpur	22-24/09/2021 28-30/09/2021 04-06/10/2021 16-18/11/2021 24-26/11/2021 01-03/12/2021 22-24/12/2021	Field foresters	20 22 23 17 33 36 36
7.	Dissemination of Knowledge through training programme for sustainable management and quality fruit collection of Chironji to stakeholders	SFRI, Jabalpur	E.Chhindwara, (Batkakhapa, Amarwada, Harrai & Dongra) W.Chhindwara (Tamyia Delakhari Chawalpani) S. Chhindwara (Khutama) Amakuhi Sawni Ramudhana N. Panna Vikrampur Janwar Chhateni Srisobhan Imlonia S. Panna Bolia Dharampura Kalda Syamgiri Pipariya	18/01/2022 19/01/2022, 20/01/2022 21/01/2022 31/01/2022 01/02/2022, 02/02/2022 08/02/2022 09/02/2022 10/02/2022 08/03/2022 09/03/2022 10/03/2022 11/03/2022 12/03/2022 13/03/2022 14/03/2022 15/03/2022	Chironji fruit collectors and field staff	45 48 58 40 70 47 51 47 57 43 67 41 42 57 42 66 41 41 68 40

S. N.	Topic	Organized by	Venue	Date	Target Group	No. of participants
8.	Capacity building cum hand holding training workshop of lac cultivation by scientific methods	Animal Ecology Division, SFRI Jabalpur	Sasaipura, Sheopur	21/06/2021	Farmers, Van samiti member and forest staff	61
9.	Training on Phase I data collection in All India Tiger Estimation programme 2022	Animal Ecology Division, SFRI Jabalpur	Gandhi Sagar Wildlife Sactuary	17-18/08/2021	Neemuch, Ratlam, Mandsaur, Jhabua, Alirajpur, Dhar, Ujjain	19
			Kheoni Wildlife Sanctuary	20-21/08/2021	Dewas, Indore, Barwah, Khandwa, Burhanpur, Badwani, Shendwah, Khargone	31
			Madhav National park	17-18/08/2021	Madhav NP, Ashok nagar, Guna, Shivpuri, Datia, Kuno Palpur WLS, Morena, Gwalior, Bhind, Sheopur	32
			Ratapani Wildlife sanctuary	19-20/08/2021	Vidisha, Bhopal, Obedullaganj (Including Ratapani WLS and Singhori WLS), Sehore, Rajgarh, Raisen, Shajapur	26
			Satpura Tiger Reserve	24-25/08/2021	Satpura TR, Narmadapuram Harda, West Betul, South Betul, North Betul, Rampur Bhatori project, Chhindwara, project	32
Pench Tiger Reserve	27-28/08/2021	Pench TR, Barghat project, South Seoni, North Seoni, West	31			

S. N.	Topic	Organized by	Venue	Date	Target Group	No. of participants
			Kanha Tiger Reserve	30-31/08/2021	Chhindwara, East Chhindwara, South Chhindwar Kanha TR, North Balaghat, South Balaghat, Dindori, East Mandla, West Mandla, Lamta project, Mohgaon-Nainpur project, Kundam project	34
			Noradehi Wildlife Sanctuary	24-25/08/2021	Noradehi WLS, Jabalpur, Damoh (Including Veerangna Durgawati WLS), Narsinghpur, North Sagar, South Sagar	22
			Bandhavgarh Tiger Reserve	27-28/08/2021	Bandhavgarh TR, Katni, South Shahdol, Umaria, Anuppur, Umaria project	26
			Panna Tiger Reserve	30-31/08/2021	Panna TR, Chhatarpur, South Panna, North Panna, Satna, Tikamgarh (Including Orcha WLS)	26
			Sanjay Dubri Tiger Reserve	02-03/09/2021	Sanjay Dubri TR, Singrauli, North Shahdol, Sidhi, Rewa	19
10.	Training on Phase III data collection under All India Tiger Estimation programme 2022	Animal Ecology Division, SFRI Jabalpur	SFRI Jabalpur	21-22/10/2021	Obedullahganj Sehore, South Balaghat, North	20

S. N.	Topic	Organized by	Venue	Date	Target Group	No. of participants
				23-24/10/2021	Balaghat, Umariya, Bhopal, South Seoni Sehore, Bhopal, Anuppur, Panna, North Betul, Rampur Bhatodi project, West Mandla, West Betul, Dewas, South Panna, North Panna, Harda, North Shahdol, Kuno Palpur, Mohgaon project, North Betul	39
11.	Workshop on data collection process	Animal Ecology Division, SFRI Jabalpur & WII	e-daksh center at Collectorate	29/11/2021	Computer operators from all 83 forest divisions	83
12.	Development of Landscape Management Plan and Monitoring with reference to Ken-Betwa River Link Project in Panna Tiger Reserve, Madhya Pradesh	Wildlife Institute of India (WII), Dehradun Uttarakhand	India International Center, New Delhi	04-05/04/2022	Dr. Aniruddha Majumdar	01

Trainings/Workshops/Meetings attended by officers/scientists and Research Staff of the Institute.

S.N.	Name of the programme	Organized by	Venue	Date	Participants
1.	औषधीय पौधों की रोपण तकनीक Webinar	NMPB & RCFC, Jabalpur	SFRI	17/05/2021 24/05/2021 31/05/2021	Dr. S.K. Tiwari Dr. A.K. Sharma Smt. Richa Seth
2.	स्वास्थ्य रक्षक औषधीय गृह वाटिका : आज की आवश्यकता Webinar	RDVV, Jabalpur	RDVV	03/06/2021	Dr. S.K. Tiwari Dr. A.K. Sharma Smt. Richa Seth
3.	आयुष आपके द्वार राष्ट्रीय अभियान अंतर्गत औषधीय पादप कृषक सम्मेलन Webinar	NMPB & RCFC, Jabalpur	SFRI	05/09/2021	Dr. S.K. Tiwari Dr. A.K. Sharma Dr. Pratiksha Chaturvedi Smt. Richa Seth

S.N.	Name of the programme	Organized by	Venue	Date	Participants
4.	महत्वपूर्ण औषधीय पौध – अकरकरा की कृषि, संग्रहण तकनीक एवं बाजार व्यवस्था Webinar	NMPB & RCFC, Jabalpur	SFRI	10/12/2021	Dr. S.K. Tiwari Dr. A.K. Sharma
5.	मध्यक्षेत्र में व्यवसायिक औषधीय खेती के लिये उपयुक्त प्रजातियां एवं उनकी किस्में Webinar	NMPB & RCFC, Jabalpur	SFRI	04/01/2022	Dr. S.K. Tiwari Dr. A.K. Sharma
6.	Natural Resources and Environmental Management.	Indian Institute of Forest Management, Bhopal	Through webinar	17/01/22 to 21/01/2022	Dr. Uday Homkar Dr. Jyoti Singh
7.	Root trainer nursery management.	PCCF, Research, extension and Lok vaniki, Bhopal.	Ahmedpur Nursery, Bhopal	11/10/2021	Dr. Uday Homkar
8.	मृदा परीक्षण	R&E Center Jabalpur	R&E Center Jabalpur	06/09/2021	Dr. Pratiksha Chaturvedi & Vinay Kumar Kori
9.	रोपणी प्रबंधन एवं रूट ट्रेनर मे पौधा तैयारी	R&E Center Jabalpur	R&E Center Jabalpur	04/02/2022	Dr. Pratiksha Chaturvedi & Vinay Kumar Kori
10.	National webinar on International day of biological activity	Govt. Science college, Jabalpur	Virtual mode	22/05/2021	54 Stakeholders
11.	National webinar on nursery techniques of medicinal plants	RCFC, Jabalpur	Virtual mode	24/05/2021	95 Stakeholders
12.	National webinar on international day of environment	RDVV, Jabalpur	Virtual mode	03/06/2021	72 Stakeholders
13.	National webinar on conservation of ecosystem and its restoration	G. Tj. Khalsa college, Jabalpur	Virtual mode	05/06/2021	64 Stakeholders
14.	National webinar on Giloy	RCFC, Jabalpur	Virtual mode	30/06/2021	89 Stakeholders
15.	REDD+ workshop, Jabalpur	TFRI, Jabalpur	Jabalpur	26-27/10/2021	Dr. Sachin Dixit, Smt. Rich Seth
16.	Meeting with Principal Secretary	SFRI, Jabalpur	SFRI, Jabalpur	22/01/2022	Officers and Technical Staff SFRI
17.	Meeting of the Society of Journal of Tropical Forestry as executive committee member.	SFRI, Jabalpur	SFRI, Jabalpur	29/12/2021 20/01/2022 24/01/2022	11
18.	Participated as speaker in National webinar on international day of biological diversity of India (We are part of the solution)	Mahakosal Vigyan Parisad (Unit of Vigyan Bharti) and Dept of Zoology and Biotechnology, Govt. Science College, Jabalpur (M.P.)	Online Mode	22/05/2021	Dr Aniruddha Majumdar
19.	Talk on wildlife field in National webinar on ecosystem restoration in ENPROTEC India foundation	Carrier college, Govindpura, Bhopal	Online mode	05/06/2021	Dr Aniruddha Majumdar

