AMBIKA PRASAD RESEARCH FOUNDATION

ANNUAL REPORT 2021-2022

BETTER ENVIRONMENT BETTER TOMORROW

ANNUAL REPORT 2021-2022

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APRF would like to thank the State Forest Departments, Odisha; National Medicinal Plants Board, New Delhi; Local Government and Non-Government Organization & the team of APRF for their never-ending effort to work for biodiversity conservation and allied research.

PRESIDENT'S MESSAGE

DR. SANJEET KUMAR
President, APRF, Odisha, India

The gift of nature & forest is incomparable and immeasurable. However, over the years, its values are taken for granted and gradually it reduced tremendously in the mindset of the people. The deep relation of human with natural environment, forest and water systems has highly reduced by man's ever-increasing greed in the name of advancement.

The great loss suffering or to be suffered in the near future due to the human activities to add more and more profit in their business by not considering the consequences of exploitation of natural environment, forest and its products. Excessive mining activities are currently blindfolded by us for the time being. However, these activities cannot be covered for long as the disaster following them will certainly happen and by that time, human might realize their mistakes but unfortunately the time could not be return to save it.

Ambika Prasad Research Foundation, Odisha, takes the steps forward with or without other Government and Non-Government organization to make awareness on the values of biodiversity & its means to conserve it, means to sustainable use of these products and on the consequences of its loss.

The organization also works on the herbal remedies on traditional medicinal systems used by the tribal communities, the importance of such medicines and how such people make use of these plants in a sustainable way.

CONTENTS

ABOUT APRF

APRF focuses deeper into the study of biodiversity conservation management through involvement of community in and around the forest areas. The study involves extensive surveys in forest areas of different Forest Divisions of Odisha, India. Research survey with respect to forest fire, monitoring regeneration, management of forest fire, addressing livelihood of local communities, indigenous traditional practices, in various areas like food, medicine or allied purposes. The organization in collaboration with the State Forest Department, Odisha conducted several training programs on awareness of medicinal plants, floral biodiversity, biodiversity conservation management, wetland conservation, etc. and taken up several developmental works like initiating the development of Medicinal Plants Garden, Butterfly Garden, Orchid Restoration, etc. Other research activities are currently under process and some are yet to come.

BIODIVERSITY ASSESSMENT

Floral biodiversity gives the idea about the variability of different plant species of the forest. Assessing the floral diversity of the area is important as to monitor the current status of the available plant species, to develop strategies for sustainable utilization of the plant or plant products at different levels starting from village, country to region.

According to the Convention of Biological Diversity (CBD), biodiversity assessment plays an important role to ensure that the strategies, policies and programmes provided in Article 6 are implemented and to see the results expected out of them are achieved. It is also important to provide the information on biodiversity status, stresses and benefits required for Article 14 on impact assessment and minimizing the adverse impacts. Ambika Prasad Research Foundation carried out the floral biodiversity assessment of Rairangpur Forest Division (RFD). During the survey, about 928 plant species were enumerated belonging to 568 genera and 155 families. Some important tree species found in RFD are *Shorea robusta, Bombax ceiba, Holoptelia integrifolia, Butea monosperma, Madhuca longifolia, Buchanania lanzan, Schleichera oleosa, Mallotus philippines* etc. Other plant species having threats like Fanfana (*Oroxylum indicum*), Kujuri/Pengu (*Celastrus paniculatus*), Bandhana (*Desmodium oojeinense*), Lodha (*Symplocos racemosa*) etc. were found. Again, some medicinally important plant species like *Andrographis paniculata*, *Tinospora cordifolia, Curculigo orchioides, Desmodium gangeticum, Rauvolfia serpentina, Hemidesmus indicus, Woordfordia fruticosa* etc. were also observed. Floral biodiversity assessment for Bonai Forest Division is still under process.

COMMUNITY LEVEL BIODIVERSITY MANAGEMENT

Wildlife management & biodiversity conservation can be treated as utmost problems throughout the world. The problems could be solved through local communities and also World Conservation Union's Protected Areas Categories- V and VI suggest the same for management of wildlife and conservation works. If the conservation activities and implementation in Reserve Forest or Protected areas do not have any socio-political controversy, State Forest Department could be able to manage it under low-cost solution in better ways with local communities through community conservation. Despite of many complexes and challenges, local communities are driving their own initiatives to conserve wildlife and biodiversity in general to generate sustained livelihood.

