



Institute of Forest Genetics and Tree Breeding



Established in 1988 through integration of various research Centres functioning in and around Coimbatore.

Mandate of IFGTB

Assess the genetic variability, identify varieties within the forests of Western and Eastern ghats and the Island forests, and work on the indigenous species available in the forests for productivity enhancement, biodiversity conservation besides working on selected exotic species of high economic importance and contribute to livelihood enhancement and the development of tree based enterprises and activities in the mandated states. Thus IFGTB will also work on the problems faced by the forest departments, industries and other stakeholders of the mandated states.



Core Competence

To evolve trait specific trees with increased biomass production through conventional breeding strategies, biotechnological interventions and precision silvicultural practices.

Thrust Areas

- 1. Increasing productivity in farmlands/plantations/homesteads through scientific breeding programmes and biotechnological interventions.**
- 2. Making available quality planting stock by establishment of orchards and quality seeds.**
- 3. Forest Genetic Resources Networking for conservation, management and sustainable utilization**
- 4. Support agroforestry, trees outside forests, plantation forestry for supply of wood resources to wood based industries.**
- 5. Identify lesser known timber species from forests, to support production forestry and also germplasm conservation.**

...Contd.

- 6. Adaptation and mitigation research on climate change**
- 7. Strengthen forests and plantation health through research inputs including precision silviculture techniques**
- 8. Provide forestry solutions to stakeholders specifically to State Forest Departments and Farmers for productivity enhancement and conservation gains**
- 9. Massive education programmes to mandated states**
- 10. Intensive Extension Programmes to reach stake holders**
- 11. Forestry data generation and retrieval**
- 12. Bioprospecting for novel compounds.**

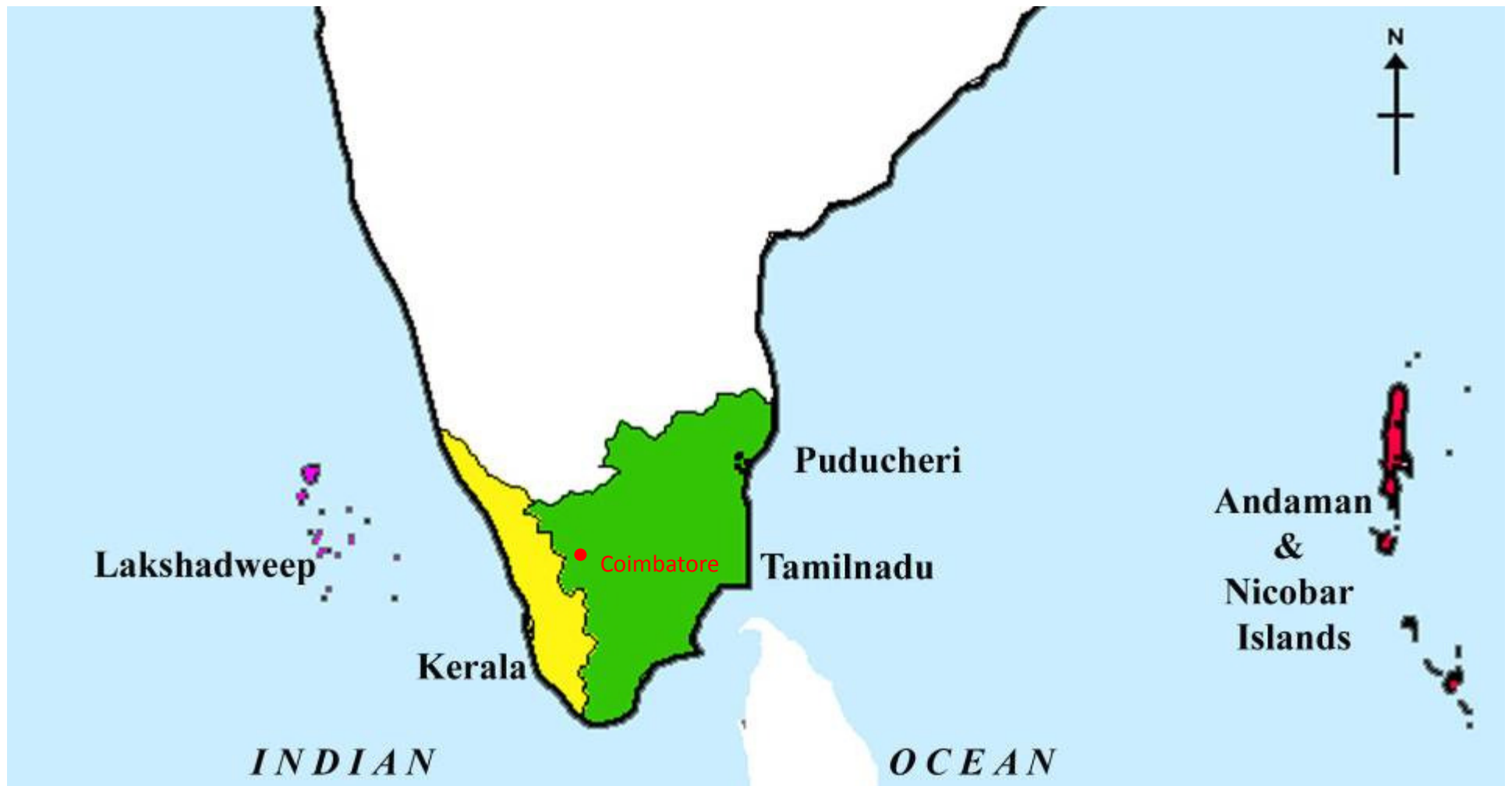
Strategies

- ❖ Carry out **genetic improvement** of species by establishment of Seed Stands, SPAs, SSOs and CSOs
- ❖ Develop clones for large-scale **clonal forestry** programme
- ❖ Supply of quality seeds and planting material to **improve productivity** of forests and plantations
- ❖ **Promote tree cultivation** as a profitable and economically remunerative venture in collaboration with SFDs, other research institutes, universities and interested NGOs.
- ❖ **Translate the success of off and on-farm trials** as demonstration models through effective extension.
- ❖ **Promote and encourage more farmers to adopt the successful agroforestry models.**
- ❖ **Environmental amelioration** through ecorestoration of problem soils, bioremediation, improvement of soil health, increase of green cover, creation of shelterbelts, etc.

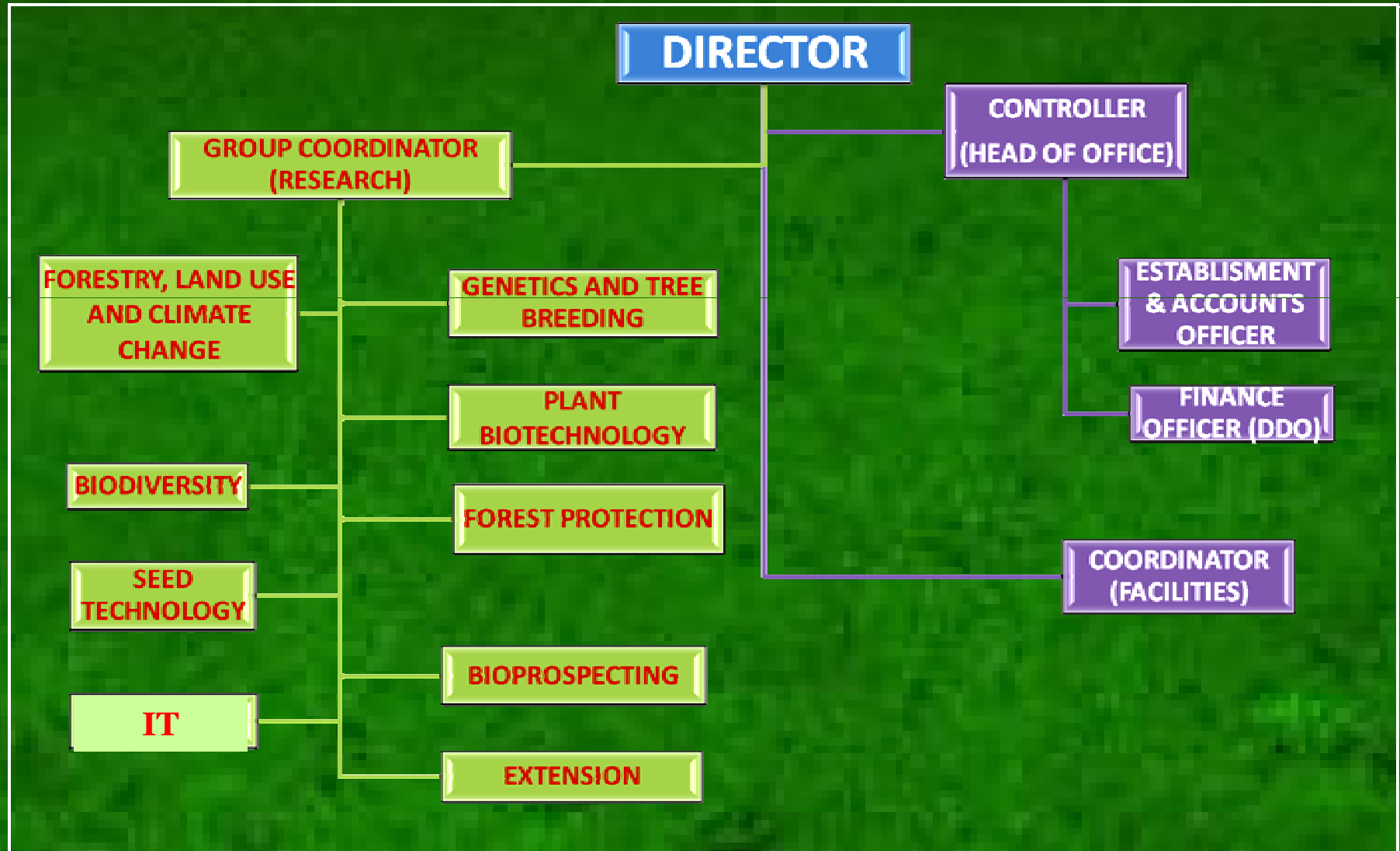
- ❖ **Genetic engineering and marker assisted selection for productivity enhancement and conservation.**
- ❖ **Expedition for identification of new species**
- ❖ **Species recovery and restoration**
- ❖ **Conduct range of studies on species and clones to understand response to elevated CO₂**
- ❖ **Generation of data on trees to make available to stake holders**
- ❖ **Make available new ecofriendly forest based organic compounds for growth and productivity enhancement**
- ❖ **Promote forestry extension through PhD programmes, summer trainings to college students**
- ❖ **Provide solutions through extension delivery mechanisms.**

Jurisdiction

The Institute undertakes national level research on tree improvement and caters to the specific research needs of two States and three UTs.



ORGANIZATION

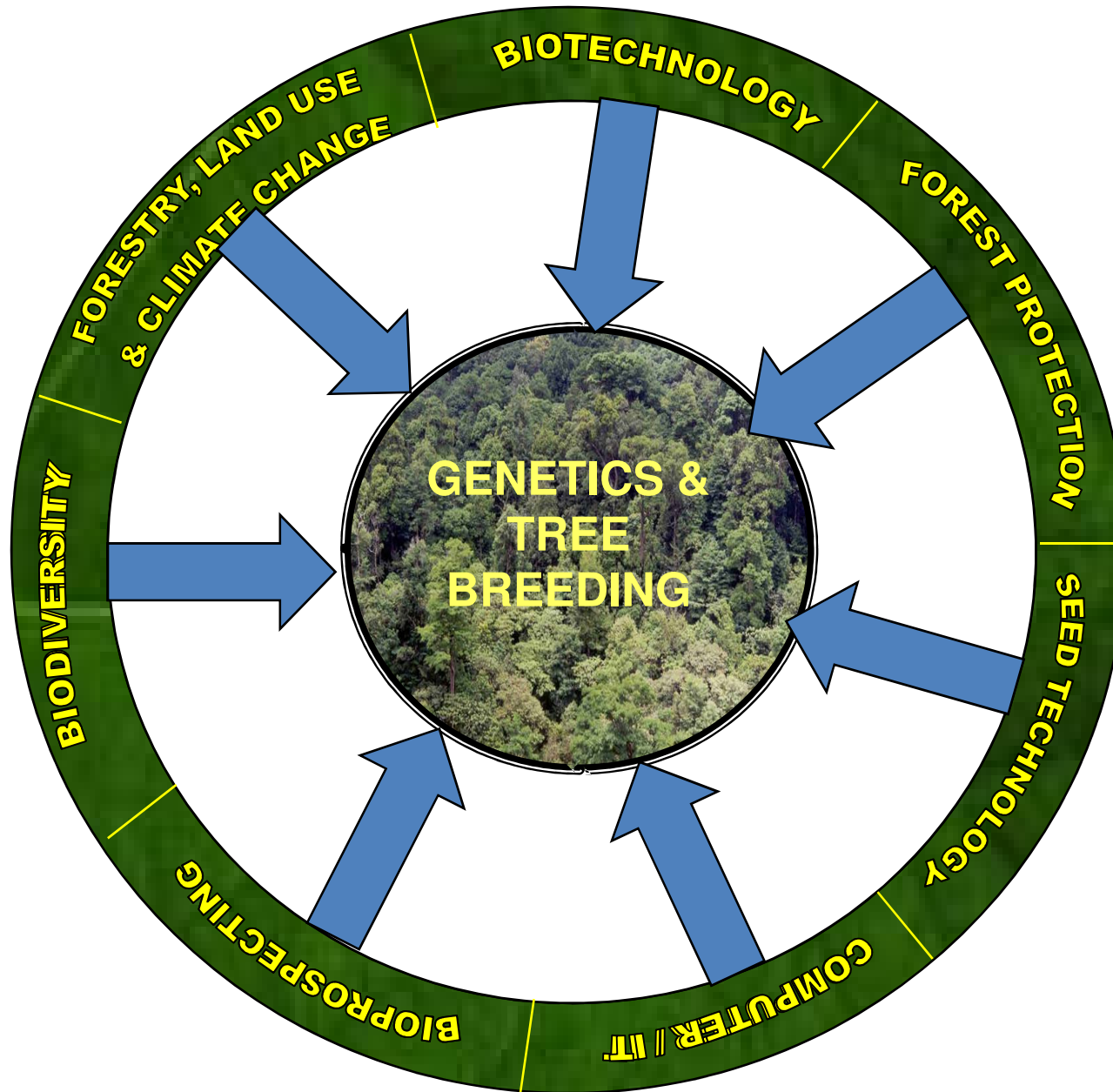


Forestry Research : Thrust Areas and Themes

Sl. No.	Thrust Area	Theme
1	Ecosystem Conservation and Management	<ol style="list-style-type: none">1. Climate Change2. Ecology and Environment3. Biodiversity4. Forest Botany5. Tribals and Traditional Knowledge System
2	Forest Productivity	<ol style="list-style-type: none">1. Silviculture2. Social Forestry, Agro-forestry /Farm Forestry3. Forest Soils and Land Reclamation4. Watershed Management
3	Genetic Improvement	<ol style="list-style-type: none">1. Conservation of Forest Genetic Resources2. Tree Improvement3. Vegetative Propagation4. Biotechnology

4	Forest Management	<ol style="list-style-type: none"> 1. Sustainable Forest Management (SFM) 2. Forest Economics 3. Forest Biometrics 4. Participatory Forest Management 5. Policy and Legal Issues 6. Information and Communication Technology (ICT)
5	Wood Products	<ol style="list-style-type: none"> 1. Wood and other Lignocellulosic Composites 2. Wood Processing 3. Value Addition and Utilization 4. Wood Chemistry 5. Pulp and Paper
6	Non-wood Forest Products (NWFPs)	<ol style="list-style-type: none"> 1. Resource Development of NWFPs 2. Sustainable Harvesting and Management 3. Chemistry of NWFPs, Value Addition and Utilization 4. Biofuels and Bioenergy
7	Forest Protection	<ol style="list-style-type: none"> 1. Insects pests, diseases and control 2. Mycorrhizae, rhizobia and other useful microbes 3. Weeds and Invasive species

ROLE OF DIVISIONS





STRENGTHS

Profile of research posts

- **On deputation**
 - Director-1
 - Conservator of Forests-3
 - Deputy Conservator of Forests-3
 - Forest Ranger-2
- **Permanent**
 - Scientists- 30 (Scientist B to Scientist F)
 - Research Officer- 4
 - Research Assistants- 38
 - Technical Assistants- 26