S.N.	Name of the programme	Organized by	Venue	Date	Participants
20.	Vigyan Bharti Adhiveshan on medicinal plants 2021	Vigyan Bharti and Ministry of Ayush, Gol	Online mode	13/06/2021	Dr Aniruddha Majumdar
21.	Webinar on historical importance on Rani Durgawati dynasty rules w.r.t. Wildlife in M.P.	Mahakaushal Vigyan Parishad	Online Mode	24/06/2021	Dr Aniruddha Majumdar
22.	Webinar on preparedness for All India Tiger Estimation 2021-2022	National Tiger Conservation authority, New Delhi, PCCF Wildlife and All FDs	Online mode	02/07/2021	Director SFRI & Dr. Aniruddha Majumdar
23.	Talk on World Tiger Day		Online Mode	29/07/2021	Dr Aniruddha Majumdar
24.	Wildlife monitoring at Ladakh-Talk by Raghu Chundawat	Wildlife Institute of India	Online mode	04/08/2021	Dr Aniruddha Majumdar
25.	Guest speaker and co-Chairperson in National Webinar on National park, Tiger reserve, Wildlife sanctuaries, Botanical and Zoological gardens of India- Identification, conservation and management	Govt. Madhav Sadashivrao Govalkar college, Rewa (M.P.)	Online mode	01/09/2021 to 06/09/2021	Dr Aniruddha Majumdar
26.	Evaluation of progress under AITE 2022 research project by HoFF M.P.	PCCF & HoFF	Online	12/09/2021	Director SFRI & Dr Aniruddha Majumdar
27.	Participated as speaker in National webinar on importance of wildlife and its conservation	School and studies in Zoology and Biotechnology, Vikram University, Ujjain	Online Mode	08/10/2021	Dr Aniruddha Majumdar
28.	Participated in webinar on Global trend in bamboo sector	State bamboo mission, Bhopal	Online mode	26/12/2021	Dr Aniruddha Majumdar and Imrat Sen
29.	Review meeting on AITE 2022 Phase I data collection	PCCF Wildlife	Online mode	04/01/2022	Dr Aniruddha Majumdar
30.	Participated in series of webinar on Global trend in bamboo sector	State bamboo mission, Bhopal	Online mode	14/01/2022	Dr Aniruddha Majumdar and Imrat Sen
31.	9th Lac Coordination Committee Meeting on Conservation of lac insect genetic resources	ICAR-Indian Institute of Natural Resin and Gum	Online mode	20/01/2022 to 21/01/2022	Dr. Aniruddha Majumdar, Anirudhwa Sarkar and Balram Lodhi
32.	Bamboo webinar series 18- Bamboo for food and health	Madhya Pradesh Bamboo mission & Bamboo entrepreneurship Development Foundation, Baihar, Balaghat	Online mode	25/02/2022	Dr Aniruddha Majumdar and Imrat Sen

S.N.	Name of the programme	Organized by	Venue	Date	Participants
33.	Participated as speaker in Woman's on wildlife Conservation (Science day)	Mata Gujri College, Jabalpur	Mata Gujri college Jabalpur	28/02/2022	Dr Aniruddha Majumdar
34.	Participated as speaker in population estimation (World Wildlife Day)	Mata Gujri College, Jabalpur	Mata Gujri college Jabalpur	03/03/2022	Dr Aniruddha Majumdar
35.	Organization of talk on mechanization in Natural Resin & Gums production for sustainable environment at ICAR-IINRG, Ranchi	ICAR-Indian Institute of Natural Resin and Gums, Ranchi	Online Mode	06/07/2021	Balram Lodhi
36.	Attended three days online training workshop on Sustainable Technological Interventions for Entrepreneurship development in Tribal zone.	Organised by ICAR-IINRG, Ranchi in collaboration with National Institute of Agricultural Extension Management, Hyderabad	Online Mode	10/08/2021 to 12/08/2021	Balram Lodhi
37.	Webinar on GIS mapping software for everyone	Environmental systems research Institute (ESRI.com)	Online mode	22/02/2022	Tanveer Rizvi
38.	Extending Desktop functionality using Arc-GIS Runtime	Environmental systems research Institute (ESRI.com)	Online mode	23/02/2022	Tanveer Rizvi
39.	Geo-design Summit-AEC SIG 2022	Environmental systems research Institute (ESRI.com)	Online mode	31/03/2022	Tanveer Rizvi
40.	Review Meeting on "Monitoring Re-introduced Tiger (<i>Panthera tigris</i>) in Nauradehi Wildlife Sanctuary."	Nauradehi Wildlife Sanctuary, Sagar (M.P.)	Nauradehi Wildlife Sanctuary, Sagar (M.P.)	17/01/2022	Dr. Anjana Rajput
41.	राज्य स्तरीय REDD+ Cell की प्रथम एवं द्वितीय बैठक Webinar	APCCF GIM, MP	SFRI, Jabalpur	16/12/2021, 22/01/2022	Richa Seth
42.	IPCC की छठी मूल्यांकन रिपोर्ट – जलवायु परिवर्तन के प्रभाव एवं अनुकूलन भारत के परिपेक्ष्य में एक परिचर्चा Webinar	EPCO Bhopal	SFRI, Jabalpur	02/03/2022	Richa Seth

2.3.3 DOCUMENTATION CENTRE

Mandate

1. Documentation of research information/results.
2. Documentation of technical literature on forestry research activities of the Institute.
3. Maintenance of ledger files.
4. Providing research information to the users.
5. Publication of Vaniki Sandesh.

Activities

1. Maintenance of general and specific ledger files. At present, 250 general and 165 specific ledger files are being maintained. The research findings published in various journals/bulletins and reports, etc. were photocopied and added regularly in the respective ledger files.
2. Documentation of technical literature on forestry research.
3. Documentation of research articles published in different Journals, Magazines, Newsletters, Bulletins, Vaniki Sandesh, Annual Research Report and Extension series.
4. Documentation of final reports of the projects financed by external agencies.
5. Publication of quarterly journal "Vaniki Sandesh", technical bulletins and extension series.
6. Sale of SFRI publications.

A quarterly journal "Vaniki Sandesh" covering articles on forestry research in the institute and elsewhere is published by the institute. Vaniki Sandesh is circulated to officers of the state forest department, research institutes, universities and individuals. The annual subscription is fixed at Rs.150/- for individuals and Rs. 300/- for institutions.

Sale of Publications

The institute has published 27 brochures.

Journal Section

The branch is well furnished with a reading room. During the year 13 journals were received.

Achievements during the year

1. Two issues of Vaniki Sandesh Vol.11 No. 2 & 3, 2020 (April –September). Vol. 11 No. 4, 2020 (Oct.-Dec.) & Vol.12 No.1 & 2 (Jan.-June) 2021 were published..
2. 02 project reports were documented.
3. A sum of Rs. 5930/- was received from the sale of bulletins, extension series, and other publications
4. 14 periodicals were received and displayed.
5. 65 articles were selected, photocopied, classified and filed into ledger files.
6. 180 damaged pages of ledger files were replaced by xerox copies.

Periodicals subscribed / complimentary

Sl. No.	Name of the Journal
1.	Indian Forester
2.	Journal of Non Timber Forest Product
3.	Indian Journal of Forestry
4.	Journal of Soil and Water Conservation
5.	Environmental Justice
6.	My Forest
7.	FRIM in FOCUS
8.	Journal of Tropical Forestry

Sl. No.	Name of the Journal
9.	Wood is Good : Grow Move, Use Move
10.	मध्यप्रदेश वनांचल संदेश
11.	MPCST NEWS LETTER
12.	SNHC JOURNAL
13.	Annals of Forestry
14.	Tree of Bhopal

SFRI PUBLICATIONS

1. Technical bulletins

S N.	Bulletin No.	Title	Year
1	2	Volume Table of Terminalia tomentosa for M.P.	1963
2	4	Yield Table of Sal for M.P.	1966
3	5	Seed Directory vol. I	1967
4	9	Standard Volume Table of Teak for S.Chhindwara in M.P.	1971
5	10	Family Ranunculaceae to Polygonaceae in M.P. (Monograph of 13 family)	1971
6	11	Teak growth tables of different ecological forest types in M.P.	1971
7	12	Standard volume tables of <i>Boswellia serrata</i> for Nimar tract in M.P.	1971
8	15	Bark Table for <i>Boswellia serrata</i>	1971
9	16	Family Linaceae to Berseraceae	1974
10	18	Species for plantation in M.P. (Reprint)	1977
11		मध्यप्रदेश में वृक्षारोपण के लिये उपयुक्त प्रजातियाँ	1977
12	22	Bamboo Plantation	1986
13	23	Fuel wood removal by headloads-A case study of Jabalpur	1987
14	24	Eucalyptus cultivation in M.P. – JTF	1987
15	26	Socio-economic Potential of Minor Forest Produce in M.P.	1991
16	28	Material for forest flora of Madhya Pradesh	1996
17	29	Tissue culture protocols for Teak, Neem & Khamer	1997
18	30	Growth statistics of forest plantations	1997
19	31	Medicinal plant of M.P. distribution, cultivation & trade	1998
20	32	Local Volume Table for Teak, Sal and other species	1997
21	33	Price Trends of some medicinal plants	1998
22	34	Biological Diversity of SFRI premises	1998
23	35	Seed production in Teak Seed Orchards in M.P.	1998
24	36	Seed certification protocol of forest tree species	1998
25	37	Tissue culture protocols for important medicinal plants of M.P.	1998
26	38	Macro-propagation protocol of some tree and medicinal plants species.	1998
27	39	Yield and stand tables of teak in Madhya Pradesh	1998
28	40	An Annotated Bibliography of Bamboo	1999
29	41	Status survey of Non Timber Forest Produce in primary Tribal Markets: A case study in Amarkantak Plateau.	1999
30	42	Application of laboratory seed testing results in nursery practices.	2000
31	43	म०प्र० में भिलवा का सामाजिक आर्थिक विश्लेषणात्मक अध्ययन।	2000
32	44	Silviculture research in M.P.	2000