The engagement of local people in the conservation of biodiversity represents a win-win situation. Tribes have their own way to preserve the biodiversity and to maintain the sustainability like sacred groves, trees around temple, joint forest management etc.

COMMUNITY LEVEL BIODIVERSITY MANAGEMENT

The Eastern Ghats region of Odisha are highly concentrated with many tribal communities. Considering the spatial distribution of ST population in Odisha's 30 districts, census figures of India for 2011 recorded that Malkangiri district has the highest proportion of tribal communities followed by Rayagada, Mayurbhanj and Sundargarh. The study was conducted in Sundargarh district of Odisha, having around 51% of tribals. Major communities in this area are Munda, Ho, Dehuri, Bhuian etc. Survey works was done in seven selected villages (Lassi, Kemsila, Sarkunda, Batagaon, Bhutuda, Siliguda & Badamba) of Barsuan range of Bonai Forest Division, Sundargarh, Odisha. Information is collected and opinion is taken on forest fire, forest canopy, collection of NTFPs (Non-Timber Forest Produces), wildlife, medicinal plants, eco-tourism, local participation in eco-tourism programme and how shifting cultivations be minimized, Pre-designed Passport Data Form (PDF) were used. Semi-structured questionnaire method was adopted to complete the survey works.

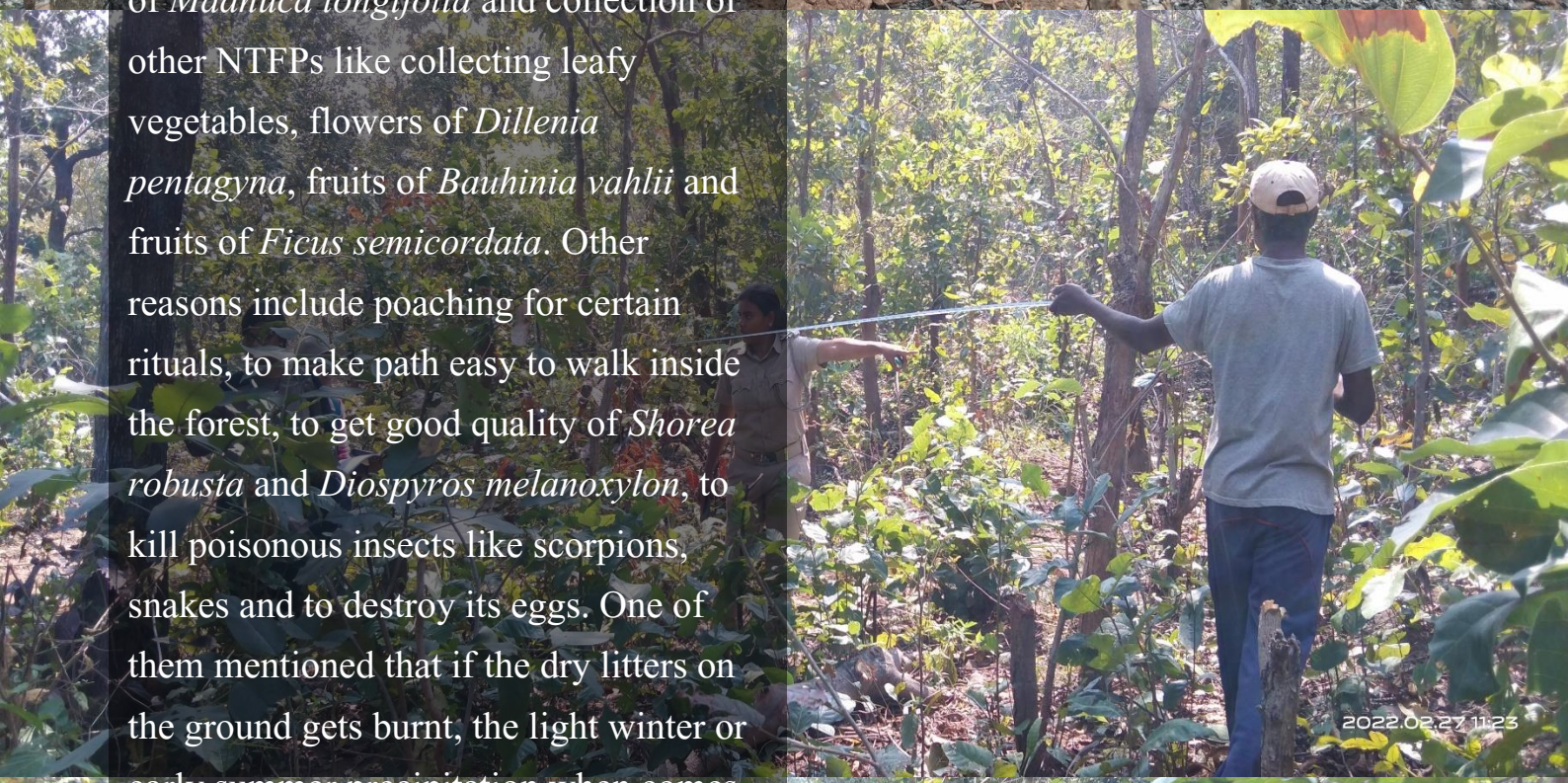
FOREST FIRE & MONITERING REGENERATION

Forest fire in India has been an aged old practice or phenomena which is still prevailing every year in many forest patches. Effect of Forest fire may differ depending upon the landscape and vegetation. It could have social and ecological benefits like recycling of nutrients, help in regeneration, remove invasive weeds, lowering of fuel loads on the one hand and it might cause the loss of biodiversity, affect the ecosystem functioning, could destroy the vegetation and could have significant impacts on the terrestrial, aquatic and atmospheric systems like soil erosion, loss of wildlife habitat, etc.