STRENGTHS

Laboratories

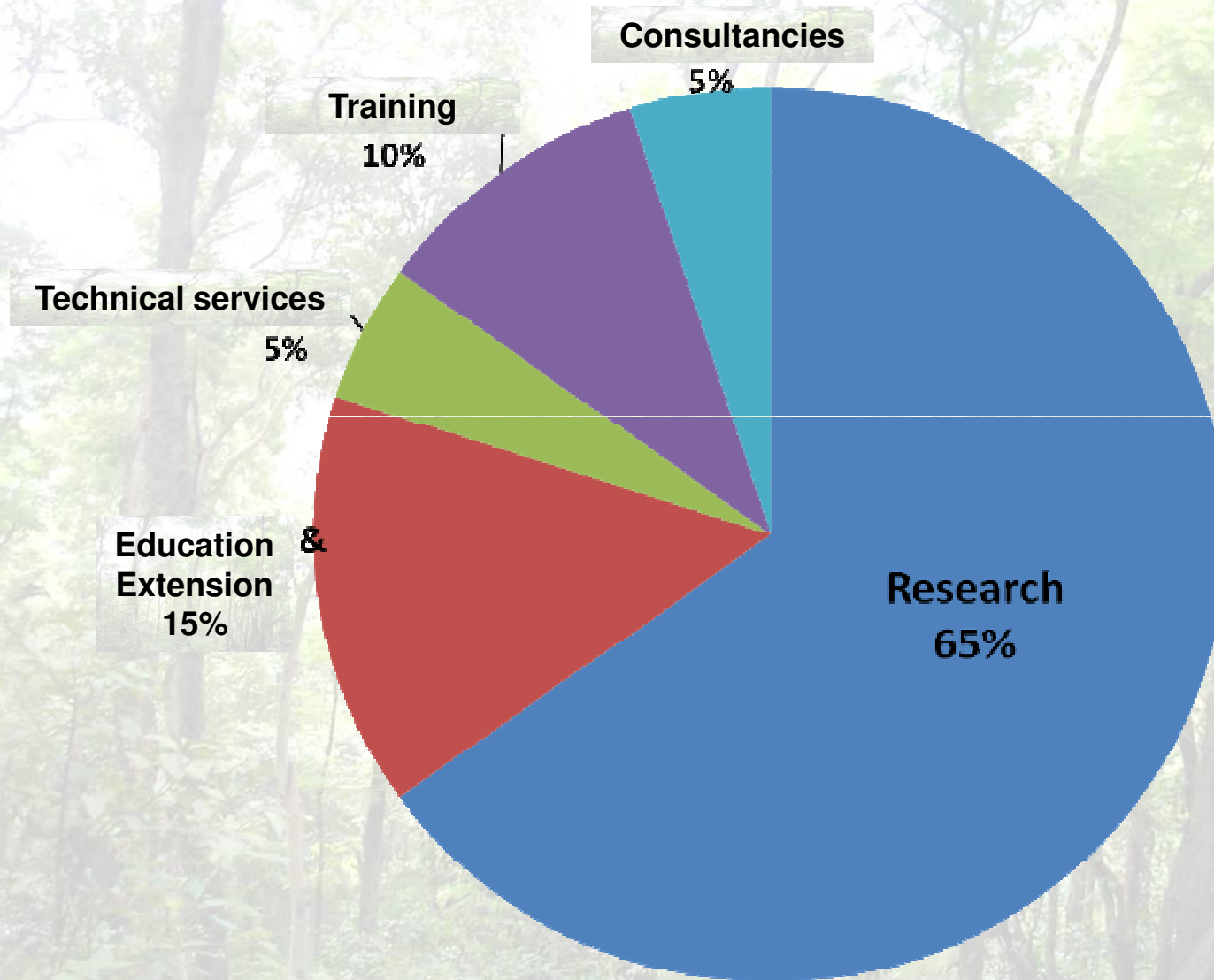
- Soil and water testing
- Seed testing
- Phytochemistry
- Tissue culture
- Isozyme
- DNA fingerprinting
- Genetic transformation
- Genomics
- Entomology
- Pathology

Facilities

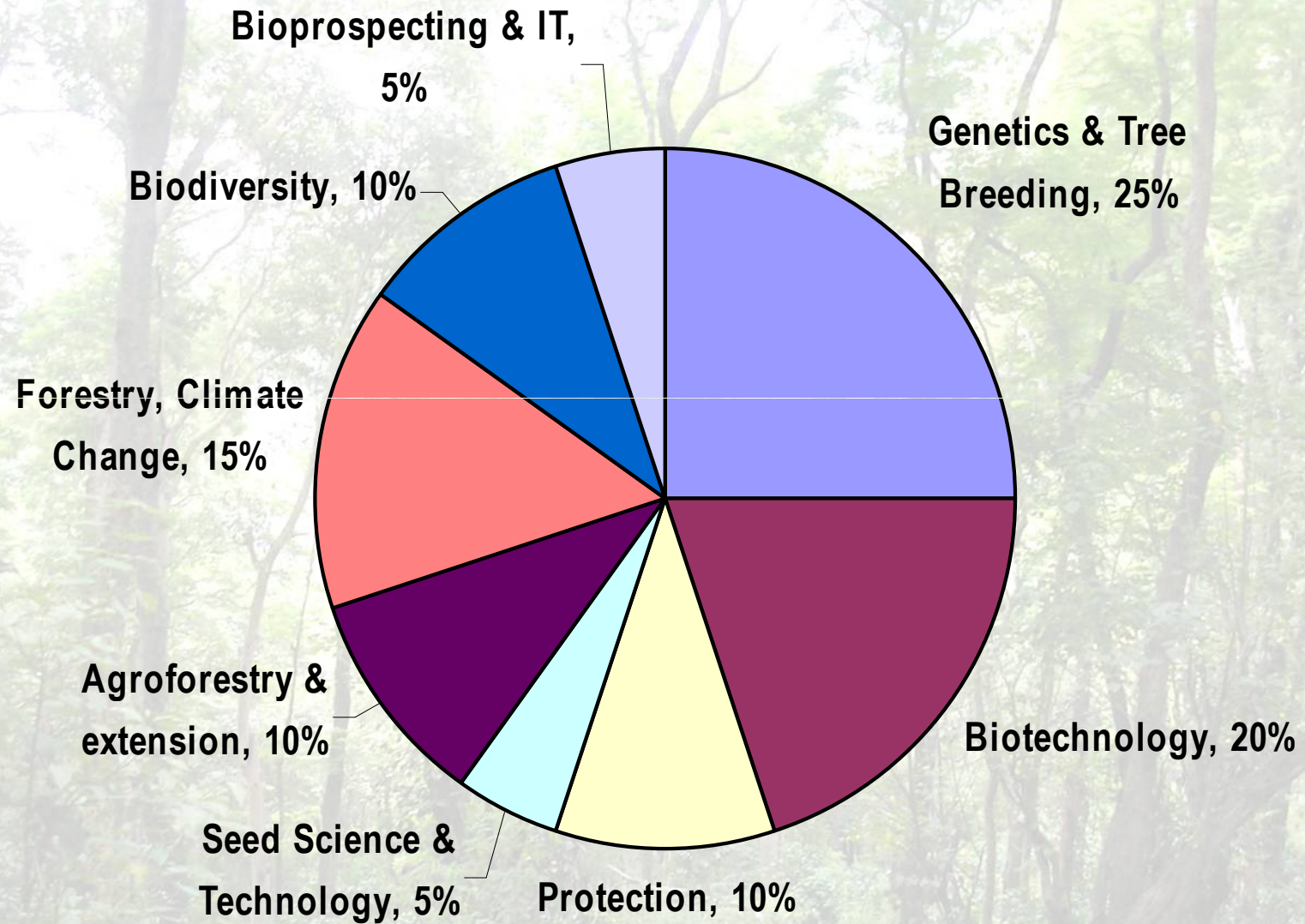
- Nurseries
- Vegetative Propagation Complex
- Glass house
- Mist chambers
- Seed bank
- Herbarium
- Arboretum
- Library
- Computer lab



Balancing Allocation of Time, Human & Financial Resources



Distribution of projects for the Institute



Species prioritized by IFGTB

Casuarinas

Eucalypts

Acacia auriculiformis

Acacia mangium

Bamboo

Tamarindus indica

Tectona grandis

Dalbergia spp.

Acrocarpus fraxinifolius

Anthocephalus cadamba

Khaya senegalensis

Melia dubia

Pterocarpus santalinus

Toona ciliata

Pterocarpus dalbergioides

Ailanthus spp.

Calophyllum inophyllum

Sapindus emarginatus

Macaranga peltata

Santalum album

Canarium strictum

Terminalia spp.

Gmelina arborea

Bombax ceiba

Artocarpus spp.

Azadirachta indica

Pongamia pinnata

Thespesia populnea

Albizia spp.

Grevillia robusta

Sweitenia mahogani



A large, dense evergreen tree, possibly a cypress or similar, is shown against a clear blue sky. The tree's branches are thick and covered in dark green, needle-like foliage. The sky is a uniform, bright blue. The text 'Salient Achievement' is overlaid in the bottom right corner in a dark blue, serif font.

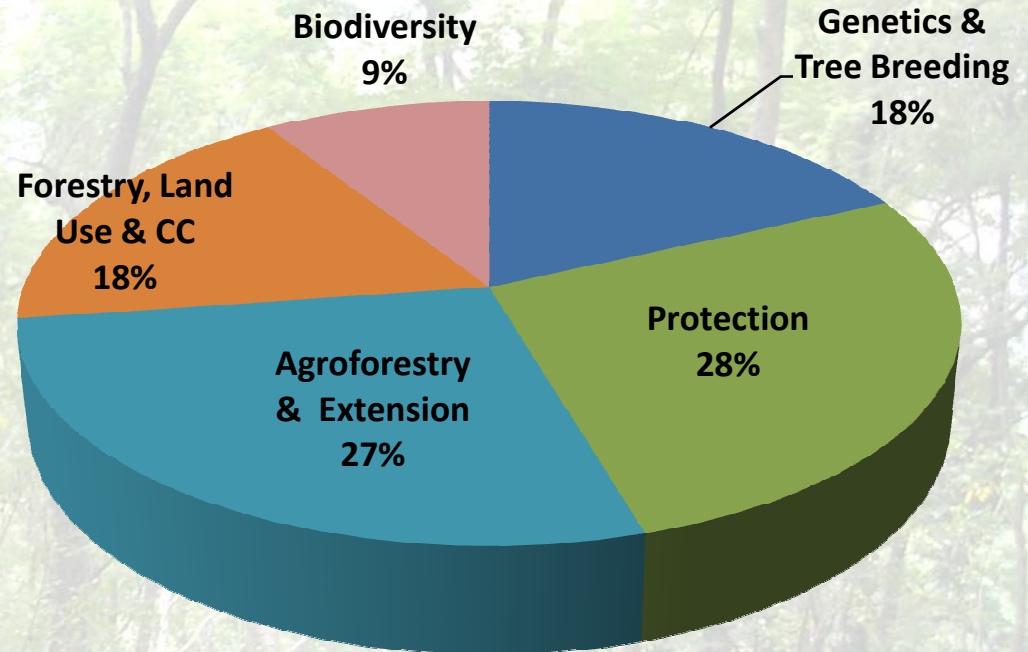
Salient Achievement

PROFILE OF THE PROJECTS COMPLETED

Projects completed (2009-2010): 11
NFRP: 9 ; EAP: 2

Discipline

Genetics & Tree Breeding	2
Biotechnology	0
Protection	3
Seed Science & Technology	0
Agroforestry & Extension	3
Forestry, Land Use & Climate Change	2
Biodiversity	1
Bioprospecting & IT	0



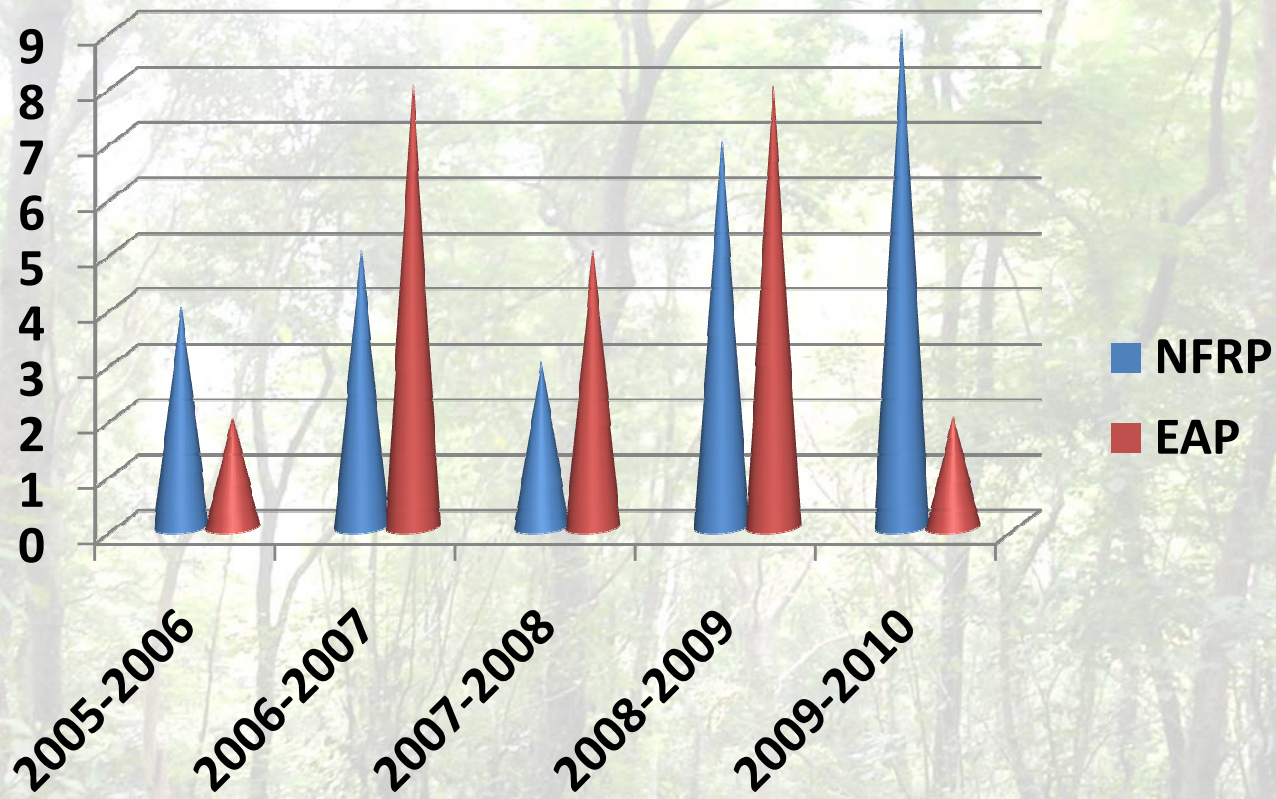
Total projects completed (1988-2010) : 102

HIGHLIGHTS OF THE RECENTLY COMPLETED PROJECTS

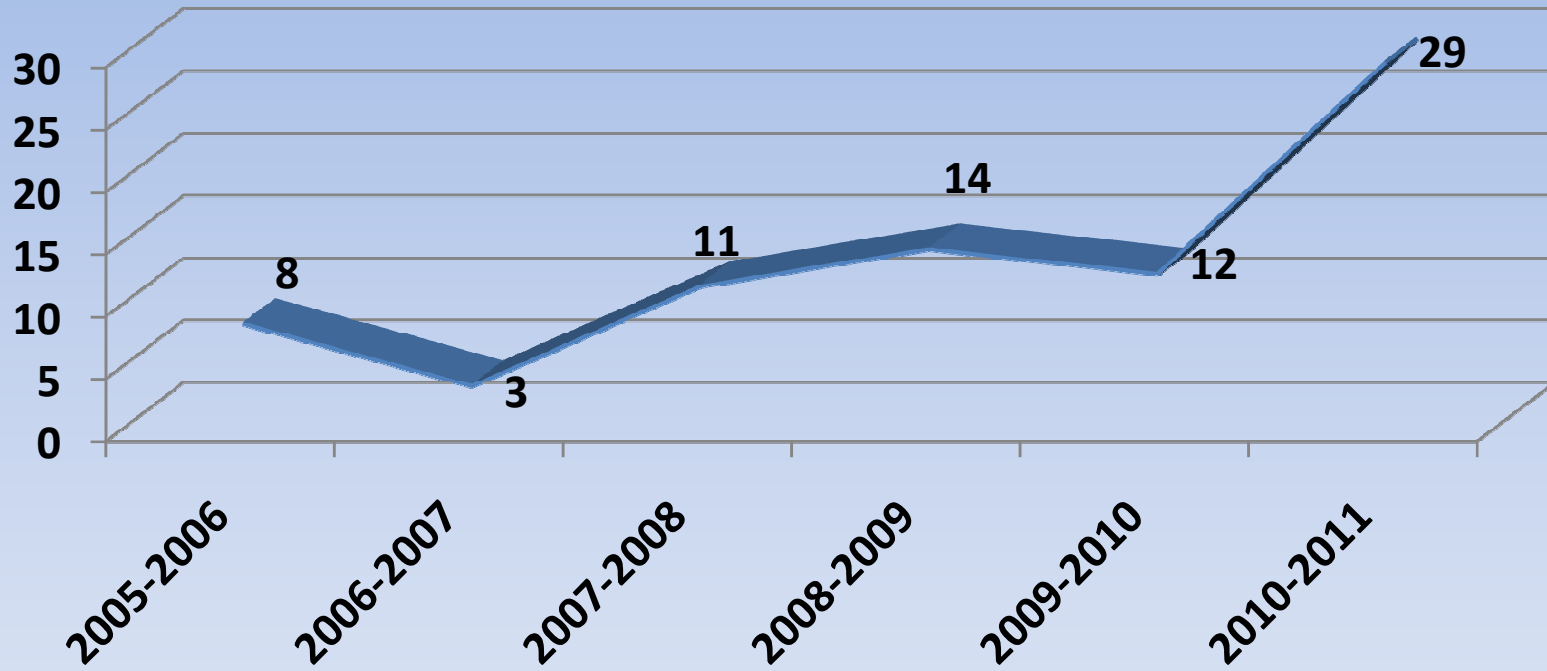
- Established second generation SSOs of *Acacia auriculiformis* at Panampally, Palode, Pandy & Vadakkancherry
- Identified & conserved 47 red phenotypic variants & 30 sweet tamarind trees in germplasm bank at Kurumbapatti, Salem. Control pollination between red & sweet was successful.
- 100 ha bamboo model plantations established in 6 agro climatic zones of Tamil Nadu and growth performance assessed. *Bambusa vulgaris* found superior in culm production than other bamboos. Macro & micro propagated bamboo studied for organic & inorganic fertilizer treatments on field. Trained horticulture officers of TN on bamboo cultivation.
- Survival & growth performance of *Casuarina equisetifolia* vs *C. junghuhniana* tested in different inland and coastal zones. Propagation methods were standardized.
- 594 trees of *Pterocarpus marsupium* in 17 distinct populations of TN and 204 trees from 10 populations in Kerala were studied for their tree morphology and seed characters.