S N.	Bulletin No.	Title	Year
33	45	Handbook of Bamboos with particular reference to M.P.	2002
34	46	औषधीय पौधों की खेती की प्रचार प्रसार पत्रिका।	2003
35	47	Medicinal herbs in trade: a study of safed musli (chlorophytum species) in Madhya Pradesh	2003
36	48	Collection, processing and marketing of <i>Buchanania lanzan</i> in Madhya Pradesh	2005
37	49	मध्यप्रदेश के महत्वपूर्ण आयुर्वेदिक पादप	2005
38	50	आंवला वृक्षारोपण एवं आर्थिक महत्व	2008
39	51	उच्च गुणवत्ता के बीज एकत्रीकरण, भण्डारण, उपचारण, प्रमाणीकरण तथा बीजोत्पादन क्षेत्रों के चयन एवं प्रबंधन पर दिग्दर्शिका।	2008
40	52	Floral Diversity of Kanha Tiger Reserve	2009
41	53	Nursery and Planting technique of Tree Species	2010
42	54	Forest Glossary for All (English – Hindi)	2010
43	55	वृक्षारोपण मार्गदर्शिका	2011
44	56	संग्रहित लाख में समय के साथ वनोपजों में होने वाली कमी का अध्ययन।	2014
45	57	Status of natural gum and gum oleo-resin of M.P.	2014
46	58	बीज प्रक्षेत्र का चयन, बीज उत्पादन क्षेत्र की स्थापना, प्रबंधन, बीज संग्रहण, भण्डारण, उपचारण, परीक्षण एवं रोपणी प्रबंधन	2014
47	59	वानिकी में मेक्रोक्लोनल प्रोपेगेशन तकनीक द्वारा वृक्ष एवं औषधीय प्रजातियों के क्लोनल पौधे तैयार करने की विधियाँ।	2014
48	60	सामुदायिक भागीदारी द्वारा अकाष्ठीय वनोपजों के मानचित्रण एवं आंकलन विधि मार्गदर्शिका।	2015
49	61	अकाष्ठीय वनोपज सतत् विदोहन एवं प्रबंधन नियमावली।	2015
50	62	कैमरा ट्रैप मार्गदर्शिका	2016
51	63	अकाष्ठीय वनोपज प्रजातियों का अंतःस्थलीय, बाह्य स्थलीय संरक्षण, नवप्रवर्तन – वनवर्धन एवं विकास।	2016
52	64	अकाष्ठीय वनोपज सतत् विदोहन एवं प्रबंधन नियमावली।	2016
53	65	Volume table of Teak for various divisions of Madhya Pradesh	2016
54	66	Volume table of <i>Shorea robusta</i> (Sal) for various forest divisions of Madhya Pradesh	2016
55	67	रोपणी मार्गदर्शिका	2016
56	68	Growth table of important coppices origin species for Madhya Pradesh	2016
57	69	वन एवं औषधीय प्रजातियों की रोपणी एवं रोपण तकनीक मार्गदर्शिका	2016
58	70	कट रूट स्टॉक विधि : लेन्टाना उन्मूलन की नई तकनीक	2017
59	71	बाघ, सह-परभक्षी, चौपायों एवं उनके वासस्थल का अनुश्रवण हेतु मार्गदर्शिका	2017
60	72	प्रशिक्षण मार्गदर्शिका – आधुनिक जीपीएस, रेंज फाईंडर एवं कम्पास हेतु	2017
61	73	Primary Processing and Drying Techniques of NTFPs	2017
62	74	Directory of Medicinal Plants Traders and ISM Industries in Madhya Pradesh	2017
63	75	Selection of superior races of Khamer (<i>Gmelina arborea</i>) through clonal propagation	2017
64		क्लोनल प्रोपेगेशन द्वारा खमेर (<i>मेलाईना आरबोरिया</i>) की श्रेष्ठ नस्लो (रेसेस) का चयन	2017
65	76	Quantitative estimation of bioactive compounds through Chemo-fingerprinting (HPLC) for the identification of quality germplasm - <i>Andrographis paniculata</i> , <i>Bacopa monnieri</i> and <i>Swertia angustifolia</i>	2017
66	77	औषधीय पौध प्रजातियों की जबलपुर वन वृत्त के वनक्षेत्रों में वर्तमान स्थिति, संख्यात्मक घनत्व एवं उपलब्ध मात्रा का आंकलन "सर्वेक्षण एवं आंकलन	2017

S N.	Bulletin No.	Title	Year
		मार्गदर्शिका''	
67	78	बाघ, सह-परभक्षी, चौपायों एवं उनके वासस्थल का अनुश्रवण- 2018 हेतु मार्गदर्शिका	2018
68	79	Volume table of miscellaneous species for various divisions of Madhya Pradesh.	2018
69	80	हमारी कंद संपदा : मध्यप्रदेश में पायी जाने वाली कंद प्रजातियों की पहचान एवं विवरण	2018
70	81	Propagation techniques of economically important endangered and rare species (salai, shisham, achar, maida lakdi and bija) of Madhya Pradesh	2018
71	82	पलाश के वृक्षों में लाख की कृषि प्रक्रिया	2018
72	83	बांधवगढ़ टाईगर रिजर्व के घास मैदानों का पारिस्थितिकीय अध्ययन : वन्य प्राणी प्रबंधन के संदर्भ में	2018
73	84	कुसुम के वृक्षों में लाख की कृषि प्रक्रिया	2019
74	85	Climate Change and Role of Communities in Adaptation and Mitigation	2019
75	86	मध्यप्रदेश की प्रमुख गोंदों के उत्पादन एवं संग्रहण क्षेत्र	2019
76	87	कार्बन का महत्व, पर्यावरणीय घटनाओं से इसका संबंध एवं वनों में कार्बन संचयन का आंकलन ।	2019
77	88	Quantitative estimation of bioactive compounds of 5 commercially important medicinal plants through chemo-fingerprinting (HPLC) for the identification of quality planting material.	2019
78	89	दुर्लभ एवं संकटग्रस्त प्रजातियों की रोपणी तकनीक का प्रचार प्रसार	2019
79	90	वनों एवं वन रोपणियों में लगने वाली कीट व्याधियों एवं उनके निदान पर किये गये कार्यों का सरल भाषा में संकलन : मध्यप्रदेश के संदर्भ में	2019
80	91	Species specific cage designs to rescue & transport the wildlife & nest boxes for birds.	2020
81	92	Quantitative determination of bio-active compounds of critically endangered and rare medicinal plants Alectra chitrakutensis and Butea superba through chemoprofiling	2021
82	93	Clonal propagation studies of Alectra chitrakutensis and Butea superba critically endangered and rare medicinal plants	2021

1. Extension Series

Ext. Series	Title	Year
1.	Teak Seed collection and uses	1981
2.	वृक्षारोपण में बीजों का महत्व	1981
3.	म.प्र. में साल रोपण की तकनीक	1991
4.	पड़त भूमि विकास हेतु उपयुक्त प्रजाति लेडिया	1991
5.	ईसबगोल	1994
6.	सर्पगन्धा	1994
7.	रोसा घास	1995
8.	A mechanical device for pre sowing treatment of teak seeds	1995
9.	वृक्षारोपण कैसे करें	1996
10.	S.F.R.I Publications	1999
11.	माइकोराइजा (वैम)	1999
12.	राजजोबियम	1999
13.	एजेटोबेक्टर	2000
14.	पी.एस.बी. (फास्फोरस विलायक)	2000
15.	आँवला : वनों से किसानों तक	2000

Ext. Series	Title	Year
16.	बाँस : वनो से किसानों तक	2000
17.	सागौन : वनो से किसानों तक	2000
18.	खमेर : वनो से किसानों तक	2000
19.	यूकेलिप्टस : वनो से किसानों तक	2000
20.	बच (एकोरस केलेमस)	2001
21.	सतावर (एस्पेरेगस रेसीमोसस)	2001
22.	सफेद मूसली (क्लोरोफाइटम बोरिविलियानम)	2001
23.	कलिहारी (ग्लोरिओसा सुपरबा)	2001
24.	सनाय (केसिया आगस्टफोलिया)	2001
25.	सर्पगंधा (रावोल्फिया सर्पेन्टिना)	2001
26.	अश्वगंधा (विद्यानिया सोमनीफेरा)	2001
27.	मुश्कदाना (एबलेमासकस मास्केटस)	2001
28.	लेमनग्रास (सिंबोपोगन फ्लेक्सिपोसस)	2001
29.	मेन्था या पोदीना (मेन्था आर्वेसिस)	2001
30.	लघुवनोपजों का प्राथमिक प्रसंस्करण (भाग 1)	2003
31.	लघुवनोपजों का प्राथमिक प्रसंस्करण (भाग 2)	2007
32.	Directory of Medicinal Plants Trades and ISM Industries of Central India	2009
33.	Monograph on <i>Alectra chitrakutensis</i>	2011
34.	Monograph on <i>Ceropegia bulbosa</i> and <i>Ceropegia macrantha</i>	2011
35.	Monograph on <i>Crateva magna</i> and <i>ficus cupulata</i>	2011
36.	Monograph on <i>Dioscorea tomentosa</i> , <i>D. wallichia</i> and <i>d. alata</i>	2011
37.	Monograph on <i>Flemingia stricta</i> and <i>F. paniculata</i>	2011
38.	Monograph on <i>Guggal (Commiphora wightii)</i>	2011
39.	Monograph on Maida tree (<i>Litsea glutinosa</i>)	2011
40.	Monograph on Padri tree (<i>Radermachera xylocarpa</i>)	2011
41.	Monograph on Shyonaka (<i>Oroxylum indicum</i>)	2011
42.	Some ethnic plants in cure of various human diseases	2011
43.	कमरकस (पलाश) गोंद का सतत् विदोहन, प्राथमिक प्रसंस्करण, श्रेणीकरण एवं भण्डारण तकनीकों का प्रदर्शन	2012
44.	साल बोरर से साल वनो की सुरक्षा	2014
45.	Education material on Conservation , multiplication and utilization of rare, endemic Angiosperms and Pteridophytes in Forest Botanic Garden of State Forest Research Institute, Jabalpur (M.P.)	2014
46.	Education material on Herbarium preparation and its management	2015
47.	मध्यप्रदेश के वनों में पायी जाने वाली महत्वपूर्ण दुर्लभ प्रजातियों की उपयुक्त रोपणी तकनीकी का विकास।	2015
48.	खमेर शीर्ष सूखन रोग एवं प्रबंधन तकनीकी मार्गदर्शिका	2015
49.	खनन क्षेत्रों में वनीकरण एवं पारिस्थितिकीय पुर्नस्थापना हेतु तकनीकी मार्गदर्शिका	2015
50.	नर्मदा तट पर वृक्षारोपण हेतु उपयुक्त प्रजातियाँ एवं रोपण विधियाँ	2017
51.	मार्गदर्शिका-साल वृक्षों की मृत्युदर को प्रभावित करने वाले कारकों का अध्ययन एवं उनके रोकथाम के उपाय	2017
52.	मार्गदर्शिका-आर्थिक महत्व की प्रजातियों बीजा, धावड़ा एवं अचार मे होने वाले रोगों का समेकित प्रबंधन एवं तकनीक	2017
53.	महुआ प्रशिक्षण एवं प्रदर्शन मार्गदर्शिका	2018
54.	सलई वृक्ष में वैज्ञानिक विधि से टैपिंग तकनीक, सतत् विनाश विहीन विदोहन, प्राथमिक प्रसंस्करण एवं भंडारण विधि – मार्गदर्शिका	2018