The period of forest fire in Badampahar Range, Rairangpur Forest Division were observed mainly from February to April, when the atmosphere is dry and warm with very less to no precipitation. The nature of fire in these areas is mostly a surface fire that burns the thick dried leaves, dried shrubs, climbers and herbs. The dried twigs or dead logs on the surface of forest floor are normally burnt. The intensity of heat in this fire is less as the fuels are mainly dried leaves and dried twigs. During night time, the fire spreads slowly while during day time, it spreads rapidly and sometimes it could raise till the height of 5-10 feet. In some cases, it reaches till the height of 12 feet. Fire could be inside the forest, under the tree or it could be in an open field normally the paddy field.

FOREST FIRE & MONITERING REGENERATION

Collection of Non-timber Forest Produces is the main reason for Forest fire. These include collection of flowers of *Madhuca longifolia* and collection of other NTFPs like collecting leafy vegetables, flowers of *Dillenia pentagyna*, fruits of *Bauhinia vahlii* and fruits of *Ficus semicordata*. Other reasons include poaching for certain rituals, to make path easy to walk inside the forest, to get good quality of *Shorea robusta* and *Diospyros melanoxylon*, to kill poisonous insects like scorpions, snakes and to destroy its eggs. One of them mentioned that if the dry litters on the ground gets burnt, the light winter or early summer precipitation when comes gets in contact with the soil easily which thereby enhance the regeneration rate. This is then fed upon by herbivores.