- 594 trees of *Pterocarpus marsupium* in 17 distinct populations of TN and 204 trees from 10 populations in Kerala were studied for their tree morphology and seed characters.
- Automated OTC established and 7 species were studied for responses to elevated CO₂. Results showed significant increase in growth teak, Casuarinas and Eucalyptus under elevated CO₂.
- Agroforestry models demonstrated in different agroclimatic conditions of TN. Teak with sugarcane scored high B:C ratio followed by Casuarina- Cotton in North eastern zone. Similar models are envisaged for TCPL species.
- Volatiles present in Teak and Casuarina were successfully used as markers for identification of insect-pest tolerant phenotypes.
- Growth performance of *Casuarina junghuhniana* was found to be better than *C. equisetifolia* with respect to bark feeder pest incidence. Panchakavya and Dasagavya was found to be effective in controlling the bark feeder in Casuarina.

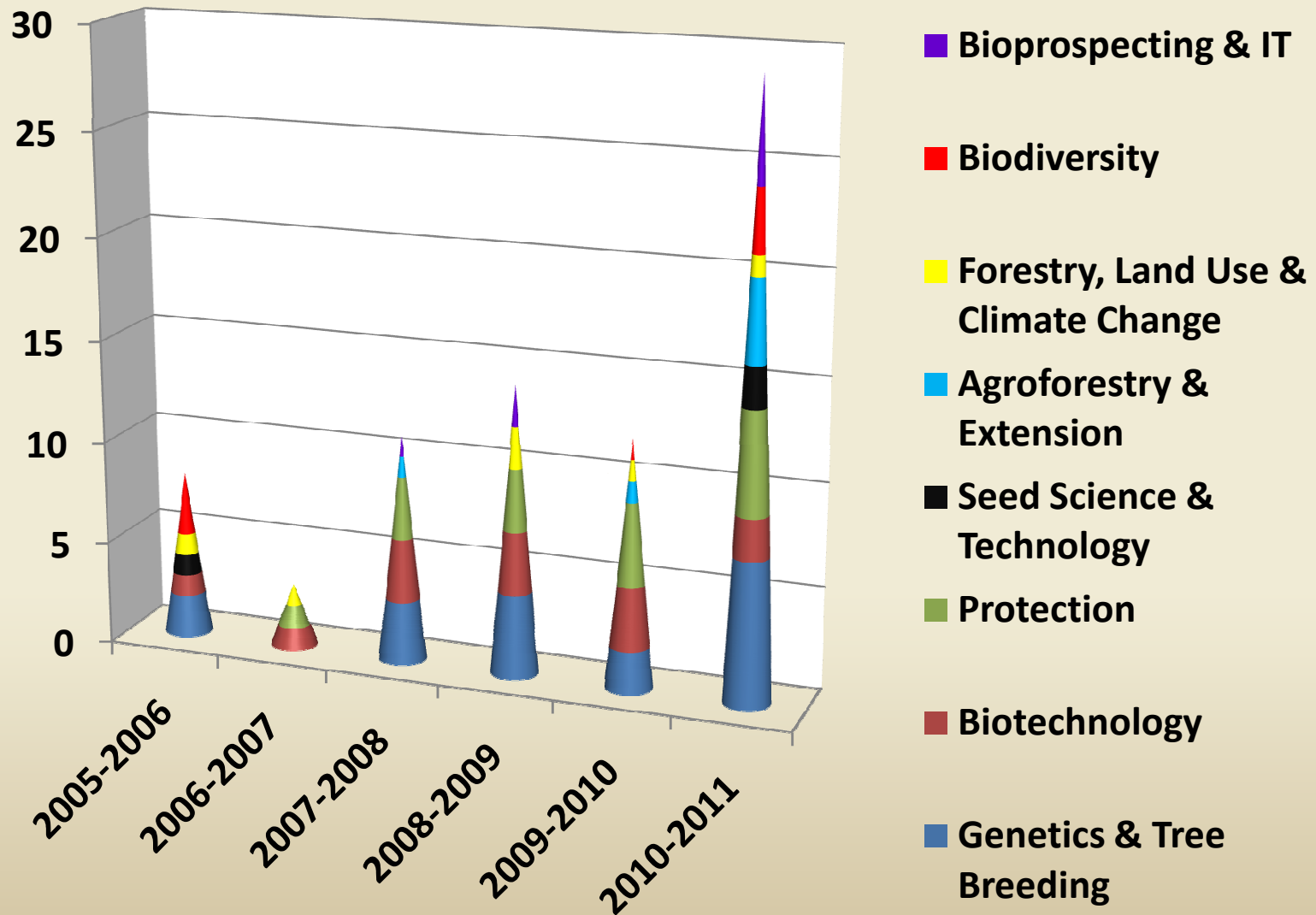
Number of projects completed across years



Number of new NFRP projects bagged across years



Subjects wise NFRP projects bagged over years





Increasing Productivity of Teak Plantations

Established **SPAs** in 134 ha (Kerala: 95 ha; Tamil Nadu: 39 ha) in collaboration with SFDs

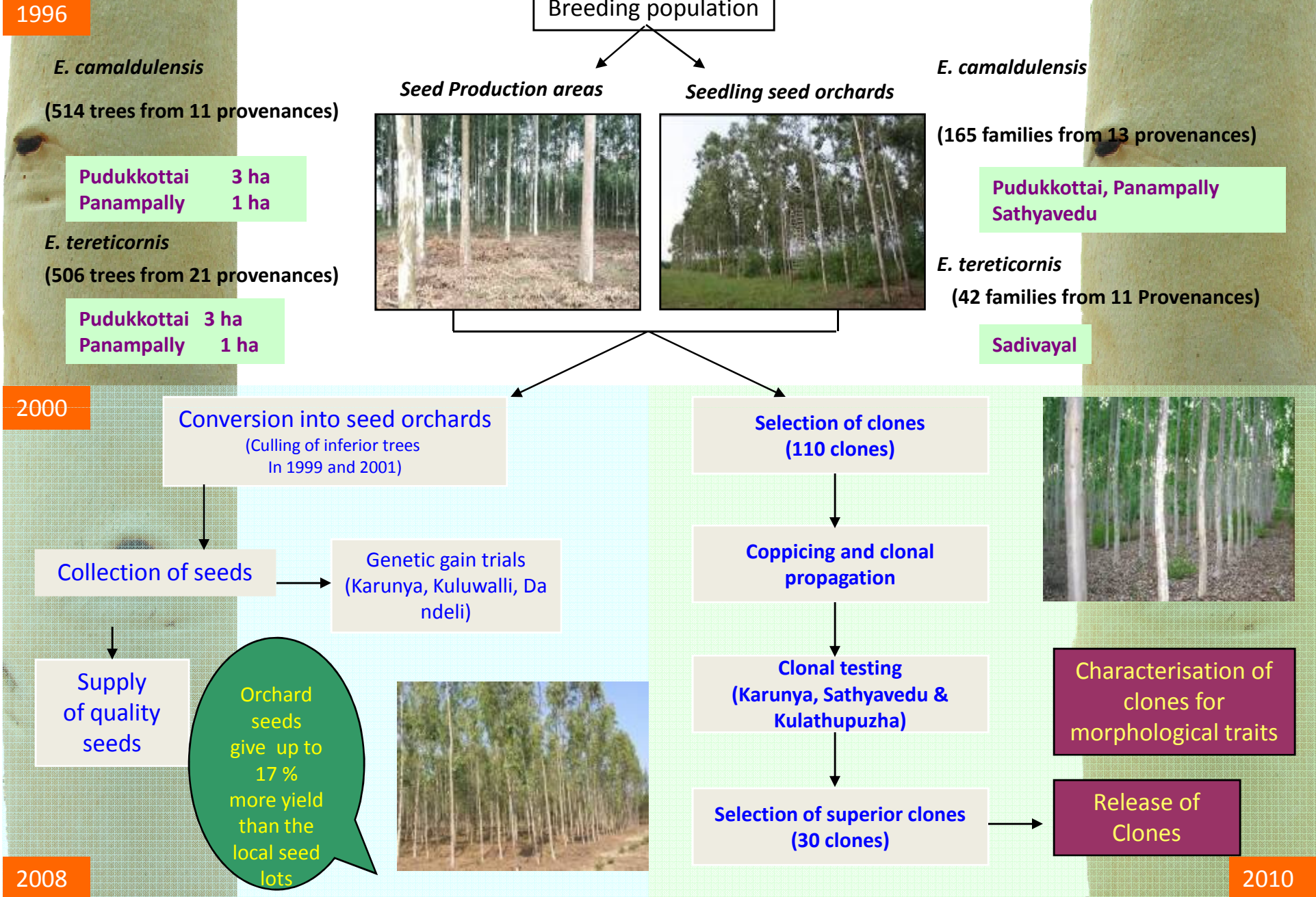
Developed cost-effective **clonal technology** to produce superior planting stock.

Developed **tissue culture protocol** to mass multiply clones and seed orchard derived seedlings

Clonal testing of teak to select **site-specific clones**.



Eucalyptus Improvement Programme in IFGTB





Ramets of a shortlisted clone

Growth performance of tested clones

Clone	GBH (cm)	ht (m)	Clone	GBH (cm)	ht (m)
1	37.58	16.30	101	30.42	17.30
7	34.46	13.75	111	33.95	14.44
9	35.14	16.31	115	34.40	16.60
10	29.45	15.65	116	31.11	16.56
17	36.58	16.17	123	29.50	14.34
19	31.4	16.50	124	30.71	16.13
31	34.43	16.67	131	34.57	15.63
53	36.50	17.50	136	34.64	15.11
66	33.67	16.29	154	35.38	15.63
69	35.54	18.30	186	34.38	16.72
75	27.30	16.06	187	30.33	15.88
76	32.42	17.50	188	32.83	16.00
88	32.61	15.08	191	32.13	16.50
94	31.69	16.42	196	33.59	17.44
100	29.32	11.61	198	31.59	16.78

Clone	GBH (cm)	ht (m)
ITC-3	32.5	17.3
ITC-7	30.2	14.6
ITC-10	38.1	16.9

Hybrids of Eucalypts

12 Intra-specific crosses were produced in *E. tereticornis* – 2003 - Karunya

20 Inter-specific crosses were produced between *E. t* and *E. pellita*, *E. alba*, *E. camaldulensis*, *E. grandis* to combine growth with wood density and Growth with form –
2 locations: Panampally and Karunya

The hybrids are being evaluated for their growth performance

- 36 months growth data reveal full sib families of *E. tereticornis* x *E.pellita*, *E.grandis* promising



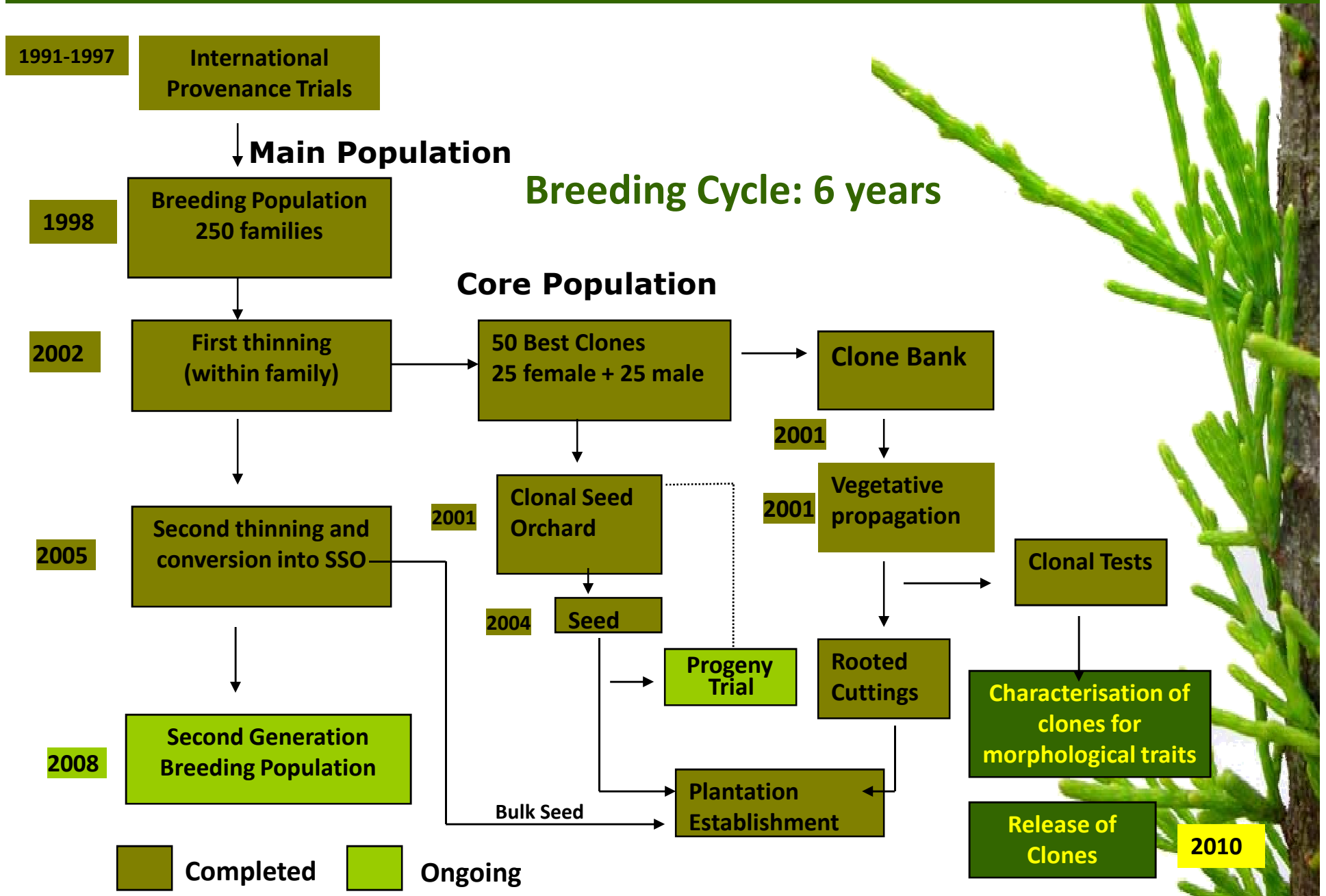
E. tereticornis x *E. pellita*



E. tereticornis x *E. grandis*

Panampally

Breeding Programme for *Casuarina equisetifolia*



CASUARINA

Orchard seeds yielded 13% gain in dryland 28% in irrigated land

IFGTB Seed Orchard Seed

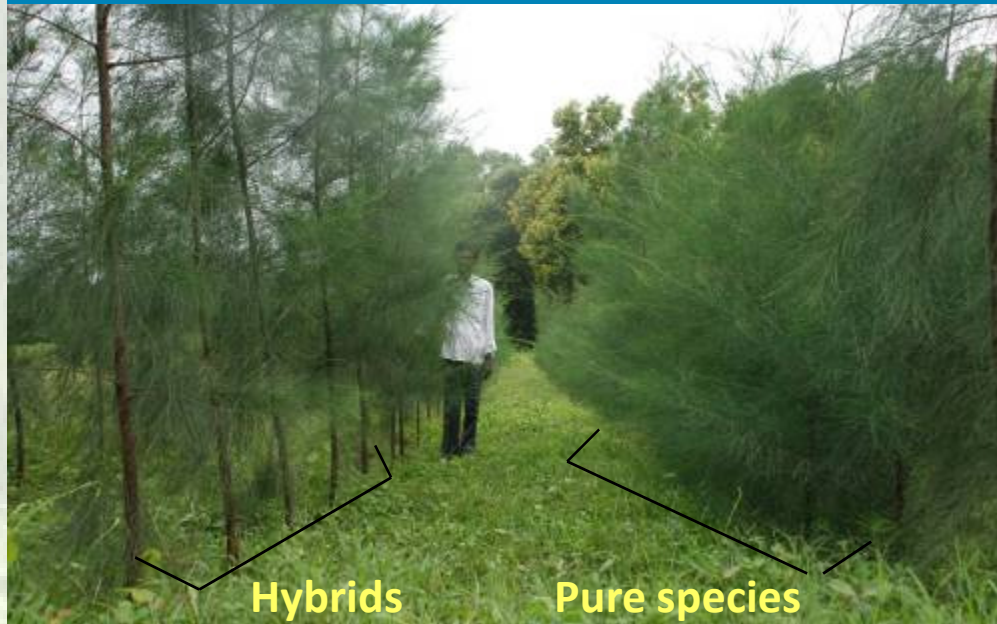
Unimproved Local Seed



Hybrids of Casuarina

- **Interspecific hybrids developed**
- **Faster growing than either of parents**
- **Currently under various stages of field testing.**

Casuarina equisetifolia x *C. junghuhniana*



Developing strategies for describing, testing and registering varieties of four forest tree species in India



Stripe

Flakes

Combination

- Develop species level descriptors for 2 Eucalyptus and 2 Casuarina species.
- Develop provenance level descriptors based on the variability in populations in two Eucalyptus and two Casuarina species
- Develop clonal descriptors for Eucalyptus and Casuarina.