Ext. Series	Title	Year
55	पौधों की विक्रय दरें ।	2018
56	मध्यप्रदेश में पाई जाने वाली प्रमुख गोंदों की विदोहन एवं विदोहनोत्तर तकनीक	2018

Brouchers

S.N.	Title	Year
1	अचार (बुकनेनिया लेन्जन)	2007
2	महुआ (मधुका लेटीफोलिया)	2007
3	बहेड़ा (टरमिनेलिया बेलेरिका)	2007
4	बांस (डेन्ड्रोकेलेमस स्ट्रिक्टस)	2007
5	बीजा (टेरोकार्पस मारसूपियम)	2007
6	सागौन (टेक्टोना ग्रेंडिस)	2007
7	बबूल (अकेशिया निलोटिका)	2007
8	खैर (अकेशिया कटेचू)	2007
9	खमैर (मेलाइना आरबोरिया)	2007
10	ऑवला पौधों का विनाश विहीन विदोहन एवं संरक्षण मार्गदर्शिका	2007
11	महुआ रासायनिक उर्वरकों के प्रयोग से महुआ फूल एवं फल की उत्पादकता में वृद्धि	2011
12	जन भागीदारी द्वारा अकाष्टीय वनोपजों का प्राकृतिक वन क्षेत्रों में सतत् विदोहन एवं प्रबन्धन तकनीकी का विकास	2012
13	कूल्लू गोंद का सतत् विदोहन, प्राथमिक प्रसंस्करण, श्रेणीकरण एवं विपणन	2013
14	धावड़ा गोंद का सतत् विदोहन, प्राथमिक प्रसंस्करण, श्रेणीकरण एवं विपणन	2013
15	सलई गोंद का सतत् विदोहन, प्राथमिक प्रसंस्करण, श्रेणीकरण एवं विपणन	2013
16	पलाश गोंद का सतत् विदोहन, प्राथमिक प्रसंस्करण, श्रेणीकरण एवं विपणन	2013
17	वनौषधि विपणन सूचना विश्लेषण केन्द्र	2014
18	बॉस-बीज संग्रहण, भण्डारण, उपचारण एवं नर्सरी प्रबन्धन	2015
19	खमैर - बीज संग्रहण, भण्डारण, उपचारण एवं नर्सरी प्रबन्धन	2015
20	कुल्लू-बीज संग्रहण, भण्डारण, उपचारण एवं नर्सरी प्रबन्धन	2015
21	भिलवा - बीज एवं रोपणी तकनीक	2017
22	माहुल - बीज एवं रोपणी तकनीक	2017
23	मुण्डी - बीज एवं रोपणी तकनीक	2017
24	कुम्भी - बीज एवं रोपणी तकनीक	2017
25	मृदा नमूना एकत्रीकरण विधि	2017
26	अश्वगंधा - बीज एवं रोपणी तकनीक	2017
27	कालमेघ - बीज एवं रोपणी तकनीक	2017
28	सर्पगंधा - बीज एवं रोपणी तकनीक	2017
29	जैविक खाद एवं नीम खली वानिकी प्रजातियों के पौधों की वृद्धि में लाभदायक	2017
30	कृषि वानिकी पद्धति के अंतर्गत गेहूँ के साथ क्लोनल यूकेलिप्टस रोपण : लागत एवं आय	2017
31	SFRI ENGLISH BROCHURE (About Institute)	2017
32	SFRI HINDI BROCHURE (About Institute)	2017
33	REGIONAL-CUM-FACILITATION CENTRE, CENTRAL REGION, JABALPUR (RCFC)	2017
34	क्षेत्रीय-सह-सुविधा केन्द्र मध्य क्षेत्र, जबलपुर (आर.सी.एफ.सी.)	2018
35	वृहत् स्तर पर पौधा रोपण कैसे करें	2018
36	कलिहारी (<i>Gloriosa superba</i>)	2019
37	गुग्गल (<i>Commiphora wightii</i>)	2019

S.N.	Title	Year
38	अश्वगंधा (<i>Withania somnifera</i>)	2019
39	भिलवा (<i>Semecarpus anacardium</i>)	2019
40	चिरायता (<i>Swertia chirata</i>)	2019
41	सलई (<i>Boswellia serrata</i>)	2019
42	चित्रक (<i>Plumbago zeylanica</i>)	2019
43	चनाहुर (<i>Marsdenia tenacissima</i>)	2019
44	सफेद मुसली (<i>Chlorophytum borivilianum</i>)	2019
45	कुचला (<i>Strychnos nux-vomica</i>)	2019
46	बायविडंग (<i>Embelia ribes</i>)	2019
47	गिलोय (<i>Tinospora cordifolia</i>)	2019
48	हर्रा – बीज एवं रोपणी तकनीक	2020
49	बहेड़ा – बीज एवं रोपणी तकनीक	2020
50	रीठा – बीज एवं रोपणी तकनीक	2020
51	हल्दू – बीज एवं रोपणी तकनीक	2020
52	खुरासानी इमली – बीज एवं रोपणी तकनीक	2020
53	सतावर (<i>Asparagus racemosus</i>)	2020
54	निशोथ (<i>Operculina turpethum</i>)	2020
55	शंखपुष्पी (<i>Evolvulus alsinoides</i>)	2020
56	तुलसी (<i>Ocimum sanctum</i>)	2020
57	स्तीविया (<i>Stevia rebaudiana</i>)	2020
58	कालमेघ (<i>Andrographis paniculata</i>)	2020
59	अग्निमथ (<i>Premna Integrifolia</i>)	2020
60	सहजन (<i>Moringa oleifera</i>)	2020
61	रक्त चंदन (<i>Pterocarpus santalinus</i>)	2020
62	मलकांगनी (<i>Celastrus paniculatus</i>)	2020
63	केवाच (<i>Mucuna pruriens</i>)	2020
64	मण्डूकपर्णी (<i>Centella asiatica</i>)	2020
65	गोखरू (<i>Tribulus terrestris</i>)	2020
66	बावची (<i>Psoralea corylifolia</i>)	2020
67	सदाबहार (<i>Catharanthus roseus</i>)	2020
68	चंद्रसूर (<i>Lepidium Sativum</i>)	2020
69	अनंतमूल (<i>Hemidesmus indicus</i>)	2020
70	बेल (<i>Aegle marmelos</i>)	2021
71	खस (<i>Vetiveria zizanioides</i>)	2021
72	गुड़मार (<i>Gymnema sylvestre</i>)	2021
73	अशोक (<i>Saraca asoca</i>)	2021
74	ब्राह्मी (<i>Bacopa monnieri</i>)	2021
75	ईसबगोल (<i>Plantago ovata</i>)	2021
76	सर्पगंधा (<i>Rauwolfia serpentina</i>)	2021
77	बच (<i>Acorus calamus</i>)	2021
78	उच्च गुणवत्ता के अचार फलों के संग्रहण हेतु अवधि निर्धारण एवं विनाश विहीन विदोहन	2021
79	श्योनक	2021
80	पादर	2021

S.No. 79 to 80 published during the year.

TM - Training Material

Note: Payment for the above bulletins and extension series may be made by Demand Draft in favour of the Director, State Forest Research Institute, Jabalpur.

2.3.4 LIBRARY AND INFORMATION CENTRE

Mandate

SFRI library and information center is a prominent library of the state of Madhya Pradesh in the field of forestry. It houses books, reports, Indian Forest Records, Working Plans, Working Schemes, Forest resource surveys and Sanctuary Plans. Apart from the research staff of the Institute, forest officers, scientists and technical staff make use of the library facilities. Students, research scholars from various institutes and universities also visit the library regularly.

The library and information centre maintains literature on forestry and allied subjects. It has books on environment, silviculture, forest protection, mensuration, management, marketing, utilization, social forestry, biodiversity, ecology, botany, tissue culture, tree improvement, law, medicinal plants, wildlife, seed science and computer science, etc. approximately 10243 books are available.

Following activities were undertaken during the year.

S. No.	Works	Status
1.	Circulation of books, working plans, reports and other reading materials	Routine work
2.	Correspondence with users for return of books	Routine work
3.	Provide CAS to users	Routine work
4.	Classification of books and arrangement of classified books	Routine work
5.	Preparation of book card slips and pasting of book pockets on books	Routine work

2.3.5 COMPUTER AND INFORMATION TECHNOLOGY

Mandate

1. Application of computers in forestry.
2. Design, development and implementation of computer based information system.

Objectives

1. To design and develop the website of the institute.
2. To provide logistics and maintainance of all the computer peripherals of the institute.
3. To provide Internet Facilities in the Institute without interruption at 50 Mbps high speed.
4. To maintain CCTV Cameras in the Institute and Main Gate for security purpose.
5. Maintenance of EPABX facilities (Intercom) in the Institute.
6. Maintenance of Biometrics for attendance of all employees of the Institute.
7. To maintenance video conferences.

Information Technology Centre

Information Technology centre has a number of computer systems connected to each other via Local Area Network (LAN) and with Domain server. The computer systems are shared by a router to access World Wide Web information and Wi-Fi, which is also connected by local area network (LAN).