FOREST FIRE & MONITERING REGENERATION

Survey during monsoon revealed that the forest floor was covered with green layer of regeneration of tree seedlings, shrubs, climbers, tuberous plants, herbs, etc. The study of burnt areas were restudied after monsoon. Regenerations were noted and the most observed common tree seedlings in the studied areas include *Shorea robusta*, *Azadirachta indica, Buchanania lanzan, Diospyros melanoxylon, Cassia fistula, Dalbergia latifolia, Symplocos racemosa* etc. The most common shrubs include *Woodfordia fruticosa, Glochidion lanceolarium, Grewia hirsuta, Olax scandens* etc. are observed. Common climbers in these areas include *Cissampelos pareira, Asparagus racemosa, Celastrus paniculatus, Combretum roxburghii, Tinospora cordifolia, Cryptolepis buchananii, Ichnocarpus frutescens, Hemidesmus indicus, Dioscorea bulbifera, Dioscorea hispida*, *Dioscorea puber, Dioscorea wallichii* etc. Common herbs include *Andrographis paniculata, Elephantopus scaber, Curculigo orchioides, Polygala arvensis*, *Sida cordata, Typhonium spp., Curcuma* spp., etc. The regeneration observed with a sound floral diversity also comprises of many medicinally important species like *Scindapsus officinalis, Celastrus paniculatus, Oroxylum indicum, Pterocarpus marsupium, Symplocos racemosa, Gloriosa superba*, etc. In many cases, important ground flora (ground orchids) like *Geodorum densiflorum, Geodorum laxiflorum* and many *Nervilia* spp. have been observed as regenerated flora of the burnt areas. During forest fire season, the soil of the forest floor is exposed with shedding of *Shorea robusta* flowers.

Bombax ceiba

INDIGENOUS TRADITIONAL KNOWLEDGE

Indigenous Traditional Knowledge (ITK) of the forest dwellers with respect to food, medicine and other uses should be well understood as this knowledge carry valuable information not only for human benefits but also to develop conservation strategies for the sustainable utilization of forest products.

Survey for the ITK was carried out at Koira and Barsuan Range of Bonai Forest Division, Sundargarh, Odisha, India. In Koira Range, about 29 villages were surveyed. The survey revealed about 63 plant species that was commonly used in the Indigenous Traditional practices. Out of it, maximum species belongs to Fabaceae family followed by Asteraceae, Dioscoreaceae, Rubiaceae etc.

INDEGENOUS TRADITIONAL KNOWLEDGE

Indigofera cassioides

Medicinal plants belong to a huge plant group, representing the most ancient form of medication, used as traditional medicines in many countries throughout the world. It is not only a source of health care systems, but also having economic importance and traded extensively on large scales ranging from the local to the international market. Indigenous Traditional Knowledge is deep rooted in many countries of the world. The tubers of *Dioscorea bulbifera* are burnt and consumed as snacks whereas the tubers of *Dioscorea hispida* are kept overnight in running water and consumed as a vegetable. *Antidesma ghaesembilla*, a very common leafy vegetable consumed by the Munda tribe, locally known as Matha saga. Likewise leaves of *Hibiscus sabdariffa* is used as leafy vegetable in Munda community and they use its fruits to make a sweet & sour chutney. The fully ripen fruits are also eaten raw or cooked.

ORCHID RESTORATION

Orchids grown in wild, play an important role in the biodiversity make up in the forest. However, due to many factors including natural and anthropogenic activities, there is a loss of many species of orchids from the wild. Many are unaware of the fact that orchids can be grown as epiphytes, terrestrial or in some cases, on a rocky habitat.

Apart from anthropogenic activities of extracting orchids from the wild for food, medicine or ornamental purposes, sometimes orchids on branches of trees can be flown and fell on ground by the wind. Ambika Prasad Research Foundation, with the help of Bonai Forest Division, Odisha, initiated a work for restoration of the orchids. Restoration of orchids in the wild or to develop a natural orchid garden in Tensa Nature Camp, Bonai Forest Division.

ORCHID RESTORATION

Preparation of artificial orchid growing media

Orchid Restoration activities at State Botanical Garden, Bhubaneswar.

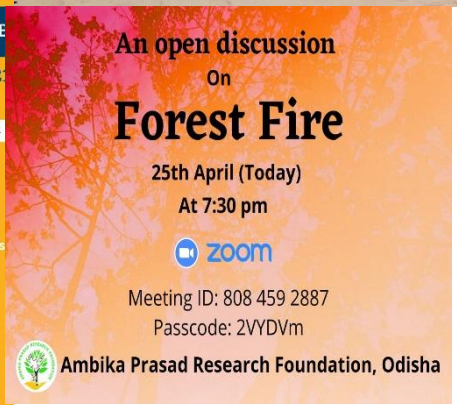
NATIONAL SEMINAR & TRAINING PROGRAMS

Training programs were conducted in Forest Department, Odisha for the Forest officials on the aspect of Floral Biodiversity, with relation to overlying dependents on Forest, sustainable management of forest products, the practical ways to conserve the forest in corporation with the communities inhabiting in and around the forest.