Casuarina junghuhniana

C. equisetifolia



Fruit Characters

Released clones

- IFGTB has released 4 new high yielding clones each of
- *Eucalyptus camaldulensis* and *Casuarina equisetifolia*

IFGTB – EC 1

IFGTB – CE 1

IFGTB – EC 2

IFGTB – CE 2

IFGTB – EC 3

IFGTB – CE 3

IFGTB – EC 4

IFGTB – CE 4



Genetic Improvement of *Acacia mangium*

- ❖ Australian Tree Seed Centre supplied seeds of 80 families of *A. mangium* selected from outstanding provenances during 1996.
- ❖ **Breeding populations with these families have been established at Nilambur and Sadivayal.**
- ❖ These breeding populations have been converted into seedling seed orchards by culling inferior trees and seeds are being collected regularly and supplied to user agencies.



Genetic Improvement of *Artocarpus* spp.

- ❖ Natural populations of *A.heterophyllus*, *A.hirsutus* and *A.lakoocha* identified in Tamil Nadu and Kerala.
- ❖ Variation recorded in tree morphology, fruit bearing habit, fruit size, bulb size, pulp taste, pulp color, pulp consistency, seed morphology, seed weight, seed germination and seedling growth characteristics in *A heterophyllus*.



SPA of A. hirsutus, Palode, Kerala



A Seed Production Area of *A. hirsutus* was established at Palode.

Molecular studies revealed that Eastern and Western ghat populations are distinct.

Selection and conservation strategies have been developed for these species for future breeding programmes.

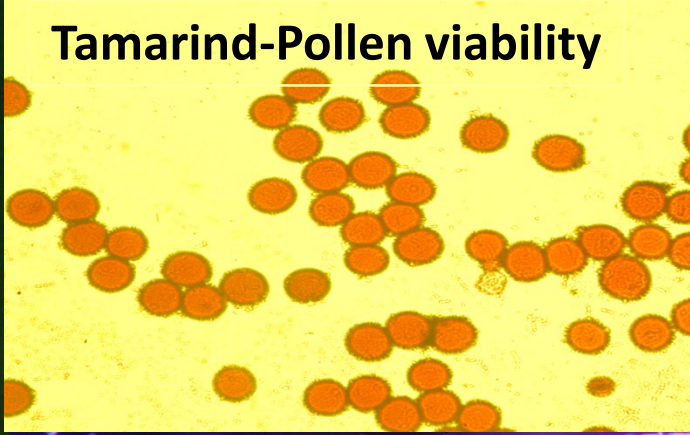
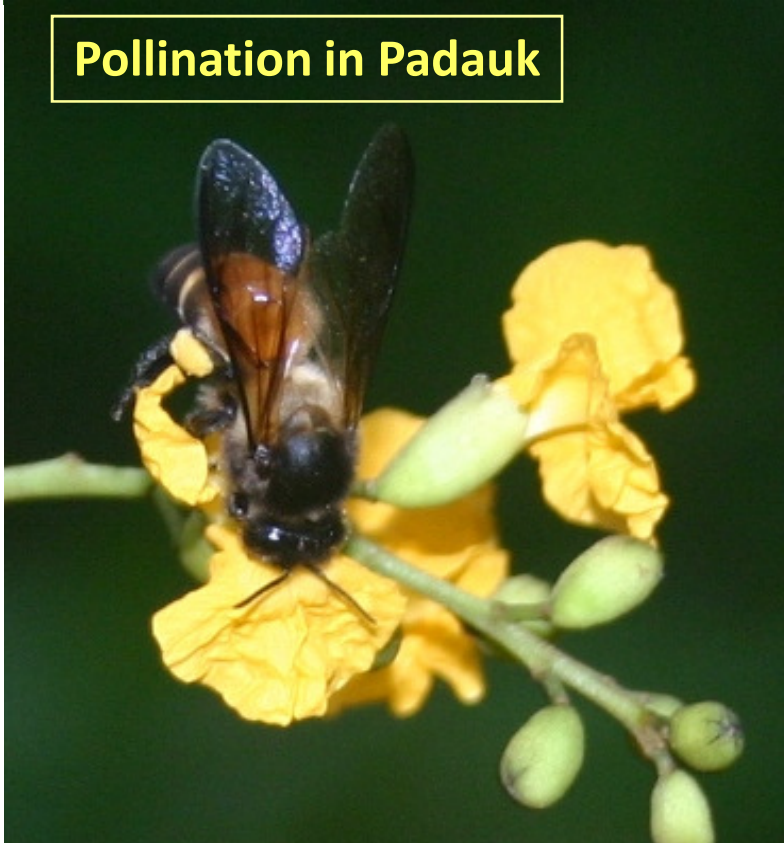


Pollination in Mangroves

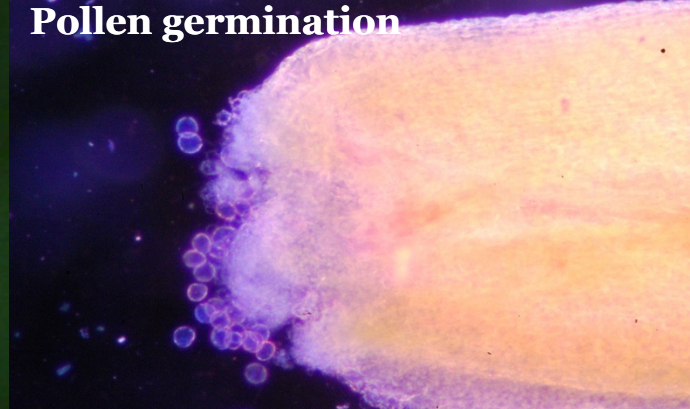
Reproductive Biology Studies

Reproductive success depends on the Pollination Syndromes

Pollination in Padauk



Tamarind-Pollen viability



Pollen germination



Casuarina- male inflorescence

Genetic Improvement of Trees



Selection of Neem trees with high oil and azadirachtin content (10,000 ppm and above).

Post-harvest technology for Jatropha.

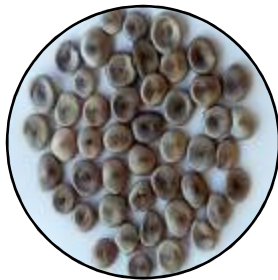
Germplasm characterization of Tamarind and Terminalia.



Seed Handling of Commercially Important Medicinal Plants



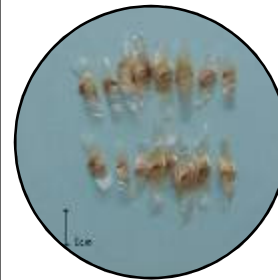
Aegle marmelos



Strychnos nux-vomica



Terminalia bellirica



Oroxylum indicum



- *Aegle marmelos*
- *Feronia elephantum*
- *Emblica officinalis*
- *Syzigium cuminii*
- *Strychnos nux-vomica*
- *Oroxylum indicum*
- *Pterocarpus marsupium*
- *Terminalia bellirica*
- *Saraca asoca*
- *Tinospora cordifolia*
- *Gymnema sylvestre*
- *Asparagus racemosa*
- *Erythrina indica*

Seed Handling Techniques Standardised for *RET* Species



Aristolochia tagala



Smilax zeylanica



Myristica dactyloides

- *Canarium strictum*
- *Embelia ribes*
- *Garcinia gummigutta*
- *Hydnocarpus alpina*
- *Myristica dactyloides*
- *Persea macrantha*
- *Smilax zeylanica*
- *Rauwolfia serpentina*
- *Aristolochia tagala*
- *Celastrus paniculata*
- *Rhaphidophora pertusa*
- *Symplocos racemosa*
- *Symplocos cochinchinensis*

Canarium strictum



Rauwolfia serpentina



Persea macrantha

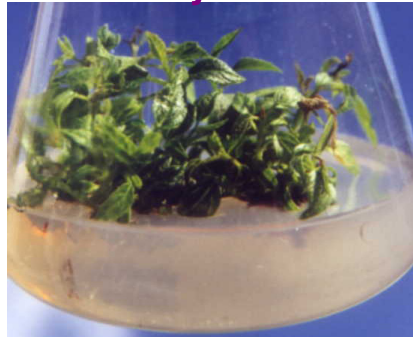


Tissue culture protocol developed

D. giganteus



E. torelliana X *E. citriodora*
hybrid



Teak



Eucalypt hybrid at
IFGTB



Species Multiplied

Eucalypts

Teak

Acacia hybrid

Bambusa bambos

B. bambos var. *giganteus*

B. nutans

Dendrocalamus strictus

D. stocksii

Field demonstration trial of *D. stocksii*



Molecular markers for *Eucalyptus* improvement programme

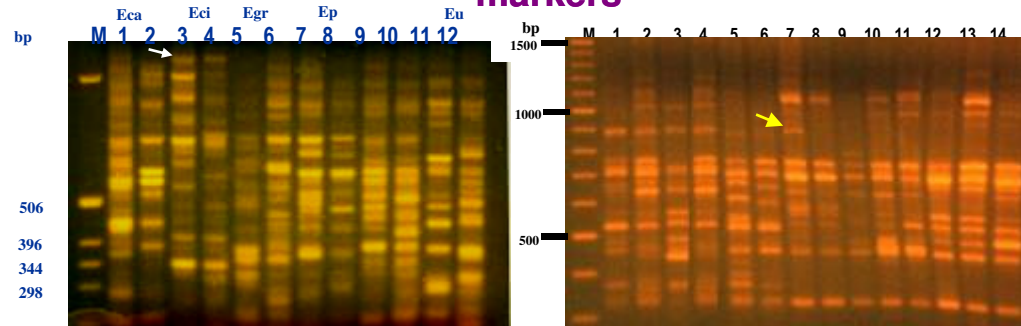
Discrimination of eucalypt clones and species using DNA markers

Identified Markers can be used for

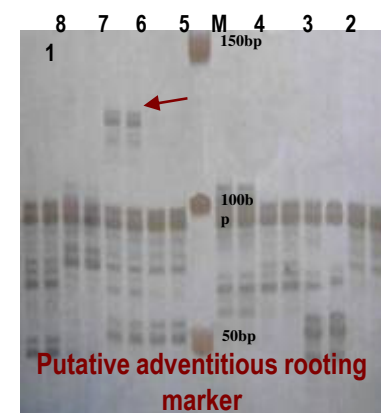
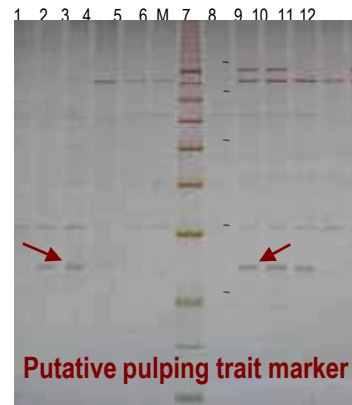
- ❖ Species identification
- ❖ Hybrid authentication
- ❖ Diversity estimation
- ❖ Clonal discrimination
- ❖ Trait identification

Development of trait specific markers

- Adventitious rooting
- Pulping
- Salinity tolerance
- Insect pest resistance



Primer	ISSR markers (bp size approx.)	Clones identified
5' anchored		
R(CA)7	1498, 1134, 955, 911, 775, 638, 630, 287	40, 27, 9, 13, 1, 7, 3, 12, 16
T(GT)9	981, 961, 543, 376	24, 20, 6, 17
TA(CAG)4	1556, 1133, 1002, 726	10, 34, 21, 28
3' anchored		
UBC810	1440, 1318	20, 23
UBC842	960, 657	7, 13



IPM Package For Nursery Pests

PACKAGE STANDARDISED FOR

Psyllids, Aphids & defoliator in Albizia

Papilio demoleus in Bael

Scale insect and Slug in Neem

Eligma in Ailanthus

Defoliator in Pongamia

Thrips & defoliator in Elengi

TREE	PEST	INJURY	MONTHS												
			J	F	M	A	M	J	J	A	S	O	N	D	
<i>Albizia lebbek</i>	Psyllid	Sap feeding			L	L	L	M	L	H	H	H	H	H	
	Aphid	Sap feeding			L	L	M	M	M	H	H	H			
	<i>Rhesala imparata</i>	Defoliation					L	M	M	M	M				
	<i>Mylocterus</i>	Defoliation					L	L	H	H					
	<i>Eurema blanda</i>	Defoliation										H	H	H	H
	Coccids	Sap feeding						L	L	L					

Pest Calendar



Monitoring pest population with light traps



Cultural operations



Application of plant based extracts

SURVEY FOR EUCALYPTUS GALL PROBLEM



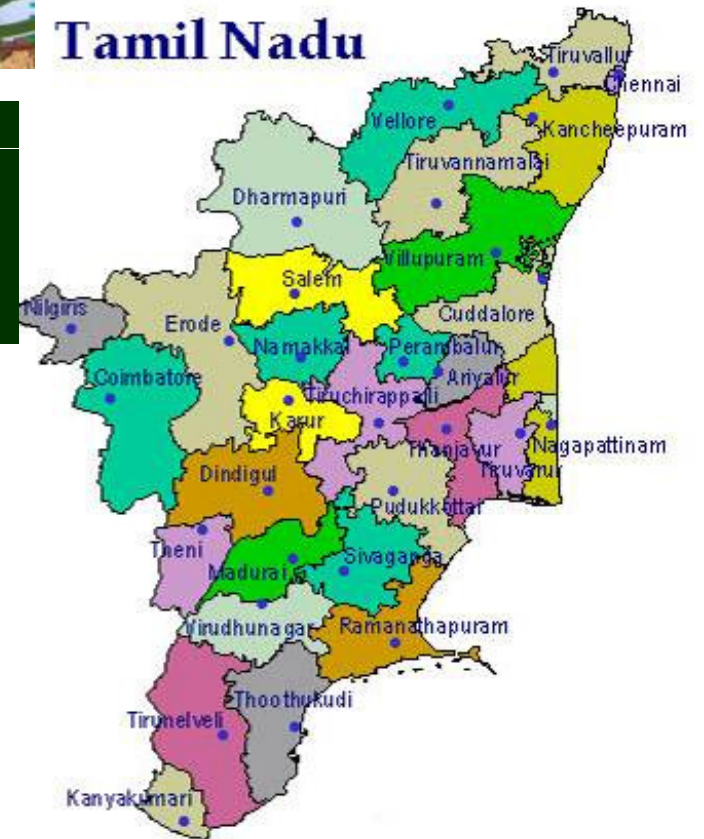
KERALA

<i>Eucalyptus grandis</i>	Affected
<i>E. camaldulensis</i>	Affected
<i>E. tereticornis</i>	Affected
<i>E. urophylla</i>	Not Affected
<i>Urograndis</i>	Not Affected

Mananthavady
Cheruvancherry
Nilambur
Agali
Munnar
Vandiperiyar
Kottur
Arippa
Kandanchira
Kulathupuzha
Punalur

Villupuram
Thirukovilur
Virudhachalam
Karur
Pudukottai
Sivaganga
Aranthangi

Tamil Nadu



Mycorrhizae in the Forest Ecosystem

- Studied diversity of Ecto- and Endomycorrhizal fungi associated with forest tree species in the Nilgiri Biosphere Reserve (NBR)
- Reported a few fungi for the first time from NBR.
- Pure cultures were isolated and maintained in the Institute's culture bank.
- Pure culture and mass production techniques were standardized.
- Potential mycorrhizal biofertilizers have been applied in nursery and field for enhanced biomass production of economically important tree species.