Activities carried out during the year

1. Presentations of Powerpoint for BOG, RAC, Workshops, Meetings, Seminars and Trainings, etc. has been done successfully through out the year.
2. Maintained online meetings & conferences through video system.
3. Website of the institute has been upgraded time to time.
4. Provided internet surfing and e-mail facilities to users through LAN and Internet.
5. Maintained all computer peripherals viz., computer systems, printers, scanners, LAN, UPS etc.
6. Research work data in a domain server are stored during the year.

3. PUBLICATIONS AND PRESENTATION OF RESEARCH PAPERS/ ARTICLES BY SCIENTISTS / RESEARCH PERSONNEL'S OF THE INSTITUTE

(April 2021 to March 2022)

Papers published in Journals (National and International)

S.N.	Name of Journal	Title of paper	Author(s)	Vol. No.
1.	Journal of Tropical Forestry	Quantitative estimation of Gallic acid through chemoprofiling in <i>Saraca asoca</i> bark from different provenances of India	S.K. Tiwari, P.K. Shukla, M.P. Goswami and A.K. Sharma	2021/ Vol.37(III)
2.	Journal of Tropical Forestry	Biomass, carbon and carbon pool estimation in preservation plot of Hoshangabad Forest Division of Madhya Pradesh.	Sachin Dixit, A.K. Sharma, Amit Pandey and S.K. Tiwari	2021/ Vol.37(III)
3.	Journal of Engineering, Computing & Architecture.	An observation of different types of soil for growth of <i>Stevia rbaudiana</i> in different areas of Jabalpur. (Madhya Pradesh)	Gunjan Nema and Uday Homkar	Vo. II Feb. 2022
4.	Journal of Tropical Forestry	Study of sal regeneration status in borer affected protected areas –Kisli Range in Kanha Tiger Reserve	Jyoti Singh, Vijay Haldkar, Shailendra Nema and Rajkumar Khare	Oct. Dec. 2021 Vol. 37 No. IV
5.	Journal of Tropical Forestry	Temporal Changes in Prey Population of large carnivores in six tiger reserves of Madhya Pradesh	Anjana Rajput, Aniruddha Majumder, Zeeshan Ali, Rishika Thakur and Prashant Kumar Kori	July-September, 2021 Vol 37 (III)
6.	Indian Journal of Entomology and Zoology Studies.	Study on abundance of lac associated fauna in Seoni and Balaghat districts of Madhya Pradesh.	Balram Lodhi, Pratibha Bhatnagar and Bharat Aarmo	2021/9 (2) : 608-613
7.	Indian Journal of Agriculture Research	Lac insect occurrence in different agro-climatic zones of Madhya Pradesh	Pratibha Bhatnagar, Balram Lodhi and Sunil Prajapati	2021/ 45 (2) : 324-335
8.	Indian Journal of Entomology	Occurrence of lac insect and its host plants in Madhya Pradesh	Pratibha Bhatnagar, Balram Lodhi, Sunil Prajapati and Bharat Aarmo	2021/Online published Ref. No. e20334
9.	Journal of non timber forest products	Socio Economic profile of lac growers in Mandla district of Madhya Pradesh, India	Balram Lodhi, Pratibha Bhatnagar, Vijay Bahadur Singh, Jatashankar and Sunil Prajapati	2021/27(4): 197-201
10.	Indian Journal of Entomology and Zoology Studies	Survey record of lac insect occurrence in Maharashtra	Pratibha Bhatnagar, Balram Lodhi, Ramdeen Bhalavi and Sunil Prajapati	2022; 10(1): 193-200

S.N.	Name of Journal	Title of paper	Author(s)	Vol. No.
11.	International Journal of Applied Research	Bird diversity of Narmada wetland area and its adjoining habitat of Mathwad Range Alirajpur Division, Madhya Pradesh, India	Anjana Rajput, Shailendra Singh Yadav and Prashant Kumar Kori	Vol. 7, Issue 8, pp. 184-191, 2021
12.	International Journal of Advances in Engineering and Management (IJAEM)	Watershed Delineation in Mathwad Range, Alirajpur Forest Division for Soil-Water Conservation for management of displaced wildlife due to construction of Sardar Sarovar Dam	Anjana Rajput*, Prashant Kumar Kori and Shailendra Singh Yadav	Vol. 3, Issue 9, pp: (426-432), Month: Sep. 2021
13.	PNAS	High frequency of an otherwise rare phenotype in a small and isolated tiger population	VinaySagar, Mayank M. Verma, Uma Ramakrishnan and others	September 13, 2021 https://doi.org/10.1073/pnas.2025273118

Papers Published from SFRI

S.N.	Name of the Journal	Title of paper	Author(s)	Year/ Vol. No.
1.	Vanki sandesh	Baheda (<i>Terminalia bellerica</i>): Nursery and plantation techniques.	डॉ. प्रतीक्षा चतुर्वेदी	January-June 2021 Vol 12 No 1-2
2.	Vaniki Sandesh	Economical and commercially viable Medicinal and NTFP species of Jabalpur forest circle	S.K.Masih	2021
3.	International Herbal fair 22-26 December 2021, MPMFD, Bhopal (M.P.) Souvenir	Forest Dependent Communities (FDCs) and their time schedule of traditional collection, processing, storage, and trade	S.K.Masih	2021
4.	Vaniki Sandesh	Collection, processing, storage and trade Pattern of Forest Dependent Communities (FDCs)	S.K.Masih Shakti Shukla	2021
5.	Vaniki Sandesh	मध्यप्रदेश के देवास जिले में गोंदो के संग्रहण की मात्रा एवं संग्राहकों की आय में योगदान का आँकलन	डॉ. जी. एस. मिश्रा एवं सुनील कुमार पयासी	12
6.	Van Dhan Vyapar patrika	कुसुम के वृक्षों में लाख उत्पादन की कृषि प्रक्रिया	Balram Lodhi, Bharat Aarmo, Rajesh Barman, Vijay Bahadur & Dr. Aniruddha Majumdar	2021/ Vol 21 (02), 3-9.
7.	Vaniki Sandesh	Volume tables of Miscellaneous Species for Raisen Division	Richa Seth	October 2019-March 2020(vol:10-11)
8.	Vaniki Sandesh	Volume tables of Dhawa (<i>Anogeissus latifolia</i>) for Mandla Division	Richa Seth	April 2020-September 2020 (vol:11, no.2 & 3)
9.	Vaniki Sandesh	Volume tables of Haldu (<i>Haldina cordifolia</i>) for Mandla Division	Richa Seth	Vol.- 12 (Jan. March 21) No 1 & 2

Paper published/presented in seminars/ symposiums/ workshops/webinar

S. N.	Name of seminars/ symposiums/ workshops/webinar	Title of the paper	Author(s)	Vol. No.
1.	National conference on "Value addition and Marketing of NTFPs."	Physico-chemical properties of zero calorie plant: <i>Stevia rabaudiana</i> .	Gunjan Nema and Uday Homkar	-
2.	लघुवनोपज संदेश स्मारिका अंतर्राष्ट्रीय वन मेला	ग्राम खिलौली जिला कटनी मे लघुवनोपज के संग्रहण एवं विपणन – एक परिचय	राजेश बर्मन, विजय बहादुर सिंह, प्रतिभा भटनागर, अनिरुद्ध मजूमदार एवं अमिताभ अग्निहोत्री	2021
3.	-do-	गटरान का उपयोग एवं विपणन – एक परिचय	राजेश बर्मन, अनिरुद्ध मजूमदार, प्रतिभा भटनागर एवं अमिताभ अग्निहोत्री	2021
4.	National web symposium on Recent Advances in Beneficial Insects, Natural Resins and Gums held at ICAR-IINRG, Ranchi during February 25-26, 2021	Study on abundance of lac associated fauna in Seoni and Balaghat districts of Madhya Pradesh (Poster Presentation)	Balram Lodhi and Pratibha Bhatnagar	
5.	-do-	Lac insect occurrence in different agro-climatic zones of Madhya Pradesh of Madhya Pradesh (Poster Presentation)	Pratibha Bhatnagar and Balram Lodhi	
6.	XV World Forestry Congress 2022 Sub-themes ST3: Green pathway to growth and sustainability	Tiger Occupancy in Ratapani Landscape: What is the reason behind tiger presence in proximity of capital Bhopal, Madhya Pradesh, India	Mayank Makrand Verma & Satyadeep Nag	Submission ID 3486773
7.	PILDC2021, India Land & Development Conference 25th Nov 2021, at Centre for Land Governance, NRMC, Bhubaneswar	Tiger Conservation Prioritization Units (TCPUs) in Ratapani-Kheoni Landscape of Vindhyan range with Special Reference to Ecological Restoration of Wild Land Blocks	Mayank Makrand Verma Satyadeep Nag, Mradul Tripathi & Amitabh Agnihotri	

Publication of technical bulletins / brochures

S. No.	Name of technical bulletins/brochures	Authors	Bulletin/ brochure No.
1.	दुर्लभ एवं संकटग्रस्त प्रजातियों की रोपणी तकनीक का प्रचार-प्रसार	उदय होमकर	89
2.	Van Dhan Vyapar	Dr. A. Majumdar	Vol. 21(2)
3.	Van Dhan Vyapar	Dr. A. Majumdar	Vol. 21(3)
4.	Survey and Assessment Manual	Dr. Dharmendra Verma Dr. S.K.Masih	77
5.	उच्च गुणवत्ता के अचार फलों के संग्रहण हेतु अवधि निर्धारण एवं विनाश विहीन विदोहन।	Dr. Archana Sharma	-

4. BUDGET / FINANCE

Funding Sources

- 1 Grant-in-aid under non-plan budget of the Govt. of Madhya Pradesh, Forest Department
- 2 Project based external funding from govt./semi govt./non- govt. organizations and private donors.
- 3 Special assistance received from miscellaneous funding agencies.
- 4 Revenue from various sources of the institute.