NATIONAL SEMINAR & TRAINING PROGRAMS

National Seminar entitled "Indigenous documentation Conservation & Development of Traditional Knowledge, Secondary metabolites and pharmacological values of medicinal plants" was conducted in the interest to have a common platform for students, experts in related field, academicians, traditional healers for knowledge & discussion.

NATIONAL SEMINAR & TRAINING PROGRAMS

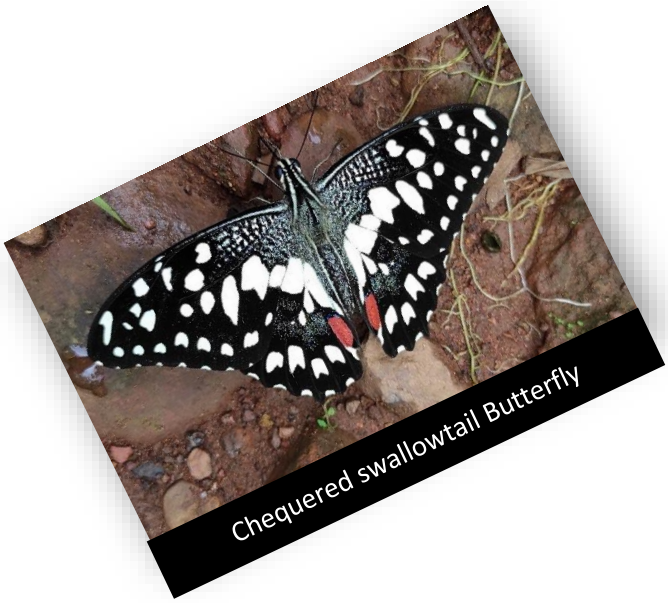


Field study of the medicinal Sand dune flora and experiencing the practical knowledge with students, experts and traditional healers with different aspects of medicinal plants and their ecology on the third day of the National Seminar conducted. Again, many free Webinars were organized on “Medicinal Plants on the Terrace” & “An open discussion on Forest Fire”.

BUTTERFLY GARDEN

Butterflies play an important role in the ecosystem. They pollinate alongside the collection of nectar from flower by sitting and migrating from flower to flower. This in turn induces a genetic variation or induce traits that could increase the chances of survival in stress conditions. Abundance of butterflies indicates that the ecosystem is healthy.

Butterflies are therefore a major source of forest and ecosystem restoration.



Chequered swallowtail Butterfly

Moduza procris procis

They gather in flock to suck the nutrient rich muddy soil mostly near streams and often gets intoxicated by it. This behaviour of butterflies is known as mud puddling.

Considering the importance of butterflies and to enhance and create a healthy ecosystem, APRF with the help of the forest officials took an initiative to develop the Butterfly Garden at Tensa Nature Camp, Bonai Forest Division.

The plants that are often preferred by them at different stages of their lifecycle for different purposes are considered and selected to be grown. Again, the artificial mud-puddling area has been developed to attract more butterflies.

Mud-puddling

Designed by:
Rajkumari Supriya Devi
Ambika Prasad Research Foundation

MEDICINAL PLANTS GARDEN

Medicinal plants available in forest are vast and diverse. For a layman, its medicinal values are not easily known. And if one knows its medicinal value, often people find it difficult to identify it in the wild. Hence, medicinal plants garden plays an important role. The collection of different medicinal plants with identified names and important medicinal uses can make it easy to recognise and clear the confusion sometimes created in photographs. students, researchers, academicians, traditional healers or any layman can find a congregate knowledge from it and sometimes through discussion. APRF along with the Forest Officials of Bonai Forest Division developed a Medicinal Plant Garden in Tensa Nature Camp, Bonai Forest Division.

Hugonia mystax

About 61 plant species are selected for the development of Medicinal Plants Garden from different categories of herbs, shrubs, climber, tree, aquatic plants and grasses. Some of them include *Andrographis paniculata, Rauvolfia serpentina, Gymnema sylvestre, Pterocarpus marsupium, Nymphaea pubescens, Cynodon dactylon* etc.