Amanita muscaria



Laccaria fraterna



Lycoperdon perlatum



Russula parazurea



Scleroderma citrinum



Suillus brevipes

Economic Evaluation of Agroforestry Models



Economic
productivity
models based



on

- Casuarina
- Acacia
- Neem
- Melia



Climate change research

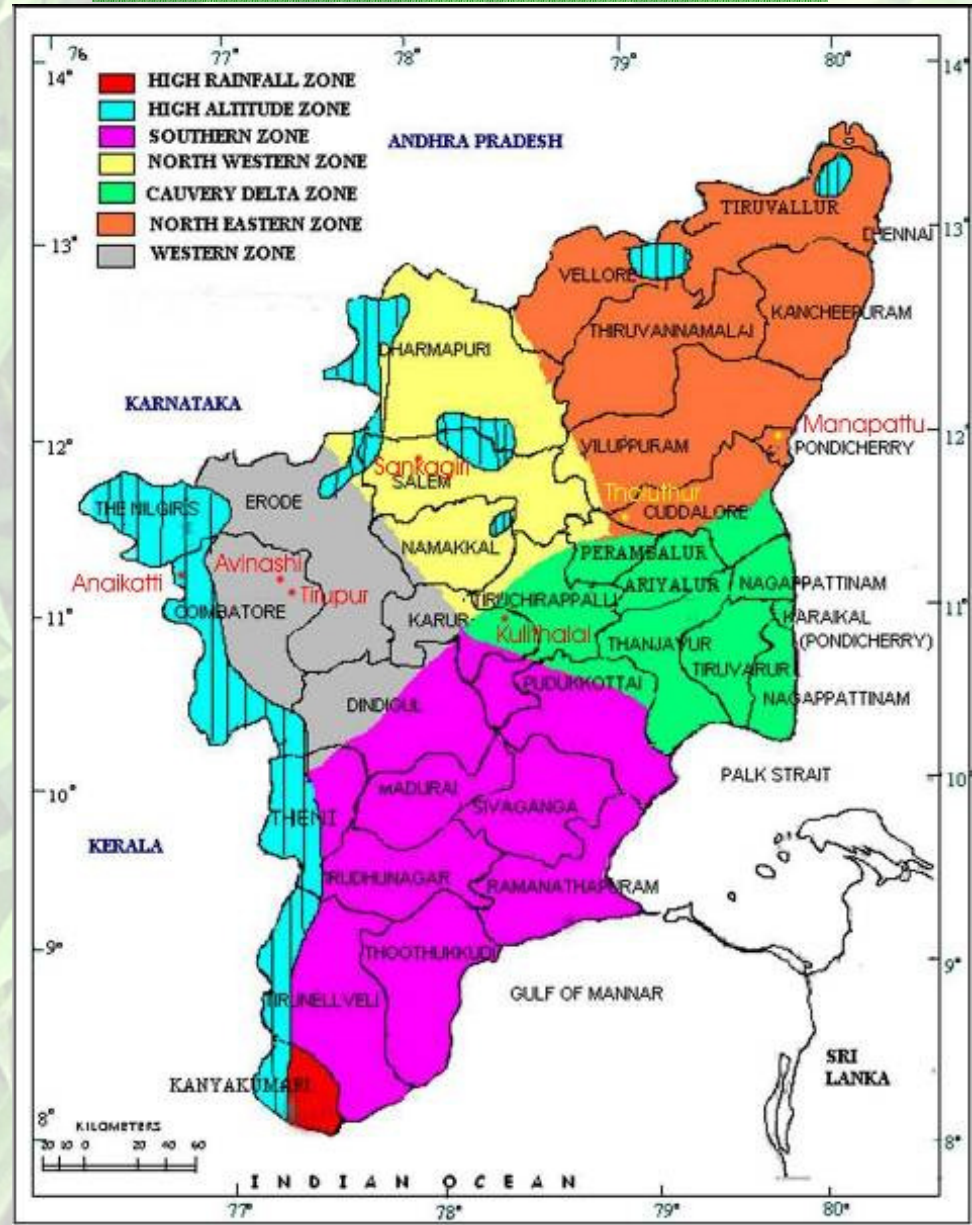
Study of effect of elevated levels of carbon dioxide on different species



Assessment on carbon pool potential of important tree species at different sites, ages and management regimes



Bamboo productivity



Species taken up for trials

Bambusa bambos

Bambusa balcooa

Bambusa tulda

Bambusa vulgaris

Bambusa nutans

Dendrocalamus strictus

Dendrocalamus stocksii

Total area – 100 ha

Threatened Species Recovery Research For Kolli Hills MPCAs, Tamil Nadu

Aristolochia tagala

Canarium strictum

Celastrus paniculata

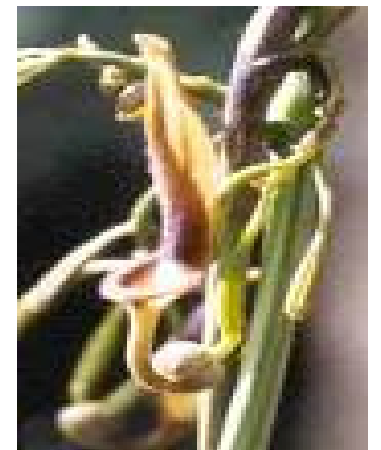
Myristica dactyloides

Persea macrantha

Rhaphidophora pertusa

Smilax zeylanica

Symplocos cochinchinensis



- Spatial distribution and population dynamics
- Phenology, floral biology, reproductive behaviour
- Seed handling techniques

Eco-restoration of problem sites

Problem soils like quartz dumps, magnesite / lime stone/ bauxite mine spoils were reclaimed using suitable tree species and proper soil amendments.



Quartz dump before reclamation



Reclaimed quartz dump



Reclamation of bauxite mine spoils after 1 year



Reclamation of bauxite mine spoils after 2 years

Studies on natural regeneration of important trees in Silent Valley National Park

Studied the dynamics of natural regeneration of trees and identified problems of regeneration specific to the dominant species



West coast tropical evergreen forest
Mesua-Palaquim-Cullenia association

Forest, Forest–Grassland ecotone and grasslands were studied for the regeneration status of important trees

ONGOING RESEARCH



DIVISIONWISE PROFILE OF THE ONGOING PROJECTS

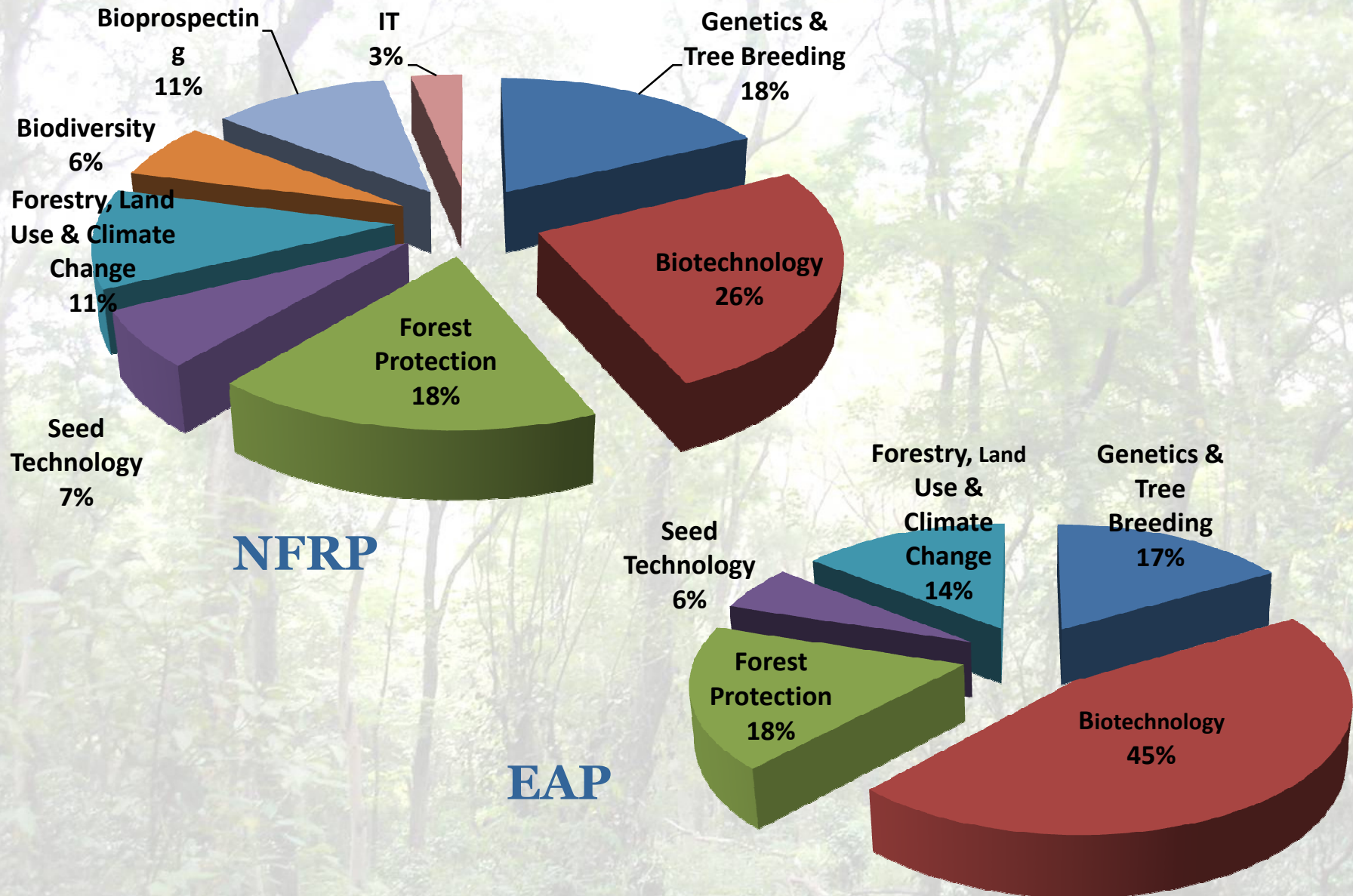
Total ongoing projects: 76

NFRP : 62

EAP : 14

Genetics & Tree Breeding	11	3
Plant Biotechnology	16	6
Forest Protection	11	3
Forestry, Land Use & Climate Change	7	2
Seed Technology	4	0
Biodiversity	4	0
Bioprospecting	7	0
IT	2	0

DIVISION WISE PROFILE OF THE ONGOING PROJECTS



Funding Sources for Ongoing Research Projects

Type	Funding Agency	No. of Projects
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National

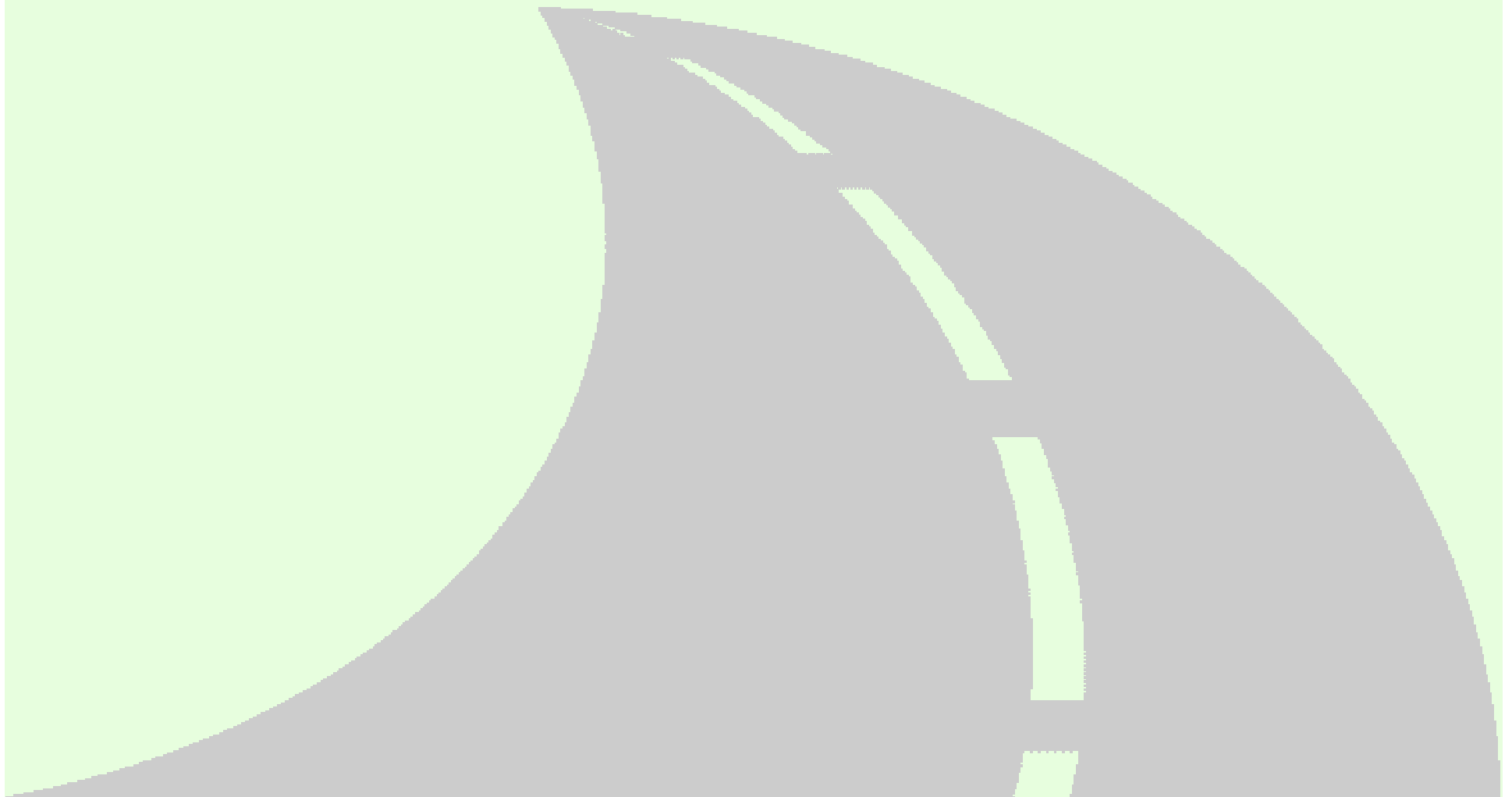
ICFRE	: 62
Dept. of Biotechnology	: 05
National Medicinal Plants Board	: 01
Protection of Plant Varieties and Farmers Rights Authority (PPVFRA)	: 01
National Bamboo Mission	: 01
NOVOD Board	: 01
Ministry of Agriculture (NAIP; ICAR)	: 01
Tamil Nadu State Planning Commission (HADP)	: 01

Department of Primary Industries,

**International
funding**

Queensland, Australia	: 01
International Foundation for Science, Sweden	: 01
AusAID	: 01

Interactive meetings





Stake Holders Meeting with TNFD





Stake Holders Meeting with KFD

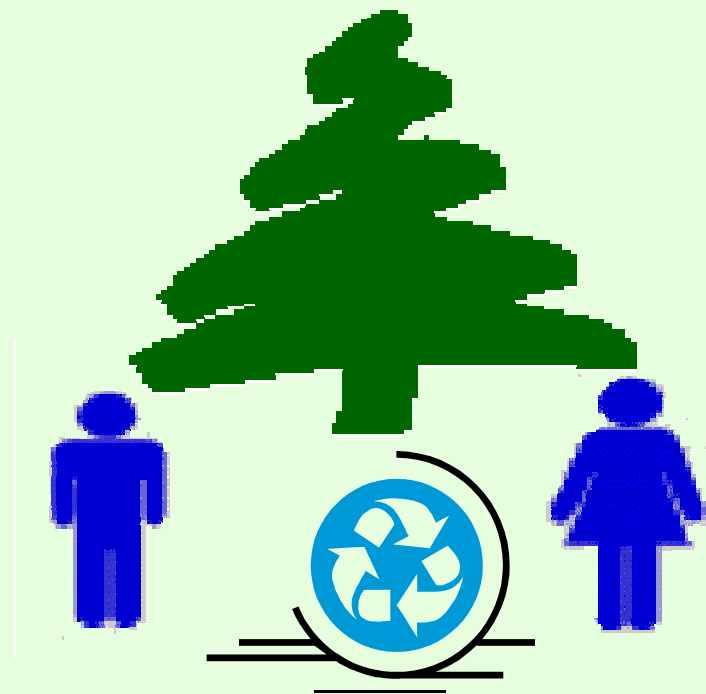




Stake Holders Meeting with ANI Forest Department



EXTENSION ACTIVITIES



LIASONING & NETWORKING

Each scientist has been made incharge of districts in the jurisdiction area of the institute covering TN, Kerala, Puducherry, ANI & Lakshadweep so as to enable extension support to the farmers in the respective areas

District profile has also been made by the individual scientists for regular updating

Inauguration of Exhibition and Farmers Mela and Release of Eucalyptus and Casuarina Clones





Farmer's Mela 2010 at IFGTB





Training to Tamil Nadu Forest Department Staff





Training to Andaman Forest Department Staff





International Training on FGR Conservation and Management





Training to students, teachers & farmers



KANDIYUR DEMO VILLAGE- NURSERY ESTABLISHMENT & INTERACTION





VVK at IFGTB

**TREE INFO
CENTRE, IFGTB**



VAN VIGYAN KENDRA, KUTHIRAN, KERALA

- ❖ Training to Farmers and Foresters
- ❖ Establishment of Model Nursery
- ❖ Distribution of Seedlings to farmers and other users
- ❖ Provide publicity materials like signage, exhibits
- ❖ Preparation of pamphlets in Malayalam and English