Financial support and expenditure 2021-22

Budget head	Opening balance (Rs.in lakhs)	Budget received during the year (Rs. in lakhs)	Total Amount (Rs. In lakhs)	Expenditure (Rs. in lakhs)
10-2406 Non-Plan (Grant-in-aid)	0.00	40,000,000	40,000,000	65,072,099
Deposit Works (Sponsored projects)	41,486,953	55,691,293	97,178,246	28,310,279
Total Rs.	41,486,953	95,691,293	137,178,246	93,382,378

Details of sponsored projects

Various projects have been funded by govt./semi. Govt./non. and private agencies from time to time. Such on- going and completed projects during the year 2021-22 are given below:

S. No.	Project Name & I.D.No.	Sponsoring agency	Balance available in the beginning of the year	Amount received in the year	Total Amount	Total Expenditure (1.4.20 to 31.3.21) Rs.
On-Going Projects						
1	देवास जिले में लोक वानिकी प्रबंध योजना क्रियान्वन का अनुश्रवण एवं मूल्यांकन। AF/P/E/19-20/07	APCCF R/E & LV M.P Bhopal	967,068	-	967,068	520,489
2	मध्यप्रदेश में महुआ फूल एवं अचार गुठली के उत्पादन एवं संग्रहण मात्रा का आंकलन एवं उनकी वंशागत विविधता की पहचान करना। AF/P/E/18-19/22	APCCF R/E & LV M.P Bhopal	1,699,205	1,950,000	3,649,205	1,923,880
3	पश्चिमी मध्य प्रदेश के मालवा का पठार कृषि जलवायु प्रक्षेत्र (Agro-Climatic Zone) के लिये उपयुक्त कृषि वानिकी पद्धतियों (Agro forestry Models) का विकास एवं उनका कृषकों की निजी भूमियों पर प्रदर्शन AF/P/E/18-19/17	APCCF R/E & LV M.P Bhopal	969,857	-	969,857	206,098
4	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 GEN/P/E/18-19/24	APCCF R/E & LV M.P Bhopal	1,597,598	-	1,597,598	769,470

S. No.	Project Name & I.D.No.	Sponsoring agency	Balance available in the beginning of the year	Amount received in the year	Total Amount	Total Expenditure (1.4.20 to 31.3.21) Rs.
5	Genetic diversity assessment using molecular markers for elite identification of existing candidate plus trees of Teak (<i>Tectona grandis</i>) Madhya Pradesh. GEN/P/E/21-22/11	APCCF R/E & LV M.P Bhopal	-	1,580,000	1,580,000	-
6	Germplasm evaluation and standardization of propagation technology for production of quality planting stock of medicinally important tree species viz. <i>Anogeissus latifolia</i> & <i>Commiphora wightii</i> SD/P/E/19-20/04	APCCF R/E & LV M.P Bhopal	2,177,113	250,000	2,427,113	654,006
7	Dissemination of knowledge through training programme for sustainable management and quality fruit collection of Chironji to stakeholders. SD/P/E/19-20/05	APCCF R/E & LV M.P Bhopal	1,295,601	-	1,295,601	106,219
8	Training and demonstration programme on establishment and best management of seed production areas, seed technology and nursery management for field foresters. SD/P/E/19-20/06	APCCF R/E & LV M.P Bhopal	1,959,728	-	1,959,728	592,192
9	अनुसंधान एवं विस्तार रोपणियों का श्रेणीकरण, मान्यता एवं लघु शोध कार्यो की अद्यतन स्थिति का आंकलन SD/P/E/19-20/09	APCCF R/E & LV M.P Bhopal	-	335,616	335,616	-
10	रोपणी में रूट ट्रेनर में पौध तैयारी, पौधों में होने वाली बीमारियों का निदान एवं रोपणी प्रबंधन पर प्रशिक्षण एवं प्रदर्शन SD/P/E/21-22/03	APCCF R/E & LV M.P Bhopal	-	200,000	200,000	41,698
11	Selection of species, root trainer sizes and potting mixes to be adopted by the Forest Department Nurseries of Madhya Pradesh for the ten selected tree species. SD/P/E/21-22/04	APCCF R/E & LV M.P Bhopal	-	1,777,938	1,777,938	3,000
12	Survey, population density and quantitative assessment of medicinal plants of the sustainable development of livelihood generation in Jabalpur Forest Circle M.P. BD/P/E/17-18/04	National Medicinal Plants Board) New Delhi	985,499	-	985,499	246,493
13	Establishment of "Regional - Cum- Facilitation Center (RCFC) for Central Region at SFRI. BD/P/E/17-18/11	National Medicinal Plants Board) New Delhi	2,808,575	9,262,447	12,071,022	4,063,075
14	Network project on conservation of Lac insect genetic resource SEM/P/E/14-15-05	IINRG Ranchi (ICAR)	9,788	980,000	989,788	989,788
15	Tiger presence and their dispersal movements in Ratapani-Kheoni landscape of Vindhyan range." WL/P/E/17-18/09	PCCF, Wildlife, M.P, Bhopal	663,393	-	663,393	416,234

S. No.	Project Name & I.D.No.	Sponsoring agency	Balance available in the beginning of the year	Amount received in the year	Total Amount	Total Expenditure (1.4.20 to 31.3.21) Rs.
16	Maintenance of monitoring and evaluation facilities and data base of predators prey in Madhya Pradesh" WL/RA/32	PCCF, Wildlife, M.P, Bhopal	6,820,664	-	6,820,664	-
17	Monitoring of re- introduced tigers (<i>Panthera tigris</i>) In Nauradehi Wildlife Sanctuary" WL/P/E/18-19/01	PCCF, Wildlife, M.P, Bhopal	2,018,102	-	2,018,102	776,567
18	Capacity building of Frontline Forest staff of Madhya Pradesh for 5th cycle of All india Tiger Estimation Programme 2021-22" WL/P/E/21-22/02	PCCF, Wildlife, M.P, Bhopal	-	5,615,000	5,615,000	1,580,418
19	Study on leopard (<i>Panthera pardus L</i>) presence identification of conflict zones and developing suitable mitigation measures on human-leopard interactions in the urban areas of Jabalpur and indore city, Madhya Pradesh" WL/P/E/21-22/01	PCCF, Wildlife, M.P, Bhopal	-	1,722,400	1,722,400	979,692
20	Population habitat viability Analysis (PHVA) of Hard ground Barashingha (<i>Cervus duvauceli branderi</i>) for introduction in Bandhavgarh Tiger Reserve M.P." WD/AE/P/E/21-22/12	PCCF, Wildlife, M.P, Bhopal	-	391,000	391,000	51,000
21	To study the impact of proposed Morena water supply sub-project under MPUDP (funded by the World Bank) on the Dolphin, Crocodile & Gharial and their habitat in National Chambal Gharial Wildlife Sanctuary, Morena (M.P.)" WL/P/E/18-19/20	MP Urban Development Company Limited, Bhopal	571,814	740,520	1,312,334	955,788
22	Impact Assessment of proposed Sheopur Kalan & Badoda towns as group water supply scheme-Parbati river sub-project under MPUSIP on Aquatic fauna, river hydrology & ecology and its mitigation WL/P/E/21-22/05	MP Urban Service Improvement, Bhopal	-	6,757,000	6,757,000	2,042,986
23	म.प्र. वन विकास अभिकरण द्वारा विभिन्न वन विकास अभिकरणों में वित्तीय वर्ष 2015-16 (द्वितीय मूल्यांकन) एवं 2016-17 (प्रथम मूल्यांकन) के वर्षों ऋतु में हुए वृक्षारोपण कार्यों का अनुश्रवण मूल्यांकन एवं प्रोजेक्ट इम्पेक्ट असिसमेंट किये जाने के संबंध में। SIL/P/E/20-21/01	APCCF JFM/FDA M.P. Bhopal	887,742	1,234,200	2,121,942	601,475
24	Strengthening of Market Analysis centers for technical support in Marketing of Minor Forest Produce in Madhya Pradesh. SEM/P/E/20-21/02	MP MFP Federation, Bhopal	365,018	500,000	865,018	415,647
25	Establishment of demonstration plot of <i>Bambusa tulda</i> at SFRI, Jabalpur GEN/P/E/20-21/05	Director, M.P. State Bamboo Mission Bhopal	600,000	-	600,000	96,700

S. No.	Project Name & I.D.No.	Sponsoring agency	Balance available in the beginning of the year	Amount received in the year	Total Amount	Total Expenditure (1.4.20 to 31.3.21) Rs.
26	"identification of best performing bamboo species for enhancement of income of farmers in Madhya Pradesh" SEM/P/E/20-21/06	Director, M.P. State Bamboo Mission Bhopal	1,200,060	-	1,200,060	839,059
27	Use of excavated soil for enhancing natural regeneration and plantation activities of Greenko Energy Pvt. Ltd., Rampura forest range, Neemuch district of M.P. GEN/P/E/21-22/09	Greenko Energies Private Limited	-	912,600	912,600	262,100
28	Environmental Impact Assessment on Flora, Fauna & Socio Economic Status of Local communities and action to be taken to Mitigate impact of Kopra medium project at Nauradehi Wildlife Sanctuary, Sagar. ECO/EIA/P/E/21-22/08	Water Resources Department Govt. of Madhya Pradesh	-	4,714,000	4,714,000	868,736
29	Assessment of impact of Doubling of Katni-Singrauli Railline Project on flora, fauna and habitats of Sanjay- Dubri Tiger Reserve (M.P.) .ECO/EIA/P/E/21-22/10	Ircon International Limited (Govt. of India)	-	3,606,975	3,606,975	1,375,037
30	रूट ट्रेनर पद्धति से पौधों की तैयारी कर रोपण प्रशिक्षण कार्यक्रम। EXT/P/E/2021-22/13	APCCF R&E Lokvaniki M.P Bhopal	-	3,479,900	3,479,900	-
Completed Projects						
1	Extension of developed nursery techniques of some important NTFPs and medicinal plant species through Research and Extension centres of Madhya Pradesh. BD/P/E/18-19/16	APCCF R&E Lokvaniki M.P Bhopal	304,574	-	304,574	138,503
2	चलित मृदा परीक्षण प्रयोगशाला के माध्यम से म.प्र. के अनुसंधान एवं विस्तार केन्द्रों में मृदा परीक्षण कर मृदा में उपस्थित पोषक तत्वों की जानकारी प्रदान करना। SIL/P/E/18-19/18	APCCF R&E Lokvaniki M.P Bhopal	1,398,826	-	1,398,826	6,376
3	Phytosociological study of river bank flora from Amarkantak to Mandla with special reference to impact on water quality in river Narmada. ECO/P/E/18-19/19	APCCF R&E Lokvaniki M.P Bhopal	802,507	-	802,507	376,538
4	Phenological studies and determination of sustainable harvesting limits of some important wild medicinal plants and other NTFPs with active participation of user forest dependent communities in Satna Forest Division of Madhya Pradesh" ECO/P/E/18-19/23	APCCF R&E Lokvaniki M.P Bhopal	2,315,075	-	2,315,075	420,148