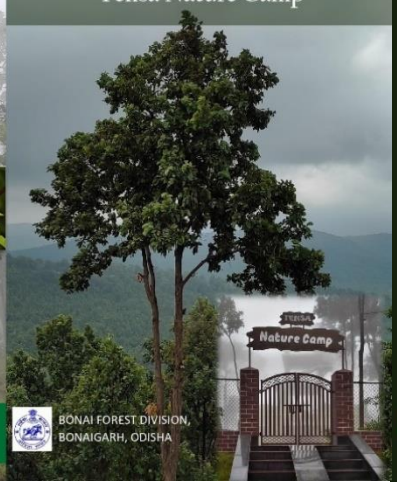
Key Development Works with Forest Department, Odisha

MEDICINAL PLANTS GARDEN

Designed by:
Rajkumari Supriya Devi
Ambika Prasad Research Foundation

BONAI FOREST DIVISION, BONAIGARH
SUNDARGARH, ODISHA

Medicinal Plants of
Tensa Nature Camp



BONAI FOREST DIVISION,
BONAIGARH, ODISHA

Tensa Nature Camp is a hub of different types of medicinal plants. A survey was made by the team of Ambika Prasad Research Foundation and enumerated about 100 plant species having medicinal values. It is important to identify such medicinal plants and develop a way to harvest sustainably so that no biodiversity is harm by over extraction.

The most common medicinal plants of Tensa Nature Camp include *Asparagus racemosa, Dioscorea bulbifera, Dioscorea wallichii, Cissampelos pareira, Eclipta prostrata, Synedrella nodiflora, Terminalia chebula, Buchanania lanzan, Shorea robusta,* etc.

Some medicinal plants of Tensa Nature Camp

***Terminalia chebula*:** It is used against heart diseases.
***Terminalia bellerica*:** It helps in digestion and relieves constipation.
***Shorea robusta*:** It is used against skin disorders.
***Arisaema tortuosum*:** It is used to treat snake bites.
***Azadirachta indica*:** It is used to treat skin diseases.
***Buchanania lanzan*:** It is a tonic for the blood.
***Dioscorea bulbifera*:** It is used against gastrointestinal disorders.
***Synedrella nodiflora*:** It is used against ne[illegible]us system disorders.
***Cissampelos pareira*:** It is used agains[illegible]
***Begonia picta*:** It is used against rheu[illegible]
***Eclipta prostrata*:** It is used against ur[illegible]y t[illegible] infection.

Key Development Works with Forest Department, Odisha

NURSERY DOCUMENTATION

Nursery documentation plays a crucial role in the development of forest. Finding alternative of the exotic competitive plants with native plants that are ecologically beneficial could bring about a great change in the health of the forest ecosystem. For this purpose, the team of APRF visited a number of forest nurseries in Rairangpur Forest Division and Bonai Forest Division to document the plants in the nursery. During the survey, it was fortunate that the team could gather knowledge on the uses of the plants of nursery in different ecological aspects other than medicinal.

PLANTATION

Some of the common plants of the forest nursery and plantation by the Forest Department include Terminalia bellirica, Terminalia chebula, Terminalia arjuna, Holoptalea integrifolia, Mellettia pinnata, Phyllanthus emblica, Tamarindus indica, Gmelina arborea, Saraca asoca, etc.

PUBLICATIONS

Tribulus terrestris

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Sanath K N, Mishra S and Kumar S. 2021. *Polygala abyssinica* R.Br. ex Fresen. (Polygalaceae): A new addition to the flora of Odisha, India. Species. 22(70): 414-416.

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Mishra S, Satapathy S, Mishra A K, Majhi R, Devi R S, Marndi S, Kumar S. 2021. *Utricularia australis* R. Br. (Lentibulariaceae): An addition to the carnivorous plants of Odisha, India. Species. 22(69): 130-133.