VAN VIGYAN KENDRA, PORT BLAIR, ANI

**Established nursery facilities for
quality planting stock production**

**Provided Laptop & LCD projector
facilities to AFD**



Books/Pamphlets/Brochures/Newsletters



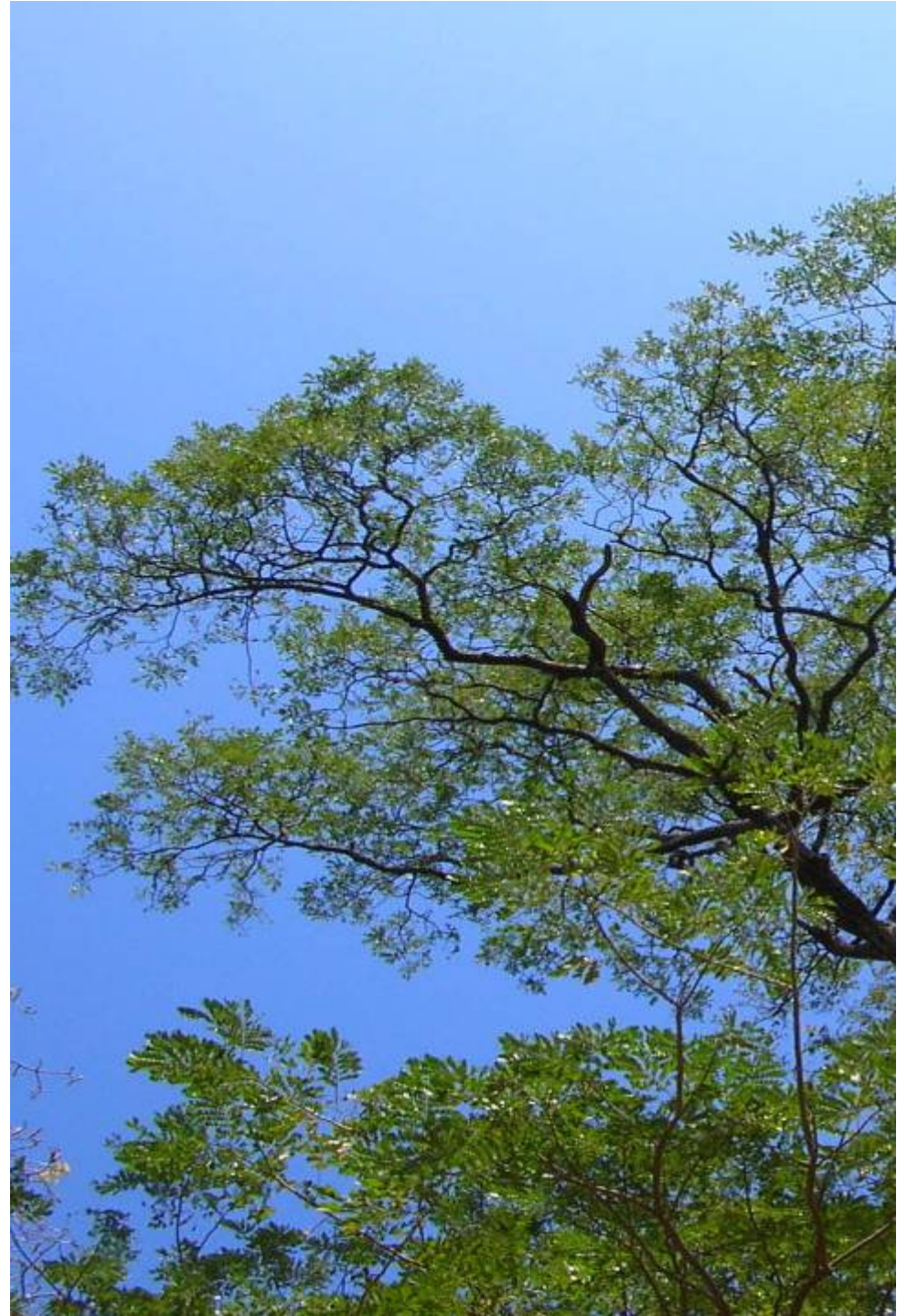
Tamil

Publications

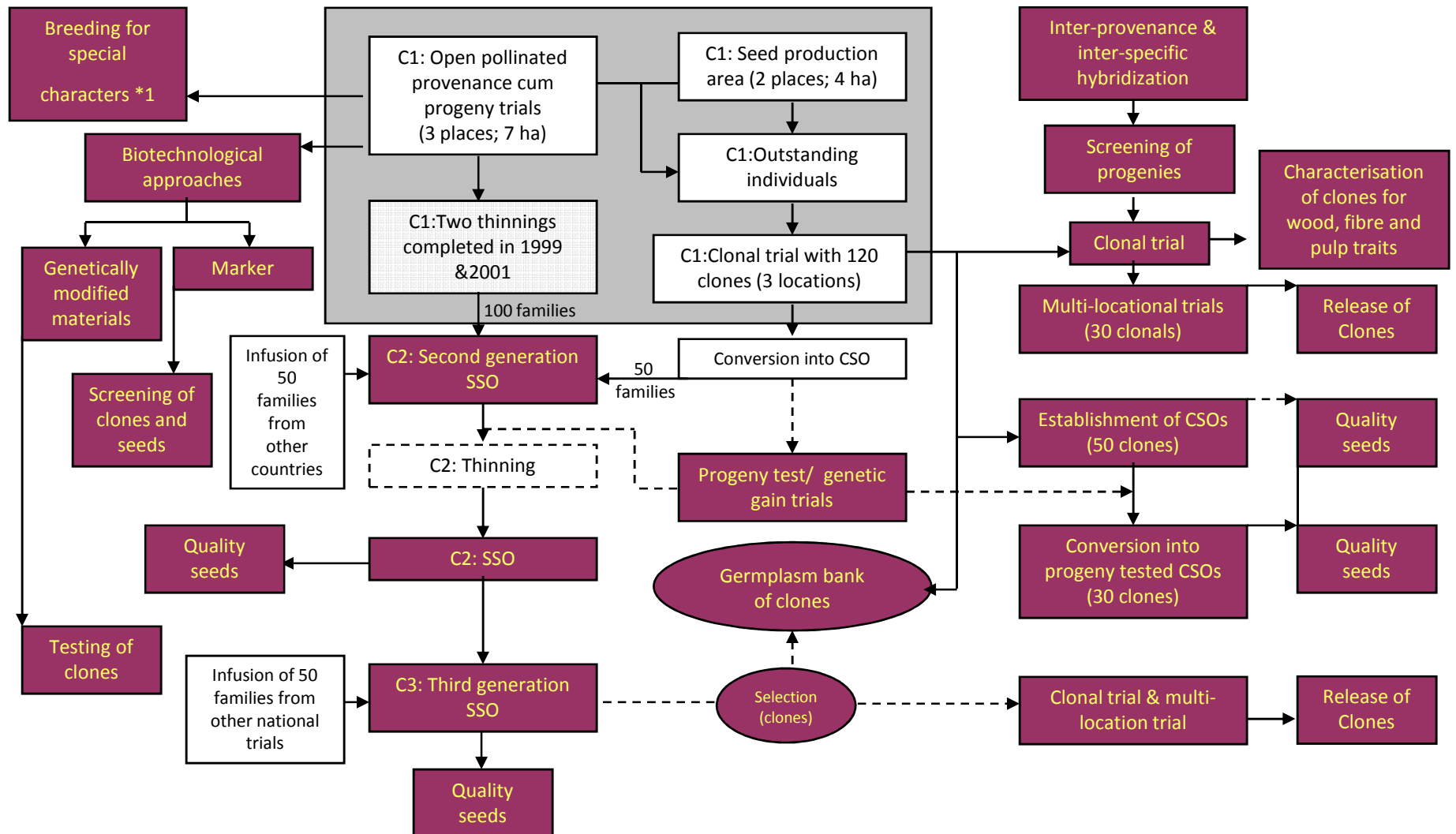
Malayalam



FUTURE PLANS



All India coordinated programme for genetic improvement of Eucalyptus

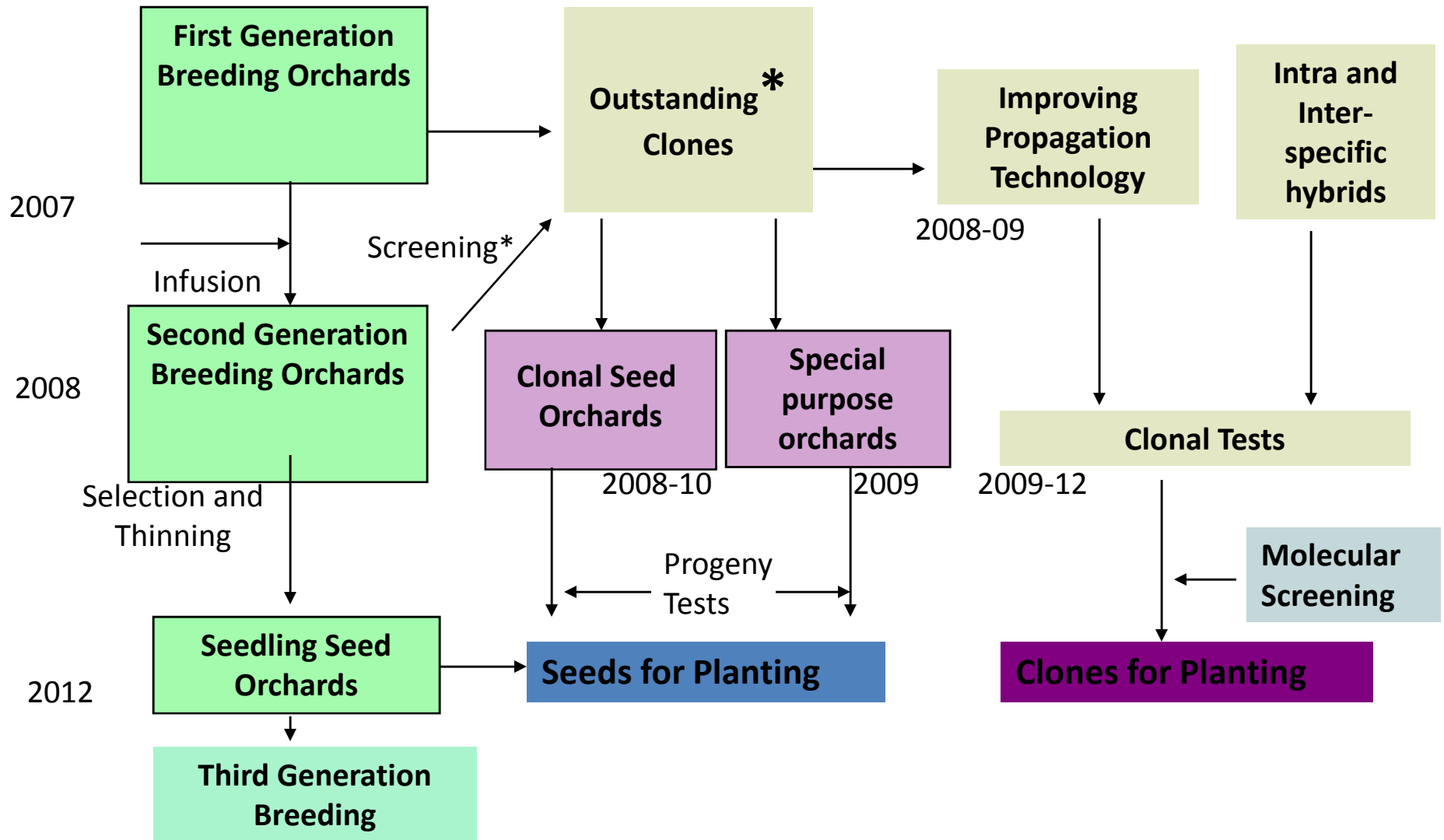


The first generation seed orchard (C1) has been completed and shown in gray background.

The envisaged collaborative activities are shown in grey boxes.

*1 special characters includes disease (Pink disease), insect pest (Gall insect), leaf blight, root rot, pulp wood traits, salinity and drought tolerance. For which selection from C1 or establishment of second generation seed orchard (C2) may be done.

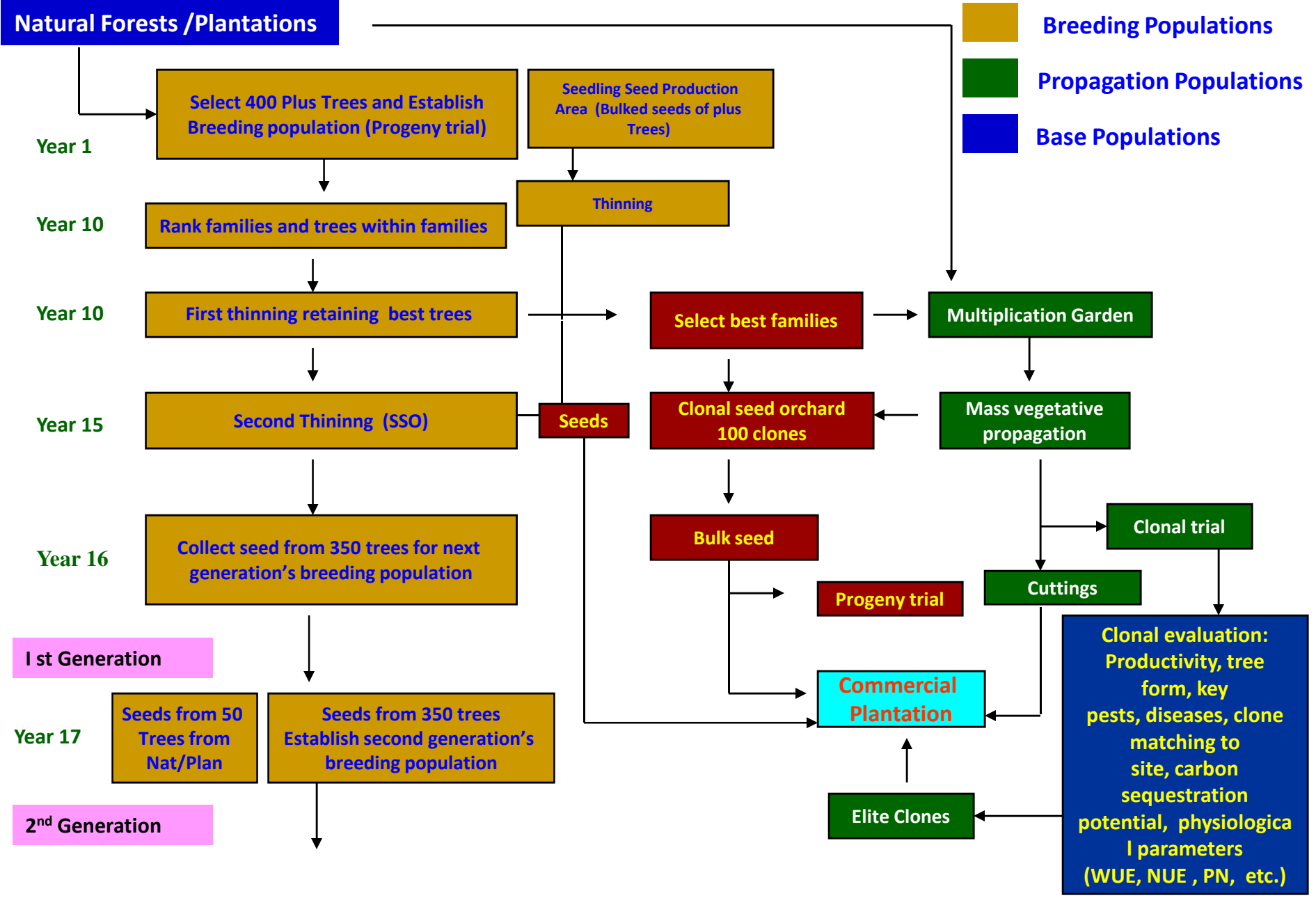
All India Co-ordinated Research Project for Casuarina