S. No.	Project Name & I.D.No.	Sponsoring agency	Balance available in the beginning of the year	Amount received in the year	Total Amount	Total Expenditure (1.4.20 to 31.3.21) Rs.
5	The scheduled tribes and other traditional forest dwellers (Recongnition of forest Rights Act), 2006 implementation and its impact in Madhya Pradesh SEM/P/E/15-16/11	APCCF R&E Lokvaniki M.P Bhopal	265,873	-	265,873	26,220
6	Climate change and its impact on forest and livelihood of people in Damoh District SEM/P/E/16-17/07	APCCF R&E Lokvaniki M.P Bhopal	145,174	-	145,174	25,398
7	Estimation of wood demand and supply in Madhya Pradesh- SEM/P/E/16-17/10	APCCF R&E Lokvaniki M.P Bhopal	208,695		208,695	-
8	Sequestered carbon in roadside plantation: an assessment of potential contribution in climate mitigation in Jabalpur Smart City. SEM/P/E/18-19/06	Enviromental Planning & Coordination Organisation (EPCO), M.P.	54,716		54,716	-
9	Biodversity Assessment of Encroachment removed area of Madan Mahal Hills of Jabalpur and it's surrounding forest area for ecological restoration through plantation and conservation of cleaned area BD/P/E/19-20/01	Nagar Nigam Jabalpur (M.P.) (Smart City)	-	702,000	702,000	358,971
10	Collection of baseline data and impact of airport activities on proposed Tiger Safari at Dumna Nature Park. WL/P/E/19-20/03	Nagar Nigam Jabalpur (M.P.) (Smart City)	111,082	-	111,082	-
11	Monitoring and evaluation of wildlife and their habitats for sustainable management and development in the protected areas/non-protected areas of Madhya Pradesh." WL/P/E/17-18/17	PCCF, Wildlife, M.P, Bhopal	8,211,217		8,211,217	765,536
Total Rs.			41,414,564	46,711,596	88,126,160	23,495,537
Interest from Bank Deposits		68,840	5,241,103	5,309,943	4,814,407	495,536
GST Received Under Project		-	1,310,887	1,310,887	-	1,310,887
Misce.Project - 3987		3,549	39,000	42,549	335	42,214
Institutional Charge		-	3,699,594	3,699,594	-	3,699,594
Gross Total		41,486,953	55,691,293	97,178,246	28,310,279	4,237,344

INCOME (Revolving Funds for the year 2021-2022)		
S.No.	HEAD	Income (In Lakh)
1	Gate Entry Fee	687,714
2	Guest House Charges	131,285
3	Rest House (Hostel) charges	81,270
4	House Rent & Water Charges	891,621
5	Misc Receipts	566,515
6	Plant Supply	52,510
7	Seed Supply	169,000
8	Sale of tender Form	7,200
9	RTI charges	4,598

INCOME (Revolving Funds for the year 2021-2022)		
S.No.	HEAD	Income (In Lakh)
10	Vehicle Auction	26,111
11	Rent From Allahabad Bank	6,300
	Interest Received :-	
12	Interest on FDR	8,295,163
	Grand Total	10,919,287

EXPENDITURE (Revolving Funds) for the year 2021-2022)		
S.No.	HEAD	Expenditure (In lakh)
1	Daily Wages	1,200,314
2	Repair & Maintenance	1,634,312
3	Travelling Expenditure	105,308
4	Bank Charge	302
5	Electricity	183,366
6	Office Expenses	93,621
7	POL Expenses	6,818
8	Stationary Expenses	138,884
9	Audit and Legal Fee	208,695
10	Internet Charges	21,400
11	Misc. Expenditure	3,270
12	GST Expenses	572,664
13	Nursery	25,000
	Gross Total	4,193,954

Income (Reserve Funds) for the year 2021-22		
	Details	Income
1	POL Recovery	6,250
2	Soil Testing charges	47,590
3	RTI Fee	2,090
4	Misc.	76,520
5	Sale of Books & Magazines	900
6	Interest on FDR	8,280,797
7	Interest from Savings	285,519
	Total Rs.	8,699,666

Expenditure (Reserve Fund) for the year 2021-22		
1	Bank Charges	4.00
	Total Rs.	4.00

Details of Accounts Financial Status as on 31st March, 2022				
S.No.	Details	Cash in Bank	F.D.R.	Total
1	Revolving Fund (Indian Bank)	333,766	5,600,000	20,933,766
2	Revolving Fund (Canara Bank)	-	15,000,000	
3	Grant-In-aid	5,136,665	-	5,136,665
4	Deposit Work (Project Funds)	26,171,951	33,300,000	59,471,951
	Total Rs.	14,776,171	46,499,000	61,275,171

Bank Account Balance up to 31 March 2022				
S. No.	Name of Account	FDR	Cash in Bank	Total Balance
1	Indian Bank - 21396750625 - SB3268 (Salary Head)	-	5,139,882	5,139,882
2	Indian Bank - 21396755986 - SB3987 (Projects Head)	33,300,000	26,350,847	59,650,847
3	Indian Bank - 50460392546 - RCFC Project Head	-	8,198,987	8,198,987
4	Indian Bank - 21396756004 - SB3990 (Revolving Fund)	5,600,000	552,617	6,152,617
5	Canara Bank - 5201101001392 - Fixed Deposit	15,000,000	-	15,000,000
6	Indian Bank - 50070181661 - Sanchit Nidhi	46,499,000	14,738,972	61,237,972
7	Indian Bank - 50251950533 - NPS A/C (Deduction Head)	-	779,534	779,534
8	State Bank of India - Tularam Chouk (Deduction Head)	-	2,227,662	2,227,662
	Grand Total	100,399,000	57,988,501	158,387,501

5. ESTABLISHMENT

Postings, Transfers, and Retirement (2021-2022)

Postings :

S.No.	Name	Designation	Date of Joining
1.	Shri Amitabh Agnihotri	APCCF & Director	28.06.2021
2.	Smt. Vandna Thakur	Forest Ranger	14.07.2021
3.	Smt. Shyama Singh	Asstt. Gr.-2	11.02.2022

Transfers :

S.No.	Name	Designation	Date of Relieving
1.	Shri Anil Kumar Neti	Forest Ranger	23.07.2021

Retirement :

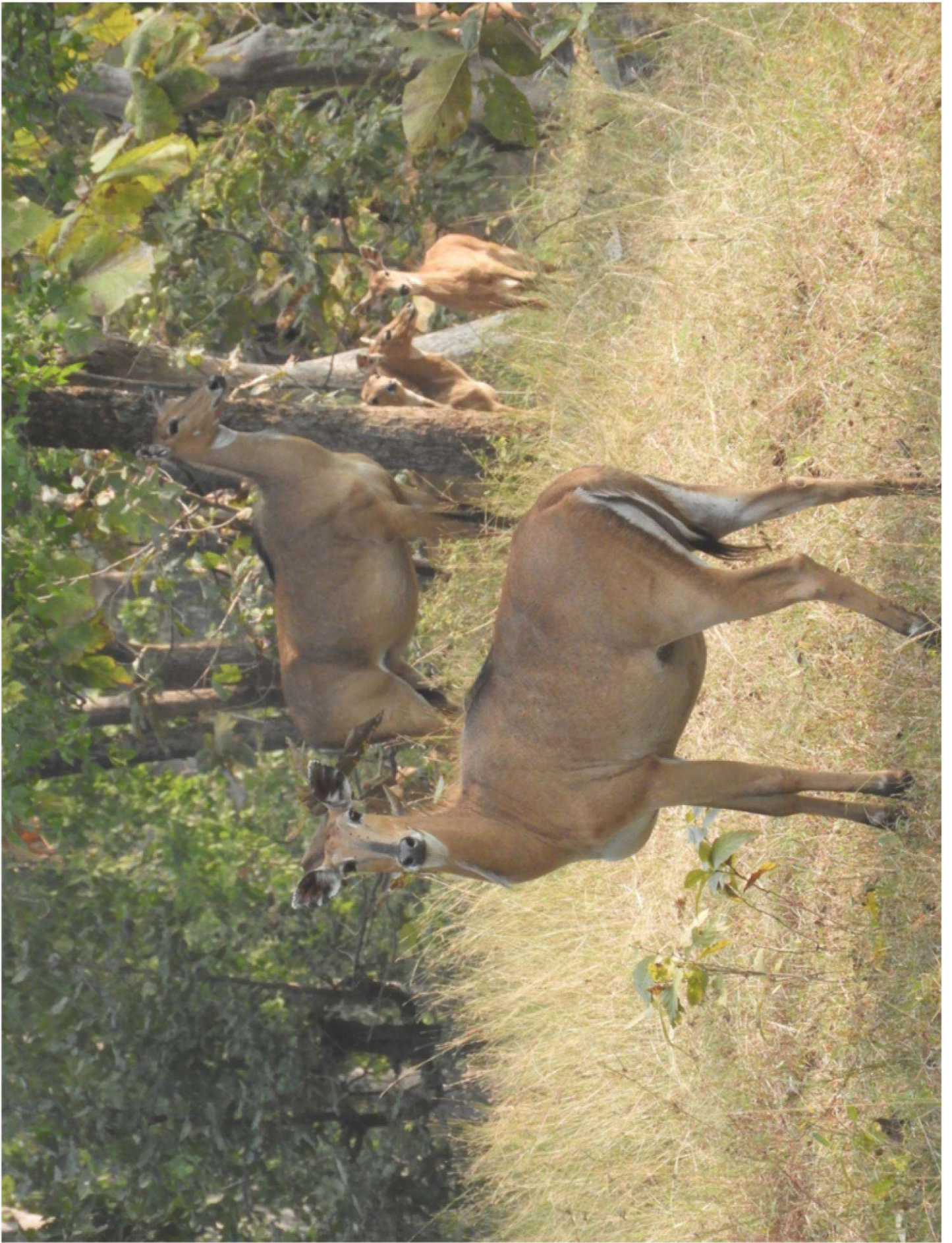
S.No.	Name	Designation	Date of Retirement
1.	Shri R.C. Gupta	ACF	30.06.2021
2.	Shri Phillip Daniel Francis	Asstt. Gr.-3	31.12.2021
3.	Shri Moh. Irshad Mansoori	Asstt. Gr.-3	31.03.2022