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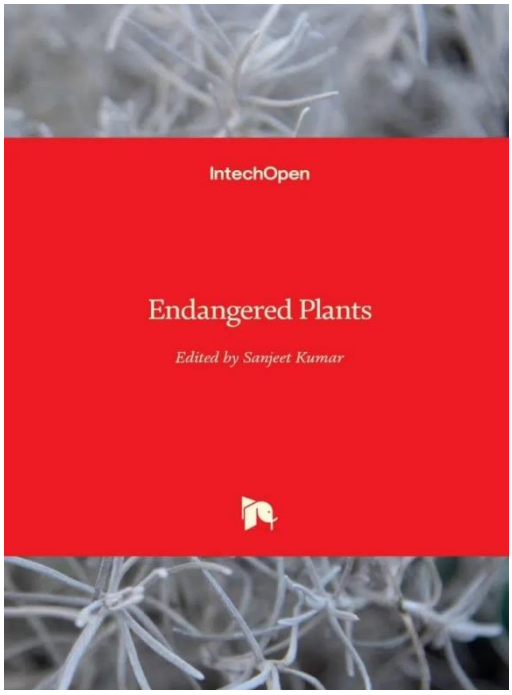
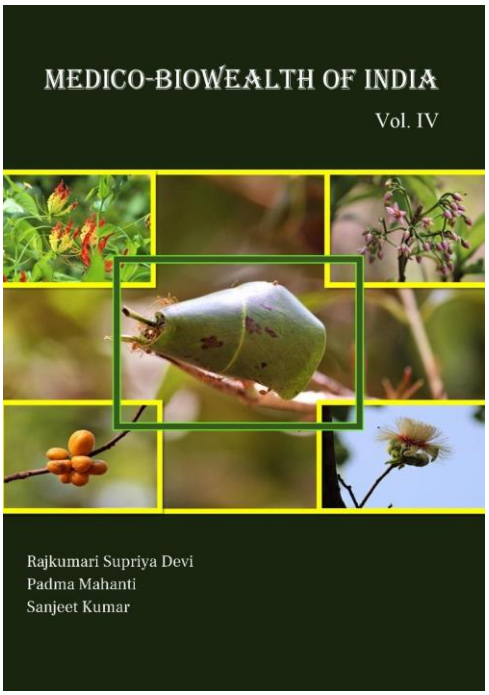
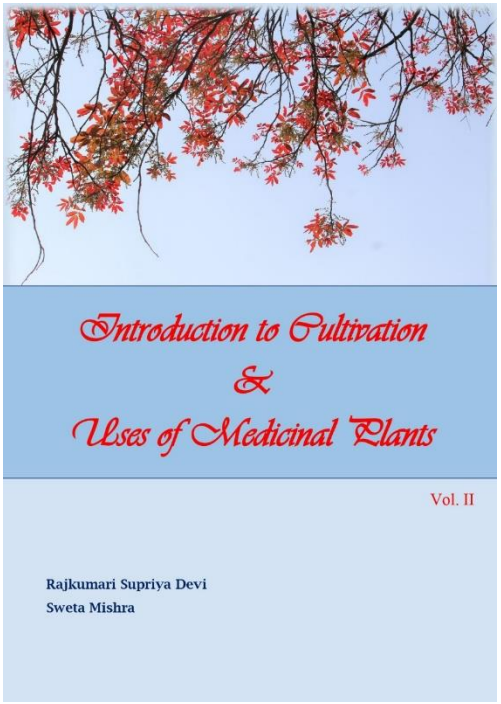
Das L, Mishra S, Das A, Dimri R and Kumar S. 2022. Some common flora of temple city of Odisha, India: Sources of ethno-medico-cultural values. Indian Forester. 148(2): 207-212.

Sanath K N, Mishra S and Kumar S. 2021. Documentation of Indigenous Traditional Knowledge (ITK) on commonly available plants in Koira Range, Bonai Forest Division, Sundargarh, Odisha, India. Asian Plant Research Journal. 8(4): 83-95.

PUBLICATIONS







OTHER ACTIVITIES

SURVEY ON FOREST FIRE & HUMAN ELEPHANT CONFLICT

OTHER ACTIVITIES

AWARENESS PROGRAM ON FOREST FIRE & HUMAN ELEPHANT CONFLICT

AMBIKA PRASAD RESEARCH FOUNDATION, ODISHA