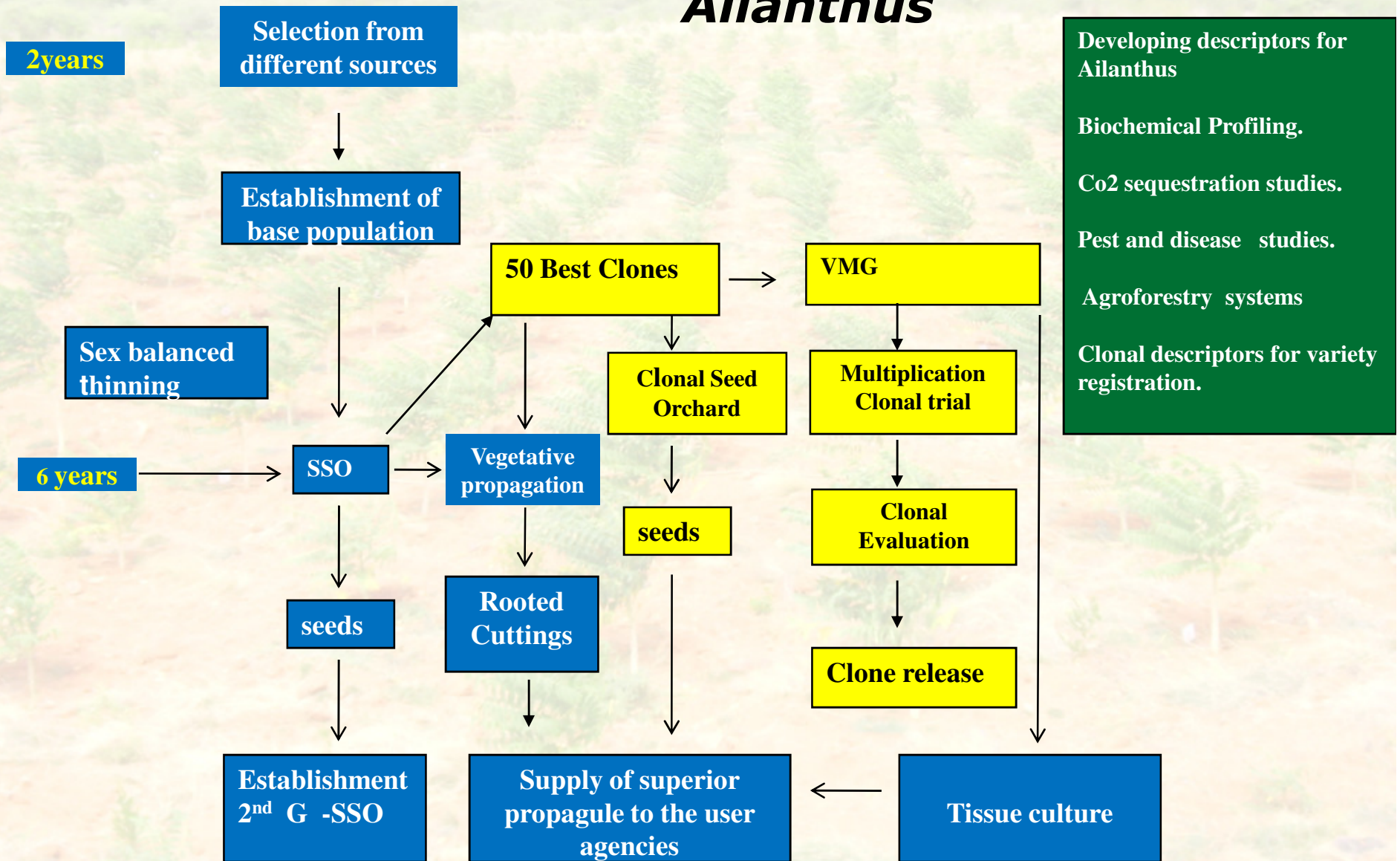
Screening for
Pulping traits, Mealay bug, Borer,
Blister bark, salinity tolerance

Coordination and testing in TN & Puducherry: IFGTB
Forest Departments: Hosting Trials and orchards; seed collection and use.
IWST: Assessment of trials in AP; Characterization of wood traits.
TFRI: Assessment of trials in Orissa.

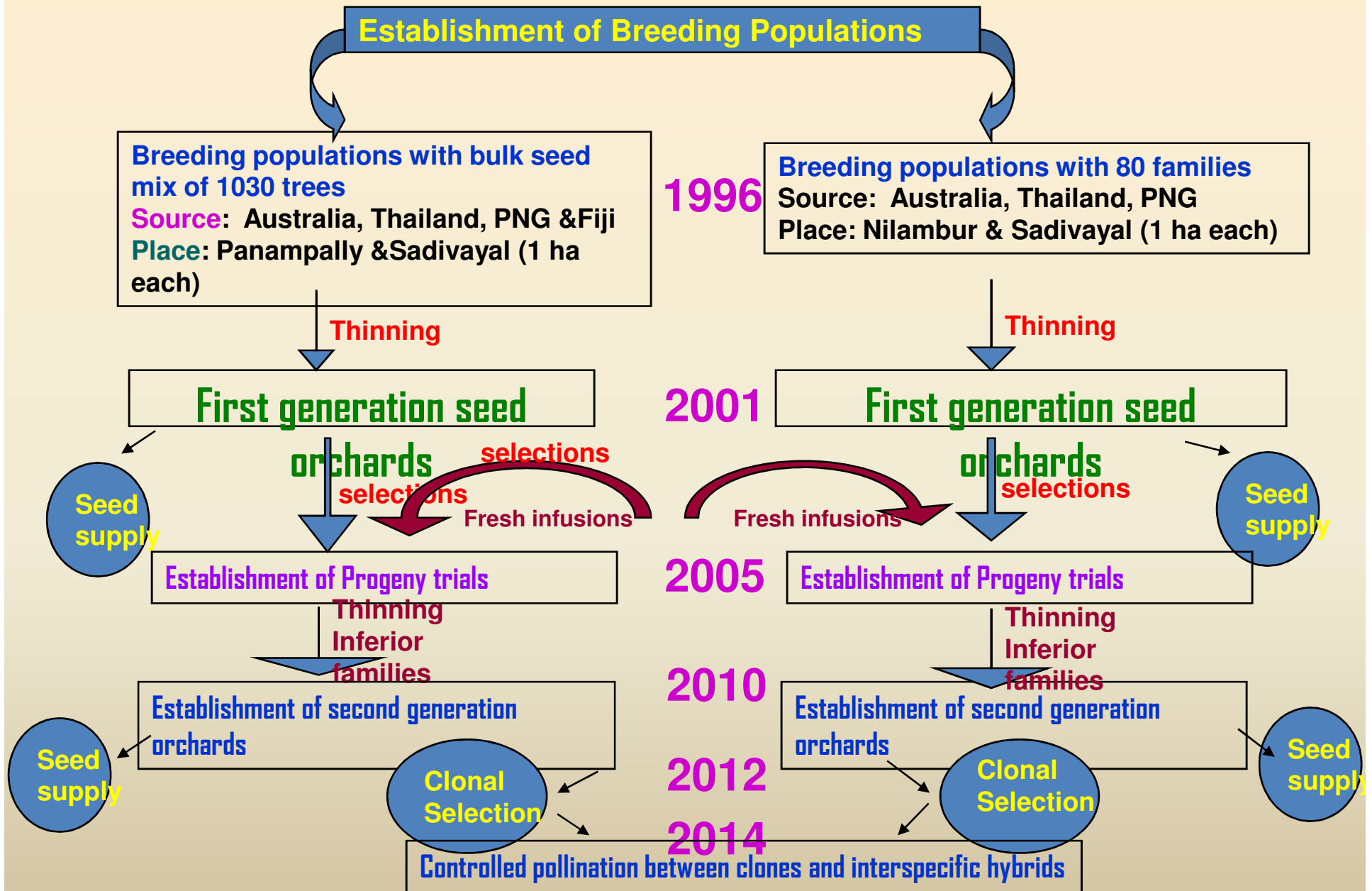
Tree improvement Strategy for Teak



Tree improvement in *Ailanthus*



Breeding Programme for Phyllodinous Acacias



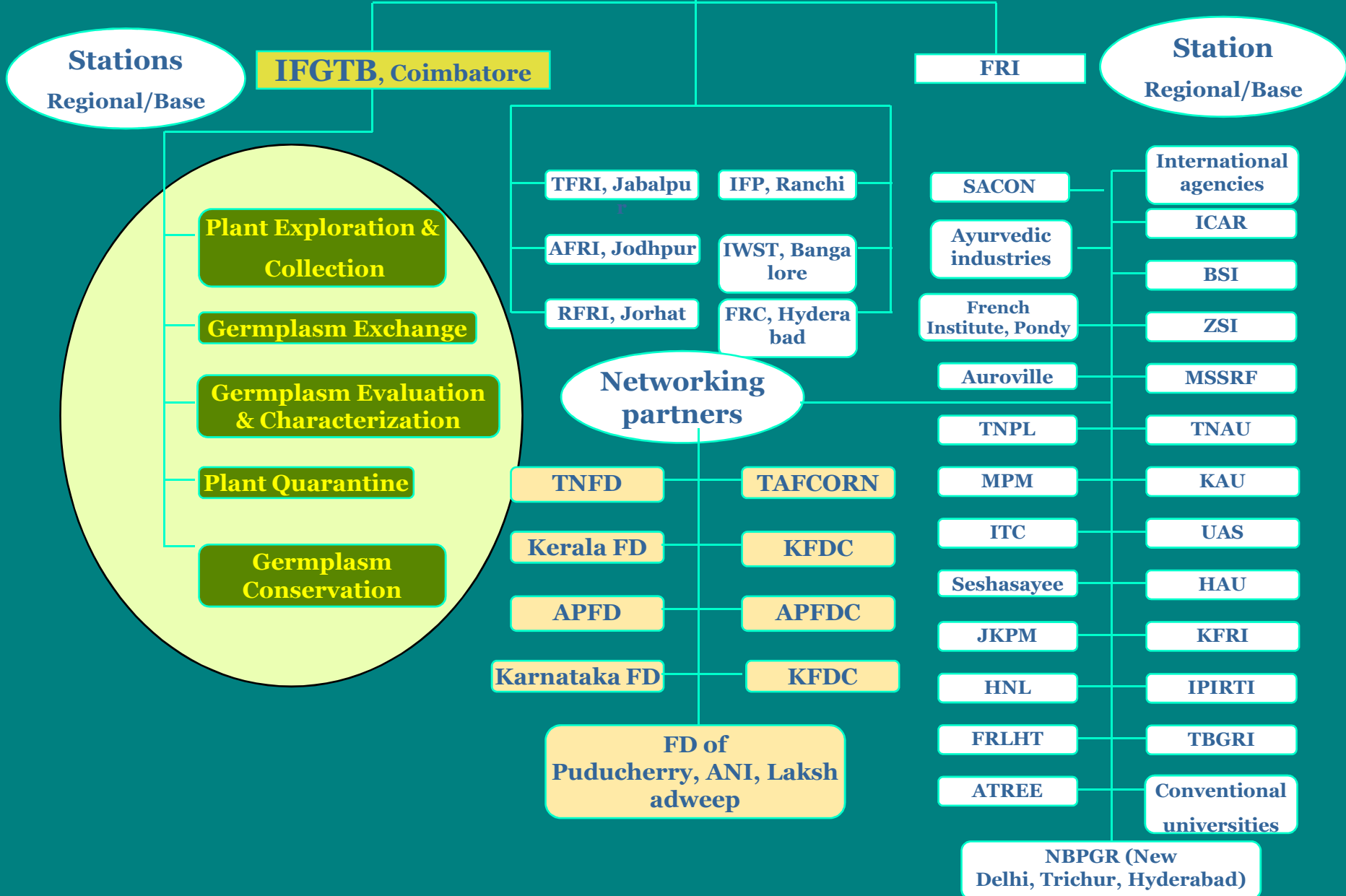
FOREST GENETIC RESOURCES MANAGEMENT NETWORK (FGRMN)

Forest Genetic Resources or tree genetic resources are genetic material of shrub and tree species of actual or potential value

Objectives

- **To identify, prioritize, assemble and conserve FGRs to strengthen *in situ* and conservation**
- **To promote and facilitate genetic improvement programs for important commercial species thereby ensuring economic prosperity through forest resources**
- **To transfer scientific knowledge on FGRs to stakeholders, promote coordinated research on conservation**
- **To facilitate exchange and extend quarantine support for FGRs**
- **To document all FGR related activities**

ICFRE



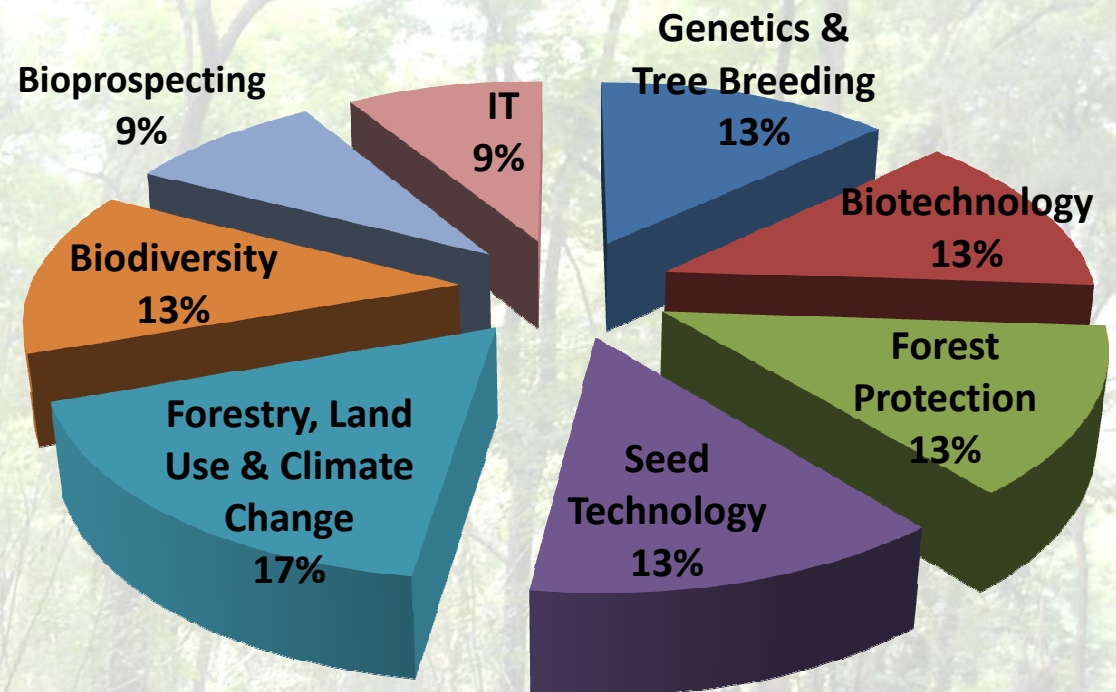
NEW PROJECTS



*Plus tree of
Eucalyptus camaldulensis
selected at Sathyavedu,
Andra Pradesh*

Division-wise Distribution of NFRP Project Proposals for RAG 2010

Genetics & Tree Breeding	3
Biotechnology	3
Forestry, Land Use & Climate Change	4
Forest Protection	3
Seed Technology	3
Biodiversity	3
Bioprospecting	2
IT	2
Total	23



Distribution of species among new projects

Species dealt in new projects

No. of projects

Thespesia populnea

1

Gmelina arborea

2

Grevillea robusta

1

Eucalyptus spp.

3

Canarium strictum

1

Macaranga peltata

1

Pongamia pinnata

1

Casuarina spp.

1

Dalbergia spp.

1

Bambusa spp.