Temporary project staff engaged during the year (April 2021 to March 2022)

S. No	Name	Designation	Project under which appointed	Period	
				From	To
1.	Dr. P.K.Shukla	Regional Director	Regional-Cum-Facilitation Centre (RCFC) Central Region, SFRI, Jabalpur MP.	Mar. 2021	Nov. 2021
2.	Alok Sharma	Dy. Director		Mar. 2021	Nov. 2021
3.	Shri Manishpuri Goswami	Consultant (T.O)		Mar. 2021	Nov. 2021
4.	Amardeep Rajak	T.A/ Supporting Staff		Apr. 2021	Mar. 2022
5.	Prateek Jain	T.A/Supt. Staff		Mar. 2021	Nov. 2021
6.	Pankaj Saini	Project Asstt.		Apr. 2021	Mar. 2022
7.	Pradeep Kumar Kori	MTS/Attendant		Apr. 2021	Mar. 2022
8.	Gunjan Nema	DEO		Mar. 2021	Nov. 2021
9.	Shailendra Nema	DEO		Mar. 2021	Nov. 2021
10.	Gunjan Nema	JRF		Dissemination of knowledge through training programme for sustainable management and quality fruit collection of Chironji to stakeholders	Jan.2022
11.	Shailendra Nema	JRF	Germplasm evaluation and standardization of propagation technology for production of quality planting stock of medicinally important species viz. <i>Anogeissus latifolia</i> & <i>Commiphora wightii</i>	Jan.2022	Dec.2022
12.	Mr. Shubham Jain	Computer Operator		Jul. 2020	Jun. 2021
13.	Jay Prakash Mishra	JRF		Jan. 2020	Dec. 2021
14.	P.S. Bhandari	Field Asstt.	Monitring reintroduced Tigers (<i>Panthera tigris</i>) in Nauradehi Wild Life Sanctuary	Aug. 2021	Jul. 2022
15.	Ajay Lavishkar	JRF		Nov. 2021	Jul. 2022

S. No	Name	Designation	Project under which appointed	Period	
				From	To
16.	Mohd. Ashad Hussain	Field Asstt.	Impact assessment of proposed Sheopur Kalan & Baroda towns a group water supply scheme.	Dec. 2021	Apr. 2023
17.	Pratap Rao Vagh	Computer Operator		Dec. 2021	Apr. 2023
18.	Shailendra Yadav	Research Associate		Nov. 2021	Apr. 2023
19.	Avinash Yadav	JRF		Aug. 2018	Jul. 2021
20.	Manish Raj	Computer Prog.		Nov. 2021	Apr. 2023
21.	Shubhanjan Ghatak	JRF		Jan.2022	Apr. 2023
22.	Deepak Kumar Singh	FA-I		Nov. 2021	Apr. 2023
23.	Prashant Kori	JRF		Nov. 2021	Apr. 2023
24.	Neha Prajapati	JRF		Training and demonstration programme of seed technology and management of seed production areas of field foresters	Jan.2022
25.	Balram Lodhi	SRF	Network Project on conservation of Lac insect genetic resources.	Apr. 2021	Mar. 2022
26.	Bharat Singh Armo	Field Asstt.		Apr. 2021	Mar. 2022
27.	Rajesh Barman	Field Asstt.	Strengthening of market analysis centre for technical support in marketing of Minor Forest Produce in M.P.	Nov.2020	Oct.2022
28.	Imrat Sen	Field Asstt.	Identification of best performing bamboo species for enhancement of income of farmers in M.P.	Aug.2021	Jul.2022
29.	Arvind Yadav	Computer Operator		Aug.2021	Jul.2022
30.	Bhagwati Prasad Kalar	Field Asstt.		Aug.2021	Jul.2022
31.	Shakti Shukla	Field Asstt.	Study on leopard (<i>Panthera pardus L.</i>) presence, identification of conflict zones and developing suitable mitigation measures on human-leopard interactions in the urban areas of Jabalpur nad Indore, M.P.	Nov. 2021	Oct. 2022
32.	Amit Jaiswal	Field Asstt.		Nov. 2021	Oct. 2022
33.	Tanuj Suryan	JRF		Nov. 2021	Oct. 2022
34.	Syed Tanveer Abbas Rizvi	JRF		Oct. 2021	Sep. 2022
35.	Janam Jay	JRF	EIA on flora fauna & socio economic status of local communities and action to be taken to mitigation impact of Kopra Medium project at Nauradehi wildlife sanctuary, Sagar district	Feb. 2022	Jan. 2023
36.	Ramdeen Bhalavi	SRF		Feb. 2022	Jan. 2023
37.	Bhupendra Patel	Field Asstt.		Feb. 2022	Jan. 2023
38.	Alka Verma	Computer Operator		Feb. 2022	Jan. 2023
39.	Mradul Kumar	Field Asstt.-2	Study on Tiger Presence and their dispersal movement in Ratapani-Kheoni.	Apr. 2021	Feb. 2022
40.	Satyadeep Nag	JRF		Oct. 2019	Dec. 2021
41.	Rakesh Purviya	Project Asstt.	म.प्र. में महुआ फूल एवं आचार गुठली के उत्पादन संग्रहण मात्रा का आंकलन।	Mar. 2021	Feb. 2022
42.		Field Asstt.	EIA on flora fauna & socio economic status of local communities and action to be taken to mitigation impact of Kopra Medium project at Nauradehi wildlife sanctuary, Sagar district	Feb. 2022	Jan. 2023

S. No	Name	Designation	Project under which appointed	Period	
				From	To
43.	Suneel Kumar Payasi	JRF	म.प्र. में महुआ फूल एवं आचार गुठली के उत्पादन संग्रहण मात्रा का आंकलन।	Dec. 2021	May. 2022
44.	Mahendra Patle	Project Asstt.		Mar. 2021	Feb. 2022
45.	Naresh Singh Marko	Field Asstt.-1		Dec. 2021	Mar. 2022
46.	Sachin Patwa	Comp. Asst. / Prog.		Mar. 2021	Feb. 2022
47.	Ram Mohan Tiwari	Project Asstt.		Mar. 2021	Feb. 2022
48.	Susheel Sonwanshi	Project Asstt.		Mar. 2021	Feb. 2022
49.	Sachin Sharma	Field Asstt.-1	देवास जिले में लोकवानिकी प्रबंध योजना क्रियान्वयन का अनुश्रवण एवं मूल्यांकन।	Mar. 2021	Aug. 2022
50.	Satish Pathak	Field Asstt.-1		Mar. 2021	Feb. 2022
51.	Shubham Kumar Pandey	Field Asstt.-II	पश्चिमी मध्यप्रदेश के मालवा का पठार कृषि जलवायु प्रक्षेत्र (Agro Climatic Zone) के लिए उपयुक्त कृषि वानिकी पद्धतियों (Agro Forestry models) का विकास एवं उनका कृषकों की निजी भूमियों पर प्रदर्शन	Mar. 2021	Feb. 2022
52.	Piyush Dubey	Computer Operator	Phenological studies and determination of sustainable harvesting limits of some important wild medicinal plants and other NTFPs with active participation of user forest dependent communities in Satna Forest Division of Madhya Pradesh.	Jan. 2021	Feb. 2022
53.	Sangeeta Verma	SRF		Jan. 2021	Feb. 2022
54.	Rahul Rathore	JRF	Identification of potential pockets and selection of candidate plus trees of Achar, Beeja, Tinsa, Haldu, Dhaman, Sissum and standardization of their clonal propagation technique.	Jun. 2021	Dec. 2022
55.	Prayut Mandal	Computer Asstt.	To study the impact of proposed water supply subproject under MPUDP on the Dolphin, Crocodile and their habitat in National Chambal Gharial Wildlife Sanctuary, Morena (M.P.)	Aug. 2021	Oct. 2021





Release of technical brochures by Hon'ble Forest Minister



Review meeting by Principal Secretary (Forest) M.P.



Exposure visit of trainee Forest Range officers to SFRI



Exposure visit of under graduate students



Exposure visit of trainee field foresters in Wildlife Department



Field demonstration of AITE techniques to field foresters

Published by

Extension, Training & Consultancy Cell

State Forest Research Institute

(An Autonomous Institute of Department of Forests, Government of Madhya Pradesh)

Narmada Road, Polipathar, Jabalpur 482008 (M.P.)

Phone : 0761-2665540, Fax : 0761-2661304

E-mail : mpsfri@mp.gov.in, mpsfri@gmail.com, website: www.mpsfri.org