1

Mangrove species

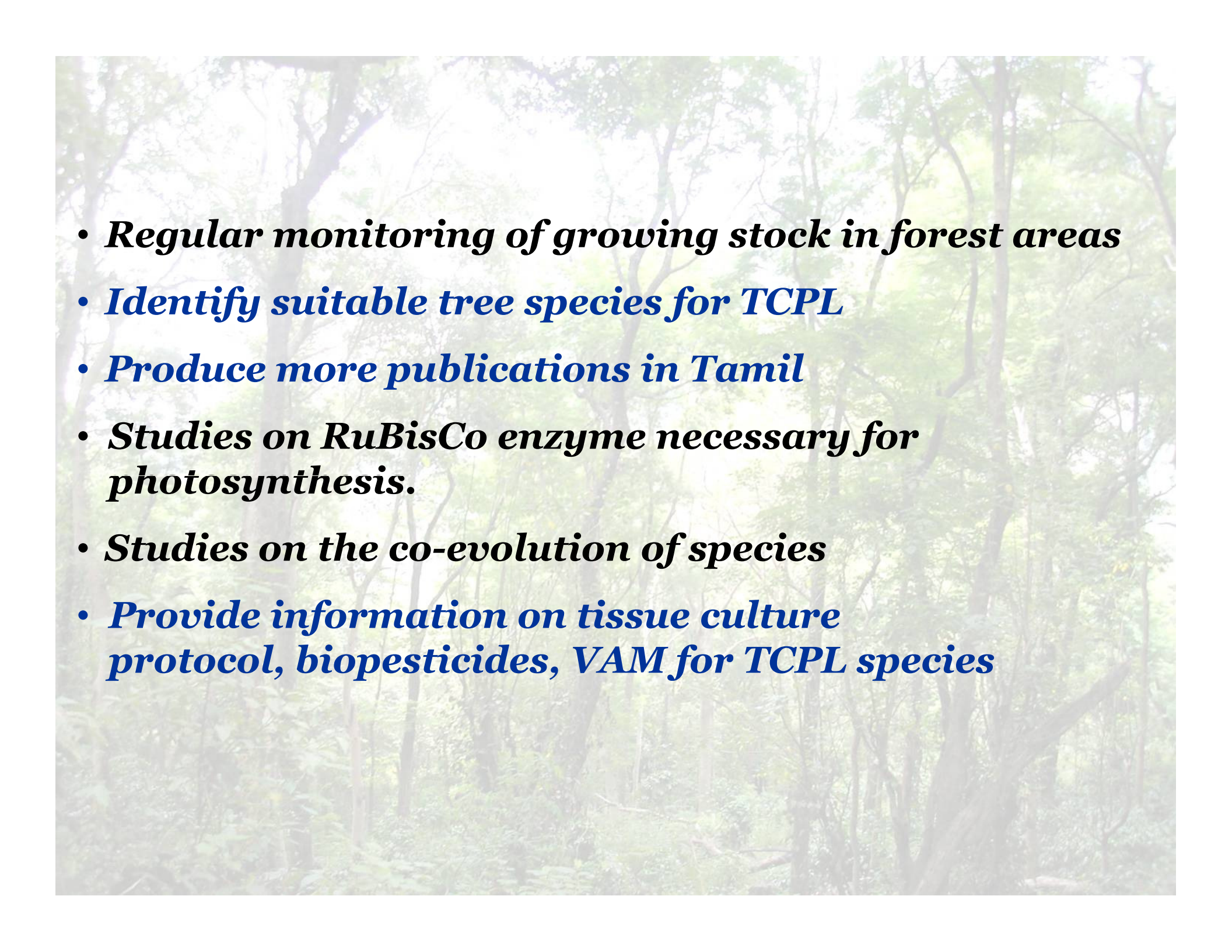
1

Species selected for tree improvement



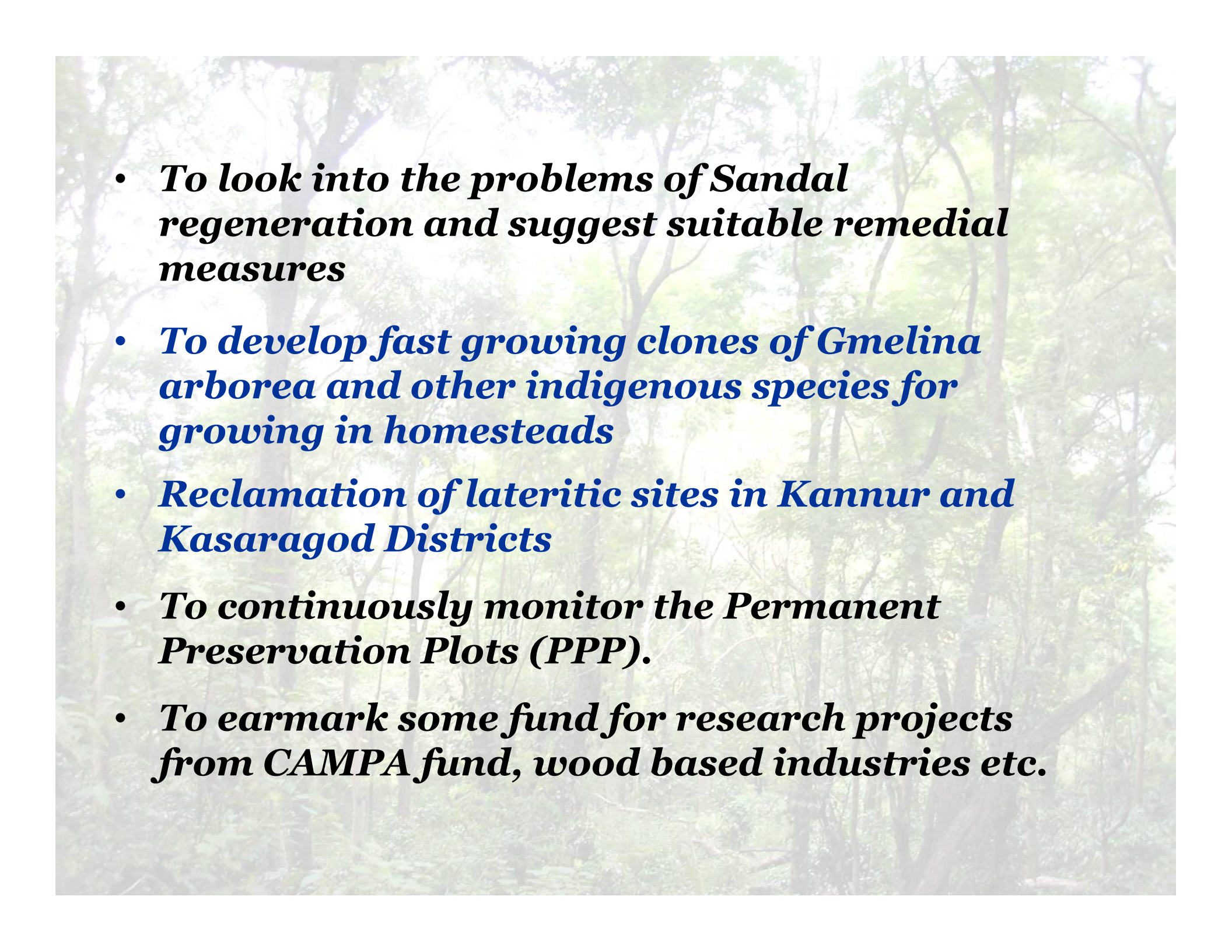
Recommendations suggested by TNFD- Stake holder meet 2010

- *Prepare quality planting stock i.e., nursery technology*
- *Weed control measures*
- *Species wise pest and diseases management plan*
- *Need for climate change related studies with special reference to the impact of elevated temperature and carbon dioxide on growth performance of trees and dependent organisms.*
- *Identify gene which can withstand high temperature and Co₂ for transformation to combat future climate change effects.*
- *Identify the best species for carbon sequestration suitable for mixed plantation*

- 
- ***Regular monitoring of growing stock in forest areas***
 - ***Identify suitable tree species for TCPL***
 - ***Produce more publications in Tamil***
 - ***Studies on RuBisCo enzyme necessary for photosynthesis.***
 - ***Studies on the co-evolution of species***
 - ***Provide information on tissue culture protocol, biopesticides, VAM for TCPL species***

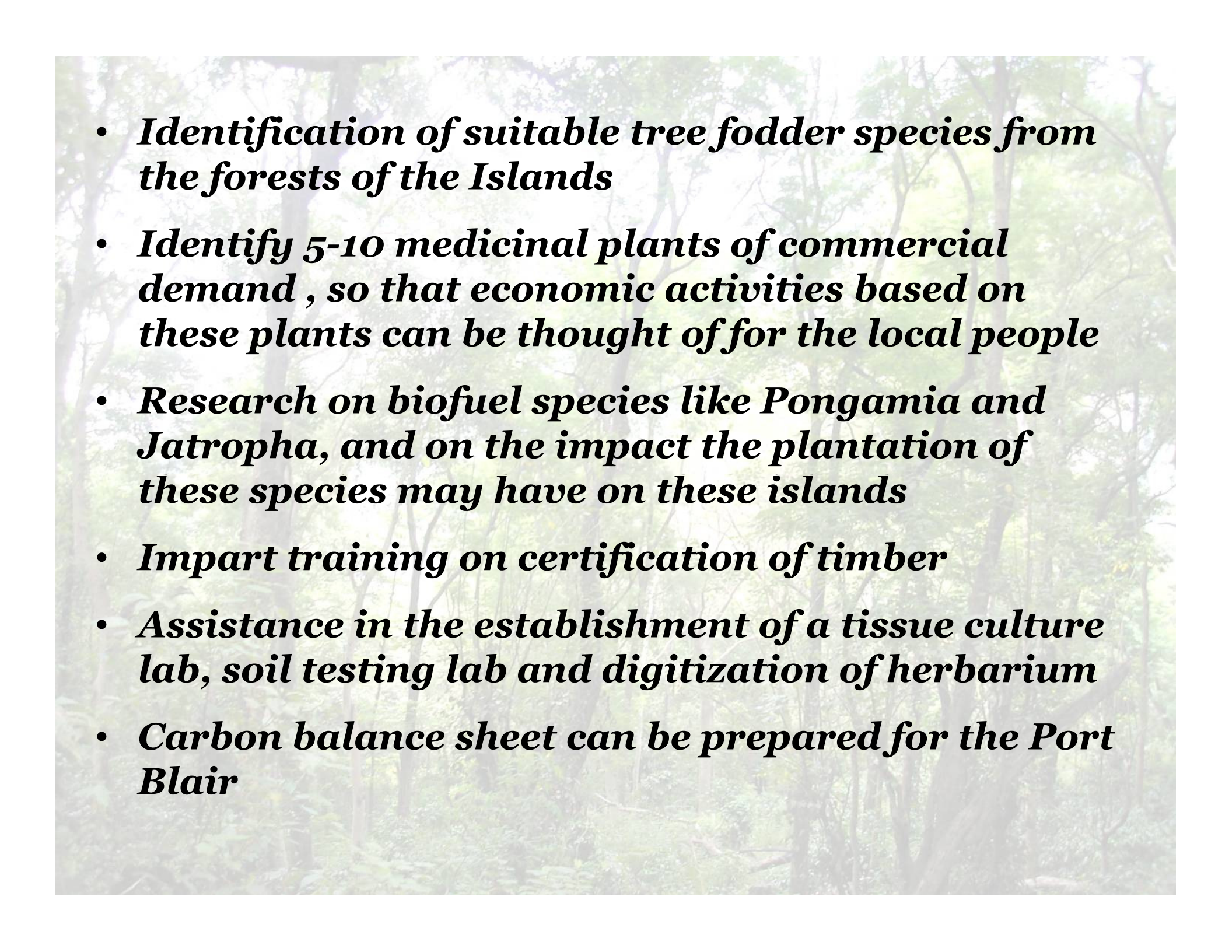
Recommendations suggested by KFD- Stake holdermeet 2010

- *To select sites for establishing Teak Seed Orchards and inspect the existing Teak SPAs including the 60 ha established by IFGTB; identify and select potential ones and suggest management practices for enhancing seed production (to be jointly undertaken by KFRI, IFGTB & KFD)*
- *To sort out hurdles if any for carrying out scientific research in forest areas*
- *To formulate a project on conservation of mangroves, with the active participation of the local people*

- 
- ***To look into the problems of Sandal regeneration and suggest suitable remedial measures***
 - ***To develop fast growing clones of Gmelina arborea and other indigenous species for growing in homesteads***
 - ***Reclamation of lateritic sites in Kannur and Kasaragod Districts***
 - ***To continuously monitor the Permanent Preservation Plots (PPP).***
 - ***To earmark some fund for research projects from CAMPA fund, wood based industries etc.***

Recommendations suggested by Andaman Forest Department- Stake holder meet 2010

- *Development of techniques for rehabilitation of the mangrove areas that have suffered due to upliftment of land*
- *Work out suitable techniques for conversion of teak plantations to natural forests.*
- *Provenance delimitation for the species that are being extracted from the forests now, to understand the extent of genetic diversity*
- *Study in population genetics would help in conservation efforts as well as tree improvement*
- *Seed handling techniques, seed storage methods and nursery practices have to be standardized for native species*

- 
- ***Identification of suitable tree fodder species from the forests of the Islands***
 - ***Identify 5-10 medicinal plants of commercial demand , so that economic activities based on these plants can be thought of for the local people***
 - ***Research on biofuel species like Pongamia and Jatropha, and on the impact the plantation of these species may have on these islands***
 - ***Impart training on certification of timber***
 - ***Assistance in the establishment of a tissue culture lab, soil testing lab and digitization of herbarium***
 - ***Carbon balance sheet can be prepared for the Port Blair***

Year 2010 Stakeholder issues addressed through projects & activities

- **Tamil Nadu Forest Department : >50%**
- **Kerala Forest Department : 50%**
- **Andaman & Nicobar Islands Forest Department : 10%**

Forestry Research : Thrust Areas and Themes

Sl. No.	Thrust Area	Theme	No. of projects
1	Ecosystem Conservation and Management	<ol style="list-style-type: none"> 1. Climate Change 2. Ecology and Environment 3. Biodiversity 4. Forest Botany 5. Tribals and Traditional Knowledge System 	1 2 2
2	Forest Productivity	<ol style="list-style-type: none"> 1. Silviculture 2. Social Forestry, Agro-forestry /Farm Forestry 3. Forest Soils and Land Reclamation 4. Watershed Management 	1 1
3	Genetic Improvement	<ol style="list-style-type: none"> 1. Conservation of Forest Genetic Resources 2. Tree Improvement 3. Vegetative Propagation 4. Biotechnology 	1 8

4	Forest Management	<ol style="list-style-type: none"> 1. Sustainable Forest Management (SFM) 2. Forest Economics 3. Forest Biometrics 4. Participatory Forest Management 5. Policy and Legal Issues 6. Information and Communication Technology (ICT) 	2
7	Forest Protection	<ol style="list-style-type: none"> 1. Insects pests, diseases and control 2. Mycorrhizae, rhizobia and other useful microbes 3. Weeds and Invasive species 4. Forest Fire and Grazing 	3 1 1

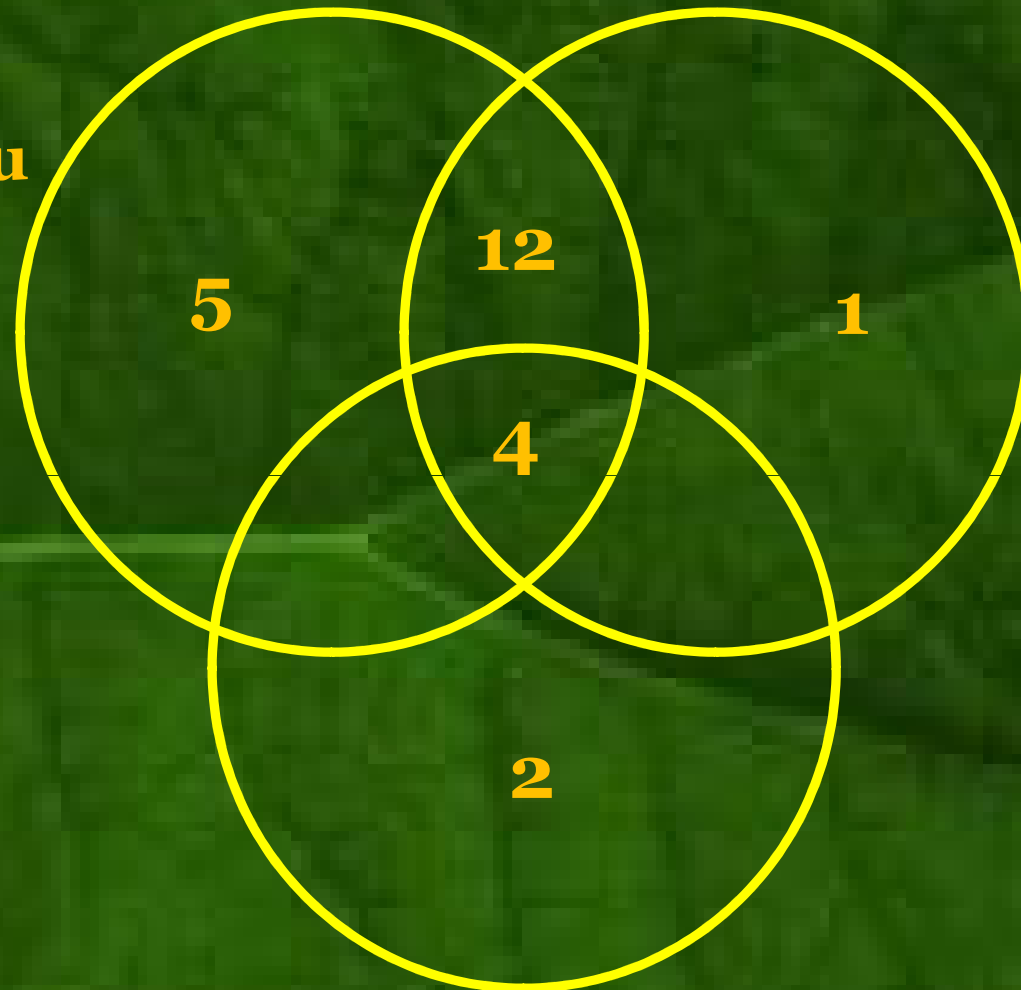
Uniqueness of the new project proposals

- ✓ **Tree improvement programme initiated for new species such as *Thespesia populnea*, *Macaranga peltata*, *Grevellia robusta* & *Gmelina arborea***
- ✓ **Addresses restoration of mangroves affected by tectonic plate movement**
- ✓ **Development of methodology for converting plantations to natural forests**
- ✓ **Covers seven new species for study**
- ✓ **New problems like weed management, reclamation of problematic areas, conservation & recovery of critically endangered species, database for fast growing species have been addressed.**

Uniqueness of the new project proposals

Tamil Nadu
(21)

Kerala
(17)



**Andaman &
Nicobar Islands** **(6)**

Future of forestry research

- **21st century forestry is about understanding and managing complexity.**
- **There are still great number of unanswered questions about future of forestry**
- **Looking for new ways about the subject & its problems, improving site specific & issue specific solutions through an array of modern tools, techniques and ideas are essential**
- **This calls for sharing of information from all stakeholders.**

A photograph of a dense forest of tall, mature trees with thick canopies against a clear blue sky. The trees are mostly deciduous with vibrant green leaves. The perspective is looking upwards, emphasizing the height of the trees. The text 'THANK YOU' is overlaid in white, serif font at the bottom center.

THANK YOU